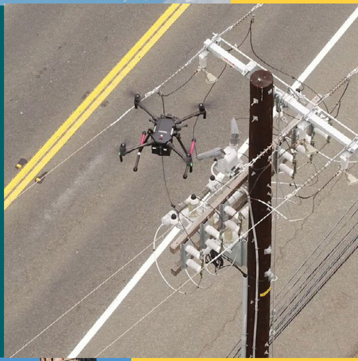


2021 WILDFIRE MITIGATION PLAN UPDATE (REVISION)

June 3, 2021

CONTENTS

Executive Summary

Southern California Edison Company is dedicated to the safety of our customers and the communities we serve. In this report, we set forth our update to the Commission-approved 2020-2022 Wildfire Mitigation Plan (WMP). Our 2021 WMP Update builds on the successes of our WMP implementation to date, incorporates the lessons we learned during WMP deployment and reflects the continued progress we made in our analytical, engineering and process maturity in 2020.

In recent years, Californians have increasingly experienced unprecedented and destructive wildfires that have threatened their lives, livelihoods and communities. 2020 was the worst year on record, with nearly 10,000 fires burning over 4.2 million acres and consuming about 4% of all land in California, which served as a stark reminder that evolving climate change brings more extreme weather and impacts. Prolonged periods of high temperatures and drought, record-high winds and lightning storms, significant buildup of dry fuel, and continued development in the wildland urban interface are increasing the number of wildfires and making them more dangerous. Action, collaboration and partnership among utilities, regulators, communities, agencies and other stakeholders focused on reducing the probability and consequence of wildfires continue to be of paramount importance.

Despite the challenges posed by the COVID-19 pandemic, we met or exceeded nearly all the goals in our 2020 plan. We installed over 960 circuit miles of covered conductor, over 6,000 fire-resistant poles and 590 weather stations while removing more than 12,200 hazard trees that could fall into power lines and lead to ignitions.

Our 2021 WMP Update proposes:

- Additional grid hardening,
- Enhanced inspection and repair programs,
- Continuation of aggressive vegetation management,
- Increased situational awareness and response, and
- Augmented activities for Public Safety Power Shutoff (PSPS) resilience and community engagement, particularly for underrepresented groups and our access and functional needs (AFN) customers.

This WMP update also outlines how we have matured in our wildfire mitigation capabilities and our long-term plan to further advance our risk-informed decision-making, data management, grid hardening and community engagement before, during and after wildfire-related events.

While we have made considerable progress, we continue to look for opportunities to improve. We want to thank California's leadership — lawmakers and various agency personnel — for addressing this critically important public safety issue. We are proud of our partnership with local governments, first responders and the general public, who have come together to further reduce the risk of potentially devastating wildfires.

SCE’s Foundational Wildfire Mitigation Plan Progress

	Completed in 2020	Completed Since 2018	2021-22 Forecasts
Covered Conductor	More than 960 circuit miles installed	More than 1,480 circuit miles installed	Install 1,000 circuit miles in 2021 and 1,600 circuit miles in 2022. Scope will be added if feasible.
Undergrounding	Identified 17 miles for 2021-22	Performed detailed risk and engineering analyses and identified targeted scope	Approximately 4-6 miles in 2021 and 11 miles in 2022; examine ways to make undergrounding a more feasible long-term wildfire mitigation solution
High Fire Risk Inspections and Remediations	Inspected more than 199,000 distribution structures and 35,500 transmission structures; performed corresponding repairs and replacements within due dates	Completed more than 584,000 inspections on distribution structures and 86,000 inspections on transmission structures; performed corresponding repairs and replacements within due dates	Risk-informed ground & aerial inspection program to inspect over 160,000 distribution structures and over 16,000 transmission structures annually; option to inspect additional areas of concern
Vegetation Management	Maintained line clearance, completed approximately 99,500 hazard tree assessments and over 12,200 tree removals, cleared brush at base of over 230,000 poles	Expanded line clearance to recommended distances where feasible, completed over 228,000 hazard tree assessments and 18,000 removals, expanded pole brushing to almost all high fire risk area distribution poles	Continue expanded line clearances; focus on hazard tree assessments and timely removal; brush clearing at base of 200,000-300,000 poles
Weather Stations	More than 590 installed	More than 1,050 installed	375 weather stations per year. Additional scope being evaluated
HD Cameras	5 installed	166 installed. Deployment complete across HFRA	No additional scope currently
Sectionalizing Devices	49 devices installed	More than 100 devices installed	Evaluating circuits that would benefit from further sectionalization
Fast-Acting Fuses	3,025 fuses installed	More than 12,900 fuses installed	Install 330-500 fuses per year
Backup Resiliency Programs	Launched Critical Care Battery Backup Program and pilot programs including well water generator rebates, residential portable power rebate, resiliency zones and customer equipment resiliency microgrid (1 site)	Progressed in understanding customer- and community-specific needs and developed targeted programs to support critical care Medical Baseline customers and communities frequently impacted by PSPS	Expand the Battery Backup program to Medical Baseline customers in high fire risk areas who are income qualified. Scale pilot programs based on learnings

SCE's WMP Reaffirms Our Commitment to Wildfire Mitigation and PSPS Resilience

The primary objective of our WMP is to safeguard public safety. This update includes an actionable, measurable and adaptive plan for 2021 and 2022 to reduce the risk of potential wildfire-causing ignitions associated with our electrical infrastructure in high fire risk areas (HFRA).

At the same time, we are intensely aware of the impact of planned WMP work and PSPS events on our customers and communities, especially when compounded with the restrictions and disruptions from the COVID-19 pandemic. Our WMP aims to strike the appropriate balance between mitigating the risk of wildfires and these inevitable challenges, and we are committed to enhanced transparency, communication, coordination and resiliency to help mitigate the hardships caused by de-energization events.

Other key objectives of our WMP include:

- Increasing the resilience of our infrastructure to help minimize service disruptions during fires, regardless of ignition source
- Improving fire agencies' ability to detect and respond to emerging fires
- Improving coordination between utility, state and local emergency management personnel
- Reducing the impact of wildfires and wildfire mitigation efforts, including PSPS
- Effectively engaging the public about preparing for, preventing, and mitigating wildfires in our HFRA

In 2020, we successfully concluded or operationalized several WMP activities.[1] We have also added seven activities based on updated engineering assessments, ignition risk analysis and community feedback. Our 2021 WMP Update includes 39 activities that underscore our commitment to allocate significant resources to further reduce the risk of wildfires and support our communities.[2] We highlight some of the key activities for each of our wildfire mitigation capabilities below that were, in part, shaped by the successes and lessons learned since we started our targeted wildfire mitigation efforts in 2018.

Grid Design and System Hardening: Expanded Measures Are Expected to Further Reduce Wildfire Risk From Overhead Electric Systems

Covered conductor deployment continues to be one of our most important wildfire mitigation activities. We have deployed nearly 1,500 circuit miles of covered conductor to date and plan to deploy over 1,000 circuit miles of covered conductor in 2021. By the end of 2022, we expect to replace over 4,000 circuit

[1] A few activities such as quality control for detailed inspections in HFRA and vegetation management have been incorporated as part of our on-going operations and are no longer included as WMP activities. Evaluation of new technologies continues to be included, but not as WMP activities since their ignition or PSPS risk-reduction benefits have not yet been validated. To streamline our presentation, we have grouped some activities that work together to provide wildfire or PSPS mitigation benefits. An example is consolidating ground detailed inspections, aerial detailed inspections and repairs or replacements based on the results of these inspection programs, as they work hand-in-hand to address asset conditions that pose ignition risks. Please see Appendix 9.3 for a detailed comparison of previous and current WMP activities.

[2] We have worked diligently to provide complete responses to the WMP requirements regarding these activities and other information. However, given the timing of ongoing final validation of 2020 data, such as financial and outage information, we note that the information provided in some instances should be considered preliminary. If there are any material changes based on further review, SCE will promptly notify the Commission of these changes.

miles or approximately 40% of distribution primary overhead conductors in HFRA. Though wildfire risk reduction has been the primary criterion for prioritizing where covered conductor is installed, we are also assessing circuit segments where covered conductor installation can mitigate the need for PSPS de-energizations. Wood poles in HFRA are being replaced with fire-resistant poles or poles with fire-resistant wrapping as well. We are undergrounding circuit segments based on several factors, including their PSPS history, limited egress routes, terrain and community feedback. Though the 2021 scope is selective due to high costs and long construction lead times, we are examining ways to make undergrounding a more feasible long-term wildfire mitigation solution. We are adding three new system hardening initiatives — remediation of long conductor spans at risk of conductor clashes, replacement of C-Hooks installed on transmission structures and replacement of vertical switches — identified through engineering analysis, risk-informed inspection in HFRA and learnings from recent wildfire events elsewhere in California. In addition, we are planning the deployment of a microgrid pilot to provide backup power during PSPS.

Asset Management and Inspections: Structures Responsible for 99% of the Wildfire Risk Will Be Inspected

We perform risk-informed inspections and remediations in HFRA that go beyond compliance requirements in scope, frequency and approach. Asset conditions and location-specific fire risks change often between multiyear compliance cycles for inspection. Even with annual inspections, potential ignition risks found each cycle, underscore this program's efficacy. Detailed ground and aerial inspections are conducted to obtain 360-degree views of overhead structures and equipment. Repairs or replacements based on safety, reliability or ignition risks identified, are completed within the pre-established compliance timelines. In 2021, nearly 60% of distribution and approximately 50% of transmission structures in HFRA will be inspected. The assets included in these inspections account for 99% of the wildfire risk in HFRA. In 2020, based on the emergent risks during the fire season, supplemental inspections were needed in targeted locations with high dry fuel- and wind-driven risks to further reduce the probability of ignitions. For 2021, we are including the option for such targeted reinspection of assets based on observed risk factors associated with prevailing weather and fire conditions. We are also developing and implementing mobile inspection tools and data management systems to improve inspection data quality and reduce inspection cycle time.

Vegetation Management: New Platform Will Increase Efficiency and Enable Advanced Analytics

Given the importance of vegetation management to reduce the risk of wildfires, we are continuing our multipronged approach, to reduce vegetation contact with electrical lines and equipment by not only maintaining line clearances, but also by remediating trees that can fall into lines and removing brush around our poles. Furthermore, we are investing in an integrated software platform that will help streamline scheduling and processing of the enormous volumes of work, improve data management and facilitate advanced analytics and predictive modeling across all vegetation management activities.

Situational Awareness and Weather Forecasting: Additional Weather Stations, Satellite Imagery and Advanced Technology Will Boost Capabilities

We continue to advance our weather modeling and situational awareness capabilities to better understand wildfire risks and more precisely target PSPS de-energization events to affect as few customers as possible, while still addressing dangerous fire threat conditions. Since program inception in 2018, we have installed more than 1,000 weather stations in our HFRA. In 2021, we will continue to progressively deploy hundreds of additional weather stations to further our predictive modeling capabilities regarding potentially dangerous winds and elevated fire potential. We are also implementing a host of technology advancements in 2021, such as a next-generation weather modeling system and integration of satellite imagery to collect additional information on weather, fuels and fire activity. In addition to our weather-related situational awareness initiatives, we are also seeking to improve the monitoring of potential issues on our system through advanced Early Fault Detection technologies.

Grid Operations and Protocols: Resources Dedicated to Refining Circuit-Specific Measures

We are continuing to assess and adjust our operational protocols to prepare for extreme fire risk events, including circuit-specific plans for sectionalization, equipment settings and patrols ahead of potential PSPS events. This includes a dedicated and trained incident management team (IMT), heightened efforts on community engagement and customer communication before, during and after events, as well as an expanded customer care program. Additional details about our PSPS-related efforts are described in more detail below.

Emergency Planning and Preparedness: Trained Workforce Is Ready to Restore Power and Assist Customers

We remain prepared to serve our customers and help them face emergencies that disrupt their electrical service. In the event of a major emergency, we have a dedicated customer support team to assist impacted customers. Our highly qualified workforce is trained on protocols to restore power safely and quickly after de-energization events. We have a process in place to learn about our performance, and improve on our responses. We discuss this in more detail below.

Stakeholder Cooperation and Community Engagement: Strong Partnerships Increase Outreach to Hard-to Reach Customer Groups, Provide Aerial Resources for Fire Agencies

We are working ever-more closely with our customers, local and tribal government agencies, fire agencies, community-based organizations (CBOs) and other utilities on emergency planning, incident management and outreach. In 2020, we:

- Conducted nine virtual community meetings
- Held PowerTalks with residential and business customers to provide information on outages and outage management
- Led resiliency workshops for water agencies, telecommunication companies and school districts
- Met with government and business associations to discuss their concerns and offer solutions
- Developed strong partnerships with approximately 50 CBOs to increase the effectiveness of our customer outreach, especially for hard-to-reach groups

In 2021, we are targeting much of our engagement efforts on communities heavily impacted by PSPS and actively evaluating and refining our stakeholder coordination and customer outreach approaches based on feedback on 2020 events. We have instituted a formal feedback process to help us incorporate specific critiques and recommendations.

Despite California's investment in firefighting resources, 2020 underscored the strain put on fire agencies with the growth of large fires. After a successful limited-scale partnership with the Orange County Fire Authority in 2020, we are partnering with the fire agencies in our service area to provide temporary mitigation of up to five aerial resources such as helitankers to bolster firefighting capabilities, primarily to protect electrical infrastructure during fires for service resilience to our customers.[3]

Risk Assessment and Mapping: Improved Risk Models and Incorporating PSPS Risks Will Help Prioritize Work Even More Effectively

In 2020, we met some significant milestones in enhancing our risk analytics. We integrated our enterprise-level risk modeling approach with the asset- and location-specific risk models, transitioned to a new ignition consequence modeling tool that uses expanded historical data at higher granularity and developed asset-specific probability of ignition models for transmission and sub-transmission assets in addition to the distribution asset models built previously. Furthermore, we supplemented our wildfire risk model to include PSPS as part of the overall risk, thus more accurately accounting for risks impacting our customers and risk reduction associated with our wildfire mitigation activities. These improvements enable us to drive consistent risk-informed decision-making at the enterprise and activity levels, help us more accurately estimate risk along the grid and risk to our communities and better target how much work to do where and when.

Resource Allocation Methodology: Risk Analysis Along with Operational Considerations Help Us Direct Our Resources

We have performed risk-reduction and risk-spend efficiency (RSE) calculations using the granular approach mentioned in Risk Assessment and Mapping above. This provides a more accurate understanding of relative risk buy down with any WMP activity and enables us to more consistently evaluate the relative risk-reduction benefits of our portfolio of WMP activities. We are using the results of our risk analyses to make more informed decisions when validating selected wildfire mitigation activities and prioritizing resource allocation within a WMP activity. We note that RSE, while an important and valuable input, is not, and should not, be the only factor used to develop or execute a risk mitigation plan. The RSE metric does not account for certain operational realities, including planning and execution lead times, resource constraints, work management efficiencies, ability to target specific risk drivers and regulatory compliance requirements. We consider these additional factors while determining the type and volume of work undertaken to reduce wildfire and PSPS risks in a timely manner.

Data Governance: Focus on Data Quality Will Enable Next-Generation Geospatial and Risk Analytics and Automated Processing of Inspection Images

We are enhancing our data quality and consistency, enabling next-generation geospatial and risk analytics and automating data sharing and reporting capabilities by developing a centralized cloud-based data repository and data platform that integrates information from disparate sources. This will also enhance our data management capability and enable automated processing of asset inspection images, thereby increasing efficiency and reducing human error. For example, just in 2020, our aerial inspections generated approximately 5 million images. Having centralized geospatial data eliminates the need to extract and consolidate data for each instance of data-sharing and enables standardization and automation of reports. Going forward, we can store such large and growing volumes of data, increase the

[3] Between Oct. 1 – Dec. 15, 2020, the leased Coulson-Unical CH-47 helitanker made 145 water drops (308,000 gallons) over four fires.

accuracy and productivity of image analysis to determine repairs and replacements needed and enhance our risk modeling capabilities using higher quality asset condition information.

SCE is Determined to Improve PSPS Protocols and Mitigate PSPS impacts

PSPS is a necessary mitigation to protect public safety under extreme conditions that we use as a last resort. We recognize and appreciate the impact of PSPS events on our customers. Keeping the lights on, and everything else electricity powers, is in our DNA, and we do not take lightly any decision to proactively de-energize portions of the grid. Though the frequency and scope of PSPS events are expected to lessen as we execute our WMP activities, PSPS will have to remain available as a tool to mitigate wildfire risk during severe weather and high Fire Potential Index events. In 2019 and 2020, our post-patrols found approximately 60 incidents of wind-related damage that could have potentially caused ignitions, and there were likely many more that could not be observed after the events.

Our highly trained PSPS IMT plans and executes our PSPS protocols designed to maximize effectiveness while reducing the negative impacts to customers, by limiting de-energizations to specific circuit segments and facilitating the swift and safe restoration of power. In 2020, we transitioned to a dedicated IMT model for knowledge continuity and operational consistency from event to event and to help focus on continuous improvement between events.

By all accounts, 2020 was an extreme weather and fire season. In fact, five of the six largest wildfires in California's history took place last year and average rainfall totals across Central and Southern California remained 50%-75% below normal through mid-January 2021. Such drought conditions, coupled with exceedingly low fuel moisture and very strong wind gusts, increased the risk for ignition and spread of catastrophic wildfires, putting us on alert for, and at times necessitating, PSPS events. Firefighting resources were strained in our service area and across the state, and the dry fuels accumulation increased the potential consequence of any ignition. The threats posed by these abnormal weather conditions meant that many customers were affected on multiple occasions, including holidays and while customers were trying to work and attend classes from home in compliance with stay-at-home orders.

Despite the adverse conditions, 2020 demonstrated the extraordinary efforts of the women and men of our company to prepare for and conduct necessary PSPS to protect life and property, partner with communities, fire agencies and other stakeholders and support our customers in time-tested, novel and sometimes individualized ways. Compared to 2019, we were able to reduce the average duration of PSPS events by 33% and customer minutes of interruption by 22%. Of the circuits de-energized in 2019, 46% did not experience PSPS in 2020. We also considerably increased utilization of sectionalization devices to limit the scope of PSPS and the largest event in 2020 impacted 38% fewer customers than the largest event in 2019.

We are investing in enhanced circuit mitigations, customer care, external communication, notification processes and technologies. This includes expanding circuit-specific grid hardening and PSPS mitigation plans, especially for frequently impacted circuits. For example, our current plans for 2021 include installation of covered conductor on more than 100 circuit segments that were de-energized during PSPS events. We are assessing potential expansion of this scope. We are also refining our PSPS thresholds informed by improved weather and fire modeling along with completed grid hardening. In 2020, we contracted with 56 Community Resource Centers, an increase of 300% over 2019, and deployed eight Community Crew Vehicles to provide information and services to customers during PSPS de-energization events and will continue to provide this support in 2021. In this upcoming year, we are expanding our customer care portfolio to better support Medical Baseline customers and help with community resiliency zones. We are redesigning our grid protocols and customer notifications processes to address specific concerns and feedback from county partners and are collaborating with heavily impacted communities for education, outreach and critical infrastructure planning support to help other entities providing critical services be more resilient as well.

Of the customers who experienced PSPS de-energizations in 2020, approximately 27,000 fewer customers are expected to experience PSPS events in 2021 under the same weather conditions. Almost half of these customers are not expected to experience PSPS again.

Notwithstanding improved PSPS operations, more of our customers experienced PSPS de-energizations in 2020 largely due to weather, and our communication efforts did not meet the needs and expectations of our customers and agency partners. In light of recent feedback, we are taking a fresh and hard look at finding ways to further reduce PSPS de-energizations and meet community and regulatory expectations in terms of sharing our PSPS decision-making approach; keeping our customers informed more effectively; improving communication and coordination with regulators, local governments, fire agencies and other partners; and providing our customers, especially Medical Baseline and AFN customers, with more resiliency options and financial help. The action plan that was submitted on Feb. 12, 2021 provided details on the concrete steps we will take to deliver tangible improvements (see Section 9.11 for the PSPS Corrective Action Plan). We can and will do better going forward.

Further Advancements in SCE's Wildfire Capability Maturity Expected Through 2025

We have made great strides in developing our wildfire mitigation capabilities, going beyond minimum regulatory requirements in several key areas, increasingly relying on data and advanced analytics to plan and prioritize resource allocation for wildfire risk mitigation and establishing robust operational processes for planning, preparedness and stakeholder engagement. For example, we have incorporated risk, as determined by predictive modeling of equipment failure and consequences, to schedule inspections. We are maintaining our advanced capabilities in several areas, including emergency planning and preparedness. One of the critical areas we are focusing on this year and the near future is better data management, advanced analytics and automation that will be foundational to our continued progress in grid hardening, asset management, vegetation management and grid operations among other activities.

We continue to support the refinement and utilization of a wildfire mitigation capability maturity model. It can help identify, share and continually improve a suite of best practices and lessons learned to combat the growing risk of wildfires. Our responses to the survey questions for 2021 maturity reflect the progress we made in 2020 along with a clearer understanding of the Wildfire Safety Division's (WSD) intent in these questions. Our assessment of our expected 2023 capability maturity assumes full deployment of the activities proposed in this WMP update. As outlined in our long-term plan for wildfire mitigation, we expect to achieve high maturity across all categories by 2025. We agree with the WSD's goal of transitioning from compliance-based activities to risk-informed planning and execution; it is therefore critically important to conduct an assessment of the current regulatory structure and processes for scope and funding approval of risk mitigation activities, to achieve higher levels of maturity.

In 2020, the inaugural process for developing the maturity model and the compressed timelines for various WMP-related regulatory activities did not afford incorporation of participant comments. We look forward to a public process working with the WSD to modify and refine this survey and the scoring mechanism for subsequent cycles to better align with a shared understanding of utility operations and the necessary evolution of wildfire mitigation capabilities in California. This is especially important as the capability maturity model is an important consideration for developing and executing our long-term WMP, which requires significant resources, funding allocation and long execution lead times in some areas.

SCE Drives Improvements Through Appropriate Use of Metrics

Metrics and underlying data are critical components for WMP development, execution and evaluation, but we continue to emphasize that the near-term focus should be on efficient implementation of our planned activities, while the assessment of whether the activities are having the desired and expected impact on risk reduction should be measured over a longer time horizon. A clear distinction is necessary between metrics that can help monitor compliance with approved WMPs and those that can help evaluate the effectiveness of these approved plans and inform future WMP updates.

As in 2019 and 2020, we provide annual program targets for each WMP activity, which establish goals to evaluate compliance. As stated in previous filings and submittals, tracking program targets for approved WMPs is the best means of determining progress and assessing WMP compliance in the near term.

We previously proposed a few outcome-based or effectiveness metrics that we believe our mitigations will help improve, and when normalized for weather and other exogenous factors and analyzed for trends, can be used to measure the efficacy of our wildfire mitigation work and inform any required modifications. These metrics include CPUC reportable ignitions, faults and energized downed wire events in HFRA along with the number of customers impacted, average duration of PSPS events and timeliness and accuracy of PSPS notifications. Prudent grid operations, maintenance and upgrades will not eliminate risk entirely, but over time and cumulatively, will result in an overall improvement in these outcome-based metrics. These metrics, however, cannot be used to measure progress or compliance per approved plans in the short term. Other metrics such as safety incidents, acres burned or structures destroyed, though important to understand and drive California's fire mitigation efforts, are impacted by factors and circumstances such as climate change, fire-suppression efforts and fire response, that are largely outside of the utility's control. Therefore, only applicable outcome-based metrics should be selected for WMPs.

We look forward to collaborating with the WSD, utilities and other stakeholders to agree on how the outcome-based metrics should be appropriately measured and used to draw pertinent conclusions.

We Will Remain Adaptable in 2021 to Improve and Address Emergent Issues

Our understanding of wildfire and PSPS risks and the efforts we need to undertake to effectively mitigate these risks has evolved over the last year based on new information and stakeholder feedback and analysis, as discussed above. The scope and cost forecasts for 2021 and 2022 in this update are therefore different from what we set forth in our 2021 General Rate Case (GRC) filed in August 2019 and our 2020 WMP submitted in February 2020. We remain flexible to incorporate the guidance in our pending 2021 GRC Decision and hope and expect that the cost recovery mechanism approved there will reflect the dynamic scope of activities envisioned by the WMP annual update and change order processes. We will continue to reevaluate asset- and location-specific risks, benefits and mitigation needs, and will modify or adjust our plan accordingly to better utilize constrained resources and funds for risk reduction. Though regulatory and stakeholder expectations regarding wildfire mitigation continue to increase, we are always looking for operational efficiencies, and that aim — to prudently execute the appropriate scope of work — is no different for our wildfire mitigation activities.

Finally, as evidenced in 2020, unexpected challenges such as the COVID-19 pandemic may require us to change the work we do and how we do it, and we commit to vigilance and flexibility to meet emergent needs of our customers and the grid that serves them.

Conclusion

The 2020 wildfire season clearly demonstrated the continued urgency of wildfire prevention, response and emergency preparedness. Our employees work hard to help protect our customers and communities from the threat of wildfires. Despite the challenges presented by the pandemic, we met or exceeded nearly all the goals in our 2020 plan.

At the same time, we know there are areas for improvement and more work to be done. Our 2021 WMP Update builds upon our Grid Safety and Resilience Plan, previous WMPs and our 2021 GRC proposal, incorporating progress made and lessons learned regarding wildfire mitigation since 2018. It includes additional inspections and remediations in targeted areas based on emergent fire weather conditions, augmenting our system hardening activities to target higher-risk conductor spans, switches and hardware, providing aerial fire-suppression resources such as helitankers to fire agencies and establishing central data platforms for next-generation data analytics and governance. It provides a plan that effectively demonstrates prudent operation of the grid and customer care with measurable and actionable targets.

We are committed to finding opportunities to reduce the impacts of PSPS events on our customers. With another year of PSPS data to work with, we will continue to review opportunities to accelerate mitigations for circuits that are frequently subject to PSPS events so we can reduce the size, frequency and duration of these events. We will be expanding our battery backup program to include all income-qualified Medical Baseline customers in addition to critical care customers. Community outreach will continue, especially to AFN customers, emphasizing both PSPS readiness and emergency preparedness.

We look forward to continuing to work with state policymakers, local government officials, CBOs and other stakeholders to build a more resilient California.

1 PERSONS RESPONSIBLE FOR EXECUTING THE WMP

Provide contact information of the responsible person(s) executing the plan, including

- *Executive level with overall responsibility, with position title and contact information (telephone and email).*
- *Program owners, individually identified with position title contact information (telephone and email) specific to each component of the plan*

Due to the broad nature of the work being outlined in this WMP, multiple Organizational Units within SCE are responsible for executing the specific wildfire activities. The accountable areas include Transmission & Distribution (T&D), Customer Service, Safety, Security, & Business Resiliency, and Generation. Overarching execution and oversight of this WMP is provided under the direction of Steve Powell, Executive Vice President of Operations.

The program owners of the components of SCE's wildfire mitigation strategies and programs are outlined below by the WMP initiatives and subsections in Section 7.3.1, which includes the details of SCE's wildfire mitigation activities. The data and descriptions included in Chapters 2 through 6 and Chapter 8 support these WMP activities. Certain subsections in Section 7.3.1 do not have specific wildfire activities but have important supporting roles. Therefore, they are included in Table SCE 1-1[4] and reference multiple organizational units due to the cross-functional nature of several of those sections.

Table SCE 1-1
2021 Wildfire Mitigation Initiatives by Operating Unit and Department

Wildfire Mitigation Initiatives	Program Owner(s)	Contact Information
Overall WMP Oversight	• Steve Powell, Executive Vice President, Operations	• (626) 302-7834 Steve.Powell@sce.com
7.3.1 – Risk Assessment and Mapping	• Robert LeMoine, Director (Enterprise Risk Management & Insurance) • Jose Goizueta, Director (T&D-Asset Management, Strategy & Engineering (AMSE))	• (626) 302-4476 Robert.F.LeMoine@sce.com • (909) 274-1133 Jose.Ramon.Goizueta@sce.com

[4] In this WMP, SCE has included several of its own tables and figures separate from Tables 1-12 included in the Guidelines. Because the Guidelines tables are numbered in sequence without regard to the WMP numerical sections, SCE's tables and figures are labeled Table SCE and Figure SCE and then the first number in the section they appear, i.e., Table SCE 1, Table SCE 5, etc., in order to differentiate between the tables required in the Guidelines and SCE's tables and for consistency regarding figures.

Wildfire Mitigation Initiatives	Program Owner(s)	Contact Information
7.3.2 – Situational Awareness and Forecasting • Weather Stations (SA-1) • Fire Potential Index (FPI) (SA-2) • Weather and Fuels Modeling System (SA-3) • Fire Spread Modeling (SA-4) • Fuel Sampling Program (SA-5) • Remote Sensing / Satellite Fuel Moisture (SA-7) • Fire Science Enhancements (SA-8) • Distribution Fault Anticipation (DFA) (SA-9)	Donald Daigler, Director (Safety, Security & Business Resiliency) (SA-1, 2, 3, 4, 5, 7, 8) • Russell Ragsdale, Director (T&D-Asset Management, Strategy & Engineering) (SA-9)	• (626) 302 1389 Donald.Daigler@sce.com • (626) 302-3133 Russell.Ragsdale@sce.com
7.3.3 – Grid Design and System Hardening • Covered Conductor (SH-1) • Undergrounding Overhead Conductor (SH-2) • Branch Line Protection Strategy (SH-4) • Installation of System Automation Equipment – Remote Controlled Automatic Recloser/Remote Controlled Switch (RAR/RCS) (SH-5)	• Russell Ragsdale, Director (T&D-Asset Management, Strategy & Engineering) (SH-1, 2, 4, 5, 6, 7, 8, 10, 12, 13, 14) • Jim Buerkle, Director (Generation) (SH-11)	• (626) 302-3133 Russell.Ragsdale@sce.com • (626) 302-0500 Jim.Buerkle@sce.com

Wildfire Mitigation Initiatives	Program Owner(s)	Contact Information
• Circuit Breaker Relay Hardware for Fast Curve (SH-6) • Circuit Evaluation for PSPS-Driven Grid Hardening Work (SH-7) • Transmission Open Phase Detection (SH-8) • Tree Attachment Remediation (SH-10) • Legacy Facilities (SH-11) • Microgrid Assessment (SH-12) • C-Hooks (SH-13) • LSI (SH-14) • Vertical Switches (SH-15)		
7.3.4 – Asset Management and Inspections • Distribution Ground / Aerial Inspections and Remediations (IN-1.1) • Transmission Ground / Aerial Inspections and Remediations (IN-1.2) • Infrared Inspection of Energized Overhead Distribution Facilities and Equipment (IN-3) • Infrared Inspection, Corona Scanning, and High Definition Imagery of Energized Overhead Transmission Facilities and Equipment (IN-4) • Generation Inspections and Remediations (IN-5)	• Raymond Fugere, Principal Manager (T&D-Asset Management, Strategy & Engineering) (IN-1.1, 1.2, 3, 4, 8) • Jim Buerkle, Director (Generation) (IN-8)	• (909) 274-6340 Raymond.Fugere@sce.com • (626) 302-0500 Jim.Buerkle@sce.com

Wildfire Mitigation Initiatives	Program Owner(s)	Contact Information
• Inspection Work Management Tools (IN-8)		
7.3.5 – Vegetation Management and Inspections • Hazard Tree Management Program (VM-1) • Expanded Pole Brushing (VM-2) • Expanded Clearances for Legacy Facilities (VM-3) • Dead and Dying Tree Removal (VM-4) • VM Work Management Tool (Arbora) (VM-6)	• Melanie Jocelyn, Principal Manager (T&D-Compliance & Operational Support) (VM-1,2,4,6) • James Buerkle, Director (Generation) VM-3	• (909) 274-1236 Melanie.Jocelyn@sce.com • (626) 302-0500 Jim.Buerkle@sce.com
7.3.6 – Grid Operations and Protocols • Customer Care Programs (PSPS-2)	• Donald Daigler, Director (Safety, Security & Business Resiliency) • Jessica Lim, Principal Manager (Customer Service – Customer Programs and Services)	• (626) 302 1389 Donald.Daigler@sce.com • (626) 302-0819 Jessica.Lim@sce.com
7.3.7 – Data Governance • Wildfire Safety Data Mart and Data Management (WiSDM/Ezy) (DG-1)	• Ranbir Sekhon, Director (Business Transformation) • Donald Daigler, Director (Safety, Security & Business Resiliency) • Russell Ragsdale, Director (T&D-Asset Management, Strategy & Engineering) • Jose Goizueta, Director (T&D-Asset Management, Strategy & Engineering) • Raymond Fugere, Principal Manager (T&D-Asset Management, Strategy & Engineering)	• (626) 302-1649 Ranbir.Sekhon@sce.com • (626) 302 1389 Donald.Daigler@sce.com • (626) 302-3133 Russell.Ragsdale@sce.com • (909) 274-1133 Jose.Ramon.Goizueta@sce.com • (909) 274-6340 Raymond.Fugere@sce.com

Wildfire Mitigation Initiatives	Program Owner(s)	Contact Information
7.3.8 – Resource Allocation Methodology	• Robert LeMoine, Director (Enterprise Risk Management & Insurance) • Dana Cabbell, Director (T&D-Integrated System Strategy)	• (626) 302-4476 Robert.F.LeMoine@sce.com • (909) 274-1588 Dana.Cabbell@sce.com
7.3.9 – Emergency Planning & Preparedness • SCE Emergency Response Training (DEP-2)	• Donald Daigler, Director (Safety, Security & Business Resiliency) • Jessica Lim, Principal Manager (Customer Service-Customer Programs and Services)	• (626) 302-1389 Donald.Daigler@sce.com • (626) 302-0819 Jessica.Lim@sce.com
7.3.10 – Stakeholder Cooperation and Community Engagement • Customer Education and Engagement – Community Meetings (DEP-1.2) • Customer Education and Engagement – Marketing Campaign (DEP-1.3) • Customer Research and Education (DEP-4) • Aerial Suppression (DEP-5)	• Donald Daigler, Director (Safety, Security & Business Resiliency) (DEP-5) • Jessica Lim, Principal Manager (Customer Service-Customer Programs and Services) (DEP-1.2, 1.3, 4)	• (626) 302-1389 Donald.Daigler@sce.com • (626) 302-0819 Jessica.Lim@sce.com

1.1 VERIFICATION

Complete the following verification for the WMP submission:

Rule 1.11 Verification

I am an officer of the applicant corporation herein, and am authorized to make this verification on its behalf. The statements in the foregoing document are true of my own knowledge, except as to matters which are therein stated on information or belief, and as to those matters I believe them to be true.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 5th of February, 2021.

Steven Powell

Steve Powell

Executive Vice President of Operations

SOUTHERN CALIFORNIA EDISON COMPANY

2244 Walnut Grove Avenue

Rosemead, CA 91770

2 ADHERENCE TO STATUTORY REQUIREMENTS

Section 2 comprises a "check list" of the CPUC Code Sec. 8386 (c) requirements and subparts. Each utility shall both affirm that the WMP addresses each requirement AND cite the Section or Page Number where it is more fully described (whether in Executive Summary or other section of the WMP).

Mark the following table with the location of each requirement. If requirement is located in multiple areas, mention all WMP sections and pages, separated by semi-colon (e.g., Section 5, pg. 30-32; Section 7, pg. 43)

(22) Cites Any other information that the Wildfire Safety Division might require.

Table 2-1
Adherence to Statutory Requirements

Require-ment	Description	WMP Section
1	An accounting of the responsibilities of persons responsible for executing the plan	Chapter 1
2	The objectives of the plan	Section 5.2
3	A description of the preventive strategies and programs to be adopted by the electrical corporation to minimize the risk of its electrical lines and equipment causing catastrophic wildfires, including consideration of dynamic climate change risks	Sections 4.2, 5.2, 7.1, 7.3
4	A description of the metrics the electrical corporation plans to use to evaluate the plan's performance and the assumptions that underlie the use of those metrics	Chapter 6
5	A discussion of how the application of previously identified metrics to previous plan performances has informed the plan	Section 4.1
6	Protocols for disabling reclosers and deenergizing portions of the electrical distribution system that consider the associated impacts on public safety. As part of these protocols, each electrical corporation shall include protocols related to mitigating the public safety impacts of disabling reclosers and deenergizing portions of the electrical distribution system that consider the impacts on all of the aspects listed in PU Code 8386c	Section 7.3.6.1
7	Appropriate and feasible procedures for notifying a customer who may be impacted by the deenergizing of electrical lines, including procedures for those customers receiving a medical baseline allowance as described in paragraph (6). The procedures shall direct notification to all public safety offices, critical first responders, health care facilities, and operators of telecommunications infrastructure with premises within the footprint of potential deenergization for a given event	Sections 8.2, 8.4
8	Plans for vegetation management	Sections 5.2, 5.4, 7.1, 7.2, 7.3.5

9	Plans for inspections of the electrical corporation's electrical infrastructure	Sections 5.2, 5.4, 7.1, 7.2, 7.3.4
10	Protocols for the deenergization of the electrical corporation's transmission infrastructure, for instances when the deenergization may impact customers who, or entities that, are dependent upon the infrastructure	Section 8.13
11	A list that identifies, describes, and prioritizes all wildfire risks, and drivers for those risks, throughout the electrical corporation's service territory, including all relevant wildfire risk and risk mitigation information that is part of the Safety Model Assessment Proceeding and the Risk Assessment Mitigation Phase filings	Section 4.3
12	A description of how the plan accounts for the wildfire risk identified in the electrical corporation's Risk Assessment Mitigation Phase filing	Section 4.3
13	A description of the actions the electrical corporation will take to ensure its system will achieve the highest level of safety, reliability, and resiliency, and to ensure that its system is prepared for a major event, including hardening and modernizing its infrastructure with improved engineering, system design, standards, equipment, and facilities, such as undergrounding, insulation of distribution wires, and pole replacement	Sections 5.2, 5.4, 7.1, 7.2, 7.3.3
14	A description of where and how the electrical corporation considered undergrounding electrical distribution lines within those areas of its service territory identified to have the highest wildfire risk in a commission fire threat map	Section 7.3.3.16
15	A showing that the electrical corporation has an adequately sized and trained workforce to promptly restore service after a major event, taking into account employees of other utilities pursuant to mutual aid agreements and employees of entities that have entered into contracts with the electrical corporation	Sections 7.3.9.1, 7.3.10.1
16	Identification of any geographic area in the electrical corporation's service territory that is a higher wildfire threat than is currently identified in a commission fire threat map, and where the commission should consider expanding the high fire threat district based on new information or changes in the environment	Section 4.2.2
17	A methodology for identifying and presenting enterprise wide safety risk and wildfire-related risk that is consistent with the methodology used by other electrical corporations unless the commission determines otherwise	Sections 4.3, 4.5
18	A description of how the plan is consistent with the electrical corporation's disaster and emergency preparedness plan prepared pursuant to Section 768.6, including plans to restore service and community outreach	Section 7.3.9.4
19	A statement of how the electrical corporation will restore service after a wildfire	Section 7.3.9.5
20	Protocols for compliance with requirements adopted by the commission regarding activities to support customers during and after a wildfire, outage reporting, support for low-income customers, billing adjustments, deposit waivers, extended payment plans, suspension of disconnection and	Section 8.4

	nonpayment fees, repair processing and timing, access to electrical corporation representatives, and emergency communications	
21	A description of the processes and procedures the electrical corporation will use to do the following: (A) Monitor and audit the implementation of the plan. (B) Identify any deficiencies in the plan or the plan's implementation and correct those deficiencies. (C) Monitor and audit the effectiveness of electrical line and equipment inspections, including inspections performed by contractors, carried out under the plan and other applicable statutes and commission rules.	Section 7.2
22	**Guidance-9 – Insufficient Discussion of Pilot Programs:** SCE shall detail i. all pilot programs or demonstrations identified in its WMP; ii. status of the pilot, including where pilots have been initiated and whether the pilot is progressing toward broader adoption; iii. results of the pilot, including quantitative performance metrics and quantitative risk reduction benefits; iv. How the electrical corporation remedies ignitions or faults revealed during the pilot on a schedule that promptly mitigates the risk of such ignition or fault, and incorporates such mitigation into its operational practices; and v. a proposal for how to expand use of the technology if it reduces ignition risk materially	Section 7.1.D
23	**SCE-5 – Detailed Timeline of WRRM Implementation Not Provided:** SCE shall provide i. the status of implementation of WRRM; ii. a description of how it plans to use WRRM to evaluate its 2020 WMP initiatives, including how it will make future decisions based on this model; iii. all factors it will consider in this evaluation; iv. changes to 2020 WMP initiative type, scope, or priority being considered as a result of WRRM implementation and resultant outputs; and v. a description of whether information from the evaluation of 2020 WMP initiatives will be used to inform scoping of those initiatives or adjustments to those initiatives in 2021 and beyond, and if yes, a description if the criteria (including quantitative metrics) used to inform those adjustments and provision of those metrics.	Section 4.3
24	**SCE-9 – Lack of Detail regarding Pole Loading Assessment Program:** SCE shall submit Geographical Information System (GIS) files detailing: i. areas where Pole Loading Program (PLP) assessments have been completed during the prior reporting period; ii. areas where PLP assessments are planned for the following quarter	SCE's Q4 2020 Quarterly Data Report (QDR)
25	**SCE-20 - Potential notification fatigue from frequency of PSPS communications Quarterly Report (QR):** SCE shall detail i. its plans for ensuring PSPS notifications are both timely and accurate; ii. the number of PSPS events initiated during the prior quarter; iii. the number of pre-event notifications sent for each event; iv. the number of false-positive pre-event notifications (i.e., a customer was notified of an impending PSPS event that did not occur) for each event	Section 8.5
26	**Guidance 3- Action SCE-1:** In its 2021 WMP update, SCE shall: 1) provide a table and narrative similar to that provided in the RCP filing that includes all 136 initiatives from the 2020 WMP, as well as any additional initiatives	Section 9.6

	added in the 2021 filing, and 2) provide additional narrative about the choice of model(s) being used for each initiative.	
27	**Guidance 3- Action SCE-2:** In its 2021 WMP update, SCE shall: 1) describe how it determined 5,000 as the setpoint for distinction of ignition outcomes, 2) provide the range of historical data used for wildfire consequence modeling, and any non-SCE data used, 3) provide the algorithm(s) used to calculate the unitless risk score and baseline wildfire risk score for both distribution and transmission, and 4 describe the useful life of each mitigation, and provide how such was calculated.	Section 9.6
28	**Guidance-3- Action SCE-3**: In its 2021 WMP update, SCE shall: 1) provide each asset-specific Point of Ignition model, 2) describe the frequency and method(s) in which POI models are tested for accuracy, and 3) describe the frequency in which SCE plans on updating POI models, including details on what will be updated.	Section 9.6
29	**Guidance-3- Action SCE-4**: In its 2021 WMP update, SCE shall: 1) describe how all the models outlined in SCE's RCP response interact with one another, and 2) describe the process SCE uses to determine when to use each model.	Section 9.6
30	**SCE-2- Action SCE-5**: In its 2021 WMP update, SCE shall provide the specific protocols, including supporting documentation (e.g. reports, analysis, procedures, checklists, etc.), used for determining outages.	Will be submitted as part of SCE's February 26 Supplemental Filing
31	**SCE-2- Action SCE-6**: In its 2021 WMP update, SCE shall provide all supporting documentation (e.g. reports, analysis, procedures, checklists, etc.) relating to its "deeper investigations into ignitions".	Will be submitted as part of SCE's February 26 Supplemental Filing
32	**SCE-2- Action SCE-7**: In its 2021 WMP update, SCE shall provide the number and percentage of crew-initiated interruptions classified as equipment failures.	Will be submitted as part of SCE's February 26 Supplemental Filing
33	**SCE-2- Action SCE-8**: In its 2021 WMP update, SCE shall 1) explain how it determines which staff are required to take outage determination training, and 2) describe how SCE tracks that the mandatory outage determination training is properly taken and continued to be taken by such staff.	Will be submitted as part of SCE's February 26 Supplemental Filing
34	**SCE-2- Action SCE-9**: In its 2021 WMP update, SCE shall 1) explain how it determines which outage-related staff are required to receive the at least 16 hours of continuing education every two years, and 2) describe how SCE tracks that the training is properly taken and continued to be taken by such staff.	Will be submitted as part of SCE's February 26

		Supplemental Filing
35	**SCE-2- Action SCE-10**: In its 2021 WMP update, SCE shall describe when it began improving its training programs to reduce “other” and “no cause found” categorizations and provide all supporting training materials and procedures used.	Will be submitted as part of SCE’s February 26 Supplemental Filing
36	**SCE-2- Action SCE-11**: In its 2021 WMP update, SCE shall provide the percentage and number of outages selected for validation per month and provide the supporting procedures for performing the validation.	Will be submitted as part of SCE’s February 26 Supplemental Filing
37	**SCE-2- Action SCE-12**: In its 2021 WMP update, SCE shall describe its current QA/QC process for Outage Database & Reliability Metrics System (ODRM) validation.	Will be submitted as part of SCE’s February 26 Supplemental Filing
38	**SCE-2- Action SCE-13**: In its 2021 WMP update, SCE shall describe its current QA/QC process to ensure that training being taken by staff is effective in determining the proper cause of outages by decreasing the number of falsely entered causes.	Will be submitted as part of SCE’s February 26 Supplemental Filing
39	**SCE-2- Action SCE-14**: In its 2021 WMP update, SCE shall provide a list of all new situational awareness tools that were deployed and describe how they are being utilized to inform outage cause determinations.	Will be submitted as part of SCE’s February 26 Supplemental Filing
40	**SCE-2- Action SCE-15:** In its 2021 WMP update, regarding the algorithm that assigns a cause to outages classified as “no cause found”, SCE shall: 1) provide the percentage and number of outages that are assigned a cause by the algorithm, 2) describe how SCE checks the algorithm for accuracy, 3) provide all QA/QC procedures related to the algorithm, including frequency of QA/QC assessments, and 4) provide an analysis demonstrating the effectiveness and accuracy of the algorithm.	Will be submitted as part of SCE’s February 26 Supplemental Filing
41	**SCE-12- Action SCE-16**: In its 2021 WMP update, SCE shall submit a detailed plan on how the data will be statistically analyzed.	Section 9.6
42	**SCE-12- Action SCE-17**: In its 2021 WMP update, SCE shall 1) describe how it plans to address the fact that only 60% of the trees scheduled for full expanded clearances have been completed, 2) explain if SCE will be able to reach the goal of 100% by the end of the year, and 3) provide a comprehensive and extensive explanation as to the reason SCE is behind schedule.	Section 9.6

43	**SCE-12- Action SCE-18**: In its 2021 WMP update, SCE along with PG&E and SDG&E shall submit a joint, unified plan that reflects collaborative efforts and contains uniform definitions, methodology, timeline, data standards, and assumptions.	Will be submitted as part of SCE's February 26 Supplemental Filing
44	**SCE-13- Action SCE-19**: In its 2021 WMP update, SCE shall 1) demonstrate how it is implementing risk models for prioritizing the highest risk areas when scheduling vegetation management work, and 2) explain the determination of such areas as highest risk, including all supporting analysis.	Section 9.6
45	**SCE-13- Action SCE-20:** In its 2021 WMP update, SCE shall 1) provide a GIS map showing the locations of supplemental patrols in 2020 broken down by type (e.g. Canyon Patrols, Summer Readiness), and 2) provide the number of instances for vegetation work prescribed found by type of patrol, both in total number as well as in number of instances per circuit mile.	Section 9.6
46	**Guidance-1- Action SCE-1:** In its 2021 WMP Update, SCE shall: 1) further describe why either ignition risk and wildfire consequence risk are calculated instead of calculating both, and 2) provide an explanation for each initiative as to why it either reduces ignition risk or wildfire consequence risk, but not both.	Will be submitted as part of SCE's February 26 Supplemental Filing
47	**Guidance-1- Action SCE-2**: In its 2021 WMP Update, SCE shall: 1) rectify why it does not calculate an RSE for initiative 5.2, "Fuel management and reduction of 'slash' from vegetation management activities," and 2) explain why other fuels management activities SCE performs (e.g., prescribed burns at its Shaver Lake property and weed abatement) are not included as part of this (or any) initiative and consequently do not have calculated RSEs.	Will be submitted as part of SCE's February 26 Supplemental Filing
48	**Guidance-4- Action SCE-3**: In its 2021 WMP Update, SCE shall provide quantitative, comparable values for all "Yes" values provided in Columns D, E, F, and G of its submitted table, "Guidance-4 Appendix A."	Will be submitted as part of SCE's February 26 Supplemental Filing
49	**Guidance-4- Action SCE-4**: In its 2021 WMP Update, SCE shall: 1) explain how it determined 58 mph gusting winds to be a sufficient de-energization threshold for overhead circuits, 2) provide the percentage reduction of PSPS events based on the increased wind speed threshold, and 3) provide the range and average of historical wind speeds used for deenergization thresholds for bare overhead conductor.	Will be submitted as part of SCE's February 26 Supplemental Filing
50	**Guidance-5- Action SCE-5:** In its 2021 WMP Update, SCE shall: 1) provide a timeline and status update for when it intends to develop quantitative evaluations for each initiative, including the status of threshold values, 2) explain why any initiatives listed in Tables 2 through 10 of the QR would not be applicable for threshold values, and 3) explain what subject matter expert (SME) expertise is being used for in the development of each quantitative value and threshold.	Will be submitted as part of SCE's February 26 Supplemental Filing

51	**Guidance-7- Action SCE-6:** In its 2021 WMP Update, SCE shall: 1) clearly explain how its Enhanced Overhead Inspections (EOI) and HFRI inspections differ from its routine detailed inspections, beyond the frequency with which they are conducted, and 2) provide copies of the inspection forms used for each inspection type.	Will be submitted as part of SCE's February 26 Supplemental Filing
52	**Guidance-7- Action SCE-7:** In its 2021 WMP Update, SCE shall: 1) clarify why it chose to use approximations for the number of notifications in Tables 12 and 13 and 2) provide updated tables using actual numbers rather than approximations.	Will be submitted as part of SCE's February 26 Supplemental Filing
53	**Guidance-9- Action SCE-8:** In its 2021 WMP Update, SCE shall: 1) detail how risk reduction benefits are calculated or measured for individual pilot programs, 2) provide the quantitative pass/fail criteria used to determine the performance of individual pilot programs, and 3) discuss what threshold values are required to initiate broad implementation of pilot programs beyond the pilot phase.	Will be submitted as part of SCE's February 26 Supplemental Filing
54	**Guidance-12- Action SCE-9:** In its 2021 WMP Update, SCE shall: 1) define what "continue" or "increase" means for each instance it is used and 2 either a) implement quantitative benchmarks that are reasonable and achievable for each such instance, or b) explain how it intends to track progress of each instance if a quantitative benchmark is not provided.	Section 9.6
55	**SCE-1- Action SCE-10:** In its 2021 WMP Update, SCE shall detail how it incorporates lessons learned into the decision-making process for the selection and prioritization of its WMP programs and initiatives.	Section 9.6
56	**SCE-3- Action SCE-11:** In its 2021 WMP Update, SCE shall: 1) report on whether it achieved its expected 2020 reduction in PSPS frequency, scope, and duration, 2) commit to achieve these, or further, reductions in 2021 and beyond, and 3) set measurable, year to year, goals for reduction of the frequency, scope, and duration of PSPS events for 2021 and 2022.	Will be submitted as part of SCE's February 26 Supplemental Filing
57	**SCE-5- Action SCE-12:** In its 2021 WMP Update, SCE shall clarify whether its Q1 2021 timeline for planning and executing its transition from REAX+ to WRRM is accurate.	Section 9.6
58	**SCE-5- Action SCE-13**: In its 2021 Update, SCE shall: 1) list the 2020 WMP initiatives being reevaluated using WRRM and the results of that reevaluation, and 2) show how the new WRRM risk scores compare to those from the previous REAX+ model.	Will be submitted as part of SCE's February 26 Supplemental Filing
59	**SCE-6- Action SCE-14**: In its 2021 WMP Update, SCE shall discuss 1) how the present and future effects of climate change are considered in weather station placement and 2) how SCE's weather station network is and can be used in its operations beyond PSPS deenergization related decision-making.	Section 9.6
60	**SCE-6- Action SCE-15:** In its 2021 WMP Update, SCE shall: 1) break down the cost of environmental review and land rights fees it expects from the USFS,	Section 9.6

	as detailed in Table 25 of its QR, and 2) provide information regarding partnerships with or applications to the USFS to install weather stations and "meteorological sample sites" as it relates to 36.2 CFR 220.6.	
61	**SCE-8- Action SCE-16:** In its 2021 WMP Update, SCE shall: 1) explain whether its POI models account for splices, clamps or connectors, 2) if so, provide information detailing the impact of hotline clamp replacements on POI, and 3) if not, explain why.	Will be submitted as part of SCE's February 26 Supplemental Filing
62	**SCE-9- Action SCE-17:** In its 2021 WMP Update, SCE shall: 1) report how many PLP assessments have been completed between August 1 and November 30, 2020 and 2) if SCE's forecast of 1,250 assessments was not met, explain why there is a discrepancy between the forecast and work completed.	Will be submitted as part of SCE's February 26 Supplemental Filing
63	**SCE-10- Action SCE-18:** In its 2021 WMP Update, SCE shall: 1) describe whether each of its listed inspection program risk categorization factors (i.e., program maturity, process complexity, organizational complexity, and downstream impacts) are treated equally or weighted differently in determining program risk, 2) if weighted differently, provide the relative weighting of each factor, and 3) explain how it measures each inspection program risk categorization factor listed, including all threshold values and delineations applied.	Section 9.6
64	**SCE-10- Action SCE-19:** In its 2021 WMP Update, SCE shall detail 1) all possible corrective actions related to findings from QA/QC review and performance metrics evaluation, and 2) how it verifies the effectiveness of these corrective actions.	Section 9.6
65	**SCE-14- Action SCE-20**: In its 2021 WMP Update, SCE shall: 1) shall explain why it does not include long-term species vulnerability factors in evaluating "at-risk" tree species (e.g., climate change, water stress/drought), 2) use a scientifically and governmentally accepted definition of "invasive" to assess vegetation attributes as it relates to utility VM activities, 3) provide an evaluation of "at-risk" tree species, rather than tree types, 4) explain the purpose of the Top 10 list and how tree types and/or species are selected for (or excluded from) the list, 5) clarify what is meant by "Subject to improper pruning practices when in proximity to high voltage lines" and explain how SCE trains its VM staff and contractors to identify and avoid improper pruning, and 6) define and/or quantify attributes of "at risk" tree species, as listed in Table 26 – SCE-14,36 and explain how these factors are weighted.	Will be submitted as part of SCE's February 26 Supplemental Filing
66	**SCE-14- Action SCE-21**: In its 2021 WMP Update, SCE shall: 1) discuss how additional measures taken for "at-risk" and fast-growing tree species fit into the statistical analysis of effective tree clearance, both regulatory and enhanced, 2) explain if SCE's VM management systems record the species (in contrast to species type) of a tree, and if not, explain why, and 3) explain why analysis of clearance distance using tree "types" has adequate granularity considering the impact to future VM-related decisions and	Will be submitted as part of SCE's February 26 Supplemental Filing

	initiatives throughout SCE's large, geographically and biologically diverse, service territory.	
67	**SCE-15- Action SCE-22**: In its 2021 WMP Update, SCE shall describe any ongoing or planned efforts to address at-risk and/or fast-growing tree species using community outreach and education, so that SCE might reduce the number of at-risk, fast growing, and/or exceptions trees it encounters while performing VM activities.	Will be submitted as part of SCE's February 26 Supplemental Filing
68	**SCE-15- Action SCE-23**: In its 2021 WMP Update, SCE shall: 1) clarify which inspection program(s) encompasses the "as needed" re-inspections for "Exception Trees," 2) detail how it is determined when an "Exception Tree" needs to be reinspected, including who makes the determination, 3) explain how these re-inspections are prioritized (e.g., by tree species, by circuit, etc.), and 4) detail the methods for how SCE determines the effectiveness of these "as-needed" re-inspections.	Will be submitted as part of SCE's February 26 Supplemental Filing
69	**SCE-17- Action SCE-24**: In its 2021 WMP Update, SCE shall present a table outlining collaborative efforts with academic institutions and what role SCE plays in that research, similar to the submitted Table 28 - SCE-17, with an additional column detailing whether funding is ongoing, or subject to renewal, and if so, when.	Section 9.6
70	**SCE-18- Action SCE-25**: In its 2021 WMP Update, SCE shall identify what program or initiatives (listed in subpart (iii)) corresponds with the data sources listed as part of its response to this condition.	Section 9.6
71	**SCE-19- Action SCE-26**: In its 2021 WMP Update, SCE shall clarify whether the "additional benefits" are solely accounted for in the covered conductor program or if the cost is distributed amongst several initiatives.	Section 9.6
72	**SCE-20- Action SCE-27**: In its 2021 WMP Update, SCE shall: 1) describe the lessons learned during the implementation of its 2020 PSPS events, and 2) detail the corrective actions it has taken to resolve the issues (i.e., both issuance of false-positive and false-negative notifications) associated with its PSPS event notifications in 2020.	Will be submitted as part of SCE's February 26 Supplemental Filing
73	**SCE-22- Action SCE-28:** In its 2021 WMP Update, SCE shall provide a copy of its study to "determine the best use of fuel reduction" as an attachment.	Section 9.6
74	**Guidance-8: Prevalence of equivocating language – failure of commitment:** Include objectives and targets for each of its initiatives that are measurable, quantifiable, and verifiable by the WSD	Section 4.6
75	**SCE-16: Lack of ISA-Certified Assessors-** Provide an analysis of the expected incremental cost and incremental risk reduction benefit of hiring, training, or subcontracting additional ISAs	Section 7.3.5.14
76	**Critical Issue SCE-01: Regression of Reported Risk-Spend Efficiency (RSE) estimates for Mitigation Initiatives Compared With 2020 WMP Submission** 1. SCE shall identify the initiatives that had RSE estimates in its 2020 WMP but not in its 2021 WMP Update and provide the missing RSE estimates for those initiatives in its 2021 WMP Update.	Section 9.8

	2. SCE shall provide the RSE estimates for mitigation initiatives located in non-HFTD and Zone 1 territory where they have corresponding RSE estimates in Tier 2 and Tier 3 HFTD areas. If such RSE estimates cannot be provided, SCE shall respond with a thorough explanation for the reasons associated with this.	
77	**Critical Issue SCE-02: Inadequate Alternatives Analysis** 1. SCE shall elaborate on its decision-making process to include a thorough overview of the initiative selection procedure. The overview must show the rankings of the decision-making factors (i.e., planning and execution lead times, resource constraints, etc.) and pinpoint where quantifiable risk reductions and RSE estimates are considered in the initiative selection process. The WSD recommends a cascading, dynamic "If-Then" style flowchart to accomplish this prioritization requirement. 2. SCE shall present the updated decision-making process by including one example of the initiative selection procedure for each of the following mitigation categories: a. Situational awareness and forecasting (7.3.2) b. Grid design and system hardening (7.3.3) c. Asset management and inspections (7.3.4) d. Vegetation management and inspections (7.3.5) e. Grid operations and protocols (7.3.6)	Section 9.9
78	**Critical Issue SCE-03: Inadequate justification for extensive utilization of covered conductors** 1. Using the RSE estimates provided in SCE-01 and SCE-02 above, SCE shall fully and adequately demonstrate why it has selected covered conductors over alternative initiatives in its decision-making process. In particular, SCE shall demonstrate: a. How the location of covered conductor installation is focused on its highest wildfire risk circuit segments; b. How the location of covered conductor installation is focused on circuits that are subject to frequent PSPS events; c. The effectiveness of covered conductors both in-field and long-term in comparison to other alternative initiatives; and d. How covered conductor installation compares to other initiatives in its potential to reduce the number and/or length of PSPS events.	Section 9.10

79	**Critical Issue SCE-04: Insufficient detail on SCE's Public Safety Power Shut-Off (PSPS) Corrective Action Plan (CAP) is included within its 2021 WMP Update** 1. Identify and describe the relevant measures included within the CAP that relate to the following parts of Chapter 8. a. 8.0 Public Safety Power Shutoff, Including Directional Vision (p. 336); 8.1.1 Lessons learned from PSPS since the utility's last WMP submission (p. 338); Support for vulnerable customers (p. 339); Sharing data with public entities (p. 339); 8.1.2 Expectations for how the utility's PSPS program will evolve over the coming 1, 3, and 10 years (p. 340) b. 8.1.4 Quantitative description of how the circuits and numbers of customers SCE expects will be impacted by any necessary PSPS events is expected to evolve over time (p. 343) c. 8.2.1 Strategy to minimize public safety risk during high wildfire risk conditions (p. 347); 8.2.5 Protocols for mitigating the public safety impacts (p. 357) d. 8.4.1 How the utility is identifying vulnerable communities (p. 361) e. 8.5 Plans for ensuring PSPS notifications are both timely and accurate (p. 367) 2. In addressing subparts 1.a. through 1.e., above, include relevant, quantitative, and qualitative specifics of what will be updated via the CAP in terms of measures, deliverables, and milestones (i.e., 2021 goals, benchmark dates, expedited work such as number of circuit segments designated for removal from PSPS scope, anticipated wind threshold decreases). 3. In addressing subparts 1.a. through 1.e., above, indicate how the relevant CAP measures will reduce PSPS scope, scale, and frequency. 4. Attach the PSPS Corrective Action Plan to the 2021 WMP Update as an appendix. Do not point to or reference the appendix in lieu of providing direct, complete answers as indicated in the above subparts.	Portions of Chapter 5 and 7; Chapter 8; Section 9.11

3 ACTUALS AND PLANNED SPENDING FOR MITIGATION PLAN

3.1 SUMMARY OF WMP INITIATIVE EXPENDITURES

Table 3-1 summarizes the projected costs (in thousands) per year over the three-year WMP cycle, including actual expenditures for years passed.

Table 3-2 breaks out projected costs per category of mitigations, over the three-year WMP cycle. The financials represented in the summary tables below equal the aggregate spending listed in the mitigations financial tables reported quarterly. Nothing in this document shall be construed as a statement that costs listed are approved or deemed reasonable if the WMP is approved, denied, or otherwise acted upon.

Table 3-1
Summary of WMP Expenditures[5] (Nominal)

	Spend in thousands $
2020 WMP Planned	1,308,269
2020 Actual	1,356,922
Difference	48,653
2021 Planned	1,704,298
2022 Planned	1,783,476
2020-22 Planned	4,844,696

Table 3-2
Summary of WMP Expenditures (Nominal) by Category[6]

WMP Category	2020 WMP Planned	2020 Actual	Difference	2021 Planned	2022 Planned	2020-22 Planned (w/2020 Actual)
Risk and Mapping[7]	-	1,319	1,319	945	524	2,788
Situational Awareness	23,964	20,481	(3,483)	45,102	41,784	107,368
Grid Design and System Hardening	962,704	585,379	(377,325)	835,979	1,035,462	2,456,821

[5] The summary of WMP Expenditures reflects combined Capital and Operation and Maintenance (O&M) costs, including overheads.

[6] The summary of WMP Expenditures reflects combined Capital and O&M costs, including overheads

[7] SCE Views Risk & Mapping activities (e.g., Fire Spread Modeling), as part of Situational Awareness foundational tools.

Asset Management and Inspections	59,942	311,452	251,510	352,925	234,710	899,087
Vegetation Management	137,221	350,574	213,353	351,525	361,324	1,063,424
Grid Operations	22,447	30,820	8,373	55,773	49,628	136,222
Data Governance	-	1,796	1,796	16,761	15,950	34,508
Resource Allocation	78,519	45,202	(33,317)	7,610	6,086	58,898
Emergency Planning	23,472	5,944	(17,528)	14,313	14,528	34,784
Stakeholder Cooperation and Community Engagement	-	3,955	3,955	23,365	23,479	50,798
Total	**1,308,269**	**1,356,922**	**48,653**	**1,704,298**	**1,783,476**	**4,844,696**

3.2 SUMMARY OF RATEPAYER IMPACT

Report the projected cost increase to ratepayers due to utility-ignited wildfires and wildfire mitigation activities engaged in each of the years below. Account for all expenditure incurred in that year due to utility-ignited wildfires / mitigation activities and provide methodology behind calculation below Table 3-3.

Table 3-3
WMP Electricity Cost Increase to Ratepayers

	Annual performance – Actual					
Outcome Metric Name	**2016**	**2017**	**2018**	**2019**	**2020**	**Unit(s)**
Increase in electric costs to ratepayer due to utility-ignited wildfires (total)	N/A	N/A	N/A	0.14 cents per kWh impact to system average rates (SAR). The monthly bill impact for a non-California	0.07 cents per kWh impact to SAR. The monthly bill impact for a non-CARE residential customer with average	*Dollar value of average monthly rate increase attributable to utility-ignited wildfires per year (e.g., $3/month on average across customers for utility-ignited wildfires occurring in 20XX)*

				Alternate Rates for Energy (CARE) residential customer with average usage of 500 kWh is $0.99.	usage of 500 kWh is $0.47.	
Increase in electric costs to ratepayer due to wildfire mitigation activities (total)	N/A	N/A	N/A	N/A	0.21 cents per kWh impact to SAR. The monthly bill impact for a non-CARE residential customer with average usage of 500 kWh is $1.41.	*Dollar value of average monthly rate increase attributable to WMPs per year*

SCE interprets the category of "increase in electric costs to ratepayers due to utility-ignited wildfires" to include 1) replacement wildfire liability insurance costs (i.e., costs for wildfire liability insurance premiums incurred after a wildfire associated with utility infrastructure causes depletion of then-current coverage); 2) Catastrophic Event Memorandum Account (CEMA) costs incurred for restoration and repair associated with wildfire events associated with utility infrastructure; and 3) uninsured third-party damage claims for events associated with SCE's infrastructure that have been reviewed by the Commission and included in customer rates. The increases do not include costs that are either under review, that will be reviewed by the Commission for later cost recovery or are otherwise not included in customer rates. The increases also do not include costs associated with claims paid pursuant to any wildfire liability insurance policy Self-Insured Retention (SIR) or costs approved by the Commission on a forecast basis as "claims reserve" in a GRC. SCE interprets the category of "increase in electric costs to ratepayer due to wildfire mitigation activities" to include wildfire mitigation costs that have been reviewed by the Commission and included in rates. The increases do not include wildfire mitigation activity costs that are either still under review, that will be reviewed by the Commission for later cost recovery or are otherwise not currently included in customer rates.

4 Lessons Learned and Risk Trends

4.1 Lessons Learned: how tracking metrics on the 2020 plan has informed the 2021 plan

Describe how the utility's plan has evolved since the 2020 WMP submission. Outline any major themes and lessons learned from the 2020 plan and subsequent implementation of the initiatives. In particular, focus on how utility performance against the metrics used has informed the utility's 2021 WMP.

Class B Deficiency SCE-1; Action Statement SCE-10: In its 2021 WMP Update, SCE shall detail how it incorporates lessons learned into the decision-making process for the selection and prioritization of its WMP programs and initiatives.

SCE's wildfire mitigation efforts have grown and advanced in recent years to help mitigate the threat of wildfires in HFRA. SCE continuously evaluates its wildfire mitigation initiatives based on execution experience, internal analysis, stakeholder feedback, benchmarking, customer surveys and post-event PSPS reports. This evaluation process includes monitoring the implementation of WMP initiatives along with the effectiveness of the WMP initiatives. As stated in previous filings and submittals, tracking program targets for approved WMP activities is key to determining progress in the near-term. Progress and outcome metrics, on the other hand, help inform the effectiveness of wildfire mitigation activities and can also help identify improvements and necessary changes.

SCE has continued its development and enhancement of machine learning models to quantify the Probability of Ignition (POI) caused by equipment and facility failure (EFF) and contact with foreign objects (CFO). The models utilize historical outages and faults caused by EFF and CFO, SCE asset data including circuit connectivity, historical weather data, tree inventory data, etc., to identify patterns that lead to faults and then sparks. Several outcome metrics included in SCE's 2020 WMP are used to drive or support SCE's wildfire mitigation efforts. For example, ignition data and data on outages and faults are factored into SCE's calculation of the POI in SCE's wildfire risk models, which is then combined with other inputs to determine the overall wildfire risk. For PSPS decision-making, SCE includes asset repair notifications and long-span metrics in its PSPS wind/gust triggers. These metrics, however, are often influenced by exogenous factors outside the utilities' control such as weather, fire suppression efforts, fire response, etc. Therefore, progress and outcome metrics must be normalized to review trends over time, and not in any single year, when using them to assess WMP effectiveness. Prudent grid operations, maintenance, and upgrades will not eliminate risk entirely; but, over time and cumulatively, are expected to result in overall improvements in outcome metrics, such as ignition events associated with SCE's electrical infrastructure.

SCE also collects data and metrics at the wildfire mitigation initiative level to assist in its evaluation of their effectiveness. SCE will detail these further in its response to Quarterly Report Action Statement SCE-5. Progress, or lack thereof, on a metric is among the various issues that can become a lesson learned for SCE. These lessons learned, in turn, inform SCE on whether to expand, curtail, or maintain an initiative at its current scope. In some cases, it has led SCE to allocate resources to entirely new initiatives. At a high level, how lessons learned affect SCE's selection and prioritization of its WMP programs and initiatives is as follows:

1. The lesson or problem is identified.
2. A working team develops a proposed solution.
3. Changes to strategy, scope, budget, or resources are identified.
4. Depending on the scale of the proposed change, the solution is vetted with appropriate governance committees.
5. If approved, SCE's operating plan is modified to account for the change.

SCE's initial WMP was developed through industry benchmarking, testing and evaluating historical ignition drivers (e.g., CFO, EFF). The ability to pivot based on new information or insights from lessons learned is important to implement effective practices and discontinue ineffective ones. Aerial inspections and the long-span initiative are two examples of new mitigations that were developed based on new engineering analyses and field observations. Table SCE 4-1 below summarizes the lessons learned in 2020 and the corresponding changes made to our 2021 WMP Update.

Table SCE 4-1:
Summary of Lessons Learned

Category	Change	Lesson Learned in 2020	Description of Change in 2021 WMP Update
Risk Assessment and Mapping	Shift to Technosylva consequence model	For the 2020 WMP, SCE used the Reax consequence model. Although Reax was a significant improvement over system-level average consequence estimates (e.g., Tier 3, Tier 2), the modeling had limitations with critical inputs such as outdated asset and fuel data and did not offer the granular structure/asset level output desired. This lack of granularity also required interpolation and estimation at some of the structures.	SCE elected to transition from the Reax model to Technosylva's Consequence model. Technosylva is an industry recognized model that: • Uses more recent weather, fuels, and census data • Has more advanced fire propagation modeling techniques such as urban encroachment • Directly maps consequence scores to individual structures/assets without needing interpolation from raster[8] to structure/asset • Is viewable within the company's proprietary geospatial viewer which also integrates with SCE's POI values

[8] Raster graphics, also called bitmap graphics, are digital images that are composed of tiny rectangular pixels, or picture elements, that are arranged in a grid or raster of x and y coordinates in such a way that it forms an image – *definition from Techopedia.com*

Category	Change	Lesson Learned in 2020	Description of Change in 2021 WMP Update
Risk Assessment and Mapping	Include PSPS risk in risk analysis	The risk that an asset causes an ignition is driven by the condition of the asset EFF and the potential of a CFO. The risk that a circuit will be de-energized through PSPS is driven by the wind/gust speeds and FPI at any given time. The WRM (2020) targeted mitigations to reduce the risk of asset caused ignitions but not PSPS risk.	For 2021, the Wildfire Risk Reduction Model (WRRM) includes a component that calculates the risk of PSPS de-energization based on the probability of de-energization and consequence of those de-energizations (safety, reliability and financial) at the circuit level. This integration of PSPS risk with wildfire risk allows for a more complete understanding of total risk that balances the need for targeting of wildfire risk with impacts to customers from PSPS events. This also allows SCE to better understand the impact that certain mitigations have on targeting individual risks.
Risk Assessment and Mapping	Integration of enterprise-level and program level risk analysis	For the 2020 WMP, SCE assessed wildfire risks, risk mitigation alternatives, and risk mitigation scope based on system-wide averages for probability and consequence of ignition. However, for program prioritization, SCE used circuit-segment level rankings using the WRM. This led to differences between the system level and asset- or location-specific risk analyses. Although both approaches produced similar results at the aggregate level (aggregating WRM to system), the method used to calculate RSE values using the system approach could not be directly applied at the asset level. Therefore, asset level RSE values were not known.	For 2021, the WRRM includes a method to translate the expected values produced by the model into unitless Multi -Attribute Risk Scoring (MARS) values at the asset and location level. This enables SCE to both calculate risk and risk reduction at the asset and location level as well as aggregated as needed for circuit, or system level analysis. This will drive consistent risk-informed decision-making at the enterprise and program levels. See Section 4.3.
Situational Awareness	Deployment strategy for weather stations	Weather stations deployment thus far has been largely focused on our distribution circuits in HFRA. Despite aggressive deployment of over 1,000 weather stations since program inception, SCE still has additional opportunities to progressively add more weather stations to provide additional granularity for wind and fire-weather conditions. Weather station deployment along circuits also demonstrated great value to enable sectionalization during PSPS events.	The 2021 WMP Update places additional emphasis to increase coverage along our sub-transmission and transmission infrastructures as well as filling in remaining gaps in our distribution circuits in HFRA. We anticipate this program to continue beyond 2022. The additional weather stations will also be strategically deployed to enable more sectionalization capability during PSPS events. See Section 7.3.2.1.
Situational Awareness	Enhance weather and fire modeling	In addition to wind, fuel conditions play a very significant role in the determination of wildfire risk. This is particularly true of the more extreme dry	Improved resolution, forecast output, and new machine learning models will drive more accurate and granular weather and fuels modeling. SCE will test and evaluate the new Fire Potential Index (FPI 2.0) which will

Category	Change	Lesson Learned in 2020	Description of Change in 2021 WMP Update
		fuel conditions that were experienced in 2020.	incorporate more information about fuels (e.g., fuel type and kinds of dead fuel moisture) for improved assessment of large fire threats See Section 7.3.2.4.1
Grid Design and System Hardening	Continued focus on covered conductor installation	Analysis of faults and ignitions of early deployment demonstrated that covered conductor is effective in incidents associated with contact-from-foreign objects or wire-to-wire contact.	Based on the 2018 effectiveness analysis,[9] SCE is continuing its ambitious covered conductor installation program. Next steps are to document and measure effectiveness metrics where initial deployment of covered conductor has been completed through 2020. See Section 7.3.3.3.
Grid Design and System Hardening	Initiate targeted underground-ing	SCE completed risk and engineering analyses using the WRRM geospatial viewer to increase the granularity in scoping undergrounding projects. These analyses helped to identify selected circuit-segments that would provide the additional benefits from undergrounding despite longer deployment time frame, resulting in a relatively lower RSE, and operational complexities.	In 2021, SCE will implement its lessons learned and apply its refined methodology for scoping future projects. This process will evaluate opportunities where undergrounding may provide greater risk reduction benefits and potentially cost-effective when looking at total life-cycle costs of mitigation deployments. See Section 7.3.3.16.
Grid Design and System Hardening	Add C-Hook replacement	The Camp Fire in Pacific Gas and Electric's (PG&E) service area was related to a damaged C-hook. SCE analyzed its C-hook population and determined that it has a limited number of C-hooks in its system which are aged; it is difficult to determine the condition of these C-hooks using visual inspection, even aerially.	Replace C-hooks at 53 structures proactively. This replacement effort in conjunction with C-hooks being replaced as part of other programs will eliminate C-hooks in our transmission system. See Section 7.3.3.15.1.
Grid Design and System Hardening	Add Long Span Initiative	SCE completed conductor failure studies to evaluate risk factors and determined that high sag and low conductor spacing could potentially lead to wire-to-wire contact of distribution overhead conductor in HFRAs for long spans. SCE identified mitigation options that can be deployed expeditiously and will be effective in remediating these conditions and reduce wire-to-wire contacts.	SCE expects to perform field reviews to validate the results of the LiDAR data findings and remediate between 300 - 600 spans in 2021. Over the next three years, SCE aims to complete the highest risk Long Span Initiative (LSI) remediations, with the remaining remediations to occur through 2024 or remediated through SCE's Covered Conductor Program. See Section 7.3.3.12.1.

[9] A.19-08-013[E1], Exhibit SCE-04, Vol. 05A, Part 1, pp. 178 - 223 – An Engineering Analysis on Impacts of Contact from Objects (CFO) on Bare vs. Covered Conductors; Exhibit SCE-04, Vol. 05A, Part 1, pp. 242-246 – SCE Summary of Covered Conductor Touch Current NEETRAC Report (refer to Exhibit SCE-04, Vol. 05A, Part 1, WP, pp. 224-241 – NEETRAC Report); and Exhibit SCE-04, Vol. 05A, Part 1, pp. 4 - 177 – Covered Conductor Compendium.

Category	Change	Lesson Learned in 2020	Description of Change in 2021 WMP Update
Grid Design and System Hardening	Add Vertical Switch Replacement	Engineering analysis identified legacy vertical distribution switches as an additional potential source of ignition. The wood cross arms these switches are mounted on is an additional driver in increasing the switches' probability of failure.	SCE is adding a WMP activity for replacing the legacy switches with updated models mounted on composite crossarms. See Section 7.3.3.17.3.
Grid Design and System Hardening	Pursue microgrid pilot for 2022 fire season instead of 2020	SCE's pursuit of a microgrid pilot prior to the 2020 fire season resulted in very cost ineffective proposals due to several factors, but primarily a compressed timeline and multiple proposed sites. After additional site analysis, SCE executed a successful competitive bid process and is moving forward with a preferred vendor for a single site.	In 2021, SCE initiated a microgrid pilot for a circuit-segment frequently impacted by outages due to PSPS events. The site is expected to be operational prior to the peak of the 2022 fire season. See Section 7.3.3.8.2.
Asset Manage-ment and Inspections	Updated methodology for High Fire Risk Informed Inspection (HFRI) Scope and Prioritization	In 2020, SCE conducted its risk-based inspection program at the circuit level for transmission structures. Further, in 2020, SCE used a risk prioritization methodology to drive inspections that resulted in large groups of assets to be classified as risk and non-risk. SCE realized its methodology should be refined to the structure level and take wildfire mitigations into account.	SCE created a more refined risk scoring methodology for both transmission and distribution, at the structure level. Each structure was scored based on its POI and consequence. The highest risk structures representing 99% of the total wildfire risk will be inspected in 2021 along with any structures due for a compliance inspection in 2021. The remainder will be inspected according to compliance cycles. See Sections 7.3.4.9.1 and 7.3.4.10.1
Asset Manage-ment and Inspections	Supplement HFRI Inspections	While monitoring emergent risks during the 2020 fire season, SCE recognized that there were high risk locations (e.g., dry fuels and high winds) that warranted accelerated and additional inspections, remediations and vegetation management to reduce potential ignitions due to changed asset conditions. These supplemental inspections resulted in over 3,000 conditions needing repair that were not previously identified.	SCE will supplement its wildfire-driven inspection programs with additional inspections (if warranted) in targeted locations based on emergent risk analysis. SCE forecasts approximately 30,000 distribution and 3,000 transmission additional inspections but will adjust based on actual need. See Sections 7.3.4.9.1 and 7.3.4.10.1
Asset Manage-ment and Inspections	Initiate technology program for work management tools	Consistency of inspections and data collection needs to be further strengthened. Multiple manual processes cause inefficiencies in execution time and ability to perform data analytics.	SCE is developing additional capabilities for more consistent and higher quality image capture that can advance our machine learning algorithms to provide more expedient identification of asset defects. SCE is implementing a single digital platform to support end-to-end Aerial and Ground

Category	Change	Lesson Learned in 2020	Description of Change in 2021 WMP Update
			inspection processes for Distribution and Transmission. See Section 7.3.4.3.1.
Vegetation Mapping and Inspections	Initiate technology program for work management tools	SCE's vegetation management program is being managed through various tools which affect data quality and operational efficiencies.	SCE is implementing a new work management system for all vegetation management activities in a single tool, including emergent work. The system is expected to improve resource planning and support data analysis of trends that will drive program improvements. It will also facilitate alignment with electrical infrastructure mapping and inspection findings. The system will have a future capability to integrate artificial intelligence and predictive modeling. See Section 7.3.5.19
Grid Operations & Protocols[10]	Expanded Customer Care during de-energizations	Based on an analysis of 2019 PSPS events and customer/stakeholder feedback in 2020, SCE learned that additional targeted efforts are needed to provide resiliency and backup power during de-energization events (PSPS and WMP implementation). Community Resource Centers (CRC) and Community Crew Vehicle (CCV) deployment were successful. SCE had some challenges in signing customers up for battery backup, in part due to COVID-19 impacts. By the end of 2020, SCE offered battery rebates for portable power and had a 33% enrollment rate for its battery backup program.	Besides continuing with the successful CRC/CCV deployment, in 2021, SCE is expanding its Critical Care Battery Backup (CCBB) program to include Medical baseline (MBL) customers enrolled in CARE or Family Electric Rate Assistance (FERA) and residing in a HFRA, which expands the eligible population from ~2,500 to ~12,000 customers. SCE's portfolio of customer care solutions will continue to include well water and customer resiliency zones as well. SCE is also increasing the Community Resiliency Equipment Incentive. See Section 7.3.6.5.2
Grid Operations & Protocols	Continuation of dedicated PSPS IMT	Analysis of SCE's 2019 events concluded that PSPS events were causing a draw from resources across the company for every event regardless of magnitude, impacting progress in other work including wildfire mitigation. In SCE's first 2020 Change Orders Report, we discussed increasing the Infrastructure Protection Team (discussed in Section 7.3.2.6) to serve on the dedicated PSPS IMT that will support all PSPS events, with supplemental resources brought on only as required. This proved to be effective in addressing the PSPS operational needs even with the COVID-19 teleworking impact.	Based on the observed success in 2020, SCE is continuing with a dedicated PSPS IMT in 2021. Multi-disciplinary resources are needed from across the company and, to ensure consistency, SCE will continue to use and train a dedicated team. See Section 7.3.6.5.1.

[10] Please note that lessons learned specific to PSPS are discussed in detail in Chapter 8.

Category	Change	Lesson Learned in 2020	Description of Change in 2021 WMP Update
Grid Operations & Protocols	PSPS threshold assessment	Existing PSPS thresholds were developed with a different methodology than our wildfire risk model leading to separate decision-making processes. The current model also did not account for fire-fighting resource constraints. Moreover, with continued WMP deployment, there was an opportunity to tailor PSPS thresholds based on circuit or circuit-segment specific analysis.	SCE plans to incorporate risk and consequence information from Technosylva models (Consequence) into PSPS so that proactive de-energization decisions are informed by potential wildfire impacts to communities, and update PSPS threshold methodology to account for active Geographic Area Coordination Centers (GACC) levels. SCE has already implemented higher PSPS thresholds in some areas where covered conductor has been installed and is continuing to evaluate more risk-informed approaches to tailor PSPS thresholds based on asset attributes on any specific circuits. See Sections 8.1.2 and 8.3.
Data Governance	Initiate technology programs from enhanced data management	Though wildfire-related unstructured data (such as photographs and videos from inspections) was increasing, SCE does not have adequate automated capability to store and process this data. In addition, SCE has asset-related data in nearly 40 disparate systems making data quality, data consistency, analytics and reporting manually intensive and inefficient. SCE also learned that the WSD is expanding the data requirements for asset, risk and PSPS event data.	In 2021, SCE will advance two key projects: • Ezy for data storage, visualization and AI assisted analytics • WiSDM to implement a centralized repository for wildfire related asset data to help with data management, advanced risk analytics and streamlined reporting. See Section 7.3.7.1.
Resource Allocation Method-ology	Use of updated risk analysis	Resources continue to be constrained; emerging risk areas continue to arise as SCE updates its ignition and PSPS risk analyses.	Enhanced risk analysis described in Risk Assessment and Mapping being implemented and SCE is transitioning to prioritizing deployment informed by the updated risk scores and RSEs. See Section 4.3.8.
Emergency Planning and Prepared-ness	Increased training and resource allocation	Through 2020 events, we have learned more about the needs of our customers before, during and after wildfire or PSPS events.	We have dedicated customer support teams to help impacted customers. We are also continuing to enhance our workforce training and processes to improve communication and service restoration. See Section 7.3.9.1.
Emergency Planning and Prepared-ness	Change in Marketing Campaign / Awareness	SCE analyzed customer engagement metrics (e.g., awareness and clicks to websites) for its education and outreach efforts in 2019. Early analysis suggested that SCE's local campaigns were more effective than statewide campaigns (DEP-3) in increasing customer awareness of SCE's wildfire efforts.	SCE ended this initiative (DEP-3) and focused on the local marketing campaign as part of its continuing proactive outreach to communities prior to and during peak wildfire season to ensure customer education and preparedness. SCE's First Change Order Report 9/11/20. SCE will continue the local marketing campaign in 2021. See DEP-1.3 in Section 7.3.10.1.3.
Emergency Planning and	Added Multicultural	In 2020, SCE continued to work towards promoting wildfire and resiliency	While advancing towards providing communications in prevalent languages,

Category	Change	Lesson Learned in 2020	Description of Change in 2021 WMP Update
Prepared-ness / PSPS	Commun-ications Resource Library	awareness in the prevalent languages through several channels. SCE identified that certain channels, such as radio, are not available in all prevalent languages.	SCE set up the Resource Library to serve as a centralized hub for customers to find wildfire-related outreach in all prevalent languages. See Section 8.4.3.
Stakeholder Cooperation and Community Engagement	Expanding option for aerial fire suppression	Given the intensity of the 2020 fire season and strain on fire resources, SCE realized that in certain circumstances more collaboration is needed with fire agencies to enhance fire suppression efforts for protecting electrical infrastructure during fires for service reliability and resilience. The limited-scale partnership with Orange County Fire Authority in 2020 was successfully used several times.	In 2021, SCE is partnering with fire agencies in its service area to provide funding for up to five aerial suppression resources to bolster firefighting capabilities to primarily protect electrical infrastructure during fires for service resilience to its customers but could be deployed for other fire suppression efforts if available and needed. This is intended to be a temporary mitigation measure. See Section 7.3.10.3.

4.2 UNDERSTANDING MAJOR TRENDS IMPACTING IGNITION PROBABILITY AND WILDFIRE CONSEQUENCE

Describe how the utility assesses wildfire risk in terms of ignition probability and estimated wildfire consequence, including use of Multi-Attribute Risk Score (MARS) and Multi-Attribute Value Function (MAVF) as in the Safety Model and Assessment Proceeding (S-MAP)[11] and Risk Assessment Mitigation Phase (RAMP), highlighting changes since the 2020 WMP report. Include description of how the utility distinguishes between these risks and the risks to safety and reliability. List and describe each "known local condition" that the utility monitors per GO 95, Rule 31.1, including how the condition is monitored and evaluated. List and describe each "known local condition" that the utility monitors per GO 95, Rule 31.1, including how the condition is monitored and evaluated.

In addition:

A. *Describe how the utility monitors and accounts for the contribution of weather to ignition probability and estimated wildfire consequence in its decision-making, including describing any utility-generated Fire Potential Index or other measure (including input variables, equations, the scale or rating system, an explanation of how uncertainties are accounted for, an explanation of how this index is used to inform operational decisions, and an explanation of how trends in index ratings impact medium-term decisions such as maintenance and longer-term decisions such as capital investments, etc.).*

B. *Describe how the utility monitors and accounts for the contribution of fuel conditions to ignition probability and estimated wildfire consequence in its decision-making, including describing any proprietary fuel condition index (or other measures tracked), the outputs of said index or other measures, and the methodology used for projecting future fuel conditions. Include discussion of measurements and units for live fuel moisture content, dead fuel moisture content, density of each fuel type, and any other variables tracked. Describe the measures and thresholds the utility uses to determine extreme fuel conditions, including what fuel moisture measurements and threshold* *values the utility considers "extreme" and its strategy for how fuel conditions inform operational decision-making.*

For ease of review and to minimize duplicative information, SCE has organized this section to first explain known local conditions it monitors to assess wildfire risk (part of 4.2 requirements). Next, SCE explains its service area fire-threat evaluation and ignition risk trends (part of 4.2.1 requirements). Sequentially, SCE then describes the major trends impacting ignition probability and wildfire consequence (4.2A, 4.2B, and part of 4.2.1 requirements). Information regarding ignition probability and estimated wildfire consequence, Multi Attribute Risk Score (MARS), Multi-Attribute Value Function (MAVF) and how this information is used in SCE's decision-making is discussed in Section 4.3 (4.3, part of 4.2, and other risk requirements) Section 4.3 includes a comprehensive description of SCE's overall risk mitigation framework.

Known Local Conditions

SCE accounts for known local conditions in its service area in designing, engineering, constructing, inspecting, maintaining, and operating its electrical facilities. These include wind, fuel, and other environmental conditions. For example, in 2013, SCE completed a service area-wide wind study, which was used to define high-wind areas (above the eight pounds per square foot specified in GO 95[E3]) for use in pole loading calculations for pole replacements and installations. SCE implemented the results of this wind study in 2014. Known local conditions that SCE monitors related to its wildfire mitigation programs are described below.

The Commission, in D.17-12-024[E2], adopted regulations to enhance fire-safety in the High Fire Threat District (HFTD). These fire-safety regulations aim to reduce the fire hazards associated with overhead power-line facilities in elevated and extreme areas throughout the state and are contained in the Commission's General Orders (GOs) 95, 165 and 166, and Rule 11[E3] of each of the electric IOUs' electric tariff rules. [E3] The HFTD tiers were determined based on elevated hazards for the ignition and rapid spread of power-line fires due to strong winds, abundant dry vegetation, and other environmental conditions. Since adoption of the HFTD maps in 2018, SCE began setting new construction standards, enhanced vegetation trimming, increased asset inspections, and shortened remediation timelines, consistent with the GOs, to reduce fire risk in its HFRA. At the time, SCE's HFRA included areas outside of the CPUC's HFTD. In 2019, SCE conducted a detailed analysis of its historical non-CPUC designated HFRA and determined that a small portion of this area has similar wildfire risk profile as the Commission's HFTD. The Commission, in collaboration with CAL FIRE, reviewed SCE's Petition for Modification (PFM) of Decision D.17-12-024[E2] and approved its request for a modest expansion of the Commission's HFTD with modifications.[11] SCE has historically treated its non-CPUC HFRA as a Tier 2 HFTD and its wildfire mitigation activities are conducted across its HFRA including these additional areas. SCE will continue to monitor and assess areas outside of SCE's HFRA for potential inclusion in the HFTD. See Section 4.2.2. for further details on SCE's HFRA.

[11] *See* D.20-12-030[E4].

Fuel and weather conditions play a significant role in the initiation, spread, and intensity of wildfires. Fuel conditions such as the age of fuels, condition and health of the fuels, volume and type of fuel, is very localized and dynamically impacts wildfire risk. Similarly, weather conditions such as wind speed and dryness of the air play a significant role in the initiation, spread, and intensity of wildfires, and can be local to a particular area. Historically, SCE used the Santa Ana Winds Threat Index (SAWTi) issued by United States Forest Service (USFS) to assess fuel and weather conditions, which categorizes Santa Ana wind severity with respect to the potential for large fires to occur. The SAWTi assesses fuel and weather conditions to generate a threat level associated with Santa Ana wind events and extends out six days showing four threat levels that range from Marginal to Extreme. The SAWTi covers much of the southern portion of SCE's service area. SCE used it to gauge the overall severity of forecasted or ongoing Santa Ana wind events across affected SCE districts and as additional validation of the Fire Weather Watches and Red Flag Warning (RFW) provided by the National Weather Service. SCE still monitors these services; however, SCE has since developed improved fuel and weather modeling and tools that along with its FPI, has replaced use of the SAWTi product to gauge and forecast the overall severity of fire-weather conditions. Known fuel and weather conditions that SCE monitors for wildfire risk are further described below. Please see Section 4.3 for details of SCE's fuel and weather models.

As noted above, fuel conditions play a critical role in the initiation, spread, and intensity of wildfires. Currently, SCE has several methods and tools to monitor moisture amounts in the vegetation that contributes most to significant wildfire activity. Fuel moisture (dead and live vegetation) is expressed as a percentage of the water amount compared to the dry weight of the vegetation. For dead vegetation, less than 10% moisture represents fuels that will burn actively whereas moisture for live vegetation that is less prone to burning is generally 80% or more. In 2019, SCE launched a fuels sampling program to fill in known gaps in live fuel moisture observational data. Physical samples of native living plants are collected bi-weekly to determine the dryness and ultimately the combustibility of the vegetation. This data is monitored to determine moistening/drying trends that affect wildfire activity. In addition, SCE has several models that project moisture amounts in dead vegetation. This information is combined with the bi-weekly live fuel sampling to provide a holistic understanding of the fuels environment and serve as inputs into the FPI. Please see Section 7.3.2.4.1 for details on SCE's FPI. Monitoring fuel data is also used to detect high-flammability fuel conditions. For example, in 2020, SCE used its fuel data to help determine several Areas of Concern (AOCs) for wildfire potential that resulted in targeted inspections in these areas. For more information about SCE's AOCs, please see Section 7.3.4.9.1. SCE will continue to monitor fuels by conducting bi-weekly (weather permitting) live fuel sampling to inform its FPI and help detect high-flammability fuel conditions.

As noted above, weather conditions such as wind speed and dryness of the air play a significant role in the initiation, spread, and intensity of wildfires and can be local to a particular area. Therefore, monitoring weather data is a key function. SCE monitors location-specific, real-time weather conditions through its network of weather stations. SCE currently has over 1,050 weather stations deployed across its HFRA and will continue to expand its weather station network through this WMP period as further described in Section 7.3.2.1. Weather data serve as key inputs into fire spread modeling to calculate probability and consequence of ignitions. See Section 4.3 for more details. In addition, the weather data is an input to SCE's FPI that helps assess the likelihood of significant fire activity occurring within the service area. See Section 7.3.2.4.1 for more details.

4.2.1 Service territory fire-threat evaluation and ignition risk trends

Discuss fire-threat evaluation of the service territory to determine whether an expanded High Fire Threat District (HFTD) is warranted (i.e., beyond existing Tier 2 and Tier 3 areas). Include a discussion of any fire threat assessment of its service territory performed by the electrical corporation, highlighting any changes since the prior WMP report. In the event that the electrical corporation's assessment determines the fire threat rating for any part of its service territory is insufficient (i.e., the actual fire threat is greater than what is indicated in the CPUC Fire Threat Map and High Fire Threat District designations), the corporation shall identify those areas for consideration of HFTD modification, based on the new information or environmental changes. To the extent this identification relies upon a meteorological or climatological study, a thorough explanation and copy of the study shall be included.

List and describe any macro trends impacting ignition probability and estimated wildfire consequence within utility service territory, highlighting any changes since the 2020 WMP report:

1. Change in ignition probability and estimated wildfire consequence due to climate change

2. Change in ignition probability and estimated wildfire consequence due to relevant invasive species, such as bark beetles

3. Change in ignition probability and estimated wildfire consequence due to other drivers of change in fuel density and moisture

4. Population changes (including Access and Functional Needs population) that could be impacted by utility ignition

5. Population changes in HFTD that could be impacted by utility ignition

6. Population changes in WUI that could be impacted by utility ignition

7. Utility infrastructure location in HFTD vs non-HFTD

8. Utility infrastructure location in urban vs rural vs highly rural areas

4.2.2 HFTD Evaluation

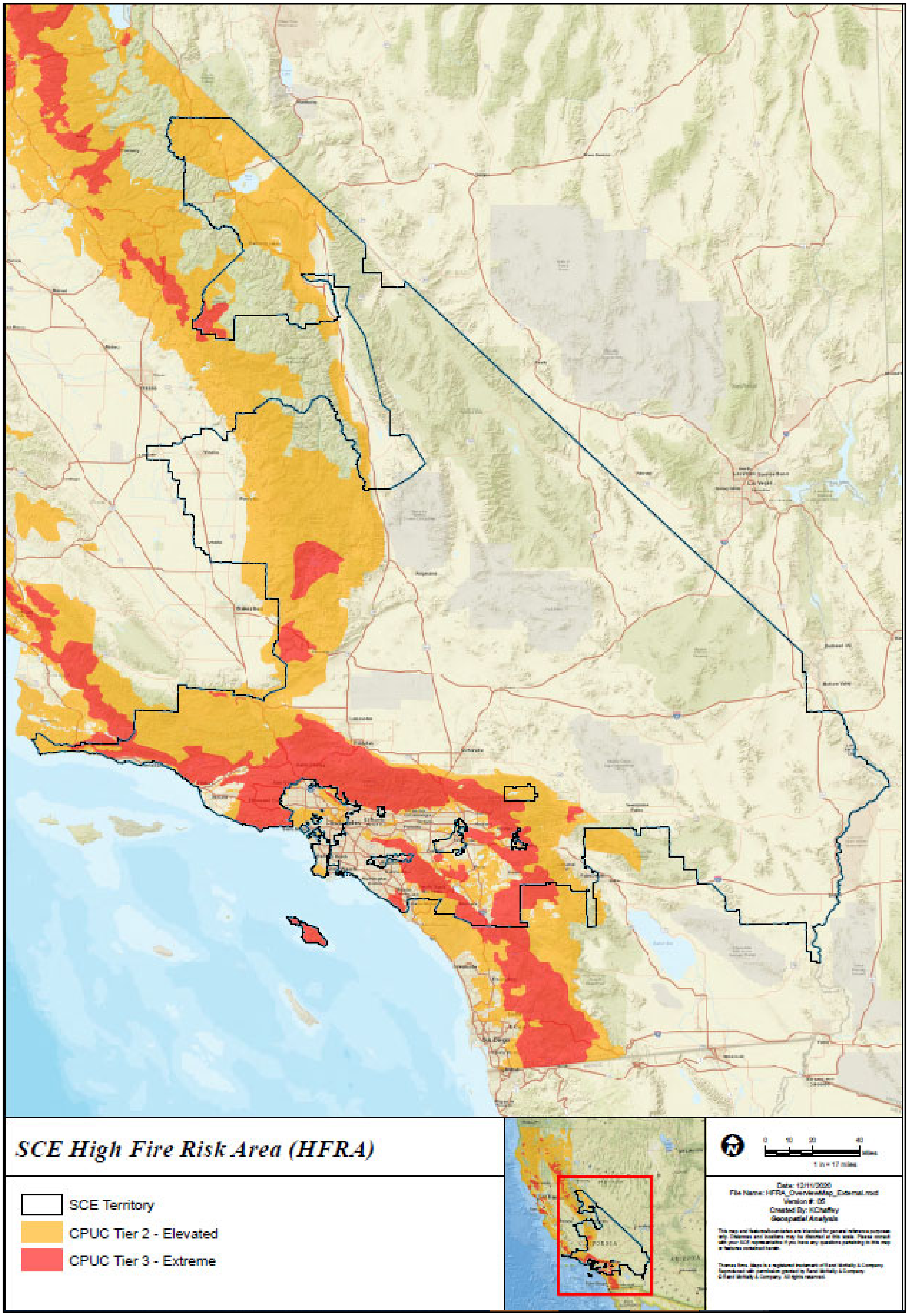
On December 17, 2020, the Commission approved SCE's request for a modest expansion of the Commission's HFTD, with modifications, to include areas in SCE's service area that pose unacceptable wildfire risk to customers and communities. The modifications included removing six areas from SCE's non-CPUC HFRA, classifying one area as Tier 3 (versus Tier 2 in the original submittal), and incorporating the remaining polygons, with slight adjustments to better align with the HFTD boundary, into Tier 2.[12] On January 20, 2021, SCE filed Advice Letter 4397-E requesting Commission staff approval of the final modification of the boundaries of the CPUC HFTD pursuant to Ordering Paragraph (OP) 2 of D.20-12-030[E4]. Commission staff will review and then update the CPUC's Statewide HFTD maps and relevant links on the

[12] *See* D.20-12-030[E4].

Commission's webpage.[13] See Figure SCE 4-1 that includes the updated HFTD in and near SCE's service area. SCE is currently implementing these boundary modifications within our internal systems and processes and anticipates completion before the June 30, 2021 deadline.[14] Because the boundary changes are in process and will take time to operationalize, data provided as part of the QDR will continue to be reported by SCE's previous HFRA, i.e., Zone 1, Tier 2, Tier 3, and SCE's non-CPUC HFRA including 200-foot buffers along the borders of these areas.[15]

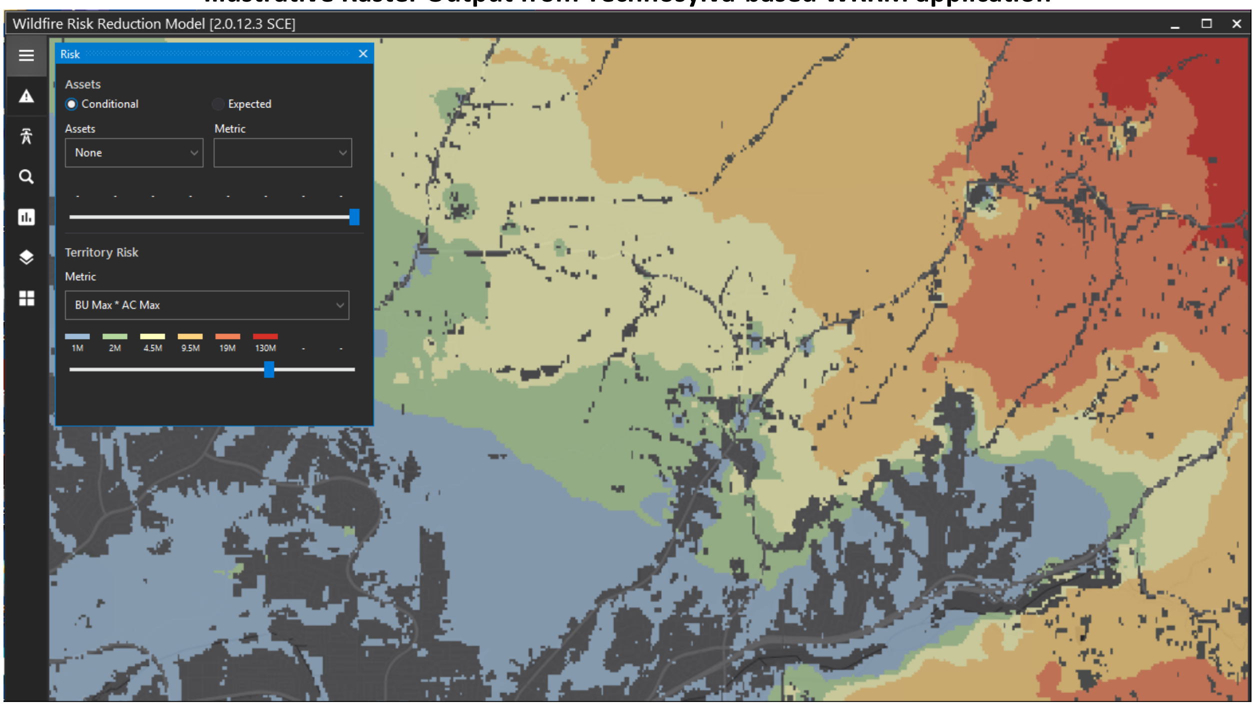
[13] Further information about and Internet access to the CPUC HFTD Map is available at: https://www.cpuc.ca.gov/FireThreatMaps/.
[14] *See* D.20-12-030[E4], OP 4.
[15] Once the boundary changes are implemented, SCE's HFRA will be identical to the HFTD with the only difference being the 200-foot buffers that abut the HFTD boundaries.

Figure SCE 4-1
Boundary Map of SCE's HFRA



In 2021, SCE will increasingly use its WRRM as a primary resource to assess the POI and consequence to holistically analyze wildfire risk. For example, WRRM models can be calibrated to help define areas of elevated and extreme risk that may substantiate recommendations to further modify the boundaries of the HFTD as needed. Figure SCE 4-2 provides an illustrative example of how wildfire consequence is geospatially mapped in the WRRM compared with the HFTD and SCE's HFRA boundaries prior to D.20-12-030[E4]. Other advanced technologies, like artificial intelligence-enabled satellite image change detection, will be explored to analyze changes in fuels or land uses that may also influence prospective changes to HFTD boundaries. While SMEs in grid operations, vegetation management, and fire management will still be an important part of the analysis, SCE is developing a more data-driven, automated approach to conducting fire-threat assessments across its service area and areas outside where its assets exist.

Figure SCE 4-2
Illustrative Raster Output from Technosylva-based WRRM application



4.2.3 Macro trends

Macro trends impacting ignition probability and estimated wildfire consequence that may impact HFRA assignment:

Below, SCE categorizes the factors it analyzes as having more material impacts on ignition probability and estimated wildfire consequence in its HFRA and separately the factors that have yet to demonstrate or be proven to have material impact on ignition probability and estimated wildfire consequence in its HFRA.

<u>Macro trends impacting ignition probability and estimated wildfire consequence in HFRA</u>

SCE describes below the macro trends impacting ignition probability and estimated wildfire consequence within its service area, highlighting any changes since the 2020-2022 WMP filing.

Change in ignition probability and estimated wildfire consequence due to climate change

Climate change is the primary driver of a range of underlying factors that affect wildfire initiation, spread, and intensity and, in turn, wildfire consequences. At a high-level, climate change-driven droughts are most tightly coupled with wildfire activity, more so than fuel density and invasive species (e.g., mountain and bark beetles) alone. This is in part because climate change is a driver of these other variables that influence wildfires as secondary factors. Meanwhile, climate/weather-related factors (e.g., droughts, extreme temperatures, high evapotranspiration, dry winds, etc.) have produced environments for extreme fire conditions. During these conditions, vegetation is often dry enough to fuel extensive fires regardless of the presence of secondary factors such as invasive species. Extreme multiyear drought (i.e., increased temperatures and decreased precipitation) may lead to an increase in dead vegetation, increased bark beetle infestations, and more fuel for wildfire, if left unmanaged. Increases in the frequency and/or magnitude of wind events can compound these impacts.

Projections by Westerling (2018) point to a future defined by intensifying and, at times, expanding areas of elevated wildfire risk, that are strongly driven by changes to underlying climate conditions used in the statistical modeling.[16] Other research, notably Williams et al (2019) further strengthens the primary link between climate change and wildfire activity in California.[17] Additionally, while the impact of climate change on utility equipment failure (e.g., lines-down) may not be overly significant as a wildfire driver, the consequences of resulting ignitions could increase as climate change makes the underlying and surrounding landscape more receptive to ignitions.

To account for a wide range of historical climate scenarios, SCE uses 41 weather scenarios across a 20-year historical climatology in its WRRM consequence model. By using a wide range of models, SCE can determine the relative risk of wildfire consequence for each location under the maximum likely weather conditions, based on a historic climatology for any given location. The result is a relative ranking of locations by ignition consequence across SCE's service area.

Change in ignition probability and estimated wildfire consequence due to other drivers of change in weather

Wildfire ignitions associated with utility equipment can occur at any time of the year and are not necessarily weather dependent. However, there is significant evidence that periods of extreme system stress, such as under high wind conditions, can lead to increases in both wildfire ignitions and consequences (Mitchell (2013); Abatzoglou, Balch, Bradley & Kolden (2018)).[18] Therefore, in addition to

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[16] Westerling, Anthony Leroy. (University of California, Merced). 2018. Wildfire Simulations for California's Fourth Climate Change Assessment: Projecting Changes in Extreme Wildfire Events with a Warming Climate. California's Fourth Climate Change Assessment, California Energy Commission. Publication Number: CCCA4-CEC-2018- 014.

[17] Williams, A. P., Abatzoglou, J. T., Gershunov, A., Guzman-Morales, J., Bishop, D. A., Balch, J. K., & Lettenmaier, D. P. (2019). Observed impacts of anthropoenic climate change on wildfire in California. Earth's Future, 7, 892–910. https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2019EF001210

[18] Mitchell, J.W., 2013. Power line failures and catastrophic wildfires under extreme weather conditions. Engineering Failure Analysis, Special issue on ICEFA V- Part 1 35, 726–735. https://doi.org/10.1016/j.engfailanal.2013.07.006; Abatzoglou, J.T., Balch, J.K., Bradley, B.A., Kolden, C.A., 2018.

leveraging a set of machine learning models to better predict ignition risk from EFF or CFO. SCE also uses in-house weather and fuels modeling, along with its FPI to focus its grid operations and emergency planning efforts toward conditions that may be more conducive to extreme wildfire events.

Change in ignition probability and estimated wildfire consequence due to other drivers of change in fuel density and moisture

As noted above, climate change is a main driver of fuel density and moisture. Vegetation is an existing condition and its contribution to ignition likelihood and wildfire consequence is predicated on its interaction with weather conditions. Westerling (2018) uses vegetation fraction as a logistic model variable to determine wildfire presence, but the regression analysis also considers a range of underlying climate variables (e.g., temperature, water deficit, etc.) to help determine how vegetation may convert to wildfire fuel. Applying these studies with SCE's experience, we consider fuel density and moisture as secondary to (though influenced by) climate change trends. Fuel density may also be reduced by active forest management. For example, Westerling's simulation of fuel treatment scenarios indicate a significant reduction of area burned relative to the baseline scenario. Based on SCE's forestry management team's experience protecting the Shaver Lake area's forests for more than three decades, fuel breaks (created in partnership with CAL FIRE), tree removal, and prescribed burning has reduced wildfire impacts to customers. For example, when the Creek Fire occurred in 2020, the largest single fire in California history at more than 379,000 acres, most of the region was spared from this devastating wildfire. SCE's actions, played a critical role in slowing the spread of the Creek Fire, reducing damage and providing more time for residents in this area to evacuate.[19]

Change in ignition probability and estimated wildfire consequence due to relevant invasive species, such as bark beetles

In recent years, mountain pine beetle outbreaks and fire activity have both increased independently and simultaneous to recent climate warming. SCE initiated its Dead and Dying Tree initiative in response to this threat. In 2020, SCE began to see the impact of the introduction of new invasive species in its HFRA. The Gold Spotted Oak Borer is a species that SCE's service area had limited exposure to until recently. The species is beginning to have a broad impact causing decline and even death on the oak tree communities

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Human-related ignitions concurrent with high winds promote large wildfires across the USA. International Journal of Wildland Fire; https://www.publish.csiro.au/wf/WF17149

https://doi.org/10.1016/j.engfailanal.2013.07.006

[19] SCE's forest management program performs several treatments a year with the goal of optimizing forest health and resilience on SCE forestlands. All the dead tree removal work that SCE's forestry team conducted around Shaver Lake helped deflect the Creek Fire at its north boundary and pushed the flames around SCE's property in a counter-clockwise fashion that gave the town of Shaver Lake an extra 24 hours to prepare. The extra time allowed firefighters to build fire lines and expand fuel breaks which are used to control or stop a fire. Fuel breaks were also created over the last two years in partnership with CAL FIRE and the Highway 168 Fire Safe Council. In addition, SCE's forestry team has been working to protect 20,000 acres of SCE-owned forest land around Shaver Lake from large wildfires through the use of prescribed burns and the tree removal work that included a prescribed burn in 2020 which played a critical role in preventing large flames from burning the Shaver Lake Recreational Area.

as it spreads. The other emerging challenge is the Invasive Shot Hole Borer which targets numerous tree species in addition to oak trees in the Wildland Urban Interface (WUI) areas. While these insects have not yet caused widespread devastation of oak and other mountainous tree species to date, it is an emerging concern to the overall impact they pose as they spread across the HFRA. The arrival of these insects has the same impact on oaks and other tree species just as the bark beetle did on pines. SCE's Dead and Dying Tree initiative effectively mitigates this risk by inspecting its HFRA multiple times a year for dead and dying trees (often due to invasive species) within striking distance of its facilities and removing them. As such, SCE has not yet seen an overall increase in the probability of wildfire ignition due to invasive species. However, these new beetle species are increasing the mortality of vegetation in the fringe HFRA areas that can accelerate the wildfire propagation into more broad wildland areas.

Macro trends minimally impacting ignition probability and estimated wildfire consequence in HFRA

Below, SCE describes the macro trends that have yet to demonstrate or be proven to have material impact on ignition probability and estimated wildfire consequence in its HFRA.

Population changes (including AFN population) that could be impacted by utility ignition

SCE uses population information from LandScan 2018, which is developed by Oak Ridge National Laboratory, to estimate potential consequence but does not use population projections to assess possible future consequence. The WRRM is a static model. As such, it does not account for population growth. Population increases over time will increase the potential consequence of a wildfire but not necessarily contribute to an ignition risk related to the electrical system. SCE assumes this population is spread out across its service area and thus includes population outside of SCE's HFRA. SCE will refresh population data, along other inputs, as it updates the model.

Population changes in HFTD that could be impacted by utility ignition

SCE uses current population from LandScan 2018, which is developed by Oak Ridge National Laboratory, to estimate potential consequence; SCE has not used population projections in the current HFTD to assess possible future consequence. The WRRM is a static model. As such, it does not account for population growth. Population increases over time will increase the potential consequence of a wildfire but not necessarily contribute to an ignition risk related to the electrical system. Population increases in the highest risk areas of SCE's service area directly increase the consequences for where wildfires are most prone to initiate. SCE will refresh population data, along other inputs, as it updates the model.

Population changes in WUI that could be impacted by utility ignition

SCE uses current population projections from LandScan 2018, which is developed by Oak Ridge National Laboratory, to estimate potential consequence; SCE has not used population projections in the WUI to assess possible future consequence. The WRRM is a static model. As such, it does not account for population growth. Population increases over time will increase the potential consequence of a wildfire but not necessarily contributes to an ignition risk related to the electrical system. SCE ranked this trend between the other population trends because the WUI includes areas outside of the HFTD but does not include all of SCE's service area. SCE will refresh population data, along other inputs, as it updates the model.

Utility infrastructure location in HFTD vs non-HFTD

SCE has not modeled ignition probability or estimated consequence under future scenarios. Given this, SCE assumed normal load growth to conceptually assess this macro trend. SCE ranked this macro trend higher than the other utility infrastructure macro trends because the HFTD includes areas in SCE's service area most prone to wildfires. SCE's utility infrastructure located in the HFTD will be hardened, i.e., all new additions will include, at a minimum, covered conductor, fire-resistant poles, etc. SCE's hardened infrastructure will reduce the likelihood of ignitions associated with SCE's facilities.

Utility infrastructure location in urban vs rural vs highly rural areas

SCE has not modeled ignition probability or estimated consequence under future scenarios. Given this, SCE assumes normal load growth to conceptually assess this macro trend. SCE's utility infrastructure located in urban, rural and highly rural areas do not necessarily align with HFTD areas. However, those areas that also traverse the HFTD will be hardened, i.e., all new additions will include, at a minimum, covered conductor, fire-resistant poles, etc. SCE's hardened infrastructure will reduce the likelihood of ignitions associated with SCE's facilities. SCE ranked this macro trend lower than the other utility infrastructure macro trend because it does not align with the HFTD.

4.3 CHANGE IN IGNITION PROBABILITY DRIVERS

Based on the implementation of the above wildfire mitigation initiatives, explain how the utility sees its ignition probability drivers evolving over the 3-year term of the WMP, highlighting any changes since the 2020 WMP report. Focus on ignition probability and estimated wildfire consequence reduction by ignition probability driver, detailed risk driver, and include a description of how the utility expects to see incidents evolve over the same period, both in total number (of occurrence of a given incident type, whether resulting in an ignition or not) and in likelihood of causing an ignition by type. Outline methodology for determining ignition probability from events, including data used to determine likelihood of ignition probability, such as past ignition events, number of risk events, and description of events (including vegetation and equipment condition).

4.3.1 Ignition Reduction Estimates

For the 2020 WMP, SCE assessed wildfire risks, risk mitigation alternatives, and risk mitigation scope based on system averages for probability and consequence of ignition. In 2019 and 2020, SCE created WRRM to model and quantify the POI and Consequence of fire at the asset level, which allows SCE to prioritize programs using asset and circuit-segment level risk rankings by targeting the assets and/or circuit-segments with the highest wildfire risks, e.g., SCE's Covered Conductor program is informed by segment-level wildfire risk rankings. Risk data at the asset-level now enables SCE to quantify wildfire risks, risk mitigation alternatives, and risk mitigation scope and perform asset- or location-specific analyses. This led to different results between the system level and asset- or location-specific risk analyses.

For 2021, the WRRM includes a method to translate the expected values produced by the model into unitless MARS values at the asset and location level. This enables SCE to both calculate risk and risk reduction at the asset and location level as well as aggregated as needed for circuit, or system level analysis. This will drive consistent risk-informed decision-making at the enterprise and program levels.

Based on the transition to asset-level risk analysis in the 2021 WMP Update, SCE's ignition forecast is dependent on using a risk buy down curve, where priority is based on mitigating the total overall risk as opposed to prioritizing reducing the number of ignitions.

SCE illustrates this concept in Table SCE 4-2:

Table SCE 4-2
Risk Illustrative Example

Asset ID	Probability of Ignition (%)	Consequence (risk points)	Total Risk
Asset A	50%	100	50
Asset B	10%	10,000	1,000

In Table SCE 4-2, Asset A has a five times higher POI vs Asset B; however, it also has a 20 times lower risk score than Asset B. The dichotomy of these independent values implores a clearer approach, which SCE is doing. SCE's risk prioritization approach addresses Asset B ahead of Asset A, even though Asset A has a higher POI, due to Asset B's higher risk score.

As shown in Table SCE 4-3, over the next two years (2021-2022) of the 2020-2022 WMP, SCE estimates more than 25% ignition reduction in HFRA compared to 2020 recorded ignitions, assuming the same weather conditions as experienced in 2020.

SCE provides an ignition forecast in the WSD's Table 7 by risk drivers over the two-year period. This reduction is driven by the methodology described in the RSE section, whereby SCE estimated the mitigation effectiveness of programs by risk drivers and determined the risk reduction given the exposure and scope of the program. The ignition forecast is then calculated by the illustrative example described above based on risk prioritization.

Table SCE 4-3
Baseline forecast (with no 2021-2022 mitigations) and forecast (with 2021-2022 mitigations) in HFRA for ignitions, outages, and primary wire downs

	Recorded	Baseline forecast (no mitigations)		Forecast (with mitigations)	
Risk Event	2020	2021	2022	2021	2022
Ignitions	50	47	47	42	37
Outages	4,420	4,813	4,813	4,390	4,049
Primary Wire Downs	173	194	194	179	163

SCE has developed machine learning models to quantify the POI caused by EFF and CFO. The models utilize historical outages and faults caused by EFF and CFO, SCE asset data including circuit connectivity, historical weather data, tree inventory data, etc., to identify patterns that lead to faults then sparks.

The baseline forecast of ignitions is based on time-series forecasting. Time-series forecasting uses patterns in history to create a forecast of what the future may look like. A time-series forecast methodology was chosen because it can capture variation over smaller periods compared to other forecasting methods. For example, a five-year average forecast method cannot capture quarterly variation, such as a short fire season, or trends taking place over those five years. By capturing quarterly ignition data, our time-series approach predicts a seasonal pattern based on history. Should a sub-driver begin trending, either up or down, the time-series method can detect and forecast the implications to the system-wide ignition rate.

In Sections 4.3.2 to 4.3.9 below, SCE describes its wildfire risk analysis and how it informs SCE's decision-making process, including how it distinguishes this risk from other safety and reliability risks.

4.3.2 SCE's Risk-Informed Decision-Making Approach for WMP

SCE's Enterprise Risk Management (ERM) process annually identifies and evaluates the key risks that the enterprise and its customers face, with a focus on safety, such as wildfire risk. SCE uses a multi-step process that includes both a top-down and bottoms-up approach, as described below:

- Top-down review of enterprise-level risks: This effort is aimed at assessing the breadth of activities ongoing at SCE, in the state, and in the utility industry to identify key risks. It includes a review of utility benchmarking, industry trends and research, public policy efforts, legislative activities, CPUC and other regulatory proceedings, major SCE initiatives, and critical business functions. The team also compiles and assesses feedback on current and emerging enterprise level risks through company-wide surveys and direct discussions with SCE leadership.
- Bottom-up review of SCE Enterprise Risk Register: SCE's ERM function maintains an enterprise risk register that captures and assesses risks from across the enterprise, based on interviews and feedback from working groups throughout the organization, including from engineering analyses and field observations. New risks are also identified based on emerging trends in the industry.
- Consolidation and aggregation: SCE aggregates the risks identified through the above processes to evaluate which risks have potential major safety consequences, including consolidation of duplicate and similar risks.
- Review and refinement with senior leadership: Through leadership review and assessment, further refinements are made as appropriate.

Risk modeling and analysis has been a cornerstone in the development and execution of our WMPs and has matured over time. In 2018, we used this multi-step process to develop our RAMP report, which contained nine top safety risks, including wildfire.[20] SCE developed a RAMP risk model and MARS framework (SCE's version of a Multi Attribute Value Function (MAVF)) to quantify our enterprise level risks and evaluate mitigation options). SCE's MARS model aligns with the methodology approved in the Safety Model and Assessment Proceeding (S-MAP). This analysis informed SCE's Grid Safety and Resiliency Plan (GSRP) and 2019 WMP. In parallel, we developed the Wildfire Risk Model (WRM) which was used to determine probability and consequence of ignitions at the asset level.

In 2019, SCE continued to use the RAMP model and MARS framework to assess system- or HFRA-level wildfire risks and risk mitigation using HFRA-level "top down" averages for probability and consequence of ignitions. Once the appropriate mitigation was selected for overall implementation (e.g., covered conductor) SCE used the segment level POI and Reax-based consequence model (together referred to as the WRM) to risk rank conductor segments. This "top down" RAMP model, along with the "bottoms -up" circuit segment prioritization, was used to determine the prioritization of covered conductor installation in the field, in conjunction with other operational considerations. The results of these analyses were included in SCE's 2021 GRC and 2020 WMP.

In 2020, SCE achieved several key milestones in enhancing our wildfire risk analytics. We developed asset-specific POI models for transmission and sub-transmission assets to add to our previously built distribution asset models. SCE also transitioned to a new fire consequence modeling tool developed by Technosylva. We developed a method to translate the risk scores produced by our POI and consequence models into unitless values consistent with RAMP using the MARS framework at the structure (pole or tower) level. Finally, SCE developed a PSPS risk calculation to more comprehensively account for risk reduction benefits, as well as risks associated with use of PSPS for individual circuit segments. All of these improvements and additions are integrated into the overarching model referred to as the WRRM.

Table SCE 4-4
Comparison of SCE's WRM (2019) and WRRM (2020+)

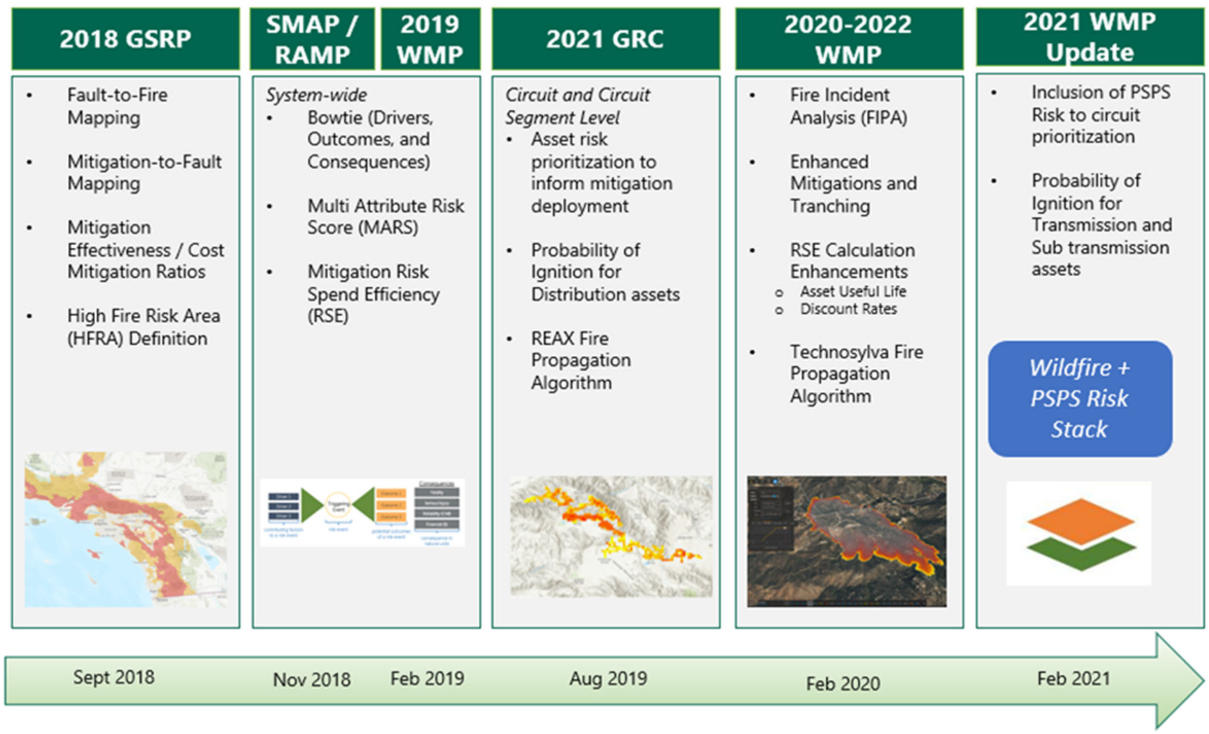
Year	Model Name	WF Probability Component	WF Consequence Component	PSPS Probability Component	PSPS Consequence Component
2019	WRM	SCE Machine Learning	Reax Consequence	Not Captured	Not Captured
2020	WRRM	SCE Machine Learning	Technosylva Consequence	Prob of PSPS De-energization	Consequence of PSPS De-energization

These improvements enable SCE to calculate risk and risk reduction at the asset and location level for both wildfire and PSPS risk in a consistent risk-informed decision-making framework. This approach benefits SCE customers by providing a quantitative assessment of both wildfire and PSPS risk, as well as the risk reduction benefits of mitigation activities targeted to reduce incidents of wildfire and of PSPS. SCE also

[20] The other eight 2018 RAMP safety risks included: 1) Building Safety, 2) Contact with Energized Equipment, 3) Cyberattack, 4) Employee, Contractor & Public Safety, 5) Hydro Asset Safety, 6) Physical Security, 7) Underground Equipment Failure, 8) Climate Change.

uses the outputs of the WRRM to perform RSE calculations using this granular approach focusing on risk-informed decision making and validation for key WMP activities. Figures SCE 4-3 and 4-4 describe the evolution of SCE's wildfire and PSPS risk modeling.

Figure SCE 4-3
Evolution of SCE's Wildfire (and PSPS) Risk Modeling

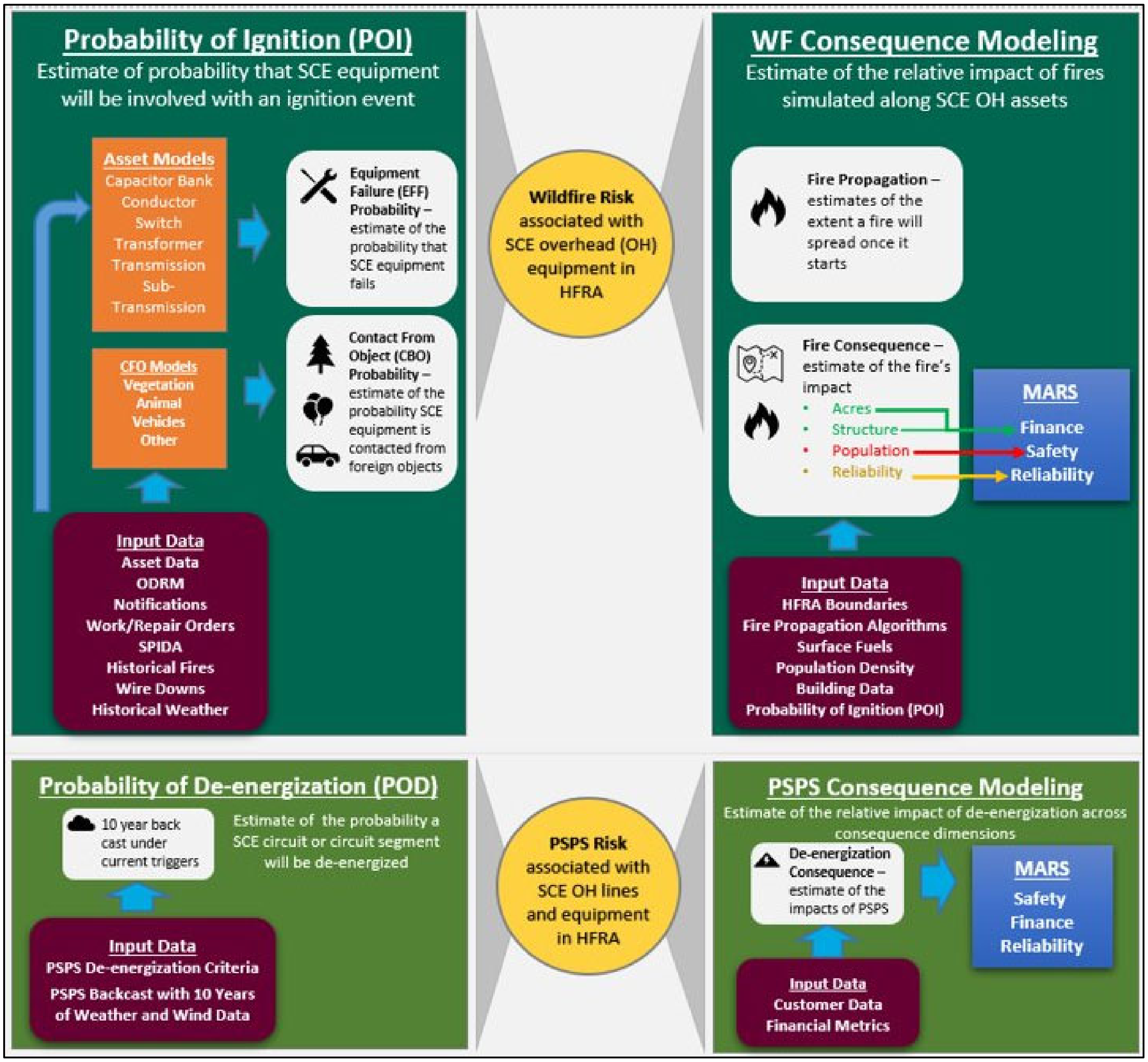


4.3.3 Wildfire Risk Reduction Modeling Framework

SCE's wildfire risk models are used to analyze and quantify wildfire risk. The outputs are used to estimate risk reduction and calculate RSEs to help make decisions about wildfire mitigation activities, and to inform the prioritization of mitigation deployment.

The WRRM framework leverages the risk bowtie to organize drivers, triggering events, and consequences. The triggering event at the center of the wildfire bowtie is an ignition in SCE's HFRA. On the left-hand side, asset and contact from object models, are used to develop an estimate of the POI for a given set of assets. For example, potential ignitions from conductors are primarily driven by equipment failure, CFO (such as trees or balloons), and wire to wire contact (such as during high winds). The consequences of these ignition events are estimated on the right-hand side using the Technosylva consequence model. The model estimates the potential spread of a fire over a given time, as well as the corresponding impact of this fire in natural units - structures, acres, and population. These consequences are then translated into MARS units to calculate RSEs of mitigation activities and compare the relative risk of wildfire ignitions to that of other risk events. The outputs of the various models are aggregated into a unified WRRM output. The output of individual models and/or the entirety of the model output, can be used for risk informed decision making.

Figure SCE 4-4
Wildfire Risk Reduction Modeling (WRRM) Framework



In 2020, SCE transitioned from Reax to Technosylva for its wildfire consequence modeling. Details on the improvements from this transition are described in the sections below.

4.3.4 PSPS Risk Model

SCE also developed a PSPS component for the WRRM.[21] Similar to the wildfire risk component of the WRRM, SCE's PSPS risk component leverages the risk bowtie to assess the relative risk of PSPS impacts to customers at each circuit or circuit segment. On the left side of the bowtie, SCE estimates the Probability of De-energization (POD) based on a 10-year back-cast of historical wind and weather conditions to estimate the annual frequency and duration of de-energization events, based on current PSPS de-energization protocols. On the right side of the bowtie, SCE estimates the safety, reliability, and financial consequences resulting from a PSPS by counting the number of customers potentially impacted. The consequences are estimated based on the number of customers on a potentially de-energized circuit, along with a multiplier for the potential safety, reliability, and financial impacts associated with those de-energizations. The PSPS risk component is an addition in this 2021 WMP Update and was not part of the WRM in the 2020 WMP.

4.3.5 Probability of Ignition Models

Within the wildfire component of the WRRM, there are two classes of POI models; EFF models and CFO. Each of the individual models are developed using machine learning algorithms for each asset or contact type as the drivers vary by asset/contact type.

Each asset-specific model uses historical outage data, available asset attributes and condition data (i.e., age, voltage, inspection results, etc.) and other asset and environmental attributes (i.e., historical wind, number of customers, etc.) to predict the probability of the asset creating a spark. Similarly, each CFO model uses outage data along with other variables to predict a spark caused by the particular type of contact (e.g., vegetation, animal, balloon).

The POI models within the wildfire component of the WRRM calculate probabilities at the structure level, and thus total ignition probability at a structure (i.e., pole or tower) is calculated as the sum of the probabilities of ignition across the assets at that location. Similarly, risk values can be aggregated to the circuit level, district, etc. Currently, for the purpose of prioritizing mitigations, all sparks are assumed to potentially create ignitions.

Development and maintenance of these models are resource intensive and complex. Significant data synthesis and quality checks are necessary prior to analysis and building models to estimate probabilities of ignition. Once the models are built, they need to be continuously tested and updated using new outage data for observed failures or "near misses," and new inspection, remediation, or replacement data for latest available asset condition.

In 2019, SCE developed POI models for distribution overhead conductors, distribution switches, distribution capacitors, and distribution transformers. In the first half of 2020, SCE further developed POI models for transmission wires and towers.

[21] SCE's PSPS risk modeling aligns with SDG&E's Wildfire Next Generation System approach.

4.3.6 Ignition Consequence Models

To estimate the consequence of an ignition in this 2021 WMP Update, WRRM uses the Rothermel fire propagation algorithm within the Technosylva consequence module to estimate the natural unit consequences (e.g. structure burned, acres burned and population impacted) from individual ignition simulations along SCE's overhead assets within HFRA. These natural units are translated into MARS units to incorporate safety, financial and reliability impacts due to wildfire. This consequence module replaces the broader "outcome" scenarios presented in GSRP and RAMP by estimating a fire's characteristics once it starts (e.g., fuel conditions and wind speed), where the fire will move (wind direction and terrain impacts), and the potential structures, population and acres impacted by a fire based on scenario-based fire sheds. The 2021 WMP Update differs from SCE's 2020 WMP, in that SCE replaced the Reax -based consequence modules with a Technosylva – based consequence model. A more detailed discussion of the evolution of our ignition consequence model enhancements is below.

In early 2019, SCE engaged Reax Engineering (Reax), an experienced fire science consulting firm, to develop a fire-propagation model for areas surrounding SCE's overhead facilities within the HFRA, and to identify relative consequence areas based on fire-weather climatology and Census data. Fire propagation characteristics were estimated using a twenty-year fire weather climatology model. Based on ignition simulations in SCE's HFRA where overhead facilities are located, fire volume – the spatial integration of fire area and flame length – was estimated to develop sample fire scars. This process was repeated across SCE's service area for hundreds of thousands of combinations of ignition location and duration. The outputs of these simulations were used to quantify the consequence as the product of fire volume and the number of impacted structures within the weighted average overlay of simulated fire scars localized to 300-meter by 300-meter Reax grid squares. SCE later enhanced the Reax consequence output to consider not only the number of structures impacted, but also impacts to safety, such as serious injuries and fatalities, acres of property burned, as well as suppression and restoration costs.

In 2020, SCE transitioned to a Technosylva-based consequence model, which included improvement over the Reax-based consequence model. Key improvements include updated and more granular model inputs (e.g., buildings, assets, fuels, population), more advanced fire propagation techniques (e.g., urban encroachment), and direct mapping of consequence scores to individual assets. Technosylva fire spread model uses individual building footprints, population count, SCE asset data, and a 20-year climatology and surface fuel data specifically calibrated to SCE's service area. This will enable SCE to re-run this simulation on an annual, or semi-annual, basis based on updated and calibrated information from previous fire weather seasons which is a significant improvement from the Reax models in targeting mitigations to HFRAs. Please see Table SCE 4-5 below for a list of model inputs, outputs, and algorithms.

Table SCE 4-5
General summary of WRRM Inputs, Outputs and Fire Propagation Algorithms

General Summary of Key Product Elements	
Category	**Technosylva WRRM**
Input Data	• LandFire 2018 surface fuels, with burn scar update as of October 2020 • Microsoft building footprints

General Summary of Key Product Elements	
Category	**Technosylva WRRM**
	• LandScan 2018 population count • Updated SCE asset information, including poles/function and locations (FLOCS) • Incorporates SCE POI for distribution and FLOC ignition assets, POI for transmission and sub transmission to be added in Q1 • Uses SCE specific 20-year climatology
Output Data	• Asset-level conditional risk (consequence only) and expected risk (POI x Consequence) assigned to individual assets • Service area-wide asset-level Hybrid Raster Consequence provided for entire service area in addition to a 20-mile buffer into adjacent service territories • Includes FLOCS • Includes asset ignition probability data • Includes outputs aggregated for all 41 weather scenarios as – mean, median, maximum and 90th percentile • Does not apply fire volume in risk outputs
Consequence Model	• Can be integrated with MARS
Fire Modeling Methods	• Uses published and endorsed models with a proprietary implementation • 20+ models used to enhance core fire modeling • Advanced urban encroachment model ensures a more accurate identification of buildings and population impacts • Uses all weather scenarios for each asset simulation(s) resulting in multiple simulations per asset • Integrates SCE ignition probability data to provide expected risk outputs in addition to conditional risk • Model and software recently adopted by State of California (CAL FIRE) as the only authoritative fire risk model in the state • Modeling methodology also adopted by PG&E and San Diego Gas and Electric (SDG&E)

In addition to asset-specific consequence values provided by Technosylva's models, the geospatial viewer tool provided by Technosylva is able to display aggregated and disaggregated risk scores geospatially across SCE's service area with an additional 20-mile buffer outside of HFRA.

4.3.7 Multi-Attribute Risk Score

The MAVF was developed as part of the S-MAP proceeding and is used in the utilities' RAMP filings to compare risks and mitigation alternatives. The MAVF was developed as part of the S-MAP proceeding and is used in the utilities' RAMP filings to compare risks and mitigation alternatives. The MAVF is also used to calculate RSE. SCE's version of the MAVF is called MARS. SCE has improved its MARS framework since first developing it for our 2018 RAMP.

As described in the previous sections, SCE modeled wildfire and PSPS risks independently from one another. In order to use this information to assess combined risk (wildfire and PSPS), as well as assess the relative effectiveness of mitigations, SCE converted WRRM natural unit consequence outputs (acres, structures, population) to MARS units. Converting these consequences to MARS units allows SCE to assess the benefit of deploying mitigations to address wildfire risk, PSPS risk, or both. Corresponding RSEs were calculated using the estimated wildfire risk reduction, PSPS risk reduction, or both as applicable.

- **Wildfire Component of WRRM** – Applicable to programs that only mitigate wildfire risk drivers and/or consequences. Example: Expanded pole brushing.
- **PSPS Component of WRRM** – Applicable to programs that only mitigate the probability of a PSPS de-energization and/or consequence caused by a de-energization. Example: Assisting customers with back-up batteries.
- **Wildfire and PSPS Components Together** – Applicable to programs that mitigate both Wildfire and PSPS risks. Example: Covered Conductor (reduces wildfire ignition drivers and raises wind speed thresholds for PSPS de-energization).
- The PSPS risk is added or "stacked" along with the wildfire risk for a total combined risk for purposes of RSE calculations.

Table SCE 4-6 below summarizes the probability and consequence modeling inputs for the wildfire and PSPS risk components of the WRRM.

Table SCE 4-6
Overview of Probability and Consequence Modeling Inputs for Wildfire and PSPS Components of the WRRM

	Wildfire Component	PSPS Component
Probability (normalized to an annual frequency)	POI based on internally developed Machine Learning algorithms at segment or asset level	Probability of de-energization based on a 10 year back-cast based on wind and FPI data using SCE's current PSPS de-energization protocols

MARS Consequence		
Safety	Population impacted based on Technosylva consequence simulation which in turn is translated into the Safety index	From the number of customers impacted from reliability, gross-up to the number of impacted population. Use a conversion ratio[22] to convert impacted population to a Safety index
Reliability	Eight hours of interruption per customer on the circuit. This duration was used in order to maintain consistency with Technosylva fire propagation simulation, which also uses eight hours.	Number of customers based on the downstream impact of a de-energization on a circuit. Duration is based on a historical back-cast as described above
Financial	Buildings and acres impacted based on values from Technosylva WRRM which is then translated to financial dollars	$250/Customer/Event

MARS uses natural units[23] of safety, reliability, and financial consequences into a combined unit-less consequence score. Since SCE's 2020 WMP, we have made three changes: (1) changes to the scaling function; (2) indexing; and (3) a methodology to account for risk associated with vulnerable/at-risk communities. This latest iteration is MARS 2.0.[24]

Scaling Function – In MARS 1.0 (2020 WMP), SCE ascribed a concave (non-linear) scaling function to safety which amplified the impact of the first few fatality or serious injury (S.I.) counts. SCE has since switched to a linear scaling function to reflect that each incremental safety event is valued the same as the previous one.

Indexing – Previously, SCE had a separate score and weighting for fatalities and serious injuries. In MARS 2.0, SCE moved to an index function which combines both fatalities and serious injuries into a single Safety index. This is consistent with the S-MAP decision which prescribes an attribute hierarchy where the top-level attribute is a label or category (in this case Safety is the top level attribute) and lower-level attributes are observable and measurable (namely fatalities and serious injuries).

[22] Given the limited information directly linking fatalities to a PSPS event, SCE used the 2003 Northeast Blackout event as a data point to determine safety impacts from an outage. That blackout lasted for 48 hours, impacted 50 Million people, and was recorded to have 100 fatalities, which converts to 4.2×10^{-8} fatalities / people-hrs. Other data points include the 2011 Southwest blackout and the 2019 PSPS outages in SCE service area.

[23] Natural units are the number of Fatalities or Serious Injuries for safety, customer minutes of interruption for Reliability, and dollars for Financial.

[24] MARS 2.0 -- Translating the Wildfire and PSPS Risk Components of the WRRM

Vulnerable / At-Risk communities – SCE has incorporated a new targeting multiplier to its Safety index which amplifies the score based on an internal analysis of two population sets, AFN[25] and Non-Residential Critical Infrastructure[26] (NRCI). At the circuit level, SCE developed both an AFN and NRCI score to incorporate the level of support that an individual or entity would need in an emergency event or PSPS event, in the case of an AFN customer. The two multipliers are constructed as follows:

1) $AFN_{Multiplier} = 1 + \frac{AFN\_Score_{circuit}}{AFN\_Score_{MAX}}$ where $AFN\_Score_{circuit}$ is the circuit level score and AFN_Score_{MAX} is the maximum score from all the circuits. The lowest AFN multiplier would be 1 in the case where the AFN score on that circuit was zero. The highest AFN multiplier would be 2 in the situation where a circuit had the highest AFN score.

2) $NRCI_{Multiplier} = 1 + \frac{NRCI\_Score_{circuit}}{NRCI\_Score_{MAX}}$ where $NRCI\_Score_{circuit}$ is the circuit level score and $NRCI\_Score_{MAX}$ is the maximum score from all the circuits. The lowest NRCI multiplier would be 1 in the case where the NRCI score on that circuit was zero. The highest NRCI multiplier would be 2 in the situation where a circuit had the highest NRCI score.

Combining these multipliers into the Safety index results in the following equation:

$$Safety\ Index = \left[1.0 * (\#\ of\ Fatalities) + \frac{1}{4} * (\#\ of\ S.I.)\right] * AFN_{Multiplier} * NRCI_{Multiplier}$$

Table SCE 4-7 below summarizes the MAVF changes between what was used in the 2020 WMP and this current year's WMP update filing.

Table SCE 4-7
Comparison of MARS 1.0 to MARS 2.0 Attributes, Units, Weights, Ranges, and Scales

2020 WMP					2021 WMP Update				
Attribute	**Unit**	**Weight**	**Range**	**Scaling**	**Attribute**	**Unit**	**Weight**	**Range**	**Scaling**
Fatalities	#	25%	0 - 100	Concave	Safety	Index	50%	0 - 100	Linear
Serious Injuries	#	25%	0 - 500	Concave					
Reliability	CMI	25%	0 – 2 Billion	Linear	Reliability	CMI	25%	0 – 2 Billion	Linear
Financial	Dollars	25%	0 – 5 Billion	Linear	Financial	Dollars	25%	0 – 5 Billion	Linear

Since the MARS framework is used to estimate both wildfire and PSPS unit-less consequence scores, they can be combined into a Wildfire+ PSPS Stacked risk as shown in Figure SCE 4-5 below.

[25] AFN customers include but not limited to Critical Care, Disabled, Medical Baseline, Low Income, Limited English, Pregnant, Children.
[26] NRCI sectors include but not limited to Healthcare and Public Health, Water and Wastewater systems, Emergency Services, Communication, Transportation, Government Facilities, Energy.

Figure SCE 4-1
Wildfire + PSPS Stacked Risk

Wildfire Risk

$$\underbrace{Probability_{ignition} \times \begin{bmatrix} Safety \\ Reliability \\ Financial \end{bmatrix}}_{\textit{Conversion to MARS}}$$

$$\text{MARS}_{\textit{Wildfire}}$$

PSPS Risk

$$\underbrace{Probability_{De-energization} \times \begin{bmatrix} Safety \\ Reliability \\ Financial \end{bmatrix}}_{\textit{Conversion to MARS}}$$

$$\text{MARS}_{\textit{PSPS}}$$

$$\underbrace{\text{MARS}_{\textit{Wildfire}} + \text{MARS}_{\textit{PSPS}}}_{\text{MARS}_{\textit{Wildfire + PSPS}}}$$

While PSPS is an effective mitigation against ignitions under extreme fire conditions, we fully recognize there are broader impacts, hardship, and risks that are introduced by proactive de-energization. This is why we have accounted for these broader PSPS impacts in our overall risk model. The combined $\text{MARS}_{wildfire}$ and MARS_{psps} model shows that wildfire risk is substantially greater than PSPS risk across the safety, reliability, and financial dimensions. Nevertheless, by incorporating the PSPS risk into the overall wildfire risk to calculate a total MARS, we have the means to target mitigations to areas that have the highest combined risk in addition to targeting wildfire and PSPS impacts separately. For example, because covered conductor remains a major program component for system hardening, we could prioritize the frequently impacted circuits and reduce the frequency of PSPS on these circuits.

4.3.8 RSE Analysis

The RSE calculation provides an indicator of the risk reduction accomplished through an activity compared to the costs for that activity. The RSE is calculated for those activities that have a direct impact on risk or consequence of wildfire and/or PSPS de-energizations. The remainder of this section provides an overview of the benefits and limitations of using RSEs in decision-making, an overview of the RSE calculation methodology, and a summary of RSE results.

RSEs are a useful tool to inform the decision-making process when evaluating alternative mitigations, selecting new programs for widespread deployment, or making changes to the scope of deployed programs. For recently concluded pilot activities, the RSE value can serve as one threshold indicator to determine whether the pilot (or program deployed elsewhere, but not yet deployed in SCE's service area) should move into full deployment.

SCE's ability to calculate RSEs at a more granular level has been enhanced based on the advancements implemented in 2020. This results in a more accurate understanding of relative risk buy down across programs and enables SCE to evaluate the relative risk reduction benefits more consistently for our portfolio of WMP activities.

It should be noted that RSE values may not be identical among the California utilities. Given that RSE values are derived from calculated risk scores which include the POI along with consequence (which are unique for each asset), they will vary based on the equipment conditions, potential for CFO, and the size of potential fires inherent in each utility's service area. In addition, each utility while following RAMP guidelines for translation to unitless values for RSE calculation, may use assumptions and values for their MAVF components that are unique to their environment which will result in differences in RSE.

RSEs, though an important and valuable input to help understand the relative value of various activities in economic terms, are not, and should not, be the only factor used to develop or execute a risk mitigation plan. The RSE metric does not account for certain operational realities, including planning and execution lead times, resource constraints, work management efficiencies, regulatory compliance requirements, environmental and permitting requirements, and conditions that are not captured within the WRRM. These additional factors are considered by SCE while determining the type, volume, and sequence of work undertaken to reduce wildfire and PSPS risks in a timely manner.

RSE Calculation Method

SCE's RSE calculation method follows the steps below.

1. Use historical counts to forecast baseline (in the absence of mitigations) wire-down, outage, and CPUC ignition levels.
2. For each program, obtain
    a. cost forecast,
    b. mitigation effectiveness – a percentage between 0 and 100% denoting the effectiveness of reducing risk driver frequency or consequences of events,
    c. prospective units to be installed/performed, and
    d. years of useful life (mean time to failure)
3. For each year, calibrate the WRRM to the forecast baseline wire-down, outage, and CPUC ignition levels to convert probabilities to frequencies.
4. Where available, use location data, mitigation effectiveness, and the WRRM to estimate risk buydown associated with the program.
    a. If location data are not available, or if the scope is not determined yet, use the risk buydown curve from the Wildfire Risk Reduction Model. Use the units to be installed/performed in that year to determine how far down the risk buydown curve the program may mitigate risk.
    b. Apply the mitigation effectiveness to the particular asset's risk drivers or consequences and compare the resulting risk with the baseline risk. The difference is the risk reduction.

5. Calculate the net present value (NPV) of the risk reduction applying the years of useful life as the time horizon.
6. Calculate the RSE by dividing the NPV of risk by the cost forecast.
7. Calculate the event buydown using the calibrated WRRM.
8. Calculate the forecast of net events by subtracting the estimated count of mitigated events from the baseline forecast.

The methodology to calculate RSEs for wildfire mitigations, as described above, is identical to that for calculating RSEs for PSPS mitigations, but instead of incorporating wildfire ignitions and its associated consequences, the model uses the PSPS probability and consequences as described in Section 4.3.2. The Covered Conductor and Undergrounding programs mitigate both Wildfire and PSPS risks. In these cases, SCE added both wildfire and PSPS risk benefits together and divided by the forecasts of the program to arrive at an RSE.

Summary of RSE Results

Table SCE 4-8 summarizes RSE results for each wildfire initiative. The WMP requirements seek RSE calculations for all WMP initiatives. SCE provides RSEs for all activities that directly mitigate wildfire or PSPS risks. However, several activities do not directly reduce either wildfire or PSPS risks. For example, various situational awareness activities as well as certain customer outreach programs or technology projects do not reduce risks by themselves but enable effective deployment of other WMP activities. Calculating reductions in probability or consequence of ignition or PSPS events for these activities would be speculative at best. As another example, pilots are being conducted not to reduce risks, but to assess technologies that can potentially reduce risks to determine operational impacts, costs, risk reduction benefits, etc. Once the results of the pilots are available, RSEs would be calculated prior to broad scale deployment. These foundational activities are necessary regardless of RSEs, and their scope and prioritization are not informed by wildfire or PSPS risk analysis. Therefore, SCE focused its RSE calculations on WMP activities where RSE calculations are meaningful to inform decision making.

Below, SCE further explains the reasoning why certain initiatives do not have RSE scores. First, SCE provides categories of activities and explanations for these categories why initiatives within them do not have a RSE score. The table below, then, includes the reasoning category for certain activities not being scored for RSEs.

Pilot activities: SCE initiates wildfire pilot activities when research, studies, benchmarking, etc. of new technologies, work methods, processes, etc. indicate there is a potential benefit to reduce wildfire risk so that SCE can test the pilot, ideally in the electrical system, collect information, and then make a data-driven decision regarding ending the pilot, targeted deployment, or full-scale deployment of an activity. SCE discussed above why RSE calculations would be unsuitable for pilots. Upon conclusion of pilot activities, if the results are favorable, SCE will use the gathered data to estimate the risk reduction of the mitigation and perform the RSE calculation as part of the analysis to inform a decision for broader deployment of the activity.

Enabling activities: Many initiatives do not reduce the POI or consequence of wildfire or PSPS but are foundational activities that provide capabilities to better manage our wildfire program. This category also includes certain customer-facing activities that help customers reduce the impacts of PSPS. Because the enabling activities do not by themselves result in a risk reduction, there is no RSE for these activities.

Insufficient historical data: For certain activities, there is insufficient data to calculate the mitigation effectiveness.

Please note that the RSE values provided in the 2021 WMP Update differ from those shared in SCE's 2020 WMP for the following reasons:

- *Risk Value Framework:* The 2021 WMP Update uses SCE's updated MAVF – MARS 2.0 – whereas SCE's 2020 WMP did not. This is described further in Table SCE 4-7 above.
- *Granularity of Analysis:* The 2020-2022 WMP used the RAMP model to calculate RSEs at the system (HFRA) level, which means that risk is evenly spread across HRFA. In the 2021 WMP Update, SCE quantified risk at the asset and circuit levels, which allows the targeting of mitigations to specific assets along the risk curve[27] (e.g., deploying vertical switches at specific locations).
- *RSE Output Structure:* Pursuant to WSD-011, the RSE table in SCE's 2021 WMP Update is structured differently than last year. In this WMP, SCE is providing RSEs in Table 12, calculated by different tiers (e.g., Tier 2, Tier 3, etc.), instead of the yearly values in last year's 2020 WMP, Tables 21-30. The use of tiers in this table provides an indication of how RSEs can change when tranches are applied. Importantly, the relative ranking of RSEs can change depending on how many tranches are used, and how those tranches are structured.

For the same reasons, updates to the calculation methodology also changed the relative RSE ranking of certain WMP activities.[28]

Table SCE 4-8
Summary Table of RSE Results

Category	ID	Initiative / Activity	RSE Calculated (Rationale)	RSE[29]	Quantified Risk Reduction Benefits
Situational Awareness	SA-1	Weather Stations	Yes	598	Reduces consequence of PSPS
	SA-2	Fire Potential Index (FPI)	No - Enabling Activity	N/A	N/A
	SA-3	Weather and Fuels Modeling System	No - Enabling Activity	N/A	N/A

[27] A "risk curve" is generated by ranking all conductor segments from highest to lowest risk and the cumulative risk bought down reflects the order in which the work is performed in order to achieve maximum risk buydown.
28 Consistent with the WSD's directive, SCE does not rely on RSE calculations as a tool to justify the use of PSPS. However, SCE calculated an RSE of 15,373 in Tier 3 for PSPS, offsetting the wildfire risk mitigation benefits by the expected increase in risk from PSPS.

[29] RSEs provided are for HFTD Tier 3, refer to Table 12 in Appendix 9.7 to see the RSEs for Tier 2 and Non-CPUC HFTD.

	SA-4	Fire Spread Modeling	No - Enabling Activity	N/A	N/A
	SA-5	Fuel Sampling Program	No - Enabling Activity	N/A	N/A
	SA-7	Remote Sensing / Satellite Fuel Moisture	No - Enabling Activity	N/A	N/A
	SA-8	Fire Science Enhancements	No - Enabling Activity	N/A	N/A
	SA-9	Distribution Fault Anticipation (DFA)	Yes	2,756	Reduces POI
Grid Design & System Hardening	SH-1	Covered Conductor	Yes	4,514	Reduces POI and reduces probability of PSPS
		Fire Resistant Poles	Yes	2,364	Reduces POI and reduces probability of PSPS
	SH-2	Undergrounding Overhead Conductor	Yes	347	Reduces POI and reduces probability of PSPS
	SH-4	Branch Line Protection Strategy	Yes	3,304	Reduces POI
	SH-5	Installation of System Automation Equipment – RAR/RCS	Yes	598	Reduces consequence of PSPS
	SH-6	Circuit Breaker Relay Hardware for Fast Curve	Yes	3,308	Reduces POI
	SH-7	Circuit Evaluation for PSPS-Driven Grid Hardening Work	No - Enabling Activity	N/A	N/A
	SH-8	Transmission Open Phase Detection	No - Insufficient Data	N/A	N/A
	SH-10	Tree Attachment Remediation	Incorporated into covered conductor	See SH-1	See SH-1
	SH-11	Legacy Facilities	No - Insufficient Data	N/A	N/A
	SH-12	Microgrid Assessment	No - Pilot Activity	N/A	N/A
	SH-13	C-Hooks	Yes	45	Reduces POI
	SH-14	Long Span Initiative (LSI)	Yes	1,957	Reduces POI
	SH-15	Vertical Switches	Yes	13	Reduces POI
Asset Management & Inspections	IN-1.1	Distribution Ground Inspections and remediations	Yes	3,225	Reduces POI
		Distribution Aerial Inspections and remediations	Yes	953	Reduces POI
	IN-1.2	Transmission Ground Inspections and remediations	Yes	1,095	Reduces POI
		Transmission Aerial Inspections and remediations	Yes	695	Reduces POI
	IN-3	Infrared Inspection of energized overhead distribution facilities and equipment	Yes	1,879	Reduces POI
	IN-4	Infrared Inspection, Corona Scanning, and HD imagery of energized overhead Transmission facilities and equipment	Yes	174	Reduces POI
	IN-5	Generation Inspections and Remediations	No - see IN-1.1	See IN-1.1	See IN-1.1
	IN-8	Inspection Work Management Tools	No - Enabling Activity	N/A	N/A

Vegetation Management	VM-1	Hazard Tree Management Program	Yes	1,602	Reduces POI
	VM-2	Expanded Pole Brushing	Yes	1,881	Reduces POI
	VM-3	Expanded Clearances for Legacy Facilities	No - Insufficient Data	N/A	N/A
	VM-4	Dead and Dying Tree Removal	Yes	2,413	Reduces POI
	VM-6	VM Work Management Tool (Arbora)	No - Enabling Activity	N/A	N/A
Grid Operations & Protocols	PSPS-2	CRCs and CCVs	Yes	188	Reduces consequence of PSPS
		Battery Backup for low-income critical care / MBL customers	Yes	22	Reduces consequence of PSPS
		Other programs: Home power backup, well water/pumping backup, resiliency zones	No - Pilot Activity	N/A	N/A
Data Governance	DG-1	Wildfire Safety Data Mart and Data Management (WISDM / Ezy)	No - Enabling Activity	N/A	N/A
Emergency Planning & Preparedness	DEP-2	SCE Emergency Responder Training	No - Enabling Activity	N/A	N/A
Stakeholder Cooperation & Community Engagement	DEP-1.2	Customer Education and Engagement - Community Meetings	No - Enabling Activity	N/A	N/A
	DEP-1.3	Customer Education and Engagement - Marketing Campaign	No - Enabling Activity	N/A	N/A
	DEP-4	Customer Research and Education	No - Enabling Activity	N/A	N/A
	DEP-5	Aerial Suppression	Yes	3,306	Reduces consequence of ignition
Alternative Technology	N/A	Asset Defect Detection Using Machine Learning Object Detection	No - Pilot Activity	N/A	N/A
		Alt Tech Evaluations: Rapid Earth Fault Current Limiter - Ground Fault Neutralizer, Resonant Grounding with Arc Suppression Coil and Resonant Grounded Transformer	No - Pilot Activity	N/A	N/A
		Alt Tech Evaluations – Distribution Open Phase Detection	No - Pilot Activity	N/A	N/A
		High Impedance (Hi-Z) Relay Evaluations	No - Pilot Activity	N/A	N/A
		Early Fault Detection (EFD) Evaluation	No - Pilot Activity	N/A	N/A
		Satellite and Other Imaging Technology for Fire Spotting	No - Pilot Activity	N/A	N/A
Other (Activities that are not enumerated initiatives)	N/A	Forest Management	No - Insufficient Data	N/A	N/A
	N/A	Vegetation Line Clearances (all)	Yes	3,592	Reduces POI

4.3.9 Resource Allocation and Prioritization Methodology

SCE has advanced its ability to make data driven, risk-informed decisions for prioritizing wildfire mitigation activities since the 2020 WMP that aligns with our RAMP methodology. SCE described above how both POI and consequence calculations improved and how one integrated approach for calculating risk was created at the enterprise and program levels. This new, integrated WRRM is being used to make risk-informed decisions for both existing in-flight WMP activities as well as for new entrants and emergent issues.

At the portfolio level, the model is used by comparing the RSE across the programs to understand the relative amount of risk buy down per dollar. This information is considered along with operational feasibilities and other factors to set the program levels. This also allows us to plan for resource needs as the model can forecast risk reduction after planned mitigations are completed thereby changing the future risk profile across programs.

At the program level, the WRRM is very flexible in that it can be used to calculate the risk (e.g., Wildfire or PSPS risk) most applicable to the individual WMP activity. For example, an activity such as the installation of covered conductor that mitigates both wildfire and PSPS risks can use the full WRRM risk score for prioritizations. Whereas an activity such as the replacement of C-Hooks, which mitigates wildfire only and does not affect PSPS thresholds, can use the wildfire component of the risk score to prioritize C-Hook replacement.

The WRRM can also be used to prioritize activities at the individual driver level. For example, vegetation activities like hazard tree removals can be prioritized using only the POI of a vegetation contact which can be isolated in the WRRM’s CFO models within the wildfire component.

Each in-flight initiative that has in the past used some form of risk informed decision process such as the WRM, Reax only, or an alternative prioritization method is being evaluated for WRRM applicability. Programs that have not yet initiated 2021 activities will use the revised risk scores from the WRRM while those where it is operationally not feasible to transition to the new scores in 2021 will begin in 2022.

As the WRRM is now SCE’s corporate standard model for calculating wildfire risk, all new programs will be evaluated and prioritized using this model where applicable. For example, when SCE determined the need to execute an enhanced inspection program in areas vulnerable to non-wind driven fires in 2020, the circuits within the susceptible areas were quickly prioritized by the consequence element of the wildfire component of the WRRM to set the order of the inspections.

The WRRM is being used to make risk informed decisions throughout our wildfire programs, however where the model is not able to accurately assess a risk, other methods will be used. For example, in this WMP SCE is presenting a program to replace vertical switches. These switches have not experienced high numbers of faults historically and therefore have low POI values in the model. However, through inspection, evidence of sparking was discovered. In this case, the RSE values produced by using the WRRM would not be considered as the main driver for evaluating this program within the portfolio of programs, but the order in which we replace these switches would utilize the consequence component of the WRRM.

While the WRRM is the primary tool used to make risk prioritized decisions for wildfire mitigation, SCE uses subject matter expertise and qualitative enterprise level risk tools to help make risk informed decisions when quantitative methods are not available or reliable. The risk bowtie, fault trees, decision trees, failure modes and effects analysis (FMEA), and probabilistic risk assessment (PRA) are some examples of these methods. For SCE's RAMP risks and for the WMP, SCE translates the outputs of these methods into MARS units to calculate RSEs and compare across different risks and mitigation alternatives.

4.3.10 Future improvements to the WRRM

SCE is considering methods to optimize across multiple mitigations at a specific location (i.e., structure level). However, executing wildfire mitigation work in that manner is not practical for certain mitigations as many are complimentary (e.g., vegetation management is required regardless of most system hardening for compliance, and installation of covered conductor includes replacement of other equipment such as poles, insulators, cross-arms, and fuses). Furthermore, it is not clear if the benefits of such granularity outweigh the costs of planning and executing wildfire mitigation in this manner. Thus, as SCE continues to develop its risk modeling optimization capabilities, it may be more constructive to optimize deployment of mitigations in different ways. For example, for a tree removal crew to remove the "riskiest" hazard tree in one region and then travel to another region to remove the next "riskiest" tree sharply reduces the pace of risk reduction for SCE and also increases the cost from the tree removal contractor due to the time elapsed between tree removals. However, determining the risk of each hazard tree in SCE's inventory, then prioritizing larger areas (i.e., region/district) with the highest hazard tree risk on average, and using that prioritization to remediate all identified hazard trees area by area may be more beneficial from a pace of risk-reduction and execution efficiency perspective.

In addition, SCE is exploring ways of reevaluating need and prioritization criteria for one mitigation activity once another mitigation has been implemented (e.g., need for expanded trims once covered conductor has been installed or changes to PSPS de-energization thresholds as more system hardening is completed). This type of sequential evaluation of mitigation deployment inherently provides optimization across multiple mitigations while still helping ensure the most effective mitigations are being deployed to reduce the greatest amount of risk in the shortest amount of time. SCE is planning to implement PSPS cross-mitigation changes in the near term, and broader cross-mitigation by 2023. As SCE's asset management capability progresses, we hope to assess tradeoffs not just among wildfire mitigation activities, but also across all risks (e.g., reliability or public safety in addition to wildfire ignition).

4.4 RESEARCH PROPOSALS AND FINDINGS

Report all utility-sponsored research proposals, findings from ongoing studies and findings from studies completed in 2020 relevant to wildfire and PSPS mitigation.

SCE's Research Strategy

SCE actively pursues and collaborates on various research topics for different issues related to wildfire mitigation including root weather causes, ignition sources, emergency responders, consequence of wildfires, customer impacts, etc. The goals of the research include integrating industry into partnership-based research programs, designing specific measurement tools in-house, identifying innovative solutions and resolving critical industry problems.

Additionally, SCE directly supports the research community by providing in-kind services, financial commitments, and letters of recommendation. SCE's parent company also supports the research community through its philanthropic efforts and grant funding. Specifically, philanthropic grants support nonprofits that facilitate convenings among a diverse range of partners and develop networks for an open exchange of information regarding the current science on climate change, fire recovery and vegetation management practices.

As an organization, the research work SCE conducts and supports, can be divided into four research areas:

1. **Discovery** - SCE supports innovative research by accepting proposals (grants, letters of support requests), collaborating with universities on wildfire mitigation/fire safety, and on occasion requesting research studies on these topics.
2. **Capacity building** - SCE invests in developing researchers by providing philanthropic grants, providing scholarships to students in Science, Technology, Engineering & Math (STEM) field and fire technology/fire academies, funding resilience challenges and providing data, information, tools and resources to local government agencies and CBOs. SCE also promotes interdisciplinary collaboration and research in disadvantaged communities.
3. **Knowledge Transfer** – SCE actively disseminates findings from its research projects and policy recommendations through industry conferences and publishing the work in technical journals. This includes support for its funded researchers and the dissemination of their work through the same channels.
4. **Partnerships** - SCE partners with universities, national labs, and research institutes to expand its reach across the industry. This includes providing matching funds or cost-sharing to support it's the partnership projects.

SCE evaluates its research opportunities to ensure they reflect both ongoing and emerging questions of priority around clean energy, wildfire mitigation and wildfire safety. The research areas listed above ensure the work we support is innovative, essential, and relevant to the industry.

The list below includes active and ongoing utility-sponsored research proposals and initiatives supported, external collaborations, and completed internal studies. The list below does not include SCE's AFN research study that will commence in 2021 and will aim to gather qualitative feedback on the AFN customer experience. Details of this planned AFN study can be found in Section 8.4. Engaging Vulnerable Communities.

Please note SCE did not include all previous/past collaboration opportunities as listed in the Resolution WSD-002, specifically SCE Deficiency 17 (SCE-17). Some opportunities are not active and relevant to this section. Please see Section 9.6 for an update on SCE-17.

4.4.1 Research Proposals

Report proposals for future utility-sponsored studies relevant to wildfire and PSPS mitigation. Organize proposals under the following structure:

1. *Purpose of research – brief summary of context and goals of research*

2. *Relevant terms - Definitions of relevant terms (e.g., defining "enhanced vegetation management" for research on enhanced vegetation management)*

3. *Data elements - Details of data elements used for analysis, including scope and granularity of data in time and location (i.e., date range, reporting frequency and spatial granularity for each data element, see example table below)*

4. *Methodology - Methodology for analysis, including list of analyses to perform; section shall include statistical models, equations, etc. behind analyses*

5. *Timeline - Project timeline and reporting frequency to WSD*

Example table reporting data elements

Data Element	*Collection period*	*Collection frequency*	*Spatial granularity*	*Temporal granularity*	*Comments*
Ignitions from contact with vegetation in non- enhanced vegetation areas	*2014 – 2020+ (ongoing)*	*Per ignition*	*Lat/long per ignition*	*Date, hour of ignition (estimated)*	-
Ignitions from contact with vegetation in enhanced vegetation areas	*2019 – 2020+ (ongoing)*	*Per ignition*	*Lat/long per ignition*	*Date, hour of ignition (estimated)*	

Utility-Sponsored Studies

Effectiveness of Enhanced Vegetation Clearances Study

1) Purpose of research: SCE is conducting a study to evaluate the effectiveness of implementing the recommended clearances between vegetation and live conductor provided for in GO 95 Rule 35, Appendix E[E5].

2) Relevant terms:

Without Enhanced Clearances: Trees in Distribution HFRA that are trimmed to the Regulation Clearance Distance (RCD), which has a minimum clearance of 4’ as required by the regulator, plus additional clearance as necessary to hold compliance through an annual cycle.

With Enhanced Clearances: Trees in Distribution HFRA that are trimmed to the Enhanced Clearance Distance of at least 12’ as recommended by GO 95, Rule 35, Appendix E [E5].

Tree-Caused Circuit Interruptions (TCCIs): events during which trees, or portions of trees, have contacted electrical equipment and caused circuit interruptions. TCCIs can result from vegetation that has fallen-in, blown-in, or grown-in.

Vegetation-Caused Ignition Events: events where a determination was made that the ignition was caused by vegetation.

3) Data elements: (see Table SCE 4-9)

Table SCE 4-9
TCCI Reporting Data Elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
Global Positioning System (GPS) coordinates of TCCI's and Vegetation Caused Ignition Events for areas Without Enhanced Clearances	2014-ongoing	Every 6 months	Specific latitude-longitude	Date of TCCI or ignition event	Where data is available
GPS coordinates of TCCI's and Vegetation Caused Ignition Events for areas Without Enhanced Clearances	December 2019 - ongoing	Every 6 months	Specific latitude-longitude	Date of TCCI or ignition event	Where data is available

4) Methodology: Data collection and comparison. For more details, see SCE's response to Action SCE-16 in response to Remedial Compliance Plan (RCP) SCE-12.

5) Timeline: December 2019 – ongoing; updates provided in SCE's annual report, as applicable.

University of California, Los Angeles (UCLA) Luskin Center for Innovation's Microgrid Study

1) Purpose of research: SCE is sponsoring and serving as a technical lead for microgrid study with the UCLA Luskin Center for Innovation to produce a report that develops a performance evaluation for microgrids to be used to inform microgrid siting decisions that maximize resiliency, equity, and grid service benefits for California communities.

2) Relevant terms:

Microgrid: In this report, UCLA uses the definition detailed in Senate Bill (SB 1339[E6]) and used in the related CPUC proceedings: "an interconnected system of loads and energy resources, including, but not limited to, distributed energy resources (DER), energy storage, demand response tools, or other management, forecasting, and analytical tools, appropriately sized to meet customer needs, within a clearly defined electrical boundary that can act as a single, controllable entity, and can connect to, disconnect from, or run in parallel with, larger portions of the electrical grid, or can be managed and isolated to withstand larger disturbances and maintain electrical supply to connected critical infrastructure."

Resiliency: The potential to serve uninterrupted loads, or minimize interruptions, to their customers during unplanned outages

Equity: The equitable distribution of the costs and benefits of microgrids including improved reliability of electrical service, reduced pollution, reduced relative costs of service, and improved workforce participation for priority customers.

Grid services: A set of products that ensure the electrical grid's reliability in order to continually provide electricity to customers at all times of day, traditionally, the resources and products that serve to maintain critical grid reliability and stability.

3) Data elements: (see Table SCE 4-10) 1) data on existing microgrids - UCLA is gathering data on existing microgrids to measure the extent to which they currently provide resiliency, equity, and grid service benefits to California communities – specific data elements will be shared in the final report and 2) literature - UCLA is examining existing literature to inform the development of a microgrid performance evaluation.

Table SCE 4-10
Microgrid Reporting Data Elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
Existing Microgrids in California	2020	Once	City	Date of installation	Data on existing microgrids was gathered to evaluate their resiliency, equity, and grid service benefits to date and to identify gaps in available data.
Relevant literature	2014 through 2020+ (ongoing)	Throughout study	Varies by study	Varies by study	Existing academic journal articles, state agency reports, and other relevant literature were gathered to inform the development of a microgrid performance evaluation framework.

4) Methodology: Literature review, supplemented by data on existing microgrids

5) Timeline: December 2019 – April 2021; updates provided in SCE's annual report, as applicable

Electric Power Research Institute (EPRI) study on "Fuel Removal Assessment for Wildfire Management"

1) Purpose of research: SCE is sponsoring this study to establish a baseline for SCE fuel removal practices in our service area within the jurisdiction of the USFS, with a target review of new research and technologies that provide promise in reducing wildfire impacts, risks, and associated costs. The learnings from the study can inform both near-term and long-term opportunities such as guidance for forestry methods for removal, and long-term goals for rights-of-way (ROWs) in consideration of the CA/USFS Shared Stewardship Memo of Understanding.

2) Relevant terms:

Fuel reduction: Fuel removal; wildfire risk; climate adaptation and resilience; integrated vegetation management (IVM); fuel removal costs and benefits; current practices; ecosystem support; fire risk reduction; right-of-way vegetation management; risk management; other terms as determined necessary.

3) Data elements:

GIS data layers of interest include: SCE service area; SCE facilities, transmission lines; SCE wildfire risk model/data; EIA data on location of other electric company infrastructure; USFS Forest boundaries; Protected areas data layer; California HFRA; Data on dead/dying trees; beetle infestation data; Costs of fuel removal; Labor and Capital costs of fuel management; other data sources as determined necessary.

4) Methodology: The approach of this project is intended to examine current SCE (and USFS) fuel removal activities (e.g. encompassing SCE or USFS policy or strategy, management practices, priority areas, data and models used) and new technologies and methodologies identified in the literature. Thus, the research is intended to undertake both a desk review of SCE and USFS documents and sources related to fuel removal as well as a targeted review of new technologies and methodologies. Establishing a "baseline" of current practice may also include a high-level review of the data and models (GIS and other) used by SCE and USFS. Expertise and best practices of key wildfire stakeholders is expected to also be tapped through outreach to USFS and other key stakeholders identified by SCE. The literature review is intended to identify opportunities and best practices for reducing risk, damages, and costs with new technologies and methodologies, and is expected to highlight utility-relevant examples. An opportunity analysis is intended to lay out opportunities, best practices, and practical considerations as options for SCE management to consider. Practical considerations from the regulated utility perspective may include: the need for cost efficiencies (e.g., related to a utility's mission for affordable rates for their customers), identifying how reduced wildfire risk can reduce costs to the utility, and other considerations that may emerge through discussions with SCE staff.

5) Timeline: Started December 2020, with an anticipated completion date of September 2021.

San Jose State University's (SJSU) Wind Profiler Project

1) Purpose of research: SCE is supporting a pilot project to help understand the nature and behavior of wind speeds above ground level in areas where weather modeling efforts are challenged due to complex terrain issues. The main goal is to develop a state-of-art vertical wind profiling monitoring program in critical wind corridors where strong downslope winds can have large impacts on utility operations and fire danger risk.

2) Relevant terms:

Wind Profiling: Vertical view of wind speeds and direction

Light Detection and Ranging Technology (LiDAR): A remote sensing method that uses light in the form of a pulsed laser to measure ranges to the Earth

3) Data elements:

Data Element	Collection Period	Collection Frequency	Spatial granularity	Temporal granularity	Comments
Wind speeds directly above the LiDAR unit or at a set angle (e.g. 45 degrees)	24-48 hours	After each event	3m resolution between 30 m and 3,000 m above ground level	Instantaneous	

4) Methodology: When deployments end, all data will be uploaded to SJSU servers for storage and data processing which will take place at SJSU. Data processing includes time-height wind vector analysis to show evolution of vertical wind profiles. Vertical velocities will be analyzed as well as backscatter intensity to determine performance of LiDAR system

5) Timeline: Multiple deployment on an ad-hoc bases over the period of one year; updates provided in SCE's annual report, as applicable.

University of Colorado Boulder Vegetation Regrowth Model

1) Purpose of research: To approximate the time it will take for a fire of similar size, spread rate, and burn intensity to occur across an area that has burned previously. This effort will help SCE prioritize strategic work activities (i.e. grid hardening, vegetation management, etc.) based on information about how long it will take before fuels conditions in an affected area reappear.
2) Relevant terms:

Vegetation Moisture: The amount of moisture (expressed as a percentage) that is in both living and dead vegetation.

Fuel Continuity: The degree of continuous vegetation over a given surface.

Fuel Loading: The amount of vegetation across a given area expressed in tons/acre.

LiDAR: A remote sensing method that uses light in the form of a pulsed laser to measure ranges to the Earth.

3) Data elements:

Data Element	Collection Period	Collection Frequency	Spatial granularity	Temporal granularity	Comments
Fuels Regrowth	Various	Various	1-2 km	Annually	Data collected and frequency has still not been determined. There will be different

					datasets which will be updated at different intervals.

4) Methodology: Extensive research will be performed by Earth Lab at the University of Colorado in Boulder to determine best practices and processes for developing such remote sensing applications. Methodology will incorporate variability and uncertainty in all applicable algorithms to provide probabilistic products.

5) Timeline: SCE anticipates it will take two years to develop and operationalize; updates provided in SCE's annual report, as applicable.

University of Colorado Boulder Fuels Potential Model

1) Purpose of research: To determine the approximate areas where the dynamic combustibility of fuels is greatest, by considering the summation of vegetation moisture, type, and amount as well as taking into account the long-term climatological affects upon the vegetation. This product will allow for an objective, quantifiable process to inform where and when to perform inspections and if any potential remediations should be accelerated.

2) Relevant terms

Vegetation Moisture: The amount of moisture (expressed as a percentage) that is in both living and dead vegetation.

Fuel Continuity: The degree of continuous vegetation over a given surface.

Fuel Loading: The amount of vegetation across a given area expressed in tons/acre.

NFDRS: The National Fire Danger Rating System is a nationally recognized system to assess and portray the degree of fire danger on the landscape.

LiDAR: A remote sensing method that uses light in the form of a pulsed laser to measure ranges to the Earth

3) Data elements:

Data Element	**Collection Period**	**Collection Frequency**	**Spatial granularity**	**Temporal granularity**	**Comments**
Level of Fuels Combustibility	Various	Various	1-2 km	Semi-Annually	Data collected and frequency has still not been determined.

					There will be different datasets which will be updated at different intervals.

4) Methodology: Extensive research will be performed by Earth Lab at the University of Colorado in Boulder to determine best practices and processes for developing such remote sensing applications. Methodology will incorporate variability and uncertainty in all applicable algorithms to provide probabilistic products.

5) Timeline: SCE anticipates it will take two years to develop and operationalize; updates provided in SCE's annual report, as applicable

Cal Poly San Luis Obispo's Wildland Urban Interface Fire Information Research and Education (Cal Poly SLO WUI FIRE) Institute

1) Purpose of research: SCE is co-funding and serving as a technical lead for the WUI FIRE Institute to tackle research needs in several wildfire risk areas that generally fall outside traditional utility business scope such as fuels sampling/management, forest/vegetation management, land policy, infrastructure hardening (property hardening, building codes etc.), fire suppression/long duration fire retardants, and early fire detection. SCE will also ask the WUI FIRE Institute to direct some of its research in the first year to identify communities within SCE's service area that would be most at risk of catastrophic wildfire events based on the following attributes: population, buildings, WUI location, ingress/egress, fuels, fire history, wind climatology, and Reax/Technosylva Consequence and Risk scores. New research projects will be identified by the fourth quarter of 2021 based on priorities and project ideas aligned with investor-owned utilities' (IOUs') needs.

2) Relevant terms: To be determined once specific projects are identified; years 2-3 (2022 – 2023)

3) Data elements: To be determined once specific projects are identified; years 2-3 (2022 – 2023)

4) Methodology: Cal Poly's WUI FIRE Institute goal is to be the Center of Excellence that uses a multi-discipline, systems-based approach that focuses on education and research factors influencing WUI fire.

5) Timeline: January 2021 – December 2023; updates provided in SCE's annual reports, as applicable

SJSU's Wildfire Interdisciplinary Research Center

1) Purpose of research: SCE is partnering with SJSU's Wildfire Interdisciplinary Research Center (WIRC) to conduct high-impact wildfire research so that improved tools and policies can be provided to community and industry stakeholders. The WIRC mission is to develop new prediction and observational tools to better understand extreme fire behavior in a changing climate. These new tools will help industry,

particularly the energy sector, manage assets during high fire danger periods. The outcomes of WIRC will be new knowledge, improved prediction tools, and community resilience policies. The center will also develop an integrated approach to solving the nation's wildfire problem by providing interdisciplinary solutions that span the physical, social, and economical scientific fields.

2) Relevant terms:
Fire Behavior: The way fires ignite, burn, and propagate as a function of the interaction between fuels, weather, and topography.

WUI: An area where building and infrastructure are in or adjacent to areas that are subject to wildfire activity.

3) Data elements: To be determined once specific projects are identified.

4) Methodology: To be determined once specific projects are identified.

5) Timeline: Ongoing

Letters of Support and Commitment

As mentioned above, SCE supports the research community through our Letter of Support (LOS) process. While these are not utility-sponsored, SCE is actively collaborating with these organizations to support their wildfire research.

SCE is serving as a technical lead to the University of Nevada, Reno's research project titled, "Fighting Wildfires under Climate Change: A Data-Informed Physics-Based Computational Framework for Probabilistic Risk Assessment and Mitigation, and Emergency Response Management." The University was awarded a grant through the National Science Foundation (NSF). This project features three distinct and novel components that will be developed and implemented into practice to fill the present knowledge gaps and technical capabilities.

SCE is serving as a technical lead and providing measurement data and circuit information of a feeder for the University of California, Riverside's research project titled, "Electric Grid Situational Awareness for Wildfire Risk Reduction." The University was awarded a grant through the U.S. Department of Homeland Security. This project will conduct experimental research to understand the dynamics of electrical fires and identify factors that influence the occurrence and spread of fires caused by electrical equipment. In addition, it will develop an analytical tool to detect and diagnose electrical grid faults before they ignite a fire by mining high-frequency sensor data in real-time.

Through cost-share and technical advisory services, SCE is supporting the Gas Technology Institute's project entitled, "Advanced Energy-Efficient and Fire-Resistive Envelope Systems Utilizing Vacuum Insulation for New Mobile Homes." Gas Technology Institute (GTI) was awarded a grant through the California Energy Commission (CEC)'s Electric Program Investment Charge Program (EPIC) program. This project will develop and demonstrate all-electric, new mobile homes that can reduce energy bills and increase fire resilience of homes. The energy efficient homes will contain vacuum insulation panel, double/triple-pane glazing, fluid applied air barrier, low capacity ultra-efficient mini-split heat pumps, heat pump water heaters and all-electric appliances. At least one prototype home is planned to be in Loma Linda, a disadvantaged and low-income community in SCE's service area.

Customer Research

SCE is conducting customer research to identify customer segments, needs and behaviors as it relates to wildfire and PSPS activities. SCE's Customer Insights team continues to conduct customer research online and via the phone, on SCE-executed PSPS related activities (see past research findings below in Section 4.4.2). The team provides insights and recommendations to other SCE Organizations enabling them to enhance PSPS programs and services offered to our customers. Additionally, SCE's Customer Insights team proactively reaches out to customers (both residential and business) to determine what they know and think about the PSPS practice, and how they feel about Southern California Edison as a result. The team will further analyze the data by comparing results from 2019 to 2020. Lastly, Customer Insights is deploying a web-based survey to capture customer feedback based on their visits to CRCs and CCVs during the December 2020 PSPS event.

4.4.2 Research findings

Report findings from ongoing and completed studies relevant to wildfire and PSPS mitigation. Organize findings reports under the following structure:

Purpose of research – Brief summary of context and goals of research
Relevant terms – Definitions of relevant terms (e.g., defining "enhanced vegetation management" for research on enhanced vegetation management)

Data elements – Details of data elements used for analysis, including scope and granularity of data in time and location (i.e., date range, reporting frequency and spatial granularity for each data element, see example table above)

Methodology – Methodology for analysis, including list of analyses to perform; section shall include statistical models, equations, etc. behind analyses

Timeline – Project timeline and reporting frequency to WSD. Include any changes to timeline since last update

Results and discussion – Findings and discussion based on findings, highlighting new results and changes to conclusions since last update

Follow-up planned – Follow up research or action planned as a result of the research

Utility-Sponsored Studies

In 2020, one SCE-sponsored study was completed. The study was entitled "Effectiveness Study of Southern California Edison's Hazard Tree Management Plan and Tree Risk Calculator for Hazard Tree Identification and Mitigation." This study's findings are described below.

1. Purpose of Research: Pursuant to a settlement agreement in its GSRP application proceeding, SCE commissioned a third-party consultant to study the need and effectiveness of SCE's HTMP and the Tree Risk Calculator for hazard tree identification and mitigation.

2. Relevant Terms:

   Hazard Tree Management Plan: SCE's program for assessing and mitigating tree on either side of SCE's electrical facilities that could directly strike or impact electric facilities.

   Tree Risk Calculator: Tool developed using industry methodology to determine a risk score for each tree assessed.

3. Data elements: See Table SCE 4-11:

Table SCE 4-11
Tree Assessments Reporting Data Elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
Tree Assessments	3-week period in 2020	Once	Three areas, (1) Idyllwild, (2) Ventura County and Northern LA County, (3) Santa Barbara and Ojai	9/14/20 through 10/2/20	

4. Methodology: An independent project team consisting of an arborist and distribution engineer evaluated a total of 376 trees using SCE's Tree Risk Calculator. The data accuracy of each record, including, but not limited to GPS, grid/circuit data, photographs, SCE general information, customer information, and tree assessment documentation was captured and reviewed. The arborist evaluated the key performance indicators for the tree calculator and its effectiveness.

5. Timeline: Started and completed in 2020.

6. Results: The project arborist determined that the Tree Risk Calculator was an efficient field data collection tool, and the data collected was sufficient to determine if a tree poses a potential risk to electrical facilities.

7. Follow-up Planned: None.

External Collaborations

1. Purpose of Research: As described in its 2020 WMP, SCE collaborates with Texas A&M on its DFA deployment to evaluate the technology performance on fault anticipation technology for potential future deployment. SCE will also continue to work closely with Texas A&M to provide information about SCE's system configuration/networks and to provide an on-going exchange of the field validations to optimize the DFA software algorithms – which will continue to improve through the 2020-2022 plan term as additional grid event data is collected.

2. Relevant Terms:

   Incipient Event – Pre-cursor event that may lead or develop into a fault or failure.

   CYME – Circuit modelling analysis software.

3. Data elements:

Table SCE 4-12
DFA Study Data Elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
Event Notification	2020 – 2022+ (ongoing)	Continuous	Circuit	Continuous	Event Notification leads to evaluation of the events
Fault Location	2020 – 2022+ (ongoing)	On Event	Circuit	Continuous	Requires additional tools for analysis
Device Failure	2020 – 2022+ (ongoing)	Continuous	Circuit	Continuous	Loss of Communications to device.

4. Methodology: The DFA program priority will begin to focus on the identification and accuracy of reported latent incipient events. The grid events and electric system data captured by the DFA systems is evaluated in real-time on an on-going basis. Evaluation and review of the events will be monitored and compared to defined success measures.
    a. Incipient Event Detection – DFA notifications including pre-event notification with sufficient duration allowing for preventive measures – weighted 85%
    b. Event Location – Accuracy of the specific location – weighted 10%
    c. Hardware Failure Rate – Monitor equipment failures – weighted 5%

    Note: 80% success rate required for all three success measures

5. Timeline: Started in 2020 and is ongoing. Updates provided in SCE's annual reports, as applicable.

6. Results: DFA notifies SCE with approximately 50 events per month for evaluation. Weekly meetings are held with the Texas A&M to discuss selected events of interest. These events are used to inform Texas A&M and identify algorithm improvements to identify event categories and further SCE's analysis and identification of events.

7. Follow-up Planned: Deployment activities are targeted to ramp up in 2021, though this may be accelerated, delayed, or terminated based on other factors such as performance, competing technology options and prioritization of work efforts.

4.5 MODEL AND METRIC CALCULATION METHODOLOGIES

4.5.1 Additional models for ignition probability, wildfire and PSPS risk

Report details on methodology used to calculate or model ignition probability, potential impact of ignitions and / or PSPS, including list of all input used in impact simulation; data selection and treatment methodologies; assumptions, including Subject Matter Expert (SME) input; equation(s), functions, or other algorithms used to obtain output; output type(s), e.g., wind speed model; and comments.

For each model, organize details under the following headings:

1. ***Purpose of model*** *– Brief summary of context and goals of model*
2. ***Relevant terms*** *– Definitions of relevant terms (e.g., defining "enhanced vegetation management" for a model on vegetation-related ignitions)*
3. ***Data elements*** *– Details of data elements used for analysis, including scope and granularity of data in time and location (i.e., date range, reporting frequency and spatial granularity for each data element, see example table above)*
4. ***Methodology*** *– Methodology and assumptions for analysis, including SME input; equation(s), functions, statistical models, or other algorithms used to obtain output*
5. ***Timeline*** *– Model initiation and development progress over time. If updated in last WMP, provide update to changes since prior report.*
6. ***Application and results*** *– Explain where the model has been applied, how it has informed decisions, and any metrics or information on model accuracy and effectiveness collected in the prior year.*

For ease of review, SCE structured this Guideline in the Model Inventory table below.

Table SCE 4-13
Wildfire and PSPS Risk Model Inventory

Model	Section	Purpose of Model	Relevant Terms	Data element	Data source	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Methodology	Timeline	Application and Results
Name of model	*2021 WMP Update - relevant section*	*Brief summary of context and goals of model*	*Definitions of relevant terms (e.g., defining "enhanced vegetation management" for a model on vegetation-related ignitions)*	***(Sample:)** Ignitions from contact with vegetation in nonenhanced vegetation areas*	*Vegetation Management database; Ignition database*	*2014 – 2020+ (ongoing)*	*Per ignition*	*Lat/lon per ignition*	*Date, hour of ignition (estimated)*	*Methodology and assumptions for analysis, including Subject Matter Expert (SME) input; equation(s), functions, statistical models, or other algorithms used to obtain output*	*Model initiation and development progress over time. If updated in last WMP, provide update to changes since 2020 WMP.*	*Explain where the model has been applied, how it has informed decisions, and any metrics or information on model accuracy and effectiveness collected in the prior year*
Weather Modeling (ADS)	7.3.2.6.1	The Next Generation Weather Modeling System (NGWMS) will provide an extensive upgrade to SCE's current in-house weather modeling capabilities and enhance SCE's ability to make more targeted PSPS decisions.	Single Deterministic Model: Outcome from a single iteration of a model Ensemble Forecasting: Outcome from multiple iterations of a model Machine Learning: The study of computer algorithms that improve automatically through experience. It is seen as a part of artificial intelligence.	Temperature	NCEP (National Center for Environmental Prediction) Course Resolution Weather Models	2019 - present	Twice Daily	2KM x 2KM	Hourly, out to five days	Standard Weather and Research Forecasting (WRF) 4.0 model specs; See full description of model solver, physics, equations, and system architecture can be found at https://www2.mmm.ucar.edu/wrf/users/wrfv4.0/wrf_model.html	Procure additional hardware to support the implementation of the NGWMS in 2021. Improve and expand machine learning modeling in 2022.	Operationalized ensemble forecasting and found it to be useful in determining circuits targeted for potential proactive de-energization. Conceptual machine learning models suggest there will be significant improvement in wind forecast accuracy at site-specific locations. Experimental 1 KM resolution output shows improvement over complex terrain.
				Relative Humidity	Sea Surface Temperatures	2019 - present	Twice Daily	2KM x 2KM	Hourly, out to five days			
				Fuel Moisture	Moderate Resolution Imaging Spectroradiometer (MODIS)	2019 - present	Twice Daily	2KM x 2KM	Hourly, out to five days			
				Wind Speed	MesoWest Weather Network; including SCE weather stations	2019 - present	Twice Daily	2KM x 2KM	Hourly, out to five days			
Firespread Modeling (FireCast /FireSim)	7.3.2.6.2	Provides risk and consequence information projecting how a wildfire will impact a community. As a result, these applications can be used to identify where the greatest impacts will be during critical fire weather events which will help proactive de-energization decisions be more targeted, allowing fewer customers to be affected by PSPS.	Fire Modeling: A process where a series of inputs (weather, fuels, vegetation type, fuel loading, etc.) are used to calculate the spread and intensity of wildfires Fire Managers: SCE resources that have a liaison role during major wildfires supporting on-site Incident Management teams	Wind Speed	ADS Data Set	2020 - present	Daily	1000 meters / 200 meters	Hourly	Uses standard Rothermel model for fire spread equations; Weather prediction model outputs for a 91-hour horizon provided daily as a continuous raster dataset. The surface fire model is the Rothermel model (1972) together with the modifications proposed by Albini (1976), and the required expansion to admit Burgan (2005) fuel types. This model provides a scalar expression of the fire front speed, the flame intensity and the flame length according to the moisture, the wind, the slope and the fuel. The model is based on the following semi-empiric formula to obtain the rate of spread (ROS) of the fire on the direction of maximum spread: • ROS= IR ξ (1+Φw+ Φs) / ρbεQig Were IR is the reaction intensity of the fire, ξ the propagation flux ratio, ρb the oven dry bulk density, ε the effective heating number, and Qig the required heat of ignition. The parameters Φw and Φs are related to the wind and surface effect. For other spread directions the fire is assumed to evolve as an ellipse where the direction of the major axis is given by a weighted sum of the vectors Φw and Φs and where the eccentricity of the ellipse is defined by the wind speed. The crown fire model is based on Rothermel (1991) and Van Wagner (1977). It determines if the fire remains burning in the surface	In 2020, SCE implemented both FireCast and FireSim. Licenses for both applications have been provided to SCE's Fire Scientist and Fire Meteorologist, and extensive training on the use of FireCast/FireSim has been provided by Technosylva. In 2021, SCE will Implement FireCast/FireSim consequence data into the PSPS decision-making during a test phase.	These applications can be used to identify where the greatest impacts (acres burned, populations impacted, buildings impacted, fatalities and injuries) will be during critical fire weather events which will help proactive de-energization decisions be more targeted, allowing fewer customers to be affected by PSPS. Beginning in summer 2020, FireSim was used to run
				Humidity	ADS Data Set	2021 - present	Daily	1000 meters / 200 meters	Hourly			
				Fuel Moisture	ADS Data Set	2022 - present	Daily	1000 meters / 200 meters	Hourly			
				Fuel Type	LandFire 2016 with Technosylva Updates to Oct. 2020	2018 - present	Annual Updates	HFRA wide	Annual Updates			
				Fuel Loading	LandFire 2016 with Technosylva Updates to Oct. 2021	2019 - present	Annual Updates	HFRA wide	Annual Updates			
				Population data	Microsoft building dataset with Technosylva updates	2018	Annual Updates	centroid of individual buildings	Annual Updates			

Model	Section	Purpose of Model	Relevant Terms	Data element	Data source	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Methodology	Timeline	Application and Results
				Building / Structures	LandScan 2018	2018	Annual Updates	aggregated count every 90 meters	Annual Updates	fuels or makes a transition to burning in crown fuels, and whether it spreads actively through the tree crowns or simply torches individual trees. The model assumes a threshold intensity for the surface fire to affect the lower canopy layer and make its transition to crown, and an extra threshold rate of spread of the crown fire to be considered active. Under certain circumstances surface fire may affect the overstory turning into a crown fire. The initiation model used is based on (Van Wagner 1977; Scott and Reinhardt 2001). The main initiation criterion is based on the a critical fireline intensity of the surface fire given by: • I= (CBH(460+25.9FMC)/100) 3/2 Where CBH is the canopy base height and FMC is the canopy fuel moisture content. The ROS of the associated active crown fire is given by 3.34 (R10)40% where (R10)40% is the spread rate predicted with Rothermel's (1972) surface fire model using the fuel characteristics for FM 10 and midflame wind speed set at 40 percent of the 6.1-m wind speed (Rothermel 1991). Finally, the two-dimensional evolution of the fire is computed as a discrete process of ignitions across a regularly spaced landscape grid through a "minimum arrival time" function (Finney 2002). Surface spotting is included and repeatable for simulations with the same inputs. The urban encroachment model also uses an advanced method to encroach fire spread into urban areas using a combination of building density and surrounding fuel loads to determine the decay rate for encroachment. This approach ensures that buildings and population are more accurately captured to calculate impacts. CAL FIRE Damage Inspection (DINS) data is used to calibrate the decay rates based on historical fire impacts. DINS is the data collected by CAL FIRE post fire identifying the impacts to structures.		simulations to understand fire potential for various wildfires. Output was sent out to fire managers for them to get a sense of where fire was heading and potential impacts to infrastructure. During the 2020 fire season, FireCast was used to understand potential impact to communities while making PSPS decisions for de-energizations.
FPI	7.3.2.4.1	Better assess fire potential across SCE service territory	Wind speed: Wind velocity 20 feet above the surface Dew Point Depression: Difference between the air temperature and the dew point temperature at two meters above ground level Fuel Moisture: Water content within the dead and living vegetation Green-up of annual grasses: Uses the Normalized Difference Vegetation Index (NDVI) to access the level of grass green-up	Wind Speed	ADS Modeling Output	2019 - present	Twice Daily	2KM x 2KM	Hourly, out to five days	FPI = (DL)/LFM + G) * FLM + Wx Where DL is dryness level which consists of dead fuel moisture. LFM is Live Fuel Moisture. G is green-up of the annual grasses. FLM is a fuel loading modifier which takes into account amount of vegetation on the ground. Wx is the weather component consisting of wind speed and dew point depression.;	In 2021 SCE will develop, test and evacuate FPI 2.0, which is an advancement over the current FPI	Built FPI 2.0 and performed initial verification using logistic modeling techniques
				Dew Point Depression	ADS Modeling Output	2020 - present	Twice Daily	2KM x 2KM	Hourly, out to five days			
				Dead Fuel Moisture	ADS Modeling Output	2021 - present	Twice Daily	2KM x 2KM	Hourly, out to five days			
				Live Fuel Moisture	ADS Modeling Output	2022 - present	Twice Daily	2KM x 2KM	Hourly, out to five days			
				Green-up of annual grasses	ADS Modeling Output	2023 - present	Twice Daily	2KM x 2KM	Hourly, out to five days			

Model	Section	Purpose of Model	Relevant Terms	Data element	Data source	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Methodology	Timeline	Application and Results
POI - Component of WRRM	4.3.5	Quantify the probability of ignitions at asset level which will then be used in the overall risk quantifications	POI: Probability of Ignition Risk=POI*Consequence of Fire	Historical Failure Data	ODRM	2015-2020+	Per outage	Structure/Circuit	Annual Updates	SCE utilizes machine learning to identify patterns that may lead to faults that may cause sparks from conductors and equipment and use the trained model to predict the probability of ignitions at asset level. SCE has modeled EFF (Equipment and Facility Failures) and CFO (Contact Foreign Objects) at subdriver level to better help risk-informed decisions	Model was developed over time. In 2019 and 2020, SCE developed models for distribution assets; towards the end of 2020, SCE has completed the modeling of transmission and sub-transmission systems	With the POI model and consequence models, SCE is able to quantify the wildfire related risks at asset and segment level, which enables more granular and targeted mitigations to better target locations with greater fire risks to better serve its customers
				Conductor Data	GE Smallworld	Continuous	Continuous	Segment	Annual Updates			
				Circuit Connectivity	GE Smallworld	Continuous	Continuous	Circuit/Segment	Annual Updates			
				Asset Data	SAP	Continuous	Continuous	Equipment/Segment	Annual Updates			
				Historical Weather Data	ADS Modeling Output	2009-2018	Ongoing	2KM x 2KM	Hourly			
				Routine Tree Data	Fulcrum	Continuous	Continuous	Lat/Long	Annual Updates			
				Hazard Tree Data	Fulcrum	Continuous	Continuous	Lat/Long	Annual Updates			
Consequence - Component of WRRM	4.3.6	Use match drop simulations based on historical weather data to model fire consequences at each asset locations. Technosylva provided the last wildfire consequences through its WRRM in 2020. SCE replaced Reax Consequence Modeling to Technosylva Consequence Modeling	Risk=POI*Consequence of Fire	Surface Fuels	LandFire 2016 with Technosylva Updates to Oct. 2020	2016 - Oct. 2020	Annual Updates	HFRA wide	Annual Updates	Technosylva conducts millions of fire simulations based on a set of historical weather scenarios to derive consequence outputs for each OH distribution and transmission line asset, and each FLOC. The analysis used a predefined set of weather scenarios, reflecting the most common worst conditions for fires historically, and runs multiple simulations for each asset (for each scenario. Fire spread predictions are conducted using different weather scenarios to derive baseline risk metrics for each asset. The spread predictions assume a uniform ignition probability for each asset.	Reax Engineering developed wildfire consequences in early 2019 and SCE has been using the Reax scores in conjunction with its POI models to make risk-informed decisions. In 2020, Technosylva completed the fire risk consequence modeling which provides better wildfire consequence results with updated data and enhanced fire propagation engines. SCE has now transitioned from using Reax to using Technosylva consequence scores	
				Canopy Fuels	LANDFIRE 2016 canopy fuels	2017 - Oct. 2020	Annual Updates	HFRA wide	Annual Updates			
				Weather Data	ADS Modeling Output	41 Fire Weather Days from 2001-2019	2000-2019	2KM x 2KM	Hourly			
				Live/Dead Fuel Moisture Data	LFM/DFM models developed by ADS	41 Fire Weather Days from 2001-2019	2000-2019	2KM x 2KM	Hourly			
				Building/Structure Data	Microsoft building dataset with Technosylva updates	2018	Annual Updates	centroid of individual buildings	Annual Updates			
				Population Data	LandScan 2018	2018	Annual Updates	90 meters	Annual Updates			
				SCE Assets	SCE Asset Databases	Ongoing	Annual Updates	Lat/Long	Annual Updates			
PSPS Risk Model	4.3.4	PSPS is calculated as a risk instead of mitigations which include safety, financial and reliability using SCE's MARS2.0 risk framework	MARS: Multi-attribute risk score which provides a risk framework that combines safety, financial and reliability impacts into one unitless score	PSPS Frequency	ADS Modeling Output	2009-2018	Twice Daily	2KM x 2KM	Hourly	SCE runs backcasting using ADS historical weather data to backcast PSPS events and evaluates frequency and duration of events at circuit level. MARS2.0 risk framework is then applied to quantify the PSPS risks associated with the expected PSPS events based on the current operation protocol	The PSPS risk was added in 2020 for 2021 WMP in order to quantity PSPS as a risk elements on top of wildfire risks	The PSPS risk was added in 2020 for 2021 WMP in order to quantity PSPS as a risk elements on top of wildfire risks, which allows SCE to quantify risk related to PSPS events hence evaluate the RSE values including PSPS risks
				PSPS Duration	ADS Modeling Output	2009-2018	Twice Daily	2KM x 2KM	Hourly			
				Customer impacted	SCE Circuit and Customer Data	2020	Ongoing	service accounts	annually			
Hazard Tree Risk Calculator	7.3.5.16.1	The risk score is derived from Tree Defects (crown & branches, trunk, and root & root collar) and Site Conditions (i.e., history of failure, topography, site changes, soil conditions, common weather	Fields that impact scoring are: High Fire Risk Area, Voltage/Line Type, Overall Tree Condition, Tree Defects, Site	High Fire Risk Area	Vegetation Management database	2019 - Present	Continuous	Lat/Long	Date of inspection	Common arboriculture conditions are populated in drop down categories for Assessors to select the most appropriate condition/s, should any apply. Applying a score to each selection (and setting a ceiling for each category) allows a standardized process for subject tree evaluation. Each of the standardized drop-down selections are weighted with scores as agreed upon by SCE's Utility Arborists.	Hazard Tree Inspections are performed on a circuit-by-circuit basis based on defined risk-consequence profiles (Reax).	The Hazard Tree Management Plan (HTMP) is a wildfire mitigation program for designated High Fire Risk Areas (HFRA) in SCE's
				Voltage/Line Type	SCE Asset Databases	Continuous	Continuous	Lat/Long	Annual			

Model	Section	Purpose of Model	Relevant Terms	Data element	Data source	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Methodology	Timeline	Application and Results
		patterns). The final scoring results can range from 1-100 (100 being the highest risk score) and determines whether or not any sort of mitigation is required. The Arborist then provides the mitigation recommendation based on professional experience and judgement of the observed overall conditions. When needed, the preferred mitigation option is removal.	Conditions, Tree Lean, Tree Height, and Likelihood of Impact. The target (SCE infrastructure) will adjust the score based on the line voltage and construction type. The qualified Assessor (ISA Certified Arborist) evaluates the tree for defects and site conditions and selects the conditions in the "risk calculator."	Tree Defects	Vegetation Management database	2019 - Present	Continuous	Lat/Long	Date of inspection			territory. The purpose of an HTMP assessment is to identify trees that pose a risk to electric facilities based on the tree's observed structural integrity and site conditions. A "Subject Tree" is any tree in the Utility Strike Zone (USZ) that has the potential to strike SCE's conductors, should it fail. If the Subject Tree's defects calculate to an intolerable risk, then mitigation measures will be prescribed to eliminate the risk. The scope of HTMP applies to all Subject Trees (including Palms and Subject Trees located on or around substation facilities) beyond the Grid Resiliency Clearance Distance (GRCD) from the high voltage conductor.
				Site Conditions	Vegetation Management database	2019 - Present	Continuous	Lat/Long	Date of inspection			
				Tree Height	Vegetation Management database	2019 - Present	Continuous	Lat/Long	Date of inspection			

4.5.2 Calculation of Key Metrics

Report details on the calculation of the metrics below. For each metric, a standard definition is provided with statute cited where relevant. The utility must follow the definition provided and detail the procedure they used to calculate the metric values aligned with these definitions. Utilities must cite all data sources used in calculating the metrics below.

1. **Red Flag Warning overhead circuit mile days –** *Detail the steps to calculate the annual number of red flag warning (RFW) overhead (OH) circuit mile days. Calculated as the number of circuit miles that were under an RFW multiplied by the number of days those miles were under said RFW. Refer to Red Flag Warnings as issued by the National Weather Service (NWS). For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings. Detail the steps used to determine if an overhead circuit mile was under a Red Flag Warning, providing an example of how the RFW OH circuit mile days were calculated for a Red Flag Warning that occurred within utility territory over the last five years.*

The RFW circuit-mile days are based on all overhead (OH) distribution and transmission circuits that traverse through the National Weather Service (NWS) Fire Weather Zone (FWZ) from the NWS[30] and a 2015-2019 historical database of RFW events from the NWS in the Iowa State University Iowa archive of NWS watch / warnings. The OH lengths of distribution and transmission circuits are calculated within each FWZ polygon (the FWZ is divided geospatially into over approximately 1,000 polygons) and are then multiplied by the number of days (or fraction of days) that a particular polygon had an RFW in effect. The annual circuit mile days are calculated by totaling all circuit mile days for all FWZ that occurred within the calendar year.

To determine if a circuit mile is under a RFW warning, SCE intersects the OH distribution and transmission circuits with the RFW FWZ polygons to define circuits or portions of circuits within RFW. As an example of how this is computed, for the RFW on November 25, 2019 issued for FWZ CAZ226, SCE determined that there were 161.97 RFW circuit mile days. This was done by computing the 615.40 distribution and transmission OH circuit miles that intersected with the FWZ CAZ226 RFW FWZ polygon, then multiplying the circuit miles by the total duration of the RFW for the FWZ. Duration of the RFW is defined by the delta between issued and expired date/time for each RFW, in this case 0.26 days.

The sources of data used in the calculation of this information include the Iowa State University Weather Warning Archive and SCE's Comprehensive Geographical Information System (cGIS) circuit data.

2. **High Wind Warning overhead circuit mile days** – *Detail the steps used to calculate the annual number of High Wind Warning (HWW) overhead circuit mile days. Calculated as the number of overhead circuit miles that were under an HWW multiplied by the number of days those miles were under said HWW. Refer to High Wind Warnings as issued by the National Weather Service (NWS). For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings. Detail the steps used to determine if an overhead circuit mile was under a High Wind Warning, providing an example of how*

[30] https://www.weather.gov/gis/FireZones

the OH HWW circuit mile days were calculated for a High Wind Warning that occurred within utility territory over the last five years.

The HWW circuit-mile days are based on all OH distribution and transmission circuits that traverse through the NWS Wind Weather Zone from the NWS and a 2015-2019 historical database of HWW events from the NWS in the Iowa State University Iowa archive of NWS watch / warnings. The OH lengths of distribution and transmission circuits are calculated within each Wind Weather Zone (WWZ) polygon (the WWZ is divided geospatially into approximately 200 polygons) and are then multiplied by the number of days (or fraction of days) that a particular polygon had an HWW in effect. The annual circuit mile days are calculated by totaling all circuit mile days for all WWZ that occurred within the calendar year.

To determine if a circuit mile is under a HWW warning, SCE intersects the OH distribution and transmission circuits with the HWW Wind Weather Zone polygons to define circuits/portions of circuits within HWW. As an example of how this is computed, for the HWW on December 31, 2019 issued for WWZ CAZ046, SCE determined that there were 136.99 HWW circuit mile days. This was done by computing the 196.87 distribution and transmission OH circuit miles that intersected with the WWZ CAZ046 HWW Wind Weather Zone polygon, then multiplying the circuit miles by the total duration of the HWW for the Wind Weather Zone. Duration is defined by the delta between issued and expired date/time for each HWW, in this case 0.70 days.

The sources of data used in the calculation of this information include the Iowa State University Weather Warning Archive and SCE cGIS circuit data.

3. **Access and Functional Needs Population** – *Detail the steps to calculate the annual number of customers that are considered part of the Access and Functional Needs (AFN) population. Defined in Government Code § 8593.3*[E7] *and D.19-05-042*[E8] *as individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking, older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant*.

In February 2020, SCE did an initial assessment of the proportion of its customers that fell within this definition and found that approximately 80 percent of its customer base would be considered AFN under this metric. To enable meaningful utility prioritization of resources, SCE collects data for a subset of this population annually, which include MBL, Critical Care, Low Income, limited English proficiency and self-certified vulnerable customers who are served by SCE through various programs and offerings. For other AFN individuals, SCE uses data from a third-party vendor to obtain consumer information based on SCE residential service accounts. However, it is important to note that some of the data available for AFN individuals is very limited (e.g., homeless or transient populations, transportation disadvantaged, and people living in institutionalized settings).

SCE relies on data from its Customer Service System (CSS) for information about the number of MBL, Critical Care, Low-Income, limited English proficiency and households that self-identify as vulnerable. SCE takes the following steps to determine the annual number of customers within each group:

- The annual number of MBL customers is calculated as the total number of customers enrolled in SCE's MBL program. Customers who are enrolled in SCE's MBL program

- Critical Care customers are a subset of the MBL population. The annual number of Critical Care customers is calculated as the total number of customers who have been identified to use medical equipment for life support purposes, meaning that the customer cannot be without life support equipment for at least two hours.

- The annual number of Low-Income customers is calculated as the total number of service accounts enrolled in SCE's low-income programs such as CARE/FERA.

- Limited English proficiency is calculated based on the total number of customers who have self-certified with SCE as their primary language is other than English.

- SCE also monitors information for households that self-identify as vulnerable. This may include those that self-identify during in-person visits prior to disconnection for nonpayment.

SCE also works to identify the population of AFN customers through Acxiom, a third-party vendor providing census-based data. Acxiom supplies data to SCE based on the residential service accounts SCE provides to them in order to obtain information about the residential profile in the home. Acxiom provides data on an annual basis. As discussed in Chapter 8, SCE launched a study in 2020 that would support capabilities in actively identifying customers who are eligible for participation in SCE's AFN programs based on propensity score (see Section 8.4.1). SCE's efforts to reach, engage and support AFN communities, including by developing partnerships with CBOs and providing for AFN needs at CRCs, can be found in the AFN Plan Quarterly Update report filed on December 1, 2020[31] and the AFN Plan filed on February 1, 2021.[32]

4. **Wildlife Urban Interface** – *Detail the steps to calculate the annual number of circuit miles and customers in Wildlife Urban Interface (WUI) territory. WUI is defined as the area where houses exist at more than 1 housing unit per 40 acres and (1) wildland vegetation covers more than 50% of the land area (intermix WUI) or (2) wildland vegetation covers less than 50% of the land area, but a large area (over 1,235 acres) covered with more than 75% wildland vegetation is within 1.5 mi (interface WUI).*

The annual number of circuit miles in the WUI is calculated by SCE geospatial overlay/intersect of OH distribution and transmission circuits within WUI polygons and calculation of total circuit lengths in miles within the WUI. The sources of data used in the calculation of this information include University of Wisconsin-Madison WUI GIS data layer and SCE's cGIS circuit data.

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[31]https://www.sce.com/sites/default/files/inline-files/Wildfire_SCEAccessandFunctionalNeedsPlanDec2020.pdf

[32] See Southern California Edison's Access and Functional Needs 2021 Plan for Public Safety Power Shutoff Pursuant to Commission Decision in Phase Two of R.18-12-005: Go to www.sce.com/regulatory/CPUC-Open-Proceedings; Click "View and Search all CPUC Documents"; Click "Proceeding #" column header; Click "Filter By", type "R.18-12-005" into the Search box, and "Apply"

The annual number of customers in the WUI is calculated by SCE geospatial overlay of customer meter locations within the WUI. The sources of data used in the calculation of this information include University of Wisconsin-Madison WUI GIS data layer and the SCE cGIS meter locations data layer.

5. **Urban, Rural and Highly Rural** – *Detail the steps for calculating the number of customers and circuit miles in utility territory that are in highly rural, rural, and urban regions for each year. Use the following definitions for classifying an area highly rural/rural/urban (also referenced in glossary):*

Highly rural – In accordance with 38 CFR 17.701[E9], "highly rural" shall be defined as those areas with a population of less than 7 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" shall be defined as census tracts.

Rural – In accordance with GO 165[E10], "rural" shall be defined as those areas with a population of less than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" shall be defined as census tracts.

Urban – In accordance with GO 165[E10], "urban" shall be defined as those areas with a population of more than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" shall be defined as census tracts.

Population density numbers are calculated using the American Community Survey (ACS) 1-year estimates on population density by census tract for each corresponding year (2016 ACS 1-year estimate for 2016 metrics, 2017 ACS 1-year estimate for 2017 metrics, etc.). For years with no ACS 1-year estimate available, use the 1-year estimate immediately before the missing year (use 2019 estimate if 2020 estimate is not yet published, etc.)

SCE calculates the number of customers in utility service area that are in highly rural, rural and urban regions each year by using population density by census tract, based on population totals in the ACS. The population per square mile will be calculated for each census tract to define tracts as urban, rural, or highly rural, in accordance with the population density definitions. The number of customers that fall within these regions will be calculated by providing a geospatial overlay of customer meter locations with the urban/rural/highly rural census tracts and then calculating the total number of meters within each urban, rural, or highly rural region type.

The sources of data used in the calculation of this information include Topologically Integrated Geographic Encoding and Referencing (TIGER)/Line with Selected Demographic and Economic Data – 2018, ACS – 2018, SCE cGIS meter locations.

4.6 PROGRESS REPORTING ON PAST DEFICIENCIES

Report progress on all deficiencies provided in the 2020 WMP relevant to the utility. This includes deficiencies in Resolution WSD-002.

Summarize how the utility has responded and addressed the conditions in the table below. Reference documents that serve as part of the utility's response (e.g. submitted in the utility's Remedial Compliance Plan, location in 2021 WMP update, etc.). Note action taken by the WSD for Class A and B deficiencies (e.g. response found sufficient, response found insufficient and further action required, etc.).

Table 4.6-1:
List of Utility Deficiencies and Summary of Response, 2020

Deficiency Number	Deficiency Title	Utility Response	Referenced Documents	WSD Action[33]
Guidance-1	Lack of risk spend efficiency (RSE) information	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provides details for the wildfire risk drivers and consequences and the associated mitigation effectiveness for 2020 WMP Activities and the risk models used to calculate the risk reduction and RSE value	SCE-2 in SCE's 2020-2022 WMP RCP, Attachment A. SCE's Submission on Mitigation Measures that are Part of a Combined Program that Cannot be Disaggregated 07-13-20 2020 WMP Risk Model Whitepaper	Deemed Insufficient: Assigned two action statements for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
Guidance-2	Lack of alternatives analysis for chosen initiatives	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE outlined the alternatives considered for its System Hardening and Vegetation Management activities. For each activity, SCE provides a summary of the rationale for selecting the WMP initiatives over the alternative options.	SCE Covered Conductor Compendium	Deemed Sufficient
Guidance-3	Lack of risk Modeling to Inform Decision-Making	Submitted in SCE WMP Remedial Compliance Plan 07-27-20: SCE provides a comprehensive overview of how it prioritizes and focuses on its wildfire initiatives whose primary purpose is the mitigation of wildfire risk or the impact of PSPS	WFLC_True Cost Of Wilfire_April2010; NIFC - Federal Firefighting Costs - Suppression Only_March2020; D 14-02-015; SCE Covered	Issued Notice of Non-Compliance (NONC) assigning four action statements for SCE to address and incorporate into 2021 filing

[33] See Chapter 2 Adherence to Statutory Requirements, Table 2-1 Check-list for a mapping of where SCE responses of Action Statements reside

Deficiency Number	Deficiency Title	Utility Response	Referenced Documents	WSD Action[33]
			Conductor Compendium	
Guidance-4	Lack of discussion on PSPS impacts	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provides an overview of how wildfire mitigation work in each category (e.g., Grid Design and System Hardening, Vegetation Management and Inspections, etc.) affects the threshold values, frequency, scope and duration of PSPS events		Deemed Insufficient: Assigned two action statements for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
Guidance-5	Aggregation of initiatives into programs / performance metrics	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE described the effectiveness of each WMP initiative that supports the reduction of ignition risk or wildfire consequence along with data, metrics, and threshold values used to measure each initiative's effectiveness.		Deemed Sufficient: Assigned one action statement for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
Guidance-6	Failure to disaggregate WMP initiatives from standard operations	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE included a table detailing the activities in SCE's 2020-2022 WMP containing 1) identification as to whether each activity is considered "Standard" or "Augmented", 2) all required data per the WMP Guidelines for Tables 21-30, 3) confirmation that SCE is accounting for each initiative by providing the memorandum account, the activity is being monitored, and SCE's accounting structure/ledger for each initiative		Deemed Sufficient

Deficiency Number	Deficiency Title	Utility Response	Referenced Documents	WSD Action[33]
Guidance-7	Lack of detail on effectiveness of "enhanced" inspection programs	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE described that the risk reduction benefit of their inspection programs is best demonstrated by the number of remediation notifications generated and how combining their inspection programs yielded higher operational efficiency		Deemed Insufficient: Assigned one action statement for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
Guidance-8	Prevalence of equivocating language – failure of Commitment	Class C – Submitted in SCE 2021 WMP Update 02-05-21: Addressed in this WMP Update, SCE provided objectives and measurable, quantifiable, and verifiable targets for each of its initiatives		Responded to in this 2021 WMP Update filing; WSD response to be determined
Guidance-9	Insufficient discussion of pilot programs	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provided information for each of its Alternative Technology activities including status, results, how SCE remedies ignitions or faults revealed during the pilot, and a proposal for how to expand technology if it reduces ignition risk materially		Deemed Insufficient: Assigned one action statement for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
Guidance-10	Data issues – general	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provided available GIS Data Schema initiative data for grid hardening, vegetation management, and asset inspections. SCE also explained that outstanding data will be provided in subsequent quarterly reports	SCE WMP 2020-2022 Remedial Compliance Plan 07-27-20	Deferred: WSD separately assessing quality of (GIS) data submissions required. To be addressed in GIS data QC reports.
Guidance-11	Lack of detail on plans to address personnel shortages	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE identified the suite of recruitment and training programs that grow the overall pool of talent in areas related to executing wildfire only WMP programs		Deemed Sufficient

Deficiency Number	Deficiency Title	Utility Response	Referenced Documents	WSD Action[33]
Guidance-12	Lack of detail on long-term planning	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE elaborates on its long-term vision for wildfire risk mitigation through 2030 highlighting key programs and activities required to advance maturity of its programs and achieve the long-term vision		Deemed Sufficient. Assigned one action statement for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-1	Lessons learned not sufficiently described	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provided the lessons learned gathered in 2019 for SCE's various WMP initiatives and how those lessons learned were applied in the planning of activities included in the 2020-2022 WMP, and in operationalizing the initiatives.		Deemed Insufficient: Assigned one action statement for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-2	Determining cause of near misses	SCE WMP 2020-2022 Remedial Compliance Plan 07-27-20: SCE explains its categorization of near misses as "Other" was based on adherence to the WSD's 2020 WMP instructions. SCE also describes its improved capability to identify the causes of faults both through additional training and utilization of tools.		Issued NONC assigning 11 action statements for SCE to address and incorporate into 2021 filing
SCE-3	Failure of commitment (PSPS)	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE detailed their efforts to reduce scope, frequency and duration of PSPS events and provided quantifiable metrics to measure PSPS reductions		Deemed Insufficient: Assigned one action statement for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing

Deficiency Number	Deficiency Title	Utility Response	Referenced Documents	WSD Action[33]
SCE-4	SCE risk reduction estimation requires further detail	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE clears up a misunderstanding in comparing of Table 11 with Table 31. SCE also provides details on how it arrived at a forecast for ignitions and faults including assumptions and calculations, and how various initiatives are forecasted to contribute to ignition reductions.	SCE's Comments on Draft Resolutions WSD-002 – WSD-009	Deemed Sufficient
SCE-5	Detailed timeline of WRRM implementation not provided	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provided the status and targeted completion dates of WRRM milestones		Deemed Insufficient: Assigned two action statements for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-6	SCE lacks sufficient weather station coverage	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provided its rationale for the weather station deployment and a cost benefit analysis for installing weather stations in the U.S. Forest Service National Forest lands		Deemed Insufficient: Assigned two action statements for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-7	Does not describe whether fire-resistant poles were factored into risk analysis	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE explains its fire resistant (FR) poles strategy and how the risk analysis for fire-resistant poles was performed separately than risk analysis to determine the effectiveness of covered conductor		Deemed Sufficient
SCE-8	Lack of detail on hotline clamp replacement program	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE explained that hotline clamps are inspected and remediated as part of its inspection and maintenance		Deemed Insufficient: Assigned one action statement for SCE to address

Deficiency Number	Deficiency Title	Utility Response	Referenced Documents	WSD Action[33]
		programs and that risk reduction estimates for hotline clamps are not separately estimated, rather risk is estimated as a part of the broader HFRI Inspection program.		and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-9	Lack of detail regarding Pole Loading Assessment Program	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provided detailed information related to PLP assessments in HFRA including assessments completed May through July 2020 and forecast PLP assessments in HFRA from August through November 2020		Deemed Sufficient: Assigned one action statement for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-10	Lack of detail on effectiveness of inspection program QA/QC	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE explained how effectiveness for inspection program QA/QC is measured by risk ranking based on the program's maturity, process complexity, organizational complexity, and downstream impacts, how threshold levels may be impacted, and the various remediation actions SCE may pursue based on findings.		Deemed Insufficient: Assigned two action statements for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-11	Lack of explanation around shift to risk-based asset management	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provided key initiatives implemented to transition to a risk-based strategy, how it adjusted the people, processes and technology within the inspections and maintenance program to make this shift, and how it will communicate and train inspectors on these changes	SCE WMP 2020-2022 Remedial Compliance Plan 07-27-20	Deemed Sufficient
SCE-12	Insufficient justification of increased vegetation clearances	Submitted in SCE WMP 2020-2022 Remedial Compliance Plan 07-27-20: SCE explains its plan to quantify the extent to which post-trim clearance distances reduce the probability of vegetation caused ignitions and outages. This plan includes definitions,		Issued NONC assigning three action statements for SCE to address and incorporate into 2021 filing

Deficiency Number	Deficiency Title	Utility Response	Referenced Documents	WSD Action[33]
		data sources, analysis methodology, and a timeline.		
SCE-13	Lack of ambition in improving Vegetation Inspection and Management Capability	Submitted in SCE WMP 2020-2022 Remedial Compliance Plan 07-27-20: SCE explains how it uses risk analysis to inform some of our vegetation management decisions and plans to improve utilization of risk modeling for future vegetation management work. SCE also explains how it plans to further integrate and leverage new technology to enhance current vegetation inspection and management efforts.		Issued NONC assigning two action statements for SCE to address and incorporate into 2021 filing
SCE-14	SCE relies only on growth rate to identify "at-risk" tree species	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE listed all factors considered in identifying "at-risk" tree species, the effectiveness of work focusing on these species and how that work impacts PSPS thresholds		Deemed Insufficient: Assigned two action statements for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-15	Lack of detail on how SCE addresses fast-growing species	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE described measures it takes to address fast growing tree species, and how the measures are implemented and evaluated for their effectiveness.		Deemed Insufficient: Assigned two action statements for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-16	Lack of ISA-certified assessors	Class C – Submitted in SCE 2021 WMP Update 02-05-21: Addressed in Section 7.3.5.14		Responded to in this 2021 WMP Update filing; WSD response to be determined
SCE-17	Details not provided for collaborative	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE included a list and description of collaboration efforts/projects with		Deemed Insufficient: Assigned one action statements

Deficiency Number	Deficiency Title	Utility Response	Referenced Documents	WSD Action[33]
	research programs	academic institutions on projects and technologies related to the overall wildfire mitigation effort.		for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-18	Discussion of centralized data repository lacks detail	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provides goals and targets related to implementation of this centralized data repository, the sources of data input that will go into the repository and how data will be reviewed for QA/QC purposes.		Deemed Sufficient: Assigned one action statement for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-19	SCE does not sufficiently justify the relative resource allocation of its WMP initiatives to its covered conductor program	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE emphasized the importance of the covered conductor initiative in mitigating wildfire risk and its effectiveness, provided alternatives considered, and explained why such a large percentage of overall wildfire mitigation spend is dedicated to that program.		Deemed Insufficient: Assigned one action statement for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-20	Potential notification fatigue from frequency of PSPS commun-ications	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provided the steps to help ensure timely and accurate PSPS notifications as described and the count of PSPS notifications for May through July 2020.		Deemed Sufficient: Assigned one action statement for SCE to address and incorporate into 2021 WMP filing or February 26 supplemental filing
SCE-21	Lack of sufficient detail on sharing of best practices	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provided details on SCE external engagements for sharing of best practices from 2018 to 2020.		Deemed Sufficient
SCE-22	SCE does not describe resources needed on fuel	Submitted in SCE's First Quarterly Report for Class B Deficiencies 09-09-20: SCE provided details on their collaboration efforts with the USFS on		Deemed Sufficient: Assigned two action statements for SCE to address

Deficiency Number	Deficiency Title	Utility Response	Referenced Documents	WSD Action[33]
	reduction efforts	fuel reduction programs, the timeline, status and resources needed.		and incorporate into 2021 WMP filing or February 26 supplemental filing

4.7 PROPOSED CHANGE ORDERS PENDING

As directed in Resolution WSD-002, SCE is providing a detailed summary of all change orders[34] submitted and not yet acted upon by the WSD.

2020 WMP Impacted Activity	High Level Summary	Date Submitted	Status
IOU Customer Engagement – End	SCE suspended its partnership with the statewide customer engagement campaign and proposes to redeploy the funds to local marketing campaign.	September 11, 2020	Pending WSD approval
Cooperation with Suppression Agencies – Change in Work Being Done	Given the intensity of the 2020 fire season and potential strain on fire-fighting resources, SCE wants to pilot the use of a Helitanker and determine appropriate SOPs/metrics going forward.	September 11, 2020	Pending WSD approval
Dist./Trans. HFRI Inspections in HFRA – Increase in Scale	SCE is continuing to improve its inspection programs to incorporate more lessons learned. This has resulted in SCE conducting additional HFRI in 2020.	September 11, 2020	Pending WSD approval
Wildfire Infrastructure Protection Team Additional Staffing – Increase in Scale	SCE is proposing an increase in scale for its Wildfire Infrastructure Protection Team to include 18 additional full-time employees who will serve on the dedicated PSPS IMT. Based on lessons learned in 2019-20, having variable resources between PSPS events created inefficiencies in operations and decision-making. A dedicated PSPS IMT reduces stress on employees allowing them to focus on their routine work.	September 11, 2020	Pending WSD approval

[34] *See* SCE's First Change Orders Report, filed September 11, 2020 and SCE's Second Change Orders Report, filed December 11, 2020.

2020 WMP Impacted Activity	High Level Summary	Date Submitted	Status
CRCs – Increase in Scale	As noted in its 2020-2022 WMP, SCE anticipated that the CRC scope recommendation would be finalized in 2020 (post-2020-2022 WMP submission) as it improves its ability to ensure timely deployment and customer access to CRCs in coordinated locations. SCE increased its count of CRC locations to 56 sites with which it contracts to activate in the case of a PSPS event.	December 11, 2020	Pending WSD approval
Asset and Vegetation Management and Inspections - Modification to Methodology	During the 2020 fire season, SCE identified 17 AOCs in its HFRA, primarily driven by elevated dry fuel levels that pose increased fuel-driven and wind-driven fire risk. In order to mitigate this risk, a dedicated team managing inspections, remediation and vegetation was required to accelerate inspections, remediation and vegetation trimming and removal in the identified AOCs. This program primarily supplements the following 2020 WMP initiative activities: • IN-1.1: High Fire Risk Informed Inspections – Distribution • IN-1.2: High Fire Risk Informed Inspections –Transmission • IN-5: High Fire Risk Informed Inspections – Generation • 2020 WMP Section 5.3.5.4: Emergency Response Vegetation Management due to Red Flag Warning or Other Urgent Conditions	December 11, 2020	Pending WSD approval

5 Inputs to the Plan and Directional Vision for WMP

5.1 Goal of Wildfire Mitigation Plan

The goal of the Wildfire Mitigation Plan is shared across WSD and all utilities: Documented reductions in the number of catastrophic ignitions caused by utility actions or equipment and minimization of the societal consequences (with specific consideration to the impact on Access and Functional Needs populations and marginalized communities) of both wildfires and the mitigations employed to reduce them, including PSPS.

In the following sub-sections report utility-specific objectives and program targets towards the WMP goal. No utility response required for section 5.1.

5.2 The objectives of the plan

Objectives are unique to each utility and reflect the 1, 3, and 10-Year projections of progress towards the WMP goal. Objectives are determined by the portfolio of mitigation strategies proposed in the WMP. The objectives of the plan shall, at a minimum, be consistent with the requirements of California Public Utilities Code §8386(a) –

Each electrical corporation shall construct, maintain, and operate its electrical lines and equipment in a manner that will minimize the risk of catastrophic wildfire posed by those electrical lines and equipment.

Describe utility WMP objectives, categorized by each of the following timeframes, highlighting changes since the prior WMP report:

1. Before the next Annual WMP Update

2. Within the next 3 years

3. Within the next 10 years – long-term planning beyond the 3-year cycle

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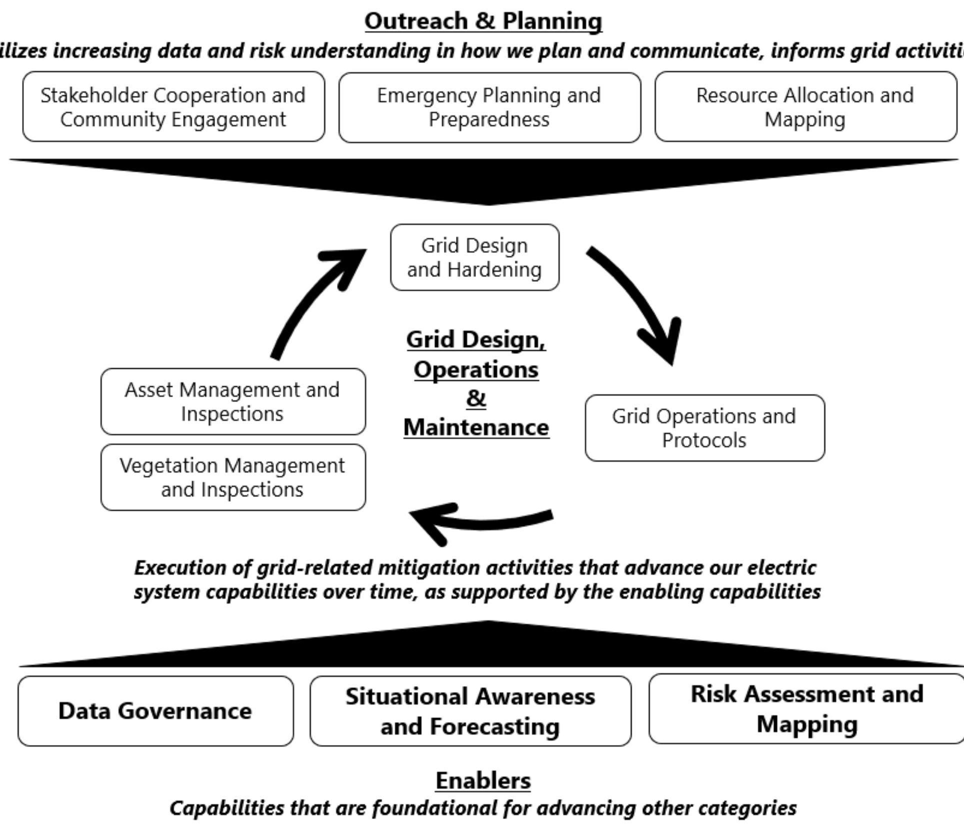
SCE's 2020-2022 WMP includes an actionable, measurable, and adaptive plan for 2020 through 2022 to reduce the risk of potential ignitions associated with SCE's electrical infrastructure in HFRA by increasing system hardening, bolstering situational awareness, and enhancing operational practices. These objectives are, in turn, supported and enabled by greater data governance, improvements in risk assessment and mapping, as well as other stakeholder and resource initiatives. Below SCE describes the objectives of its plan. For the purposes of this WMP Update, SCE considers both of the timeframes "before the next Annual WMP Update" and "within the next 3 years" to be within 2020-2022 in order to stay consistent with 2020-2022 WMP and Guidance-12 timeframes.

SCE submitted its Guidance 12 response, Long Term Plan (LTP), as part of its first Quarterly Report which identified objectives for the current WMP period, as well as future WMP periods. SCE's long-term plan is based on present knowledge and understanding of wildfire risk and mitigation programs. SCE expects its knowledge of and approach to wildfire risk mitigation activities will grow and evolve in the coming years. Likewise, any changes to legislation, regulatory policy, technology, or other foundational assumptions will influence the objectives and approach identified herein. SCE's ability to execute towards long-term objectives will also depend on the CPUC's timely approval of our WMPs and associated costs.

Figure SCE 5-1 illustrates how SCE utilizes the relationships among the WSD's various Maturity Model categories to drive toward long-term objectives. SCE's long-term strategy for wildfire risk mitigation is a multi-pronged approach. Grid design, operations and maintenance in the center of Figure SCE 5-1 represents the work SCE performs that most directly reduces the risk of ignition from utility infrastructure. As SCE executes on the near-term objectives and deploys system hardening mitigation, the long-term focus will be on growing the maturity of the supporting categories above and below. Gains in these areas do not always directly reduce ignition risks but have an important role in helping ensure that SCE is executing its wildfire risk mitigation programs with higher effectiveness and efficiency.

Figure SCE 5-1
Relational Diagram of WSD Categories for SCE Objectives



SCE's short-term objectives, which cover the current WMP period, are focused on executing our current WMP activities to develop capabilities, significantly harden the system, and reduce PSPS usage and impacts. This includes the completion of our program targets for 2021 and 2022 outlined in Table 5.3.1, as well as the category level near-term objectives identified in Section 7.1.2. The short-term objectives drive SCE toward attainable solutions to mitigate the risks of wildfire and the potential impacts of our risk mitigations. SCE's long-term objectives were developed to achieve mature capability levels, as SCE operationalizes new technologies and further integrates systems and processes to increase the granularity and automation of its data and risk modeling. These advancements will evolve SCE's decision-making approach and maintain and expand capabilities as new technologies and processes emerge. Similarly, category level long-term objectives are described in Section 7.1.2.

The specific initiatives and investments required will progress as SCE refines its approach, technology advances, and successes in some categories push advances in others. As noted in the description of Figure SCE 5-1, each of these 10 categories has an interaction with the other categories, and SCE will continue to look for opportunities for cross-cutting efforts that advance its capabilities in multiple categories. As such, SCE's long-term strategy identifies potential future focus areas that SCE believes will be critical to enabling future growth and maturity in its wildfire mitigation activities.

Details for each of the ten categories identified by the WSD for near-term strategy and goals are provided in Table SCE 7.1 and the higher-level long-term strategy and objectives are discussed in Sections 7.3.1 to 7.3.10.

Throughout the near- and long-term period, SCE will achieve an integrated, data-driven, risk-informed operational approach that helps SCE affordably balance the scale, complexity, and uncertainties associated with wildfire risks in California, inclusive of PSPS risks. SCE's approach to wildfire mitigation is a "no-regrets" approach that better positions SCE, and its customers, to be more resilient and responsive to address future challenges, either from wildfires or other emerging climate-related risks. For example, grid hardening technologies (e.g., covered conductor installation and advanced protection and control technology deployment) and inclusion of real-time diagnostics that can identify and isolate anomalies and weaknesses mitigate wildfire risks in the near-term and help SCE modernize and strengthen the grid to withstand the impacts of climate change. Resilience, rapid response capability, emergency preparedness and customer engagement will also be imperative to withstand severe weather events, such as those that manifested in 2020, and to both better prepare customers for and reduce the impact of potential PSPS events. SCE believes its plan will not only mitigate the risks of wildfire but also lead to enhanced system reliability and resiliency that help achieve environmental goals by ensuring the grid will be ready to support increasing load associated with electrification necessary to reduce greenhouse gas emissions.

5.3 PLAN PROGRAM TARGETS

Program targets are quantifiable measurements of activity identified in WMPs and subsequent updates used to show progress towards reaching the objectives, such as number of trees trimmed or miles of power lines hardened.

List and describe all program targets the electrical corporation uses to track utility WMP implementation and utility performance over the last five years. For all program targets, list the 2019 and 2020 performance, a numeric target value that is projected for end of the year 2021 and 2022, units on the metrics reported, the assumptions that underlie the use of those metrics, update frequency, and how the performance reported could be validated by third parties outside the utility, such as analysts or academic researchers. Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of each targeted preventive strategy and program.

Table 5.3-1:
List and Description of Program Targets, Last 5 Years

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Weather Stations (SA-1) See Section 7.3.2	352	593	SCE expects to install 375 weather stations but will attempt to install as many as 475	SCE is targeting to have over 1,800 weather stations installed by the end of 2022 (cumulative program inception in 2018 through 2022)	Weather Stations	Timely resolution of network stability and satellite / communication issues	Quarterly	Report showing location of weather stations, including HFTD tier
FPI (SA-2) See Section 7.3.2	N/A	Backcast FPI for calibration. Developed FPI 2.0 equations emphasizing wind speed and diversity of fuel conditions	1) Backcast 20 years of FPI using FPI 2.0 before typical height of fire season (Q3) to determine historical performance compared to current FPI 2) Run FPI 2.0 in parallel with the current FPI and compare outputs for the 2021 fire season	FPI 2.0 to replace current FPI	N/A	FPI 2.0 to replace current FPI dependent on results of validation conducted in 2021	Quarterly	Report showing comparisons of FPI 2.0 with current FPI

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Weather and Fuels Modeling System (SA-3) See Section 7.3.2	N/A	Developed methodology for end use case	Install two additional High-Performance Computing Clusters (HPCCs) to facilitate the installation and operationalization of the Next Generation Weather Modeling System allowing for more precise, higher resolution output	The Next Generation Weather Modeling System will be developed and fully operational	HPCCs	N/A	Quarterly	Model outputs and documentation of HPCC purchase and installation (invoice and statement of work)
Fire Spread Modeling (SA-4) See Section 7.3.2	N/A	Acquired statement of work from Technosylva	Develop a methodology and a strategy to test FireCast/FireSim implementation into PSPS decision making based on backcast information by Q3	Implement FireCast /FireSim into PSPS decision making process	N/A	N/A	Quarterly	Validation of the implementation methodology using 2020 PSPS event data

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Fuel Sampling Program (SA-5) See Section 7.3.2	Commenced sampling at 12 sites	Expanded sampling to include a total of 15 sites	Maintain periodic fuel sampling across SCE's HFRA and evaluate the need to sample additional locations	Maintain program and evaluate the need to sample additional locations	Fuel sampling sites	There may be data gaps that exist that need to be addressed.	Quarterly	Provide vendor reports from sampling sites
Remote Sensing / Satellite Fuel Moisture (SA-7) See Section 7.3.2	N/A	Acquired vendor scope of work	Initiate wind profiler pilot project to validate weather model performance for potential improvements to weather models	Evaluate output and determine if permanent wind profilers should be installed in designated locations	TBD	N/A	Quarterly	List of potential locations for wind profiler deployment and sample output from deployment
Fire Science Enhancements (SA-8) See Section 7.3.2	N/A	Created 40-year historical data set	Evaluate current wildfire events in context of 40-year history of wildfires.	Perform historical analysis and provide products that incorporate historical context for set weather and fuels variables	N/A	N/A	Quarterly	Provide samples of output products and narrative demonstrating how data was applied to SCE's operating needs

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Distribution Fault Anticipation (DFA) (SA-9) See Section 7.3.2	Procured 60 DFA units and initiated installations	Completed installations and evaluated the 60 DFA units and identified additional 150 circuits for deployment in 2021.	Complete installation of 120 DFA units on circuits in SCE's HFRA and continue evaluation of DFA technology which may result in SCE installing up to 150 units	SCE is targeting to evaluate effectiveness of installed units to determine scale of remaining deployments and alternative technologies (cumulative program inception through 2022)	DFA units	Construction progress dependent on being able to coordinate panned outages for installation; SCE's 2021 GRC Decision; continuing evaluation of effectiveness of installed units; alternative technology options	Quarterly	List of DFA installations, including location and HFTD tier

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Covered Conductor (SH-1) See Section 7.3.3	372	965	SCE expects to install 1,000 circuit miles of covered conductor in SCE's HFRA but will attempt to install as many as 1,400 circuit miles of covered conductor in SCE's HFRA, subject to resources constraints and other execution risks	SCE is targeting to have over 4,000 miles of covered conductor by the end of 2022 (cumulative program inception in 2018 through 2022)	Circuit miles	Resource availability; also dependent on SCE's 2021 GRC Decision	Quarterly	List of poles and locational information (including HFTD tier) where covered conductor was installed

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Undergrounding Overhead Conductor (SH-2) See Section 7.3.3	N/A	Refined targeted undergrounding methodology and began scoping for 2021	Install 4 miles of undergrounded HFRA circuits SCE will attempt to install 6 miles of undergrounded HFRA circuits, subject to resource constraints and other execution risks, such as permitting, environmental or coordinating with other utilities.	SCE is targeting to have over 15 miles undergrounded in HFRA by the end of 2022 (cumulative program inception through 2022)	Circuit miles	Coordination of planned outages and planning around any environmental challenges; continued evaluation of potential benefits of undergrounding in additional target locations may increase scope	Quarterly	List providing locational information (including HFTD tier) where undergrounding was installed

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Branch Line Protection Strategy (SH-4) See Section 7.3.3	7,765	3,025	Install or replace fusing at 330 fuse installation locations SCE will strive to install or replace fusing at 421 locations, subject to resource constraints and other execution risks	SCE is targeting to have over 13,000 fuses installed by the end of 2022 (cumulative program inception in 2018 through 2022)	Fuse installation locations	Coordination of planned outages and planning around any environmental challenges	Quarterly	List providing locational information (including HFTD tier) where fuses were installed
Installation of System Automation Equipment – RAR/RCS (SH-5) See Section 7.3.3	71	49	Based on SH-7 analysis, SCE is proceeding with preliminary scope per the Action Plan	N/A – Also dependent on SH-7 analysis/results	RAR/RCSs	Any installations would be determined by SH-7 analysis	Quarterly	List providing locational information (including HFTD tier) where RAR/RCSs were installed

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Circuit Breaker (CB) Relay Hardware for Fast Curve (SH-6) See Section 7.3.3	Updated Fast Curve Operating Settings for 156 RAR installations and developed plans for CB Relay updates	109	Replace/upgrade 60 relay units in HFRA SCE will strive to replace/upgrade 86 relay units in HFRA, subject to resource constraints and other execution risks	SCE is targeting to replace/upgrade over 250 relay units by the end of 2022 (cumulative program inception through 2022)	Fast curve settings updated / CB relays	Coordination of planned outages and planning around any environmental challenges	Quarterly	List of structures (including locational information and HFTD Tier) where relays were installed
PSPS-Driven Grid Hardening Work (SH-7) See Section 7.3.3	N/A	Reviewed 50% of all distribution circuits within HFRA to determine if modifications may improve sectionalizing capability within HFRA	SCE will develop a methodology to project probability of PSPS de-energization and impact. Utilizing this method-ology, SCE will adopt a more targeted approach by evaluating highly impacted circuits from the remaining 50% circuits in HFRA.	No further analysis expected beyond 2021 at this time	N/A	Engineering resource availability	Quarterly	List of circuits reviewed and evaluation process document

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Transmission Open Phase Detection (SH-8) See Section 7.3.3	1 pilot transmission circuit install-ation completed, not part of the 2019 WMP	6	Install transmission open phase detection devices on 10 transmission circuits	SCE is targeting to have devices installed on over 30 transmission circuits by the end of 2022 (cumulative program inception through 2022)	Transmission circuits with open phase detection devices	Transmission protection relays have been replaced with relays supporting Open Phase Detection prior to implementation	Quarterly	List of structures (including locational information and HFTD Tier) where open phase detection devices were installed
Tree Attachment Remediation (SH-10) See Section 7.3.3	101	405	Remediate 500 tree attachments SCE will strive to complete over 600 tree attachment remediations, subject to resource constraints and other execution risks	SCE is targeting to remediate over 1,700 tree attachments by the end of 2022 (cumulative program inception through 2022)	Tree attach-ment remedia-tions	Coordination of planned outages and planning around any environmental challenges; target includes all work and events that lead to remediation	Quarterly	List of structures (including locational information and HFTD Tier) where tree attachments were remediated

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Legacy Facilities (SH-11) See Section 7.3.3	N/A	100% of milestones achieved	Hydro Control Circuits – Perform evaluation on 5 circuits for possible system hardening improvements Low Voltage Site Hardening – Create 2 project plans based on 2020 engineering assessments Grounding Studies/Lightning Arrestor Assessments: Complete 12 additional assessments	100% of milestones achieved and projects as result of assessments scoped and scheduled	N/A	Resource availability and outcome of analysis/scoping	Quarterly	Project/analysis documentation; list of sites, project plans, engineering assessments & other assessments referenced in target

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Microgrid Assessment (SH-12) See Section 7.3.3	N/A	Initial RFP executed	Perform internal assessment of vendor bid and location options. If assessment is favorable, SCE will issue engineering, procurement, construction (EPC) contract to a vendor that meets SCE's design requirements.	Dependent on assessment in 2021	N/A	Land for requisite new DERs will be successfully secured, SCE can execute a mutually agreeable contract with the selected vendor,	Quarterly	Internal assessment results and listing of EPC contracts issued (if applicable)
C-Hooks (SH-13) See Section 7.3.3	N/A	N/A	Replace C-Hooks on at least 40 structures in HFRA SCE will strive to replace all C-Hooks in HFRA, currently estimated be-tween 50-60 structures	100% of C-Hooks replaced in HFRA	Transmiss-ion structures with C-hooks	Assuming that all environmental clearances to perform the work at each location are obtained	Quarterly	List of structures including locational information where C-hooks were replaced

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Long Span Initiative (LSI) (SH-14) See Section 7.3.3	N/A	N/A	Complete all field assessments for locations and corresponding remediations. Remediate the highest risk locations, estimating that 300, and up to 600, locations will be remediated in 2021, subject to the completion timeline for inspections, resource constraints and other execution risks.	Complete remediations for locations with 2022 due dates	Number of locations remediat-ed	Total number and risk priority can only be finalized after inspections are completed and LiDAR data is received from the vendor	Quarterly	List of locations assessed (including HFTD tier) and list of locations assigned a remediation
Vertical Switches (SH-15) See Section 7.3.3	N/A	Performed inspections and internal analysis/ governance	Install 20 switches in HFRA SCE will strive to install 30 switches in HFRA	SCE is targeting over 70 installations by the end of 2022 (cumulative program inception through 2022)	Vertical switches	Coordination of planned outages and resolution of any environmental challenges	Quarterly	List of structures including locational information for structures where switches were installed

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Distribution Ground / Aerial Inspections and remediations (IN-1.1) See Section 7.3.4	385,292 ground; 113,900 aerial	199,050 ground; 168,017 aerial	Inspect between 163,000 and 198,000 structures in HFRA, via both ground and aerial inspections. This target includes HFRI, compliance-due structures in HFRA and emergent risks during the fire season.	Continue current plan and inspect HFRI and compliance-due structures in HFRA	Structures	Resource availability	Quarterly	List of all structures inspected, including locational information, inspection type and HFTD tier

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Transmission Ground / Aerial Inspections and remediations (IN-1.2) See Section 7.3.4	50,583 ground; 38,998 aerial	35,562 ground; 31,381 aerial	Inspect between 16,800 and 22,800 structures in HFRA, via ground and aerial inspections. This target includes HFRI, compliance-due, and other structures within the vicinity for operational efficiency purposes in HFRA and emergent risks during the fire season.	Continue current plan and inspect HFRI and compliance-due structures in HFRA	Structures	Resource availability	Quarterly	List of all structures inspected, including locational information, inspection type and HFTD tier
Infrared Inspection of energized overhead distribution facilities and equipment (IN-3) See Section 7.3.4	4,962	5,900	Inspect approximately 50% of distribution circuits in HFRA	Inspect all remaining distribution circuits in HFRA	Circuit miles	Resource availability	Quarterly	List of all structures inspected, including locational information and HFTD tier

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Infrared Inspection, Corona Scanning, and High Definition (HD) imagery of energized overhead Transmission facilities and equipment (IN-4) See Section 7.3.4	6,700	1,005	Inspect 1,000 transmission circuit miles on HFRA circuits	SCE is targeting to have inspected over 8,500 circuit miles by the end of 2022 (cumulative program inception through 2022)	Circuit miles	Resource availability	Quarterly	List of all structures inspected, including locational information and HFTD tier
Generation Inspections and Remediations (IN-5) See Section 7.3.4	449	268	Complete inspection of 181 generation-related assets in HFRA	SCE is targeting over 1,000 generation-related asset inspections in HFRA by the end of 2022 (cumulative program inception through 2022)	Asset inspections	Resource availability	Quarterly	ArcGIS database extract; list of all structures inspected, including locational information, inspection type and HFTD tier
Inspection and Maintenance Tools (IN-8)	N/A	N/A	• Transition Aerial and Transmission Ground inspection processes to a	A single digital platform for integrated inspections across Distribution	Capability Imple-mented	Validation of project plan at each project milestone;	Quarterly	Documentation of software solutions have been rolled out

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
See Section 7.3.4			single digital platform with at least 75% of inspectors trained to use the tool by year end 2021. • Key AI/ML models leveraged by the Aerial inspection process; • Deploy scope mapping tool with GIS visualization to Distribution Planning and Engineering users • Deploy remediation mobile software and iPad devices for transmission and distribution.	and Transmission, Aerial and Ground with integrated advanced technologies (AI/ML models and assisted/augmented reality). Provide a single scope mapping tool platform for bundling remediation and outstanding notifications for optimizing Distribution and Transmission work		Application development and user testing resource availability		to inspectors and field crews

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Hazard Tree Management Program (VM-1) See Section 7.3.5	~130,000	~100,000	Assess between 150,000 and 200,000 trees for hazardous conditions and perform prescribed mitigations in accordance with program guidelines and schedules	Assess between 150,000 and 200,000 trees in 2022 for hazardous conditions and perform prescribed mitigations in accordance with program guidelines and schedules	Assess-ments	Based on staffing of ISA-assessors, density of the tree population, accessibility	Quarterly	List of trees assessed, including locational information and prescribed mitigation and list of mitigations performed including locational information and date mitigation performed
Expanded Pole Brushing (VM-2) See Section 7.3.5	~160,000	~230,000	SCE plans to pole brush between 200,000 and 300,000 Distribution poles	SCE plans to pole brush between 200,000 and 300,000 distribution poles in 2022	Poles Brushed	N/A	Quarterly	List of pole brushing locations with locational information, including HFTD tier
Expanded Clearances for Legacy Facilities (VM-3) See Section 7.3.5	N/A	61 sites treated	Treat 46 sites	SCE plans to treat all 156 sites by the end of 2022	Sites treated	N/A	Quarterly	List of facilities treated and mitigation performed

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Dead and Dying Tree Removal (VM-4) See Section 7.3.5	All planned assessments completed, ~13,500 removals identified	All planned assessments completed, ~9,000 removals identified	Perform Drought Relief Initiative (DRI) annual inspections and perform prescribed mitigations in accordance with program guidelines and schedules	Continue program; perform DRI annual inspections and perform prescribed mitigations in accordance with program guidelines and schedules	Prescribed Mitigations	N/A	Quarterly	List of trees assessed that require removal including location and date of assessment and date of removal

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
VM Work Management Tool (Arbora) (VM-6) See Section 7.3.5	N/A	Implemented release 1 application functionality for pilot user group for Dead & Dying Tree Removal	Continue Work Management Tool (Arbora) agile development and releases in accordance with project plan – complete full rollout of Dead & Dying Tree Removal and Hazard Tree Mitigation, and conduct discovery and design architecture associated with Line Clearing	All vegetation management programs on a single integrated digital platform	Capability Imple-mented	Assumes successful pilot implementation for smaller scopes of vegetation management work	Quarterly	Documentation of Implemented software solution milestones
Customer Care Programs : (CRCs) Community Resiliency Programs: (Resiliency Zones Pilot &	CRC: Contracted with 13 CRCs. Community Resiliency Programs: Identified, and secured	CRC: 56 contracted CRCs Community Resiliency Programs: Secured Customer	CRC: Adjust as needed. Community Resiliency Programs: Goals for Resilience Zones dependent on community	CRC: Adjust as needed. Community Resiliency Programs: Goals for Resilience Zones dependent on community leaders	Number of customers partici-pating in the program	Community Resiliency Programs: Community Leaders agree to identify customers to participate in the Resiliency Zones pilot. CREI is	Quarterly	Count of customers enrolled in or redemption of various customer care programs.

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Customer Resiliency Equipment Incentive (CREI)) Customer Resiliency Equipment: CCBB, Res Battery Station Rebate & Well Water Generator Rebate) (PSPS-2) See Section 7.3.6	agreement from one pilot customer. Customer Resiliency Equipment: N/A	Agreements for four Resiliency Zone sites. Completed installation of microgrid islanding capability for first pilot customer for CREI. Customer Resiliency Equipment: CCBB - Reached out to all eligible 'Critical Care' MBL customers enrolled in CARE/FERA residing in an HFRA. 837 customers enrolled; 721	leaders identifying potential customers. Targeting to obtain 5 to 10 agreements. Complete installation of microgrid islanding (CREI) capability on second pilot customer. Customer Resiliency Equipment: CCBB: Expand program to eligible MBL customers who are enrolled in CARE/ FERA and reside HFRA. Expand marketing and outreach plans. Well Water & Res Battery Station Rebates: Enhance	identifying potential customers. Customer Resiliency Equipment: Well Water & Residential Battery Station Rebate: To be determined based on 2021 learnings		dependent on approval of 2021 – 2023 GRC. Customer Resiliency Equipment: Well Water: Qualifying product list and eligibility requirements.		

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
		batteries deployed. Residential Battery Station Rebates: 856 redeemed Well Water: 185 rebates redeemed	the programs to increase customer participation by 20% - 40%					
Wildfire Safety Data Mart and Data Management (WiSDM / Ezy) (DG-1) See Section 7.3.7	N/A	N/A	WiSDM: - Complete the WisDM solution analysis and design for centralized data repository - Initiate staggered consolidation of datasets from SCE Enterprise systems Ezy Data: - Implement the cloud platform infrastructure for Ezy Data - Build a solution for data	WiSDM: - Complete the integration of key systems of record with the centralized data repository for key situational, operational, and risk datasets - Deploy the wildfire data portal with access to available data in the centralized data repository - Deliver standardized reports for increased efficiency in reporting	N/A	WSD requirements/ data specification that WiSDM scope is based on will not change	Quarterly	TBD

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
			consumption, storage and visualization of inspection data (LiDAR, HD video, photograph) - Enable an environment for Artificial Intelligence (AI) assisted analytics	Ezy Data: -Deployment of cloud Big Data solution for other asset inspection, remediation, and asset data processes -Operationalize initial set of AI/ML-based analytics use cases				
Customer Education and Engagement – Community Meetings (DEP-1.2) See Section 7.3.10	Hosted 13 in-person community meetings	Hosted nine virtual community meetings	Host at least nine virtual community meetings SCE will complete additional meetings as needed in 2021, based on PSPS impact to communities, up to 18	To be determined based on 2021 feedback	Comm-unity meetings	The number of community meetings will vary year to year, based on PSPS impact to communities the previous year.	Quarterly	List and recordings of meetings posted on SCE website; summary of feedback from meetings

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Customer Education and Engagement – Marketing Campaign (DEP-1.3) See Section 7.3.10	PSPS Awareness of 54% exceeded goal of 40%	PSPS Awareness of 56% exceeded goal of 40%	PSPS Awareness goal: 50%	To be determined based on 2021 performance	Customer awareness percentage	N/A	Quarterly	Surveys conducted by independent third party; copies of the letters and other marketing materials, and results of the surveys
SCE Emergency Responder Training (DEP-2) See Section 7.3.10	IMT – Trained 100% of the members Unmanned Aerial Systems (UAS) – N/A, program started in 2020	IMT – Trained 100% of the members UAS – Trained 50 operators	IMT – Have all PSPS IMT and Task Force members fully trained and qualified or requalified by July 1, 2021 UAS – In 2021 SCE plans to expand the program by an additional 50 operators over 2020 levels	Training is an annual requirement; therefore, the target will be refreshed each year	Persons trained	Assumes no major changes to IMT structure or strategy	Quarterly	Training logs and staffing records; training materials
Customer Research and	N/A (commenced planning for	Administered 5 surveys (PSPS Tracker	Administer at least 4 PSPS-related surveys (PSPS	At least 2-3 surveys per year	Number of surveys	N/A	Quarterly	Survey results

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Education (DEP-4) See Section 7.3.10	the 2019 PSPS Tracker to capture feedback on the 2019 events)	Survey to capture feedback on the 2019 events; wildfire community meeting feedback survey, CRC/CCV feedback survey, PSPS digital user experience survey, In-Language Wildfire Mitigation Communi-cations Effectiveness Pre/Post Survey	Tracker Survey to capture feedback on the 2020 events, wildfire community meeting feedback survey, CRC/CCV feedback survey, In-Language Wildfire Mitigation Communications Effectiveness Pre/Post Survey)					

Program Target	2019 Performance	2020 Performance	Projected Target by End of 2021	Projected Target by End of 2022	Units	Underlying Assumptions	Update Frequency	Third-party Validation
Aerial Suppression (DEP-5) See Section 7.3.10	N/A	Provided funding for 1 aerial suppression resource in partnership with Orange County Fire Authority	Will enter a Memorandum of Understanding (MOU) with CAL FIRE and local county fire departments to provide standby cost funding for up to 5 aerial suppression resources strategically placed around the SCE service area	Depends on 2021 performance	Aerial Suppress-ion resources	Successful MOU with fire agencies and acquisition of aerial suppression resources (not in competition with other state agencies seeking to acquire resource); evaluation of actual needs during the fire season	Yearly	MOU outlining aerial agreements with fire agencies/ stakeholders

5.4 PLANNING FOR WORKFORCE AND OTHER LIMITED RESOURCES

Report on worker qualifications and training practices regarding wildfire and PSPS mitigation for workers in the following target roles:

1. *Vegetation inspections*
2. *Vegetation management projects*
3. *Asset inspections*
4. *Grid hardening*
5. *Risk event inspection*

For each of the target roles listed above:

1. *List all worker titles relevant to target role (target roles listed above)*
2. *For each worker title, list and explain minimum qualifications with an emphasis on qualifications relevant to wildfire and PSPS mitigation. Note if the job requirements include the following:*

   a. Going beyond a basic knowledge of General Order 95 requirements to perform relevant types of inspections or activities in the target role

   b. Being a "Qualified Electrical Worker" (QEW) and define what certifications, qualifications, experience, etc. is required to be a QEW for the target role for the utility.

   c. Include special certification requirements such as being an International Society of Arboriculture (ISA) Certified Arborist with specialty certification as a Utility Specialist
3. *Report percentage of Full Time Employees (FTEs) in target role with specific job title*
4. *Provide a summarized report detailing the overall percentage of FTEs with qualifications listed in (2) for each of the target roles.*
5. *Report plans to improve qualifications of workers relevant to wildfire and PSPS mitigation. Utilities will explain how they are developing more robust outreach and onboarding training programs for new electric workers to identify hazards that could ignite wildfires.*

SCE summarizes the applicable information pertaining to items 1 through 4 in the tables below, for each of the five target roles identified. Full time employee (FTE) figures represent counts and percentages as of year-end 2020 and include SCE and Contractor field workers relevant to each target role. It is important to note that worker counts can fluctuate throughout the year depending on work required, resource availability, etc. particularly with contract workers. Below each table, SCE provides a more detailed description of the qualifications for each role (Item 2), as well as discussion on training and plans to improve worker qualifications (Item 5).

5.4.1 Target Role: Vegetation Inspections

SCE's Vegetation Management (VM) program performs several types of inspections, to identify the risk of vegetation contact with energized conductors and electrical assets see Section 7.3.5 for detailed information on VM inspections. Below are the worker titles that perform these inspections.

Table SCE 5-1 and Table SCE 5-2 detail the worker titles and associated qualifications pertaining to Vegetation Inspections.

Table SCE 5-1
Vegetation Inspections (SCE)

(1)	(2a.b.c)	(3)	(4)[35]
SCE Worker Titles (FTE as of 12/31/20)	Minimum Qualifications relevant to wildfire and PSPS mitigation	FTE % by Target Role	FTE % by High-Interest Qualification
SPECIALISTS	See Below	20%	33%[36]
SENIOR SPECIALISTS	ISA Arborists	80%	100%
		100%	

Table SCE 5-2
Vegetation Inspections (Contractor)

(1)	(2a.b.c)	(3)	(4)
Contractor Worker Titles	Minimum Qualifications relevant to wildfire and PSPS mitigation	FTE % by Target Role	FTE % by High-Interest Qualification
LEAD PRE-INSPECTORS	ISA Arborists	10%	100%
PRE-INSPECTORS	See below	46%	N/A
CUSTOMER COORDINATORS	See below	16%	N/A

[35] SCE defines High-Interest Qualification as one of the three listed sub-qualifications identified in part 2 of this prompt.
[36] A Specialist who obtains ISA-certification is eligible to apply to become a Senior Specialist.

GENERAL FOREMAN (G CREW)	See below	21%	N/A
QC INSPECTORS	ISA Arborists; See Below	8%	59%
		100%	

All Vegetation Management field workers must meet certain minimum qualifications. In some cases, certain worker types are required to be International Society of Arboriculture (ISA) certified. Specific qualifications for each position are detailed below.

Additional Minimum Qualifications – SCE Workers:

SENIOR SPECIALISTS: Provides oversight and guidance to field contractors performing vegetation work. Senior Specialists have additional responsibilities—such as being able to perform post-work verification (to ensure that work is done to regulatory requirements and program standards), responding to trouble orders, and performing review of work performed on SCE's Bulk Transmission System—must be an ISA Certified Arborist.

- To earn a credential as an ISA Certified Arborist, an individual must be trained and knowledgeable in all aspects of arboriculture and adhere to the ISA's Code of Ethics. To be eligible, individuals must have one or both of the following: (1) three or more years of full time, eligible, practical work experience in arboriculture; (2) a degree in the field of arboriculture, horticulture, landscape architecture, or forestry from a regionally accredited educational institute

SPECIALISTS: Provides oversight and guidance to field contractors performing vegetation work. All of SCE's Specialists must have three or more years' experience in Utility Vegetation Management.

Additional Minimum Qualifications – Contract Workers:

PRE-INSPECTORS: Personnel performing pre-inspections without supervision responsibilities. Pre-Inspectors are qualified if they meet one of the following conditions at date of hire: (1) possess a 4-year degree in related field with ability to obtain ISA certification in 12 months; (2) possess a 2-year degree in related field with one year experience and ability to obtain certification in 12 months; (3) possess two years of industry experience with the ability to obtain ISA certification in 12 months.

CUSTOMER COORDINATOR: Issues notifications regarding upcoming vegetation management work, fields customer constraints (e.g., refusals, issues with site access, etc.) related to vegetation management work, and works to obtain customer permissions, e.g., for recommended enhanced clearances. To qualify, the individual must possess a minimum of two years of related utility vegetation management pruning, inspection, or planning experience.

GENERAL FOREMAN: Oversees crew operations by helping to ensure crew safety, scheduling work based on crew qualifications, resolving escalated customer constraints, and coordinating with the Senior

Specialists in their district. At a minimum, SCE's contracts require one designated General Foreman per every eight crews. The General Foremen must be ISA Certified Arborists and/or must possess a minimum of three years of related utility vegetation management pruning, inspection, or planning experience.

QUALITY CONTROL INSPECTORS: QC Inspectors are independent of VM operations and perform inspections to verify that regulatory and program standards have been achieved. They must have either an ISA Arborist Certification or have a minimum of two years of experience performing utility vegetation inspections and have experience measuring vegetation to conductor clearance using precision measuring tools. Once the inspector is eligible for ISA certification, it is expected that the inspector will become certified within six months of eligibility.

Training and plans to improve worker qualifications:

SCE provides annual training – Utility Vegetation Management Core Plans Training – to all VM employees and vegetation contractor lead personnel. This training provides detailed reviews of program requirements, practices, and procedures, and any updates or enhancements pertaining to SCE's VM program. Typical training included in Core Plans Training includes the following process documents: (1) Transmission Vegetation Management Plan; (2) Distribution Vegetation Management Plan; (3) Hazard Tree Management Plan; (4) Vegetation Threat Management; (5) Customer Refusals; and (6) QC and SCE's Oversight Strategy. As it pertains to wildfire mitigation practices, this training identifies and conveys differences in inspecting and pruning practices (e.g., clearance distances) within SCE's HFRA vs. non-HFRA.

In addition to Core Plans Training, all VM personnel receive training to identify and understand the actions required when work is being performed in environmentally-sensitive locations. For SCE's Bulk Transmission VM inspections, SCE also provides technical training on how to use LiDAR-acquired data to determine vegetation encroachments into the minimum vegetation clearance distance.

To grow the pool of ISA-certified arborists, SCE plans to continue to hire Specialists who do not yet have an ISA-certification but who will, under the guidance of Senior Specialists, acquire the VM-related experience necessary to meet the experience requirement for an ISA-certification.[37]

5.4.2 Target Role: Vegetation Management Projects

SCE's vegetation management projects are programs focused on removing hazards, such as dead and dying trees and those that are in proximity and may pose a risk to electric facilities. The two programs are described below.

- The **Hazard Tree Management Program (HTMP)** program identifies, documents, and mitigates trees that are located within the Utility Strike Zone (USZ) and are expected to pose a risk to electric facilities based on the tree's observed structural condition and site considerations. The program

[37] More information about how SCE grows its pool of ISA Certified Arborists can be found in SCE's response to deficiency Guidance-11, filed September 9, 2020.

mitigates the potential risk to SCE's electric facilities from structurally unsound trees that can fail in total or in part, and palm trees that can dislodge palm fronds during high winds.

- The **Dead and Dying Trees initiative (formerly Drought Relief Initiative (DRI))** removes trees that are dead, dying, or diseased as part of activities that historically comprised the Bark Beetle Infestation Remediation and Drought Remediation programs. SCE has and continues to proactively remove dead, dying, and diseased trees that could fall on or contact SCE's electrical facilities. Unlike trees located near power lines that must be trimmed to prevent encroachment, large dead or dying trees can be located outside of the Right-of-Way and still fall into power lines.

Table SCE 5-3 and Table SCE 5-4 below detail the worker titles and associated qualifications pertaining to Vegetation Projects.

Table SCE 5-3
Vegetation Management Projects (SCE)

(1)	(2a.b.c)	(3)	(4)
SCE Worker Titles	Qualifications relevant to wildfire and PSPS mitigation	FTE % by Target Role	FTE % by High Interest Qualification
SPECIALISTS	See Below	20%	33%
SENIOR SPECIALISTS	ISA Arborists	80%	100%
		100%	

Table SCE 5-4
Vegetation Management Projects (Contractor)

(1)	(2a.b.c)	(3)	(4)
Contractor Worker Titles	Qualifications relevant to wildfire and PSPS mitigation	FTE % by Target Role	FTE % by High Interest Qualification
HTMP Assessors	ISA Arborists	67%	100%
DRI Assessors	See Below	24%	N/A
QC HTMP Assessors	ISA Arborists[38]	9%	100%
		100%	

[38] ISA certification is required when performing QC of the risk-score. ISA certification is not required when QC is only verifying tree has been mitigated.

Additional Minimum Qualifications – SCE Workers:

SENIOR SPECIALISTS: Resolve customer constraints and ensure that the HTMP and DRI work is done. See description above for Senior Specialist qualifications.

SPECIALISTS: Support Senior Specialists in their HTMP and DRI Work and are also not assigned to specific geographic Districts and can help where needed. See description above for Specialist qualifications.

Additional Minimum Qualifications – Contract Workers:

HTMP ASSESSORS: Responsible for conducting risk assessments on trees located in the USZ. They are qualified if, at date of hire, they possess an ISA Arborist Certification and a minimum of three years of related utility vegetation management inspection/planning experience.

DRI ASSESSORS are responsible for performing visual inspections to detect dead, dying and diseased trees in the field. They are qualified if, at date of hire, they have the requisite experience as a vegetation management professional and have two years of previous utility vegetation management experience.

HTMP QUALITY CONTROL (QC) are independent of HTMP operations and perform two specific roles related to QC of HTMP: (1) to perform an independent risk assessment to verify the accuracy of the risk assessment score achieved by the HTMP assessors; (2) verify all HTMP remediations have been performed. ISA Certification is only required for HTMP QC personnel who perform risk assessment. All other QC work requires a minimum of two years of experience performing utility vegetation inspections.

Training summary and plans to improve worker qualifications:

Training for HTMP and DRI includes: (1) training of specific HTMP and DRI processes; (2) refusal management; (3) vegetation threat management; (4) QC requirements; (5) Tree Risk Calculator training for those involved in HTMP; and (6) environmental-specific training.

Through the substantive minimum qualifications established for the various roles within Vegetation Projects, SCE has established the foundation of a strong skilled workforce. SCE will continue requiring the qualifications discussed above and encourage continued advancement of SCE and Contract workers. For example, once an assessor is eligible for ISA certification, it is expected that he or she will become certified within six months of eligibility.

As part of continuing education and improvement of the VM program, SCE updates its training programs based on lessons learned. SCE also provides refresher trainings and relevant communications to workers on updated guidelines, as there are typically changes in protocols that occur each year.

5.4.3 Target Role: Asset Inspections

SCE performs inspections of SCE's overhead distribution and transmission electric system in its HFRA that go beyond compliance requirements. These inspections are performed at ground level and aerially. For details on SCE wildfire-related inspection programs see Section 7.3.4.

SCE performs aerial inspections of its transmission and distribution assets to identify hazards that could lead to safety and reliability issues. SCE uses contractors to take high-definition imagery of assets from the air, either via helicopter or drone. In some cases, helicopters will also collect LiDAR data.

- SCE requires helicopter vendors who collect aerial imagery to maintain all required Federal Aviation Administration (FAA) certifications (CFR Part 91 and 135)[E11]. SCE's Air Operations division reviews and ensures all required FAA and other safety certifications.
- SCE requires drone vendors to have appropriate FAA certification (Part 107)[E11] and for drone pilots to maintain applicable requirements. Drone vendors use crews of two FTE; one pilot who flies the drone and one visual observer who maintains visual line of sight of the drone. SCE requires drone pilots to have experience performing such assessments.

After condition assessments are performed, SCE uses contract Qualified Electrical Workers (QEWs) to perform inspections of the captured images. These contract QEWs identify structures that may require possible remediations based on these inspections. An SCE QEW performs an internal validation of the remediations before a final notification is created.

Table SCE 5-5 and Table SCE 5-6 detail the worker titles and associated statistics pertaining to Asset Inspections.

Table SCE 5-5
Asset Inspections (SCE)

(1)	(2a.b.c)	(3)	(4)
SCE Worker Titles	Qualifications relevant to wildfire and PSPS mitigation	FTE % by Target Role	FTE % by High Interest Qualification
INSPECTOR, ELECTRICAL SYSTEM	See Below	62%	N/A
TRANSMISSION PATROLMAN	QEW	26%	100%
GENERATION: TECHNICIAN, HYDRO ELECTRICIAN & INSTRUMENT CONTROL	QEW	8%	100%
GENERATION: FOREMAN, HYDRO ELECTRICIAN & INSTRUMENT CONTROL TECHNICIAN	QEW	3%	100%

GENERATION: OPERATOR, CHIEF HYDRO STATION	See Below	1%	N/A
		100%	

Table SCE 5-6
Asset Inspections (Contractor)

(1)	(2a.b.c)	(3)	(4)
Contractor Worker Titles	Qualifications relevant to wildfire and PSPS mitigation	% by Target Role	% by Minimum Qualification
INSPECTOR, ELECTRICAL SYSTEM	See Below	27%	N/A
DISTRIBUTION/TRANSMISSION LINEMAN, JOURNEYMAN	QEW	23%	100%
DISTRIBUTION AERIAL FOREMAN	See Below	1%	N/A
TRANSMISSION AERIAL FOREMAN	QEW	2%	100%
INFRARED THERMOGRAPHER	See Below	3%	N/A
INFRARED GENERAL MANAGER THERMOGRAPHER	See Below	1%	N/A
PILOT, HELICOPTER	FAA Certified	4%	100%
DRONE PILOT	FAA Certified	36%	100%
AERIAL ENGINEER	See Below	3%	N/A
		100%	

General Minimum Qualifications: Workers who conduct detailed transmission, distribution overhead (or underground) and aerial electrical inspections must have knowledge of the basic uses and functions of electrical equipment, hand tools, power tools, techniques in performing electrical system inspections and repairs. Workers must understand the fundamentals of electric circuitry and operation of electrical equipment. Further, workers must understand SCE standards, policies and procedures, and basic GO 95 requirements[E12].

A QEW is an individual who has a minimum of two years' training and experience with exposed high voltage circuits and equipment and demonstrated performance familiarity with the services to be performed and the hazards involved. In addition, for roles where it is applicable, SCE specifies in its contracts with vendors that the contractors at a minimum should meet the qualifications for a QEW as defined by the International Brotherhood of Electrical Workers (IBEW) Local No 47. SCE also specifies that contractors that perform Journeyman Lineman tasks on SCE's Distribution system must be certified "Journeyman Linemen" as determined by criteria set forth by IBEW Local No 47.

Additional Minimum Qualifications – SCE Workers:

INSPECTOR, ELECTRICAL SYSTEM: Responsible for performing inspections of poles and equipment and must have either a certificate of completion from an accredited trade school or at least one year of experience in construction/maintenance work in electrical distribution. Inspectors must also have knowledge of: (1) basic electricity and electrical distribution principles; (2) computer programs and email systems; (3) company work rules, regulations and policies, construction methods, procedures and standards; (4) SCE's Accident Prevention Manual and safe work practices; and (5) the motor vehicle code.

TRANSMISSION/DISTRIBUTION LINEMAN, JOURNEYMAN: Responsible for performing construction and maintenance work on overhead and underground facilities. SCE Journeyman linemen are QEWs and must have: (1) working experience as a lineman or (2) working experience as a groundman and graduated from SCE's apprenticeship program, (3) working knowledge of SCE's Accident Prevention Manual. Linemen must also have successfully passed a pre-hire physical assessment. Skills and abilities required by this job are of a level normally acquired by completion of job-related high school courses and the apprenticeship program for Lineman.

TRANSMISSION SENIOR PATROLMAN: Responsible for patrolling, inspecting and ensuring assigned transmission lines are properly maintained. SCE Transmission Senior Patrolmen are QEWs and must have knowledge of: (1) equipment, tools, techniques, and methods employed in the construction, installation, maintenance and repair of overhead line facilities, roads, trails and rights of way; (2) stresses, strains, and rigging; safety regulations (3) capabilities and limitations of insulator washing equipment; (4) transmission overhead and underground circuitry and switching; (5) SCE's Accident Prevention Manual. The knowledge, skills, and abilities required for this job are of a level comparable with those normally acquired through a high school education, supplemented by technical study and extensive training and experience as a journeyman, patrolman or lineman.

GENERATION: TECHNICIAN, HYDRO ELECTRICIAN & INSTRUMENT CONTROL: Responsible for maintaining, repairing and installing computerized control systems. All SCE Generation Technician, Hydro Electrician and Instrument Control workers are QEWs and must have knowledge of: (1) basic power plant systems and their operation; (2) electrical and pressure instruments and devices as used in complex analog and digital control systems and functions of their component parts as related to power plant systems, and Transmission Distribution equipment; (3) tools, methods, materials and techniques used in repair, adjustment and testing of these systems, including computerized tooling and interface hardware and software; (4) theory of electricity, mechanics and instruments as related to installation and maintenance of electrical equipment; (5) materials, methods, practices and tools used in installation and maintenance of transformers, oil switches, regulators, motors, generators, switchboards and allied equipment; (6) principles of Physics and advanced mathematics; County and State Electrical Code; commercial or industrial wiring; proper and safe use of cleaning agents; and (7) SCE's Accident Prevention

Manual, first aid procedures, and environmental regulations and procedures as they apply to the work site. The knowledge, skills, and abilities for this job are of a level comparable to those normally acquired through courses taken in obtaining a high school education, additional technical study, and knowledge of complex digital and analog control systems and equipment; plus background experience normally attained in a similar technical field or journeyman electrician.

GENERATION: FOREMAN, HYDRO ELECTRICIAN & INSTRUMENT CONTROL TECHNICIAN: Supervises and oversees repairs and installations of control systems. All SCE Generation Foreman, Hydro Electrician and Instrument Control workers are QEWs and must have knowledge of: (1) basic power plant systems and their operation; (2) Electrical and pressure instruments and devices as used in complex analog and digital control systems and functions of their component parts as related to power plant systems, and Transmission Distribution equipment; (3) Tools, methods, materials and techniques used in repair, adjustment and testing of these systems, including computerized tooling and interface hardware and software (4) Theory of electricity, mechanics and instruments as related to installation and maintenance of electrical equipment; (5) Materials, methods, practices and tools used in installation and maintenance of transformers, oil switches, regulators, motors, generators, switchboards and allied equipment; (6) Principles of Physics and advanced mathematics, County and State Electrical Code; commercial or industrial wiring; proper and safe use of cleaning agents; and (7) SCE's Accident Prevention Manual, safety rules and regulations, first aid procedures, environmental regulations and procedures as they apply to the work site. The knowledge, skills, and abilities for this job are of a level comparable to those normally acquired through courses taken in obtaining a high school education, additional technical study, and knowledge of complex digital and analog control systems and equipment; plus background experience normally attained in a similar technical field or journeyman electrician.

GENERATION: OPERATOR, CHIEF HYDRO STATION: Supervises and controls the operation of hydroelectric generating stations and related equipment; dams, intakes, forebays, spillways, and water conduits to assure efficient loading and operations of the Hydro Division plants and must have: (1) knowledge of the fundamentals of electricity, basic AC-DC theory, basic computer theory and language; hydraulics and the principles of physics and related to equipment operation; (2) dispatching, system operating and water management procedures, operator's duties; general electrical and mechanical maintenance; overall plant facilities and their operating characteristics; and (3) SCE's Accident Prevention Manual and first aid procedures. The knowledge, skills, and abilities required for this job are of a level comparable with those normally acquired through completion of a high school education and extensive progressive training and experience in hydro generating plant operations.

<u>Training and plans to improve worker qualifications</u>:

To facilitate asset inspection work, SCE implements training for those performing inspections. This technical training prepares workers to perform their jobs safely, comply with regulatory requirements and laws, maintain system reliability, and meet the demands of new technology. SCE will continue to deploy new work methods and technologies in support of wildfire activities. As discussed in Section 7.3.4 – Asset Management & Inspections, SCE details its shift to a risk-informed inspection strategy, which involves using new tools to help perform field inspections, modify inspection checklists to evaluate asset conditions, and establish new processes. These new technologies and work methods require the creation of new training material and deployment of the training to SCE employees. In addition to technical competency, this training must provide education and clarification on new procedures and standards, building upon lessons learned obtained from field activities. SCE also conducts training for workers in this target role related to its wildfire mitigation and PSPS work, which is described in Table SCE 5-12 below.

Separately, SCE is developing a dashboard to analyze responses to certain inspection survey questions to identify where more focused training may be needed. The dashboard provides information at the employee and supervisor level allowing SCE to identify the specific questions and/or individuals that may require additional training. The dashboard can also be used to determine if training provided was effective.

As technical aspects (e.g., process, technology, or tool changes) of SCE's various inspection programs change, SCE will provide the requisite training to those who will be performing inspections. Further, SCE will update its training program based on lessons learned and provide refresher trainings as necessary to communicate changes in protocols. For example, SCE recently updated its training for Electrical System Inspectors who perform inspections through SCE's Overhead Detail Inspection and/or HFRI Inspection programs, as shown in Table SCE 5-7.

SCE requires all new Electrical System Inspectors to take the comprehensive training identified below. In addition, all ESIs will take regular refresher training every 12 months to incorporate new processes, procedures, and lessons-learned relevant to inspection practices. Additionally, in 2020, ESIs will be engaging in a comprehensive quality and consistent program to ensure accurate and consistent inspections. The program will consist of four major components all focused on improving inspection quality and ensuring inspection results are consistent.

Table SCE 5-7:
SCE Training Courses Specific to Asset Inspections

Course Name	Course Description
New Electrical System Inspector (ESI) Training is comprised of 12 modules 1. Introduction 2. Safety 3. Tools 4. Equipment Recognition 5. Clearances 6. Detailed Inspection 7. Inspect App 8. Notifications 9. Repairs 10. Private Property 11. Quality Assurance	1. Describe G.O.'s 95 & 165, explain purpose of inspection programs 2. Requirements of Inspection safety for ESIs, guidelines for PPE, safe driving & parking 3. Identify tools, proper maintenance of tools, how to use tools safety 4. Identify common Distribution equipment and purpose of equipment. How to identify damage 5. Measure & report clearances that legally define basic minimum allowable vertical clearance values 6. Purpose & duties regarding inspections, steps of the inspection method, describe P1 conditions, purpose of Annual Grid Patrol 7. Layout of survey questions by category, practice answering survey questions on iPad

Course Name	Course Description
	8. Categorize different types of Priority conditions, how & when to document notifications, how to make changes in the field tool 9. Precautions to take prior to making repairs, proper actions to take for repairs they cannot make 10. Outline responsibilities of ESI, describe access issues an ESI faces and how to approach and remedy 11. At the end of this module ESI's will be able to explain elements & purpose of QA Program and how it applies to ESI 12. Explain their part in the inspection, repair and reporting of overhead structures
Existing ESI Inspection Training	1. ODI Survey App Reference Guide (Responding to Survey Questions) 2. Inspection App User Guide 3. ESI Help Guide 4. Laser Rangefinder – TruePulse 360 Quick Start Manual 5. ODI Covered Conductor Training 2020 6. New ESI Training (Details above)

5.4.4 Target Role: Grid Hardening

SCE's Grid Hardening activities focus on implementing grid infrastructure that mitigates the risks of ignitions associated with utility equipment. This includes several activities, such as deploying covered conductor, undergrounding of overhead lines, installing system automation equipment, remediating issues with long conductor spans, replacing old and potentially faulty equipment, and more. For more information on SCE's Grid Hardening programs, please see Section 7.3.3.

Table SCE 5-8 and Table SCE 5-9 detail the worker titles and associated qualifications pertaining to Grid Hardening.

Table SCE 5-8[39]
Grid Hardening (SCE Workers)

(1)	(2a.b.c)	(3)	(4)
SCE Worker Titles	Qualifications relevant to wildfire and PSPS mitigation	FTE % by Target Role	FTE % by High Interest Qualification
APPRENTICE LINEMAN	See Below	15%	N/A

[39] The SCE worker population identified in this Table overlaps with the SCE worker population identified in Section 5.4.5 (Risk Event Inspections), as these FTE can perform both target roles.

DISTRIBUTION/ TRANSMISSION LINEMAN, JOURNEYMAN	QEW	40%	100%
FOREMAN	QEW	23%	100%
GROUNDMAN	See Below	21%	N/A
SPLICER	QEW	1%	N/A
		100%	

Table SCE 5-9
Grid Hardening (Contractor Workers)

(1)	(2a.b.c)	(3)	(4)
Contractor Worker Titles	Qualifications relevant to wildfire and PSPS mitigation	FTE % by Target Role	FTE % by High Interest Qualification
APPRENTICE LINEMAN	See Below	12%	N/A
DISTRIBUTION/ TRANSMISSION LINEMAN, JOURNEYMAN	QEW	49%	100%
FOREMAN	QEW	24%	100%
GROUNDMAN	See Below	16%	N/A
SPLICER	QEW	0.3%	100%
		100%	

General Minimum Qualifications: Workers, with the exception of Apprentice Lineman, are required to have knowledge of applicable Accident Prevention Manual (APM) rules, SCE standards, policies and procedures, G.O. 95/128[E12]; electrical theory and mechanical principals.

Additional Minimum Qualifications – SCE Workers:

APPRENTICE LINEMAN: Knowledge of and proficiency in the principles of electricity and mechanics; characteristics of electrical AC and DC circuits; the connections of electrical apparatus; equipment, circuits and their functions; principles of Physics and advanced mathematics. In addition, must possess knowledge of SCE's Accident Prevention Manual and proficiency in safe work practices, County and State Electrical Code; rigging practices; and proper and safe use of cleaning agents. The knowledge, skills, and abilities required for this job are of a level comparable with those normally acquired through courses taken in obtaining a high school education and considerable working experience in electrical repair work.

JOURNEYMAN LINEMAN: See qualifications of Lineman in Section 5.4.3.

FOREMAN: Oversee work performed by their crews and ensure the work is performed safely. Requires knowledge of and proper use of approved tools, material, equipment, as applied to the construction, maintenance and repair of overhead and underground electrical systems. Skills and abilities required for this job are of a level comparable with those normally acquired through a high school education and extensive training and experience as a Journeyman Lineman.

GROUNDMAN: Assist with overhead and underground work as assigned. General knowledge of the principles of electricity and mechanics; characteristics of electrical AC and DC circuits; and the connections of electrical apparatus; equipment, circuits and their functions. In addition, must possess knowledge of SCE's Accident Prevention Manual and safe work practices; rigging practices; and, proper and safe use of tools and cleaning agents. The knowledge, skills, and abilities required for this job are of a level comparable with those normally acquired through courses taken in obtaining a high school education.

SPLICER: Responsible for performing work on all underground lines and equipment. Knowledge of and proficiency in electrical theory and shop mathematics; methods, practices, and procedures; tools, instruments, equipment and materials; SCE's Accident Prevention Manual and safety rules; established codes and standards; and the nomenclature and functions of parts necessary for installation, replacement, inspection, servicing, overhauling and repairing overhead and underground lines, electrical equipment and related facilities. The knowledge, skills, and abilities required for this job are of a level comparable with those normally acquired through work experience as a qualified Lineman or Apprentice Transmission Cable Splicer.

<u>Training and plans to improve SCE worker qualifications</u>:

To facilitate grid hardening work, SCE implements training for SCE workers, such as those identified above. This technical training includes core technical training for working on the electric system, as well as specialized training on PSPS, HFRA, grid hardening, etc., and prepares workers to perform their jobs safely, comply with regulatory requirements and laws, maintain system reliability, and meet the demands of new technology. SCE will continue to deploy new work methods and technologies in support of wildfire activities. Wildfire activities may also require the use of new technology, such as situational awareness tools or information technology. The use of new technology is usually accompanied by end-user training to help ensure the appropriate click-through of the application and accurate capture of data. New work methods also require the creation of new training material and deployment of the training to SCE employees. In addition to technical competency, this training will provide education and clarification on new procedures and standards, building upon lessons learned obtained from field activities. For example, these trainings can include Hot Sticks Training, Aerial Construction Training, System Operations Training, etc. SCE provides these trainings through ongoing efforts with existing employees and through its Apprenticeship programs for new employees. SCE also conducts training for workers in this target role related to its wildfire mitigation and PSPS work, which is described in Table SCE 5-12 below.

5.4.5 Target Role: Risk Event Inspection

SCE inspects various risk events – ignitions, outages, wire-down, faults, etc. – to determine cause and to remediate issues. This work is performed by the same qualified field personnel who also perform other work on the system, such as Grid Hardening work. Table SCE 5-10 and Table SCE 5-11 below detail the worker titles and associated qualifications pertaining to these Risk Event Inspections.

Table SCE 5-10[40]
Risk Event Inspection (SCE)

(1)	(2a.b.c)	(3)	(4)
SCE Worker Titles	Qualifications relevant to wildfire and PSPS mitigation	FTE % by Target Role	FTE % by High Interest Qualification
APPRENTICE LINEMAN	See Below	13%	N/A
DISTRIBUTION/ TRANSMISSION LINEMAN, JOURNEYMAN	QEW	34%	100%
FOREMAN	QEW	19%	100%
GROUNDMAN	QEW	18%	100%
PATROLMAN	QEW	2%	100%
SPLICER	QEW	1%	100%
TECHNICIAN APPARATUS	See Below	2%	N/A
TROUBLEMAN	QEW	11%	100%
		100%	

Table SCE 5-11
Risk Event Inspection (Contractor)

(1)	(2a.b.c)	(3)	(4)
Contractor Worker Titles	Qualifications relevant to wildfire and PSPS mitigation	FTE % by Target Role	FTE % by High Interest Qualification

[40] The SCE worker population identified in this Table overlaps with the SCE worker population identified in Section 5.4.4 (Grid Hardening), as these FTE can perform both target roles.

APPRENTICE LINEMAN	See Below	22%	N/A
DISTRIBUTION/ TRANSMISSION LINEMAN, JOURNEYMAN	QEW	43%	100%
FOREMAN	QEW	21%	100%
GROUNDMAN	QEW	14%	100%
SPLICER	QEW	0.3%	100%
		100%	

Minimum qualifications:

APPRENTICE LINEMAN: See qualifications of Apprentice Lineman in Section 5.4.4.

LINEMAN: See qualifications of Lineman in Section 5.4.4.

FOREMAN: See qualifications of Foreman in Section 5.4.4.

SPLICER: See qualifications of Lineman in Section 5.4.4.

GROUNDMAN: See qualifications of Groundman in Section 5.4.4.

PATROLMAN: See qualifications of Groundman in Section 5.4.3.

TECHNICIAN, APPARATUS: Responsible for performing inspections and maintenance on equipment unique to electric distribution overhead and underground systems. Knowledge of and proficiency with advanced principles of three phase electrical theory, mathematics (including trigonometry), phasor analysis, use of scientific engineering calculator, publications and standards, publications, including system operating bulletins, grounding manual and GO 95/128[E12] manuals, equipment manufacturers' design and programming manuals. Must possess computer skills, including but not limited to desktop applications used in Company administrative functions as well as software and programming applications used to configure, program and test site specific equipment installations. Knowledge of and proficiency in diagnostic system analysis tools, equipment diagrams and schematic analysis, distribution and automation system design, including individual communications and operational components, SCE's Accident Prevention Manual, and safe work practices and procedures.

TROUBLEMAN: Responsible for troubleshooting and performing routine inspections and minor repairs of the electric distribution system. Troublemen are QEWs and must have knowledge of: (1) equipment, tools, techniques, and methods employed in the construction, installation, maintenance and repair of distribution overhead and underground line facilities; (2) stresses, strains, rigging; and safety regulations (3) overhead and underground circuitry and switching; (4) SCE's Accident Prevention Manual. The knowledge, skills, and abilities required for this job are of a level comparable with those normally acquired through a high school education, supplemented by technical study and extensive training and experience as a journeyman, patrolman, or lineman.

Training and plans to improve worker qualifications:

SCE will continue to refine its training program and worker qualifications based on lessons learned and feedback from field employees. We will continue to provide training to existing field personnel and those that are onboarded prior to every wildfire season. As it relates to wildfire and PSPS, SCE has implemented several training courses to educate and train field workers on proper practices and procedures. These training efforts are described in Table SCE 5-12.

Table SCE 5-12
List of Instructor Led and Web-Based transmission and Distribution Wildfire and PSPS-Related Training Courses in 2020

Course Title	Course Description
Public Safety Power Shutoff (PSPS) Training	The purpose of this workshop is to provide an overview of the overall PSPS protocol including: • Roles and responsibilities • Communications process • Internal and external types of notifications • A detailed timeline of events and • How to access the pertinent information during a PSPS activation
PSPS 2020 Patrolling & Live Field Observation (LFO) Training	Training on PSPS patrolling and live field observations protocols, and any updates since prior year
PSPS Patrolling & Live Field Observation (LFO) Refresher: Contractor Orientation (Train the Trainer)	Orientation with contractor supervisors on PSPS patrolling and live field observations protocols, and any updates since prior year; contractor supervisors trained their own field crews and submitted rosters to SCE
Protection from Wildfire Smoke	This course is to teach how to protect workers when working in areas where there may be exposure to wildfire smoke. Teaches where to acquire the Air Quality Index, the health effects from wildfire smoke and how to obtain medical treatment if needed. Also teaches how to select, use and maintain proper respirator protection.
Technology Integration – Grid Resiliency (GR)	Provides initial training on pilots or new equipment technologies being deployed across HFRA.
SOB 322 Refresher Training	System Operating Bulletin (SOB) 322 that outlines the operational protocols for overhead distribution and sub-transmission equipment within HFRA.

Course Title	Course Description
	These guidelines include RFW restrictions, switching protocols, enabling of protective devices such as RAR and patrolling requirements in HFRA.
Wildfire Annex Seminar	This Seminar is designed to introduce identified IMT, Incident Support Teams, and other pre-identified stakeholders to the SCE Wildfire Annex. Individuals will: • Be introduced to every component of the Wildfire Annex, including pre-event coordination, response structures and organizations, and available tools and resources • Gain better understanding of the various roles and responsibilities before, during, and after a wildfire • Be able to identify the different phases of the Wildfire Annex Course will provide IMT member with additional information on wildfire preparedness, response, and recovery phases.
Wildfire Smoke Protection – PAPR	This course provides usage and maintenance procedures and requirements for Powered Air Purifying Respirator (PAPR) respirators.

6 METRICS AND UNDERLYING DATA

Instructions: Section to be populated from Quarterly Reports. Tables to be populated are listed below for reference.
NOTE: Report updates to projected metrics that are now actuals (e.g., projected 2020 spend will be replaced with actual unless otherwise noted). If an actual is substantially different from the projected (>10% difference), highlight the corresponding metric in light green.

6.1 RECENT PERFORMANCE ON PROGRESS METRICS, LAST 5 YEARS INSTRUCTIONS FOR TABLE 1:

Table 1: Recent performance on progress metrics, last 5 years – reference only, fill out attached spreadsheet to correct prior reports

In the attached spreadsheet document, report performance on the following metrics within the utility's service territory over the past five years as needed to correct previously-reported data. Where the utility does not collect its own data on a given metric, the utility shall work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in the "Comments" column.

Table 1 provides a five-year history, where applicable, of Progress Metrics as defined by the Guidelines. The comment section for each metric in the table provides details of the source and data that was used or explanations for why certain data is not available.

Metric Type 1 asks for inspection counts for different inspection category types for transmission and distribution in circuit miles. SCE accounts for completed inspections by noting the counts of assets inspected instead of noting by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected. Additionally, rows were added to inspection types (1c, i-iv) in order to provide additional detail of inspection data collected as part of SCE's detailed inspection program. The drivers and programmatic inspection changes can be seen in Sections 7.3.4.9.1 for Distribution and 7.3.4.10.1 for Transmission.

Metric Type 2 asks for the number of spans inspected for vegetation compliance. SCE accounts for completed vegetation compliance inspections by circuit miles. In order to present completed vegetation compliance inspections in the requested format, SCE divided the recorded circuit miles inspected by the calculated average span length. Additionally, WSD requests the number of spans inspected where at least some vegetation was found in non-compliant condition. SCE does not record vegetation management non-compliance by specific spans. Therefore, SCE is unable to provide how many findings are on each span. The number SCE presents is just the counts of findings.

Metric Type 3, customer outreach metrics, requires information not accounted for or maintained by SCE as SCE has no jurisdiction over evacuation orders. SCE diligently requested and followed up with local governments and law enforcement and was only able to obtain information from one county. Even then, the information provided included high-level estimations of evacuation counts estimated by the local government and law enforcement entity for a very limited set of fires. Because of this, SCE is unable to obtain the requested data, analyze it, and report on evacuation related requirements in this table. SCE anticipates this to be a recurring challenge going forward.

See Table 1 "Recent performance on progress metrics, last 5 years" for more detail.

6.2 RECENT PERFORMANCE ON OUTCOME METRICS, ANNUAL AND NORMALIZED FOR WEATHER, LAST 5 YEARS

Table 2: Recent performance on outcome metrics, last 5 years– reference only, fill out attached spreadsheet to correct prior reports

In the attached spreadsheet document, report performance on the following metrics within the utility's service territory over the past five years as needed to correct previously-reported data. Where the utility does not collect its own data on a given metric, the utility shall work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in "Comments" column.

Provide a list of all types of findings and number of findings per type, in total and in number of findings per circuit mile.

Table 2 provides a five-year history, where applicable, of Outcome Metrics as defined by the Guidelines. Comments are included in the table to provide additional details about the data provided or indicate if the data is not available or not applicable for the past five years. The information provided in conjunction with the "utility-ignited" wildfire statistics should not be construed as an admission of any wrongdoing or liability by SCE. SCE further notes that the damages metrics provided may be tracked by other agencies and thus, SCE does not guarantee the accuracy of such information. Additionally, in many instances, the cause of wildfires is still under investigation and even where an Authority Having Jurisdiction (AHJ) has issued a report on the cause, SCE may dispute the conclusions of such a report.

See Table 2 "Recent performance on outcome metrics, annual and normalized for last 5 years" for more detail.

6.3 DESCRIPTION OF ADDITIONAL METRICS

Table 3: List and description of additional metrics, last 5 years – reference only, fill out attached spreadsheet to correct prior reports

Instructions for Table 3:

In addition to the metrics specified above, list and describe all other metrics the utility uses to evaluate wildfire mitigation performance, the utility's performance on those metrics over the last five years, the units reported, the assumptions that underlie the use of those metrics, and how the performance reported could be validated by third parties outside the utility, such as analysts or academic researchers. Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of each preventive strategy and program.

Metrics and underlying data are critical components for WMP development, execution, and evaluation, but we continue to emphasize that the near-term focus should be on efficient implementation of our planned activities, while the assessment of whether the activities are having the desired and expected impact on risk reduction should be measured over a longer time horizon. A clear distinction is necessary between metrics that can help monitor compliance with approved WMPs and those that can help evaluate effectiveness of these approved plans and inform future WMP updates.

As in 2019 and 2020, we provide annual Program Targets for each WMP activity which establish goals to evaluate compliance. As stated in previous filings and submittals, tracking Program Targets for approved WMPs is the best means of determining progress and assessing WMP compliance in the near term.

In its response to Guidance-5, SCE proposed five outcome-based metrics, to gauge the effectiveness of the portfolio of its wildfire mitigation activities. These outcome-based metrics are:

1. CPUC reportable ignitions in HFRA (total and by key drivers including CFO, wire-to-wire contact, tree-caused circuit interruptions, and EFF)
2. Faults in HFRA (total and by the key drivers mentioned above)
3. Wire-down incidents in HFRA
4. Number of impacted customers and average duration of PSPS events
5. Timeliness and accuracy of PSPS notifications

SCE proposed these outcome-based metrics because WMP activities are ultimately designed to reduce wildfire ignitions associated with its electrical infrastructure and reduce the impact of PSPS de-energization events to customers. Faults and wire-down events are also key metrics as they are leading indicators of potential ignitions. Importantly, these metrics are within the reasonable control of utilities when appropriately normalized for weather and other exogenous factors. Other metrics such as safety incidents, acres burned or structures destroyed, though important to understand and drive California's fire mitigation efforts, are impacted by events and circumstances largely outside of the utility's control such as climate change, fire suppression efforts and fire response. Therefore, these are not appropriate WMP effectiveness metrics.

Most of our proposed WMP activities are selected to improve these metrics over time, while the remainder are enabling activities to support and supplement those WMP activities.

Figure SCE 6-1 demonstrates how each of SCE's 2021 WMP activities map to the five outcome-based metrics.

Figure SCE 6-1
Activity to Metric Mapping

System Hardening
- Covered Conductor (SH-1)
- Undergrounding Overhead Conductor (SH-2)
- Branch Line Protection Strategy (SH-4)
- Circuit Breaker Relay Hardware for Fast Curve (SH-6)
- Evaluation of PSPS-Driven Grid Hardening Work (SH-7)
- Transmission Open Phase Detection (SH-8)
- Tree Attachment Remediation (SH-10)
- Legacy Facilities (SH-11)
- C Hooks (SH-13)
- Long Span Initiative (LSI) (SH-14)
- Vertical Switches (SH-15)

Inspections
- Distribution Ground / Aerial Inspections and Remediations (IN-1.1)
- Transmission Ground / Aerial Inspections and Remediations (IN-1.2)
- Infrared Inspection of Energized Overhead Distribution Facilities and Equipment (IN-3)
- Infrared Inspection, Corona Scanning, and High-Definition Imagery of Energized Overhead Transmission Facilities and Equipment (IN-4)
- Generation Inspections and Remediations (IN-5)
- Inspection and Maintenance Tools (IN-8)

Vegetation Management
- Hazard Tree Management Program (VM-1)
- Expanded Pole Brushing (VM-2)
- Expanded Clearances for Legacy Facilities (VM-3)
- Dead and Dying Tree Removal (VM-4)
- VM Work Management Tool (Arbora) (VM-6)

1. CPUC reportable ignitions in High Fire Risk Areas (HFRA)
2. Faults in HFRA
3. Wire down incidents in HFRA

Situational Awareness
- Weather Stations (SA-1)
- Fire Potential Index (FPI) (SA-2)
- Weather and Fuels Modeling System (SA-3)
- Fire Spread Modeling (SA-4)
- Fuel Sampling Program (SA-5)
- Remote Sensing / Satellite Fuel Moisture (SA-7)
- Fire Science Enhancements (SA-8)
- Distribution Fault Anticipation (DFA) (SA-9)

PSPS
- Customer Resource Centers (CRCs), Community Resiliency Programs (Resiliency Zones Pilot & CREI), Customer Resiliency Equipment (CCBB, Res Battery Station Rebate & Well Water generator rebate) (PSPS-2)

System Hardening
- Covered Conductor (SH-1)
- Undergrounding Overhead Conductor (SH-2)
- Installation of System Automation Equipment – RAR/RCS (SH-5)
- Microgrid Assessment (SH-12)

4. Number of impacted customers and average duration of Public Safety Power Shutoff (PSPS) events
5. Timeliness and accuracy of PSPS notifications

Disaster & Emergency Preparedness
- Customer Education and Engagement - Community Meetings (DEP-1.2)
- Customer Education and Engagement - Marketing Campaign (DEP-1.3)
- SCE Emergency Responder Training (DEP-2)
- Customer Research and Education (DEP-4)
- Aerial Suppression (DEP-5)

Data Governance
- Wildfire Safety Data Mart and Data Management (WiSDM / Ezy) (DG-1)

These activities serve the purpose of enabling a number of the remaining WMP activities and therefore map indirectly to the 5 outcome-based metrics

Table 3 in Appendix 9.7 provides the performance metrics and units SCE uses to evaluate performance within each of these outcome-based metrics, including historical performance over the past five years (2016-2020).

As described in SCE's response to Guidance-5, there might be annual variances in these metrics driven by uncontrollable factors such as weather, and effectiveness of WMP activities can be best assessed using longer-term trends in these outcome-based metrics. It will also be important to consider factors such as overall risk exposure, the population size of the assets, scope of work completed and fire suppression by third party agencies when using these outcome-based metrics. These metrics cannot be used to measure progress or compliance per approved plans in the short term. To appropriately evaluate the effectiveness of its WMP activities, SCE is developing suitable quantitative and repeatable methods to measure and normalize these outcome-based metrics. We look forward to collaborating with the WSD, utilities and other stakeholders to agree on how these metrics should be appropriately measured and used to draw pertinent conclusions.

CPUC Reportable Ignitions in HFRA, Faults in HFRA and Wire Downs incidents in HFRA

Large variations in weather events, including temperature, rainfall, fuel moisture and wind, can heavily impact outcome-based metrics including faults, wire-down events and ignitions, and can often skew direct comparisons of these metrics year over year.

SCE is monitoring the number of faults at the circuit level and ignitions and wire-down events at the structure level and by key driver (CFO, EFF, and other) both before and after the deployment of select WMP wildfire activities. By observing the key drivers of these events down to the circuit or individual structure level, SCE is building the capability to better evaluate the effectiveness of wildfire activities that were deployed to mitigate those specific drivers, as well as help align future deployment of mitigations to targeting specific drivers identified at those locations.

SCE continues to focus on maturing its modeling capabilities to provide forecasts of future ignitions across HFRA, incorporating the benefits of wildfire activities to reduce ignitions as well as normalizing exogenous factors such as weather, to provide an expected range of ignitions in future years across HFRA. In its 2021 WMP, SCE is incorporating the estimated benefits of wildfire (WF) activities, including covered conductor, vegetation mitigation, inspection mitigation, in reducing the POI at each individual pole or structure level, and includes this reduction of ignition risk when forecasting expected ignitions. At this time, SCE does not incorporate weather normalization into its WMP ignition forecasts due to the complexity of determining the causal relationship between aberrant weather and ignition probability and fire spread.

SCE is currently evaluating different approaches to normalize exogenous factors, including but not limited to, weather and 3rd party suppression efforts. As SCE continues to focus on prudent and effective grid operations, inspections & maintenance, improvements to standards and timely equipment upgrades, it is recognized that although these actions will not entirely eliminate risk, they are expected, in aggregate, to result in overall improvements in outcome metrics, such as faults, wire-downs and ignition events associated with SCE's electrical infrastructure.

Number of impacted customers during and average duration of PSPS events

As more sectionalization equipment, covered conductor, and other grid hardening activities are deployed, de-energization thresholds can be raised reducing the number of circuits and circuit segments that will need to be de-energized during extreme weather conditions. Improved weather and fire modeling capabilities along with enhanced operational protocols can also help us reduce the frequency and duration of PSPS events. However, to assess the effectiveness of the WMP activities in reducing the frequency and scope of PSPS de-energizations, the total number of customers affected or the duration of outages during any period need to be normalized for the intensity of weather events, how widespread the weather events were, and the duration of the events as these can influence the number of circuits or circuit segments that have to be de-energized. In addition to weather, these metrics have to account for customer density on impacted circuits and other factors outside SCE's control. SCE is currently evaluating how metrics such as windspeed, FPI, etc. can be used to appropriately normalize the number of impacted customers and duration of PSPS events.

The historical performance can be found in Table 3.

SCE provides information on the timeliness and accuracy of PSPS notifications in post-event reports. SCE is re-evaluating the calculation of these metrics and benchmarking with the other IOUs to understand best practices. SCE welcomes the Commission's guidance as well.

6.4 Detailed Information Supporting Outcome Metrics

Table 4: Fatalities due to utility wildfire mitigation initiatives, last 5 years – reference only, fill out attached spreadsheet to correct prior reports

Instructions for Table 4:

In the attached spreadsheet document, report numbers of fatalities attributed to any utility wildfire mitigation initiatives, as listed in the utility's previous or current WMP filings or otherwise, according to the type of activity in column one, and by the victim's relationship to the utility (i.e., full-time employee, contractor, of member of the general public), for each of the last five years as needed to correct previously-reported data. For fatalities caused by initiatives beyond these categories, add rows to specify accordingly. The relationship to the utility statuses of full-time employee, contractor, and member of public are mutually exclusive, such that no individual can be counted in more than one category, nor can any individual fatality be attributed to more than one initiative.

Table 4 provides a five-year history, where applicable, of fatalities associated with utility wildfire mitigation initiatives as defined by the Guidelines. The comment section for each metric in the table provides details of the source and data that was used or explanations for why certain data was not available.

See Table 4 "Fatalities due to utility wildfire mitigation initiatives, last 5 years" for more detail.

Table 5: OSHA-reportable injuries due to utility wildfire mitigation initiatives, last 5 years – reference only, fill out attached spreadsheet to correct prior reports

Instructions for Table 5:

In the attached spreadsheet document, report numbers of OSHA-reportable injuries attributed to any utility wildfire mitigation initiatives, as listed in the utility's previous or current WMP filings or otherwise, according to the type of activity in column one, and by the victim's relationship to the utility (i.e., full-time employee, contractor, of member of the general public), for each of the last five years as needed to correct previously-reported data. For members of the public, all injuries that meet OSHA-reportable standards of severity (i.e., injury or illness resulting in loss of consciousness or requiring medical treatment beyond first aid) shall be included, even if those incidents are not reported to OSHA due to the identity of the victims.

For Occupational Safety and Health Administration (OSHA)-reportable injuries caused by initiatives beyond these categories, add rows to specify accordingly. The victim identities listed are mutually exclusive, such that no individual victim can be counted as more than one identity, nor can any individual OSHA-reportable injury be attributed to more than one activity.

Table 5 provides a five-year history, where applicable, of OSHA-reportable injuries associated with utility wildfire mitigation initiatives as defined by the Guidelines. SCE does not use OSHA-reportable contractor and public incidents, as there is no direct employment relationship and no requirement to report to OSHA. However, SCE does monitor CPUC-reportable incidents, which have similar thresholds for identification and reporting (i.e., fatality or personal injury rising to the level of in-patient hospitalization, and in connection with utility assets). To provide a more complete data set, SCE provides data in Table 5 related to the "Contractor" and "Member of the Public" columns that correspond to CPUC-reportable incidents.

See Table 5 "OSHA-reportable injuries due to utility wildfire mitigation initiatives, last 5 years" for more detail

6.5 MAPPING RECENT, MODELLED, AND BASELINE CONDITIONS

Underlying data for recent conditions (over the last five years) of the utility service territory in a downloadable shapefile GIS format, following the schema provided in the spatial reporting schema attachment. All data is reported quarterly, this is a placeholder for quarterly spatial data.

The confidential geodatabase is being submitted through the CPUC's Kiteworks system. Non-confidential spatial data is posted on SCE's WMP webpage (https://www.sce.com/safety/wild-fire-mitigation). The geodatabase is the product of the WSD's Draft GIS Data Reporting Requirements and Schema for California Electric Corporations (Draft GIS Data Schema) and has been provided in SCE's past Quarterly Reports in compliance with Resolution WSD-002 Class B deficiency Guidance-10[E13]. The geodatabase narrative is included in the Q4 2020 QDR within Guidance-10.

6.6 RECENT WEATHER PATTERNS, LAST 5 YEARS

Table 6: Weather patterns, last 5 years – reference only, fill out attached spreadsheet to correct prior reports

Instructions for Table 6:

In the attached spreadsheet document, report weather measurements based upon the duration and scope of NWS Red Flag Warnings, High wind warnings and upon proprietary Fire Potential Index (or other similar *fire risk potential measure if used) for each year. Calculate and report 5-year historical average as needed to correct previously reported data.*

Table 6 provides a five-year history, where applicable, of weather patterns as defined by the Guidelines. The comment section for each metric in the table provides details of the source and data that was used or explanations for why certain data is not available.

The first row in Table 6 is populated with historical data on RFW by circuit mile days per year. The RFW circuit-mile days are based on all overhead distribution and transmission circuits that traverse through the NWS FWZ from a 2015-2020 historical database of RFW events from the NWS. The overhead lengths of distribution and transmission circuits are calculated within each FWZ polygon (area divided geospatially into over approximately 1,000 space areas). All circuit lengths within that FWZ polygon are then multiplied by the number of days (or fraction of days) that a particular polygon had an RFW in effect.

The Guidelines require that SCE use RFW circuit mile days per year data to normalize data required in other tables. SCE recommends the Commission consider using the NFDRS, which all fire agencies use to determine daily fire danger risk, instead of RFW data. NFDRS is a system that allows fire managers to estimate today's or tomorrow's fire danger for a given area. It combines existing and expected states of selected fire danger factors into one or more qualitative or numeric indices that reflect an area's protection needs. Fire danger ratings are typically reflective of the general conditions over an extended area, often tens of thousands of acres, where a possible wildfire could start. Fire danger ratings describe conditions that reflect the potential, over a large area, for a fire to ignite, spread and require suppression action.

See Table 6 "Weather patterns" for more detail.

6.7 RECENT AND PROJECTED DRIVERS OF IGNITION PROBABILITY

Table 7.1: Key recent and projected drivers of risk events, last 5 years and projections – reference only, fill out attached spreadsheet to correct prior reports

Table 7.1 provides a five-year history, where applicable, as well as two years of projections of Key recent and projected drivers of risk events as defined by the Guidelines. The comment section for each metric in the table provides details of the source and data that was used or explanations for why certain data is not available.

To calculate the recent drivers of risk events, SCE utilized the following data sources:

- SCE's Outage Management System (OMS) and Outage Data and Reliability Metrics (ODRM) interface
- Wire-down data to determine if the conductor failure led to a wire-down event

- Repair work records (from SCE's asset data in systems, applications & products (SAP) to identify failures
- CPUC reportable fire data

For purposes of this WMP, transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV. Transmission faults and wire-downs are typically on transmission lines 65kV and above but may include some lower voltages (such as 55kV and 33kV).

To populate wire-down data for each driver, SCE used its wire-down database containing repair orders and OMS.

To populate outage data for each driver, SCE used ODRM outage cause codes. ODRM database records and catalogs outage's impacts, and cause determined by the cooperation of field, operations, and engineering employees.

To populate the number of ignitions per year for each driver, SCE used CPUC reportable data filed for 2015 through 2019, and preliminary data for 2020. The CPUC reportable data contains date and time, latitude and longitude, voltage, location, suspected initiating event, and driver and sub-driver (e.g., animal contact, balloon contact, and transformer failure) categories. SCE mapped the suspected initiating event to the driver and sub-driver categories for 2015 through 2020.

For forecasts, SCE first created a baseline forecast for wire-down, outages, and ignitions based on time-series forecasting. Time-series forecasting uses historical patterns to create a forecast and can capture variation over smaller periods compared to other forecasting methods. Then, the baseline forecast was subjected to the same methodologies used for RSEs, whereby SCE estimated the mitigation effectiveness of programs by risk drivers and determined the risk reduction, given the exposure and scope of the program, to incorporate the effects of SCE's various wildfire programs into the forecasts.

Rows were added to the table for specific areas to provide more information in the given areas rather than the information being limited to the "Other" category.

See Table 7.1 "Key recent and projected drivers of risk events" for more detail.

Table 7.2: Key recent and projected drivers of ignition probability by HFTD status, last 5 years and projections – reference only, fill out attached spreadsheet to correct prior reports

Instructions for Table 7:
In the attached spreadsheet document, report recent drivers of ignition probability according to whether or not risk events of that type are tracked, the number of incidents per year (e.g., all instances of animal contact regardless of whether they caused an outage, an ignition, or neither), the rate at which those incidents (e.g., object contact, equipment failure, etc.) cause an ignition in the column, and the number of ignitions that those incidents caused by category, for each of last five years as needed to correct previously-reported data.

Calculate and include 5-year historical averages. This requirement applies to all utilities, not only those required to submit annual ignition data. Any utility that does not have complete 2020 ignition data compiled by the WMP deadline shall indicate in the 2020 columns that said information is incomplete.

Table 7.2 provides a five-year history, where applicable, as well as two years of projections of key recent and projected drivers of ignitions by HFTD region as defined by the Guidelines. The comment section for each metric in the table provides details of the source and data that was used or explanations for why certain data is not available.

For purposes of this WMP, transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV. Transmission faults and wire-downs are typically on transmission lines 65kV and above but may include some lower voltages (such as 55kV and 33kV).

To populate the ignitions per year for each driver, SCE used CPUC reportable data filed for 2015 through 2019, and preliminary data for 2020. The CPUC reportable data contains date and time, latitude and longitude, voltage, location, suspected initiating event, and driver and sub-driver (e.g., animal contact, balloon contact, and transformer failure) categories. SCE mapped the suspected initiating event to the driver and sub-driver categories for 2015 through 2020.

For forecasts, SCE first created a baseline forecast for ignitions based on time-series forecasting. Time-series forecasting uses historic patterns to create a forecast and can capture variation over smaller periods compared to other forecasting methods. Then the baseline forecast was subjected to the same methodologies used for RSEs, whereby SCE estimated the mitigation effectiveness of programs by risk drivers and determined the risk reduction given the exposure and scope of the program to incorporate the effects of SCE's various wild fire programs into the forecasts.

See Table 7.2 "Key recent and projected drivers of ignitions by HFTD region" for more detail.

6.8 BASELINE STATE OF EQUIPMENT AND WILDFIRE AND PSPS EVENT RISK REDUCTION PLANS

6.8.1 Current baseline state of service territory and utility equipment

Table 8: State of service territory and utility equipment – reference only, fill out attached spreadsheet to correct prior reports

Instructions for Table 8:
In the attached spreadsheet document, provide summary data for the current baseline state of HFTD and non-HFTD service territory in terms of circuit miles; overhead transmission lines, overhead distribution lines, substations, weather stations, and critical facilities located within the territory; and customers by type, located in urban versus rural versus highly rural areas and including the subset within the Wildland-Urban Interface (WUI) as needed to correct previously reported data.

The totals of the cells for each category of information (e.g., "circuit miles (including WUI and non-WUI)" would be equal to the overall service territory total (e.g., total circuit miles). For example, the total of *number of customers in urban, rural, and highly rural areas of HFTD plus those in urban, rural, and highly rural areas of non-HFTD would equal the total number of customers of the entire service territory.*

Table 8 provides a five-year history, where applicable, of state of service area and utility equipment as defined by the Guidelines. The comment section for each metric in the table provides details of the source and data that was used or explanations for why certain data is not available.

Table 8 lists the current baseline state of SCE's service area in terms of overhead circuit miles for distribution and transmission lines, substations (only in-service, not including third-party owned), and critical facilities. The table also lists the number of customers in WUI zones and by HFRA tier/zone. SCE retains a small portion of HFRA located outside of the CPUC's HFTD (SCE's non-CPUC HFRA), and operationally treats these areas as Tier 2. These areas have been added to the HFTD Tier 2 populations. HFTD Zone 1 cells only reflect portions of SCE's HFRA that are outside of HFTD Tier 2 and Tier 3 areas. Zone 1 areas that are wholly contained within Tier 2 and Tier 3 areas are reflected in those respective tiers. The WUI area delineation is based on a GIS layer published by the University of Wisconsin-Madison.

It is important to note, that GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.

SCE does not record all customers that are designated as AFN customers. As such, data provided for the AFN population only includes SCE customers enrolled in MBL and/or Low-Income (i.e., enrolled in the CARE/FERA) programs.

See Table 8 "State of service area and utility equipment" for more detail.

6.8.2 Additions, removal, and upgrade of utility equipment by end of 3-year plan term

Table 9: Location of actual and planned utility equipment additions or removal year over year – reference only, fill out attached spreadsheet to correct prior reports

Instructions for Table 9:

In the attached spreadsheet document, input summary information of plans and actuals for additions or removals of utility equipment as needed to correct previously-reported data. Report net additions using positive numbers and net removals and undergrounding using negative numbers for circuit miles and numbers of substations. Report changes planned or actualized for that year – for example, if 10 net overhead circuit miles were added in 2020, then report "10" for 2020. If 20 net overhead circuit miles are planned for addition by 2022, with 15 being added by 2021 and 5 more added by 2022, then report "15" for 2021 and "5" for 2022. Do not report cumulative change across years. In this case, do not report "20" for 2022, but instead the number planned to be added for just that year, which is "5".

Table 9 provides a five-year history, where applicable, as well as two years of projections of location of actual and planned utility equipment additions or removal, year over year, as defined by the Guidelines.

The comment section for each metric in the table provides details of the source and data that was used or explanations for why certain data is not available.

Table 9 provides planned additions, removals, and upgrades of utility equipment by the end of the three-year plan term. SCE does not routinely follow planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, the projects are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates.

Therefore, SCE is unable to map the distribution projects in GIS and subdivide as requested. The planned work with a well-developed scope and geospatial properties are typically major, longer lifecycle transmission and substation projects that have detailed engineering and/or a Certificate of Public Convenience and Necessity (CPCN) or Permit To Construct (PTC) from the Commission. Therefore, the only planned work that SCE included here are (1) transmission projects that have known, planned geospatial geometries (circuit path/route) that can be uploaded to GIS tools and then divided by population density, WUI, and HFTD Tier/Zone and (2) known, planned substation projects (of which SCE has one in the next three years, Safari Substation). Additionally, SCE plans to install at least 375 weather stations and will strive for approximately 475 additional weather stations between 2021 and 2022, but actual site/structure locations have not yet been determined and SCE is therefore unable to provide the locational attributes as requested.

The WUI area delineation is based on a GIS layer published by the University of Wisconsin-Madison.

See Table 9 "Location of actual and planned utility equipment additions or removal year over year" for more detail.

Table 10: Location of actual and planned utility infrastructure upgrades year over year – reference only, fill out attached spreadsheet to correct prior reports

Instructions for Table 10:

Referring to the program targets discussed above, report plans and actuals for hardening upgrades in detail in the attached spreadsheet document. Report in terms of number of circuit miles or stations to be upgraded for each year, assuming complete implementation of wildfire mitigation activities, for HFTD and non-HFTD service territory for circuit miles of overhead transmission lines, circuit miles of overhead distribution lines, circuit miles of overhead transmission lines located in Wildland-Urban Interface (WUI), circuit miles of overhead distribution lines in WUI, number of substations, number of substations in WUI, number of weather stations and number of weather stations in WUI as needed to correct previously reported data.

If updating previously-reported data, separately include a list of the hardening initiatives included in the calculations for the table.

Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV.

Table 10 provides a five-year history, where applicable, as well as two years of projections of location of actual and planned utility infrastructure upgrades year over year as defined by the Guidelines. The comment section for each metric in the table provides details of the source and data that was used or explanations for why certain data is not available.

Table 10 provides planned additions, removals, and upgrades of utility equipment by the end of the three-year plan term. For the reasons explained in the Table 9 section above, the only planned work included in Table 10 are transmission and substation projects that have known, planned geospatial geometries.

The WUI area delineation is based on a GIS layer published by the University of Wisconsin-Madison.

See Table 10 “Location of actual and planned utility infrastructure upgrades year over year” for more detail.

7 MITIGATION INITIATIVES

7.1 WILDFIRE MITIGATION STRATEGY

Describe organization-wide wildfire mitigation strategy and goals for each of the following time periods, highlighting changes since the prior WMP report:

1. By June 1 of current year

2. By Sept 1 of current year

3. Before the next Annual WMP Update

4. Within the next 3 years

5. Within the next 10 years

The description of utility wildfire mitigation strategy shall:

A. Discuss the utility's approach to determining how to manage wildfire risk (in terms of ignition probability and estimated wildfire consequence) as distinct from managing risks to safety and/or reliability. Describe how this determination is made both for (1) the types of activities needed and (2) the extent of those activities needed to mitigate these two different groups of risks. Describe to what degree the activities needed to manage wildfire risk may be incremental to those needed to address safety and/or reliability risks.

B. Include a summary of what major investments and implementation of wildfire mitigation initiatives achieved over the past year, any lessons learned, any changed circumstances for the 2020 WMP term (i.e., 2020-2022), and any corresponding adjustment in priorities for the upcoming plan term. Organize summaries of initiatives by the wildfire mitigation categories listed in Section 7.3.

C. List and describe all challenges associated with limited resources and how these challenges are expected to evolve over the next 3 years.

D. Outline how the utility expects new technologies and innovations to impact the utility's strategy and implementation approach over the next 3 years, including the utility's program for integrating new technologies into the utility's grid. Include utility research listed above in Section 4.4.

7.1.1 Approach to Managing Wildfire Risk as Distinct from Risks to Safety and Reliability (WSD Reference 7.1.A.)

As discussed in Chapter 4, SCE's approach to identifying and analyzing risk is consistent for all enterprise-wide key risks. Wildfire risk is one of the key safety risks, and currently a significant one. To determine types of mitigation activities needed, SCE follows the bow-tie framework to determine risk drivers (factors that increase the probability of a risk event) and risk outcomes (factors that increase the consequence of a risk event). This is followed by identifying activities that could reduce the probability or consequence the evaluating their effectiveness. This approach is followed for all key risks, including wildfire risk. The key safety risks are discussed in the RAMP report, and the mitigation activities for the key safety and reliability risks are included in SCE's GRC requests. Once mitigation alternatives are identified, SCE checks if any of them are ongoing activities and evaluates if the ongoing activities will adequately mitigate the new risk before recommending incremental work.

For example, analysis of ignition events in SCE's HFRA showed that distribution overhead conductor failure due to contact, foreign object or wire-to-wire contact, or other faults are material drivers of ignition events. SCE engineers developed several options such as replacing the bare conductor with heavier wire, undergrounding and replacing bare conductor with covered conductor. The first option is an existing activity (Overhead conductor program approved in SCE's 2018 GRC to reduce the risk energized wire-down events and safety consequences associated with human contact). Based on comparison of the three alternatives, SCE determined that covered conductor installation is significantly more efficient in terms of risk reduction, cost and expedient implementation feasibility, and this was selected as the preferred mitigation. Since this option did not overlap with any other existing activity, it was deemed an incremental wildfire mitigation activity.

Similarly, SCE's risk analysis of faults that could potentially lead to ignition showed that traditional compliance-driven detailed inspections of overhead structures and equipment (to mitigate safety and reliability risks) needed to be augmented in terms of scope, frequency, and approach to target ignition risks. For operational and cost efficiencies, SCE has combined the compliance based overhead detailed inspections with the HFRI inspections. The additional scope, frequency and approach beyond the compliance-based programs are considered incremental.[41]

Each of the wildfire mitigation activities proposed in this WMP update (such as SH-1, IN-1.1, etc.) are wildfire mitigation activities that are driven specifically to mitigate wildfire risks and incremental to activities SCE undertakes to reduce other reliability and safety risks. WSD included several activities such as intrusive pole inspections, pole loading assessments, etc. Though these activities can provide wildfire risk reduction benefits, they are not undertaken to reduce wildfire risks directly and hence are not considered wildfire mitigation activities. SCE indicates which ones are incremental activities in the narratives throughout Chapter 7.

7.1.2 Wildfire Mitigation Strategy and Goals (WSD Reference 7.1.A.-7.1.C)

Wildfire Mitigation Strategy and Goals Over the Remaining 2020-2022 WMP Period (By June 1, 2021, September 1, 2021, and before 2022 WMP Update:

SCE is including the near-term goals that cover June 1, 2021; September 1, 2021; and before the 2022 WMP Annual Update filing in the following tables.[42] In this update SCE has added several new activities, and consolidated related activities (e.g., inspections and remediations of inspection findings, various customer care programs to reduce the impact of PSPS, etc.). Additionally, SCE successfully concluded several activities which are not included going forward.[43] The lessons learned described in Section 4.1 cover the details of how SCE is changing its WMP going forward, with key highlights included in each of

[41] Note this is in response to requirement 7.1.A.
[42] Note this is in response to requirements 7.1.A-7.1.C.
[43] Please refer to Appendix 9.3 for a full list of the changes in WMP activities from the 2020 WMP to the 2021 WMP update.

the category-specific tables in Section 7.1.2.1, and the summary of major investments and implementation of wildfire mitigation initiatives achieved over the past year are included in Section 5.3.[44]

Each of the near-term goals are part of SCE's long-term Wildfire Mitigation Strategy and contribute to building foundational capabilities, communicating with stakeholders, hardening the grid, or reducing the risk of ignition or worker and public safety.

7.1.2.1 SCE Near-Term Wildfire Strategy and Goals

Table SCE 7-1
Near-Term Strategy by WMP Category

Category	Near-Term Strategy	By June 1, 2021	By September 1, 2021	Before 2022 WMP Update
Risk Assessment & Mapping	Efforts are focused on refining the probabilities of EFF and CFO across all electrical topologies.	Include in WRRM consequence calculations to align with the MAVF (MARS 2.0). Include transmission and sub-transmission models in WRRM.	Include wildfire mitigation activities in WRRM. Perform risk and risk buydown quantifications.	Enhance the model in WRRM to perform RSE quantifications for wildfire mitigations.
Situational Awareness & Forecasting	Efforts are focused on increasing data collection (through additional weather station deployment and other data sources), augmenting weather modeling and fire propagation capabilities, and piloting emerging technologies to provide incipient fault awareness.	Provide documentation on the methodology and development of FPI 2.0 (SA-2) which will include references to related peer-reviewed literature. Procure and install two additional High Performance Computing Clusters (SA-3). Develop a methodology for implementing FireCast / FireSim into PSPS. Obtain updated fuels mapping data layer and report (SA-4).	FPI 2.0 (SA-2) will be calculated for each Fire Climate Zone (and potentially each circuit) back to 1980 using SCE's historical data set. In addition, develop FPI 2.0 capabilities to produce daily circuit level output, in parallel with the current FPI. Develop and test the Next Generation Weather Modeling System (SA-3). Maintain fuels layer necessary for all fire spread modeling capabilities. Implement a test phase in which consequence data can be evaluated during PSPS events (SA-4).	Finalize 2021 weather Station installations (SA-1) per project plan. Target 100% completion of 2021 goal. Evaluate weather station siting plans for 2022. Evaluate FPI 2.0 (SA-2) performance against current FPI and develop integration plans into PSPS operations. Implement the Next Generation Weather Modeling System (SA-3).
Grid Design & System Hardening	Execute key proven hardening activities to improve wildfire-related public safety. Ensure alignment of annual execution/resource plan.	Complete all design scope not yet completed in previous year. Identify any areas of focus or execution risks from early year planning and develop action plans to mitigate.	Complete all prioritized locations of activities that reduce PSPS (e.g., covered conductor, undergrounding).	Complete execution of 2021 program targets and develop lessons learned to inform 2022 plan and execution.

[44] Note this is in response to requirement 7.1.B

		Complete highest impact location prioritization of activities that reduce PSPS impacts (e.g., covered conductor, undergrounding).		
Asset Management & Inspections	Expand the use of risk modeling in scoping and planning, to augment SCE's risk-informed asset management approach, as described in the discussion around grid hardening in SCE's WMP.	Complete 50% of distribution and transmission HFRA scope (excluding Area of Concern scope). Complete 80% of distribution infrared inspections. Completion of transmission infrared and corona inspections is subject to operating conditions.	Complete 95% of distribution and transmission HFRA scope (excluding Area of Concern scope). Complete 100% of distribution infrared inspections. Completion of transmission infrared and corona inspections is subject to operating conditions.	Complete any added area of concern inspections identified after the start of wildfire season. Complete all 2021 program targets and develop lessons learned to inform 2022 plan and execution.
Vegetation Management & Inspections	Focus on execution of key vegetation management activities, including the introduction of new work management tools and enhanced vegetation risk modeling.	SCE will have completed ~40% of the Hazard Tree Management Assessments completed. SCE will have completed ~40% of the Expanded Pole Brushing activity goal. SCE will have completed 50% of this year's Expanded Clearances for Legacy facilities compliance target. SCE will have completed ~40% of the Dead and Dying Tree inspections.	SCE will have completed ~70% of the Hazard Tree Management Assessments completed. SCE will have completed ~70% of the Expanded Pole Brushing activity goal. SCE will have completed ~83% of this year's Expanded Clearances for Legacy facilities compliance goal. SCE will have completed ~70% of the Dead and Dying Tree inspections.	100% completion for the following activities: • Hazard Tree Management Assessments • Expanded Pole Brushing • Expanded Clearances for Legacy facilities • Dead and Dying Tree inspections Continue Work Management Tool (Arbora) agile development and releases in accordance with project plan – complete full rollout of Dead & Dying Tree Removal and Hazard Tree Mitigation, and conduct discovery and design architecture associated with Line Clearing.
Grid Operations & Protocols	Continue to augment foundational systems to leverage higher quality data about the grid and integrate risk modeling.	SCE will leverage the various grid hardening initiatives (e.g., covered conductor) and our planned advancements in forecasting and modeling (e.g., FPI 2.0, other planned weather modeling upgrades, WRRM thresholds and triggers, Technosylva) to reduce scope of PSPS events and their impacts on	Streamline processes to acquire the data used for decision making more efficiently and accurately. Better analytical data will help us make more reliable decisions.	Upgrades for forecasting and modeling such as FPI, WRRM, Technosylva.

		customers. As the quality of data gathered from improved weather forecasting and enhanced modeling improves over time, SCE will be able to make better informed decisions for PSPS de-energizations.		
Data Governance	Establish a centralized data repository that consolidates data from disparate enterprise systems to enable wildfire data analytics, real-time sharing of data, and efficient reporting. Establish a cloud Big Data and Artificial Intelligence platform for in-take, organization, analytics and consumption of remote sensing data collected for wildfire mitigation initiatives.	Initiate solution analysis for the centralized data repository and portal. Continue to build and test the foundational components of the cloud Big Data Platform.	Complete the solution analysis and design of the centralized data repository and data portal. Implement foundational components of the cloud Big Data Platform. Build a solution for data consumption, storage and visualization in support of Aerial Inspections data.	Initiate staggered consolidation of datasets to the centralized data repository from SCE Enterprise systems. Complete Design and initiate the build of Artificial Intelligence platform.
Resource Allocation Methodology	Further advance our asset management framework to adopt an increasingly robust process in optimizing how we achieve our objectives.	N/A	N/A	Augment the WRRM model to allow direct comparison of multiple mitigations that may substitute for one another or complement each other. Assess PMO and OCM support needs for 2022
Emergency Planning & Preparedness	Support customers to prepare for potential de-energization (planned and unplanned).	N/A	Train and exercise PSPS IMT staff to qualify and re-qualify new and existing PSPS IMT members by mid-year.	Have all other IMT and IST members trained by end of the year. Add 50 trained UAS operators.
Stakeholder Cooperation & Community Engagement	Establish stakeholder networks and partnerships to better understand customer, community and stakeholder-specific needs and develop tailored solutions.	Sign MOU with local fire authorities to aid in aerial suppression support. Launch marketing campaign to raise PSPS and wildfire mitigation awareness.	Host at least nine community meetings to raise PSPS and wildfire mitigation awareness and hear customer concerns.	Conduct at least four PSPS related surveys.

7.1.2.2 Wildfire Mitigation Strategy and Goals Over Future WMP Periods

SCE's long-term wildfire mitigation roadmap for each of the Maturity Model's ten categories is included in its response to Guidance 12 and updated in Section 7.3. Within each category, SCE defines the objectives that support achieving the goals outlined for all utilities in Section 5.1 to Section 5.3.

SCE's achievements and key activities in this current WMP period are articulated for each category in the tables below. The table covers both the key initiatives driving progress to-date, as well as potential priorities for future WMP cycles that will drive maturity growth, based on the existing capability maturity model. The progress planned in 3 years is not directionally different from the 10-year plan, but the focus will shift to implementation, re-evaluation and continuous improvement with each passing cycle. Therefore, SCE combined the 2023-2025 and 2026-2030 timeframes in its response in the table.[45]

Action SCE-9 in WSD's evaluation of SCE's First WMP Quarterly Report asks SCE to define the terms "continue" and "increase" as used in SCE's response to Guidance 12. If SCE forecasts that a current scope and approach for a particular activity would remain unchanged, SCE called it a continuation. For example, covered conductor deployment is a continuation as SCE is not changing its long-term covered conductor deployment strategy. On the other hand, when SCE expects the scope, approach (e.g., granularity of analysis), or some other aspect to be enhanced, SCE termed that as an "increase." For example, we expect to "increase" the granularity at which we can perform weather modeling as we have access to more data to support those calculations. In either case, the quantification of deployment is captured in SCE's program targets for existing efforts, Table 5.3-1, where the inclusion of an activity across multiple years, or into future WMPs, is indicative of a "continuation." For these activities, SCE will use these forecasts to understand progress. Please note, that these targets are subject to change as part of Change Orders or in future WMP updates or WMPs based on emergent information and further refinement in risk analysis and alternative evaluation. For "increases", it was generally more used to capture the benefits that result from executing on an initiative. Table 5.3-1 will provide a quantitative capture of the deployment activity, but the qualitative benefits from the deployment, which is more appropriately aligned with "increases", will be captured in the corresponding narrative for that initiative. It is anticipated that much of the benefit will be captured in subsequent capability maturity model survey responses as the "increases" will yield maturity advancements.

7.1.2.3 Category Near- and Long-Term Strategy and Goals

7.1.2.3.1 Grid Design, Operations, and Inspections and Maintenance Categories

7.1.2.3.1.1 Grid Design & System Hardening

	2020-2022	**2023-2030**
Objective:	Execute key proven hardening activities to improve wildfire-related public safety.	Minimize and mitigate wildfire risk by developing and deploying resilient grid designs, standards, and architectures.
Maturity Growth:	*Progress expected through:* More risk inputs in prioritization; adding more risk considerations in design; and improved granularity of risk-reduction calculations. *Key Initiatives:* • Covered Conductor • Targeted undergrounding • C-Hooks	*Potential future focus:* • Adding independent audits of innovative solutions • Evaluating all potential hardening solutions (including non-commercial)

[45] Note this is in response to requirement 7.1.B

	• Long Span Initiatives • Vertical Switches	

7.1.2.3.1.2 Grid Operations & Protocols

	2020-2022	2023-2030
Objective:	Continue to augment foundational systems to leverage higher quality data about the grid and integrate risk modeling.	Significantly reduce the number, scale, duration, and impact of PSPS activations through increased automation coupled with operational flexibility enabled by grid design and adoption of DERs.
Maturity Growth:	*Progress expected through:* Improvements in average downtime; and more automation in restoration processes. *Key Initiatives:* • Battery Backup Programs • Well Water and Water Pumping Backup Generation • Resiliency Zones	*Potential future focus:* • Adding incremental automation • Reducing average downtime • Training from professional suppression agency

7.1.2.3.1.3 Asset Management & Inspections

	2020-2022	2023-2030
Objective:	Expand the use of risk modeling in scoping and planning, to augment SCE's risk informed asset management approach, as described in the discussion around Grid Hardening in SCE's WMP.	Further advance our effectiveness in targeting specific assets that require inspection or maintenance through a defined timeframe, leveraging new technologies that facilitate a near real time data-driven, risk-informed asset management approach.
Maturity Growth:	*Progress expected through:* Adding predictive analysis to inform scheduling; refining inspection checklists dynamically to asset-specific details. *Key Initiatives:* • Inspections and Remediations • Inspection Work Management Tools	*Potential future focus:* • Updating asset health data faster • Incorporating independent validation of inspection checklists • Achieving semi-automated inspection auditing

7.1.2.3.1.4 Vegetation Management & Inspections

	2020-2022	2023-2030
Objective:	Focus on execution of key vegetation management activities, including the introduction of new work management tools and enhanced vegetation risk modeling.	Comprehensive vegetation management programs that further integrate data, new technologies, analytics and risk-informed program. design and deployment to mitigate wildfire risks.
Maturity Growth:	*Progress expected through:* Asset-specific inspection procedures; and adopting best practice in collaborating with landowners on waste. *Key Initiatives:* • VM Work Management Tool (Arbora) • Hazard Tree Management Program • Expanded Clearances	*Potential future focus:* • Developing predictive modeling • Incorporating real-time sensors • Incorporating additional data inputs, as identified over time • Incorporating independent validation of checklists • Achieving semi-automated inspection auditing

7.1.2.3.2 **Enablers**

7.1.2.3.2.1 Data Governance

	2020-2022	2023-2030
Objective:	Establish a comprehensive asset data governance framework with clear roles and responsibilities of how data is to be managed, enhancing our data collection and data centralization capability using cloud, platform-centric architecture that consolidates data from disparate enterprise systems supporting automated publication to the WMP publication portal.	Enhance SCE's information management framework to further ensure data integrity and support widespread usage of data across planning, grid design, operations, and maintenance through the identification of additional asset and operational data we need to collect, the development of rigorous data governance processes, and integrated, real-time access.
Maturity Growth:	*Progress expected through:* Deploying centralized data repository; developing centralized documentation; and deployed new risk event tracking capabilities. *Key Initiatives:*	*Potential future focus:* • Adding real-time interfaces for sharing data • Adding explanations of algorithm sensitivities

	• Wildfire Safety Data Mart and Data Management (WISDM / Ezy)	• Integrating analytics to enable growth of capabilities in other areas

7.1.2.3.2.2 Situational Awareness & Forecasting

	2020-2022	2023-2030
Objective:	Focused on increasing data collection (through additional weather station deployment and other data sources), augmenting weather modeling capabilities, and piloting emerging. technologies to provide incipient fault awareness.	Embed situational awareness and forecasting into decision making processes across planning, grid design, operations, and maintenance through the development of additional data and model granularity and accessibility.
Maturity Growth:	*Progress expected through:* Higher resolution weather data; higher resolution forecasting; and improving fire detection capability. *Key Initiatives:* • Weather Stations • Next Generation Weather Modeling • Fire Spread Modeling • Distribution Fault Anticipation (DFA)	*Potential future focus:* • Adding automated error checking and correction • Developing earlier forecasting ability • Incorporating physical impacts of weather to assets • Improving ability to detect fires

7.1.2.3.2.3 Risk Assessment & Mapping

	2020-2022	2023-2030
Objective:	Efforts are focused on refining the probabilities of EFF and CFO across all electrical topologies.	Integrate how risk assessment and mapping informs asset management decisions across grid planning, design, operations, & maintenance functional areas by using a data-driven, asset component-level risk modeling methodology.
Maturity Growth:	*Progress expected through:* Higher resolution in ignition risk and consequence calculation; adding automation to processes; and advances in how we calculate risk. *Key Initiatives:*	*Potential future focus:* • Adding incremental automation • Integrating with vegetation, weather, and asset data • Performing sensitivity analysis

	• MARS 2.0 (Incorporates targeted multipliers for vulnerable / at-risk communities) • Migrate to the Technosylva/WRRM platform (with alignment between enterprise risk quantification and asset level modeling) Circuit segment and FLOC level risk analysis using WRRM (POI + Technosylva consequences)	• Incorporating independent validation

7.1.2.3.3 **Outreach and Planning Categories**

7.1.2.3.3.1 Stakeholder Cooperation and Community Engagement

	2020-2022	2023-2030
Objective:	Establish stakeholder networks and partnerships to better understand customer, community and stakeholder-specific needs and develop tailored solutions.	Effective stakeholder communication through tailored approaches for outreach, engagement and information exchange with customers, communities and stakeholders based on various groups' unique needs.
Maturity Growth:	*Progress expected through:* Developed annual Access & Functional Needs customer plans. *Key Initiatives:* • Aerial Suppression • Customer Education- Community Meetings • Customer Education- Marketing Campaign	*Potential future focus:* • Incorporate process for adopting best practices (company-wide) • Monitoring land-owner agreement with WMP initiatives • Increasing cooperation with fire suppression agencies • Cultivating lower risk vegetative ecosystems

7.1.2.3.3.2 Emergency Planning & Preparedness

	2020-2022	2023-2030
Objective:	Support customers to prepare for potential de-energization (planned and unplanned).	Best-in-class emergency planning and preparedness approach to enable customer resiliency through education, helpful programs, and

		delivery of tailored communications before, during, and following an event.
Maturity Growth:	*Progress expected through:* Adopting best practice of adding referrals to other agencies. *Key Initiatives:* • Emergency Responder Training	*Potential future focus:* • Reporting of implementing recommended improvements (post-wildfire or PSPS events)

7.1.2.3.3.3 Resource Allocation Methodology

	2020-2022	**2023-2030**
Objective:	Further advance our asset management framework to adopt an increasingly robust process in optimizing how we achieve our objectives.	Utilize factors such as data-driven risk models and scenario planning, leverage our resource allocation framework to optimize the deployment of mitigation strategies to consider location specific conditions and further ensure SCE can consistently meet all of its key objectives.
Maturity Growth:	*Progress expected through:* Improved granularity in mitigation risk projections; risk-informed portfolio decisions adding PSPS consequences; and costs for innovations. *Key Initiatives:* • Calculate RSE by HFRA Tiers (will be including 2021-2022 scope) • Calculate wildfire risk, PSPS risk, and combined risk scores for applicable WMP initiatives	*Potential future focus:* • Projecting asset level risk mitigations • Calculating RSE for all potential initiatives • Developing portfolio-wide risk-based allocation

7.1.3 Challenges associated with limited resources and how these challenges are expected to evolve over the next 3 years (WSD Reference 7.1.C)

SCE's wildfire mitigation strategy is dependent on having sufficient qualified labor to execute on the desired activities. To date, the largest resource challenge has been in vegetation management, as our ability to secure enough qualified resources has been challenged with the need for their services across other areas inside and outside of California. This applies to both ISA-certified arborists and tree pruning/removal crews. Additionally, there are more general resource challenges in ensuring subject matter expertise is available across the 10 categories, as many of these topics are rapidly evolving and can require skill sets that may not be readily available currently within the utility. Though SCE is closely monitoring any impact of the COVID-19 pandemic and has to date been able to keep up with wildfire mitigation activities, it could have an impact on resource availability. Across all of these challenges, SCE expects that continued engagement with industry to espouse the need for, as well as type of, resources will help to alleviate resource constraints we've faced as we have begun scaling many activities to address the magnitude of risk presented by wildfire.[46]

7.1.4 New Technologies and Innovations (WSD Reference 7.1.D)

How New Technologies and Innovations will affect SCE's Wildfire Mitigation Strategy and Implementation Over the Next Three Years:

This section provides information about the technologies SCE is exploring that, if successful, may be adopted as programmatic mitigations or used in the normal course of business to mitigate wildfire risk and improve resiliency of the SCE system. These technologies may be unique mitigation strategies or may supplement or improve deployment of *existing* mitigations. Though projects will vary in the exact process of adoption at SCE, they generally follow a sequential flow consisting of evaluation (step 1), pilot (step 2), small scale deployment (step 3), and finally programmatic application (step 4). If successful, these technologies may advance SCE towards achieving its long-term objectives, as described in Sections 7.1.A through 7.1.C above. The details for each technology below explain what the technology or innovation is, how the technology may reduce ignition risk, SCE's progress on assessing the technology, its plans for 2021 specifically (and through the 2020-2022 WMP period, generally), and how SCE would make the determination to adopt the technology.[47] Because these technology pilots and applications need to complete the steps identified above prior to SCE determining whether a targeted or full-scale deployment of an activity should occur, it is premature to develop an RSE calculation. Upon conclusion of technology pilot and application activities, if the results are favorable, SCE will use the gathered data to estimate the risk reduction of the mitigation and perform the RSE calculation as part of the analysis to inform a decision for broader deployment of the activity.

The technology applications identified below span a large range of approaches including improvements to inspection efficiencies, maintenance situational awareness, and system protective features. In some cases, particularly with technologies offering system protection and system monitoring, multiple technologies may be considered or adopted to achieve optimal results. The layering of systems to lower and prevent ignitions is common across many of the wildfire mitigation advanced technology activities. Some mitigations focus on fault prevention, thereby avoiding a possible ignition and related customer outage, whereas others target reducing the potential of the fault (or electric system related condition) to result in an ignition.

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[46] Note this is in response to requirement 7.1.C

[47] Note this section is in response to requirement 7.1.D

SCE continues to explore industry options for reducing ignition risks as well resiliency approaches and technologies to reduce the impacts of wildfires on SCEs customers and the electric system regardless of cause. For utility research not included in Alternate Technology and Evaluations pilots please see Section 4.4. Below is the collection of Alternative Technology options and evaluations:

Meter Alarming for Downed Energized Conductor (MADEC)

- ***Activity description*** **and** ***drivers:***

  MADEC is a machine learning algorithm utilizing smart meter data to detect a subset of energized wire-downs and other high impedance faults/hazards and is currently being used throughout SCE's service area. The MADEC system was originally developed for minimizing energized wire-down events with bare wire, but also works with covered conductor. The algorithm generates an alarm that allows an operator to act quickly and de-energize the circuit. While improvement to the MADEC system is on-going for bare and covered conductor, this activity was initiated to evaluate possible improvements to MADEC algorithm to be used for covered conductors as part of the large deployment on SCE HFRA circuits.

- ***How is the activity effective at reducing ignitions and how is effectiveness measured?:***
  Detection and prevention of downed energized covered conductor is an important aspect of public safety and of wildfire risk reduction. The MADEC system can limit the total time a downed covered conductor stays energized after falling, providing potential reduction of ignition risk. Covered conductor reduces the number of faults or failures compared to bare overhead conductors but does not eliminate them. It is unclear whether the MADEC algorithms developed for bare conductor will work for covered conductor, which necessitates the evaluation.

  This pilot will be deemed successful if MADEC's ability to detect energized covered conductor is confirmed using sufficient sample data as more covered conductor is installed in the field, and actionable changes needed to make MADEC more effective are identified (i.e., distinct voltage signature patterns that are validated by actual field conditions). While all event data is valuable, algorithm improvements will require more field data on downed energized covered conductor before the algorithm to detect them automatically can be implemented. Threshold values are not applicable.

- ***2020 Activities:***
  A machine learning algorithm requires data to build a model and teach the algorithm to generate an alarm. SCE evaluated all four energized downed covered conductor events that occurred in 2020 and determined more actionable data is required before MADEC improvements can be made for covered conductor. Since there have been limited instances of downed covered conductor to date, there has been insufficient data collected necessary to train the algorithm.

- ***2021 Planned Activities:***
  SCE will continue to evaluate downed covered conductor events in 2021. If sufficient data is available, SCE will evaluate the current MADEC and make any adjustments needed. If data continues to be

sparse for covered conductor downed wire events, SCE will use its standard continuous improvement processes for machine learning algorithms to retrain the model as appropriate.

Advanced Unmanned Aerial Systems Study

- ***Activity description and drivers:***
  SCE developed the Advanced UAS demonstration project to study the feasibility, effectiveness, and efficiency of using drones, flying beyond visual line of sight (BVLOS) missions, to conduct aerial patrols of overhead lines associated with PSPS events. The focus was on augmenting traditional patrol methods via truck, foot, or helicopter, to further reduce wildfire risk by detecting equipment risks that are more difficult to find by these other means and expedite power restoration to mitigate the impact of outages on customers.

- ***How is the activity effective at reducing ignitions and how is effectiveness measured?:***
  As with other types of pre-event patrols, conducting pre-event aerial PSPS patrols of overhead lines to look for abnormal situations that could cause faults leading up to a possible PSPS event reduces the risk of ignitions. Pre-event aerial patrols can also yield valuable situational awareness data, such as wind speed and direction, which can be sent back to our IMT to refine where and when PSPS may be needed. Once the event has concluded, aerial PSPS patrols can quickly survey overhead lines to help ensure that it is safe to restore power. Lastly, having an additional aerial patrol method can help expedite patrols and the restoration of power, thus reducing the impact of PSPS outages on our customers during larger scale events or when helicopters may be needed for other emergency purposes.

- ***2020 Activities:***
  In 2019, SCE completed the first step of its study by conducting demonstration flights utilizing extended visual line of sight (EVLOS) missions, a precursor to BVLOS that utilizes multiple visual observers along the vehicle's path to maintain visual contact with the drone. In 2020, SCE planned and executed BVLOS missions on longer segments of overhead lines, in more challenging terrain (characteristic of HFRA), and in a simulated PSPS environment (e.g., rapid response).

  SCE considers this study a success as all its success measures have been reached, and enough data has been gathered to move forward with limited operations in 2021 and beyond. First, the video (image resolution, angle, zoom, patrol speed, etc.) and wireless streaming consistency were of high enough quality that the inspectors were confident with an all-clear designation following the circuit patrol. Second, the vendors SCE contracted with were able to deploy to the simulated event with 24 to 72 hours-notice, validating the rapid response capability required of a PSPS event. Third, the simulated aerial PSPS patrols generally, on average, took less time to render an all-clear designation than it would have taken the same inspector to patrol the same circuit segment from their truck. Fourth, SCE secured the necessary FAA waivers/permits to conduct safe and compliant BVLOS operations on the study circuits. Lastly, SCE's UAS vendors did not experience any aircraft command-control issues during the study.

- ***2021 Planned Activities:***

  The study is in progress and SCE plans to conduct a cost-benefit analysis and evaluate next steps in order to determine when it is prudent to operationalize BVLOS patrols. There are currently some technical (e.g., availability of Long-Term Evolution (LTE) communications, command-control communications, video quality and zoom, etc.), regulatory (e.g., missions over densely populated areas), and resource (availability of helicopters to also facilitate aerial patrols) challenges that require further evaluation prior to determining when and where BVLOS aerial patrols may be a cost-effective and efficient means to patrol lines. SCE will continue to explore new and advanced technologies that address these limitations while also continuing to partner with the FAA on the necessary regulatory requirements as SCE develops an operational plan.

Rapid Earth Fault Current Limiter (REFCL)

SCE's REFCL program is piloting a variety of ways to reduce the energy released from ground faults to the point that ignition is unlikely. Most public safety hazards from high voltage electrical equipment come from ground faults. This includes most downed wire incidents, energized conductor contacts, events involving underground equipment failures, arc flashes, step and touch voltage incidents and fire ignitions. Each of SCE's REFCL projects have been found to substantially reduce the energy released in ground faults, and therefore have the potential to significantly reduce public safety risks.

However, the REFCL technologies also come with high cost and complexity. SCE is exploring multiple approaches because SCE's system is not homogenous, these technologies require specific configuration, and assessing the most cost-effective solution will vary across SCE's system.

(A) Ground Fault Neutralizer (GFN)

- ***Activity description and drivers:***

  The first Ground Fault Neutralizer on the SCE system will be installed at Neenach substation. When installed it will reduce ground fault energy across the approximately 180 miles of circuitry fed by Neenach substation, of which approximately 70 miles are in HFRA.

  Ignition drivers that cause a single line to ground fault can be mitigated with the use of the Ground Fault Neutralizer through reduction of fault energy. This system results in a reduction in fault energy by a factor of a hundred thousand or more compared to typical utility designs. Australian utilities have also demonstrated the ability to detect and act upon ground faults as small as a half ampere with the Ground Fault Neutralizer, making it substantially more sensitive than traditional protection.

  The Ground Fault Neutralizer is likely to be the preferred REFCL design for large substations because those systems produce a higher fault currents that require the additional inverter device to limit the fault energy.

- ***How is the activity effective at reducing ignitions and how is effectiveness measured?***

  Extensive testing was done in the Australian state of Victoria to determine the risk reduction from the Ground Fault Neutralizer. Based on this testing, the Ground Fault Neutralizer is expected to reduce ignition risk from phase-to-ground faults by at least 90%. When the anticipated benefits REFCL provides for ground fault ignition reduction are coupled with covered conductor, and other mitigations, SCE expects risk reduction capabilities that come closer to operating underground systems and is exploring how best to manage PSPS de-energization choices in these hardened grid designs.

SCE expects significant reduction in ignitions associated with phase-to-ground faults where GFN is deployed when compared to historical averages. Effectiveness will be confirmed by staged fault tests showing that the voltage on the faulted conductor is reduced quickly enough to prevent ignition.

- ***2020 Activities:***

  In 2020 SCE, received the Ground Fault Neutralizer equipment and completed engineering for the planned 2021 construction, in-servicing, and commissioning of the GFN system.

- ***2021 Planned Activities:***

  By September 2021, SCE plans to in-service the pilot ground fault neutralizer at Neenach substation.

(B) Resonant Grounded Substations (RGS)

- ***Activity* description *and drivers***

  This project converts Arrowhead substation to resonant grounding to reduce the fault current for single phase to ground faults. Resonant grounding differs from the Ground Fault Neutralizer in that it does not include an inverter. This reduces the cost and complexity of the system but means the reduction in fault current is less.

  Ignition drivers that cause a single line to ground fault can be mitigated by Resonant Grounding to reduce fault energy. This system results in a reduction in fault energy by a factor of a hundred thousand or more compared to typical utility designs. While the energy reduction is less than if a Ground Fault Neutralizer were installed at the same substation, at small substations the energy reduction can be enough to prevent ignition.

  The Resonant Grounded Substation is likely to be the preferred REFCL design for small substations. Small substations produce lower fault current and resonant grounding *alone* has been found to reduce fault currents to help mitigate ignitions from ground faults. For the purposes of REFCL systems, the distinction between "large" and "small" substations primarily depends on the lengths of overhead and underground circuitry.

- ***How is the activity effective at reducing ignitions and how is effectiveness measured?***

  Extensive testing was done in the Australian state of Victoria to determine the risk reduction from the use of REFCL Systems. Based on this testing, SCE determined that Resonant Grounding of small substations is expected to reduce ignition risk from phase to ground faults by at least 90%. When the anticipated benefits REFCL provides for ground fault ignition reduction are coupled with covered conductor, and other mitigations, SCE expects risk reduction capabilities that come closer to operating underground systems and is exploring how best to manage PSPS de-energization choices in these hardened grid designs.

SCE expects reduction in ignitions associated with phase-to-ground faults where Resonant Grounding is deployed when compared to historical averages. Effectiveness will be confirmed by staged fault tests showing that the voltage on the faulted conductor is reduced quickly enough to prevent ignition.

- ***2020 Activities:***

  An arc suppression coil to resonant ground the substation was delivered in 2020 along with associated major apparatus. SCE is on target to support a 2021 in-servicing and commissioning of the system.

- ***2021 Planned Activities:***

  By October 2021, SCE plans to in-service the equipment necessary to resonant ground SCE's Arrowhead substation.

<u>(C) Isolation Transformer REFCL Scheme</u>

- ***Activity description and drivers***:

  The Isolation Transformer REFCL scheme allows for a cost-effective approach to gain REFCL system protection to circuit-segments. Isolation transformer installations reduce requirements for system upgrades to deploy the REFCL system.

  Ignition drivers that cause a single line to ground fault can be mitigated by application of isolation transformers to reduce fault energy. This system results in a reduction in fault energy by a factor of a hundred thousand or more compared to typical utility designs.

  Costly modifications to underground 4-wire distribution systems can be avoided or minimized when comparing the Isolation Transformer REFCL application to the substation variations for the technology.

- ***How is the activity effective at reducing ignitions and how is effectiveness measured?:***

  SCE determined, through independent testing and review of the Australian REFCL Program, that the isolation transformer REFCL scheme is expected to reduce ignition risk from phase to ground faults by at least 90%. When the anticipated benefits REFCL provides for ground fault ignition reduction are coupled with covered conductor, and other mitigations, SCE expects risk reduction capabilities that come closer to operating underground systems and is exploring how best to manage PSPS de-energization choices in these hardened grid designs.

  SCE expects significant reduction in ignitions associated with phase-to-ground faults where Isolation Transformer REFCL schemes are deployed when compared to historical averages. Effectiveness has been confirmed by staged fault tests.

- ***2020 Activities:***

  In 2020, SCE successfully completed the installation of one REFCL isolation transformer application. The equipment construction standards were completed, and equipment has been installed.

- **2021 Planned *Activities***:

By November 2021, SCE plans to complete the installation of one pad-mounted isolation transformer in SCE's Menifee District on the Corsair distribution circuit.

Distribution Open Phase Detection (D-OPD)

- ***Activity description and drivers*.**

SCE is investigating a distribution Open Phase Detection (OPD) scheme to detect open phase (broken conductor) conditions on the distribution system. The detection scheme focuses on ignition reduction associated with wire-down incidents primarily for both bare and covered conductor systems. This will allow the protection system to isolate a separated conductor prior to the wire contacting the ground, while leveraging existing distribution hardware in HFRA. SCE is using existing Remote Sectionalizing Recloser (RSR) installations at circuit ties to detect a separated conductor and then rapidly commanding an alarm operation to an existing source RAR. For the pilot, setting configuration changes are made to these existing devices, followed by pairing of the devices through new radio installations. The pilot effort also provides SCE valuable information for understanding the potential for additional outages caused by the use of this more sensitive circuit protection system. The costs and functionality (such as interference of other radios) of the new communication components are being evaluated during the pilot.

- ***How is the activity effective at reducing ignitions and how is effectiveness measured?***

If successful at detecting open phase conditions and isolating lines prior to the lines contacting ground, the OPD system is expected to reduce ignition probability for ignitions. The success rate for detecting open phase conditions and isolating lines in the required time is still under review. For further information, please refer to SCE WMP Deficiency Response to Guidance-9 'Wildfire Risk Reduction Benefits'.

Evaluation includes:

1) Ability to identify and isolate an open phase condition within 1.2 seconds

3) Reduction in number of energized wire-down events

2) System reliability impacts from false detections with an operational OPD scheme

4) Costs for broad scale deployment of OPD systems

- ***2020 Activities****:*

In 2020, SCE completed the pilot installation of the open phase detection logic at five circuit locations to determine the feasibility of the Distribution OPD scheme and anticipated costs for potential larger deployments. These pilot installations focused on locations utilizing existing Remote Controlled Automatic Recloser (RAR) and RSR devices to provide telemetry, monitoring, and interrupting capability.

- ***2021 Planned Activities:***

  In 2021, the OPD logic/system for pilot installations will be monitored to collect data for any actual and false detections. Additionally, the performance monitoring will include the field performance functionality of the high-speed radio systems. SCE will also develop an assessment report that details the findings from the pilot evaluation. The pilot installations are expected to remain configured for alarming rather than tripping during the 2021 monitoring period.

Vibration Dampers

- ***Activity* description *and drivers*:**

  Vibration dampers are hardware attached to the conductors to inhibit conductor abrasion and fatigue from vibration. SCE undertook further assessment of vibration dampers for covered conductor application in 2020. The assessment involved working with manufacturers to develop vibration damper design for covered conductors and evaluating and testing the new vibration damper design. Upon completion of the assessment, SCE will publish construction standards for vibration damper application in covered conductor systems.

  - ***How is the activity effective at reducing ignitions and how is effectiveness measured?***

  Research studies found that covered conductors may be vulnerable to Aeolian vibration in certain conditions. Aeolian vibration may lead to premature conductor failure due to conductor fatigue and or abrasion. The smoothness of the covering (perfect cylinder) allows wind to pass more smoothly than when compared to bare wire, which have undulation from the individual strands, aiding the mechanism for Aeolian vibration. Additionally, because the covering reduces movement of the strands, the self-damping characteristic of the conductor is slightly reduced which may increase vibration activity. Vibration dampers will mitigate potential failures due to Aeolian vibration.

  Installing dampers should mitigate the risk of premature failure of covered conductors. Dampers have been proven to prevent the bare conductor, conductor connections and attachments from degrading due to vibration. Effectiveness would be measured by reduction in covered conductor strain after damper installation.

  - ***2020 Activities:***

    In 2020, SCE assessed vibration dampers for covered conductor application. The assessment included the following goals:

    1. Identify the need for vibration dampers on covered conductor systems.
    2. Work with suppliers on the development of vibration dampers for covered conductor applications.
    3. Evaluate the vibration damper technologies developed for covered conductor system.
    4. Develop design and construction standards for vibration damper application on covered conductor systems.

SCE completed all four goals in 2020.

The standards application criteria incorporate results from a combination of lab testing and field testing to validate the effectiveness of the vibration dampers on covered conductor systems. Lab and field test results showed that the dampers reduced high frequency and low amplitude vibrations, a signature of Aeolian vibration. Additionally, the dampers reduced the instances of vibration that correlate with material micro-strains corresponding to conductor damage. These results validate the efficacy of the vibration dampers on covered conductor systems. SCE published vibration damper design and construction standards for covered conductor application in the third quarter of 2020 focusing on improving installation that may be susceptible to Aeolian vibration. SCE is closing this pilot given that we met our 2020 goals by publishing the standard. Construction of new covered conductor circuits will include vibration dampers, as applicable.

<u>Asset Defect Detection Using Machine Learning Object Detection</u>

- ***Activity description and drivers:***

  This pilot seeks to develop a proof of concept that uses Machine Learning (ML) to automate certain time intensive activities related to overhead asset inspection such as processing of imagery. The objective is to identify defects efficiently and effectively in overhead assets in a timely manner to mitigate failures that could lead to wildfires. This initiative will enable processing of a large number of images in a short period of time to detect defects in the system much earlier than the current manual process.

  A failure signature on an asset must be detected accurately and in time for maintenance before the defect evolves into an ignition This project's scope of work will address both components. This project will involve identifying assets that have defects and prioritizing those assets for human inspection/intervention based on risk of failure and type of defect. To achieve acceptable levels of accuracy for the failure detection results, there will be extensive training of the algorithm and subject matter expertise inspector supervision. Based on the findings from the ML algorithms, inspectors can create a mitigation plan to address the concerns ahead of a failure. Once the algorithm is trained and confidence levels are within acceptable range, the ML algorithm can be incorporated into the existing inspection process to reduce time spent on the analysis of individual images.

- ***How is the activity effective at reducing ignitions and how is effectiveness measured?***

  This initiative uses machine learning to identify assets and defects from inspection imagery in the field and potentially identifies defects prior to inspections, thereby reducing potential ignition risks.

  The effectiveness metric for this pilot is the platform's ability to manage and access incoming inspection data streams and ability to detect defects accurately. Threshold values are not applicable at this stage of the initiative.

- ***2020 Activities:***

In 2020 SCE standardized data collection for future ML initiatives related to inspection activities and developed ML tools and processes to evaluate use cases and feasibility to support objective evaluation of inspection assets. The primary goal was to begin improving the prioritization of inspection resources allocation and improving defect identification rates.

- ***2021 Planned Activities:***

  In 2021, SCE seeks to accomplish the following tasks:

  - Expand its tagging initiative of assets on images for the ML algorithm.
  - Continue prioritizing and developing ML algorithms to identify defects on assets from images.
  - Develop a company-wide ML strategy that creates alignment amongst all stakeholders by leveraging existing efforts in the space.
  - Investigate processing LiDAR images using AI to process and identify vegetation encroachment on assets.
  - Explore solutions for AI on the edge to process data in real time in the field.

<u>**Transmission Partial Discharge**</u>

- ***Activity description and drivers.***
  SCE has identified a radio frequency (RF) detection technology that has the potential to determine the health of transmission assets by remotely detecting partial discharge. As equipment deteriorates, it may produce more and more partial discharge either in the form of arcing, leaking or tracking. The partial discharge can be detected via RF emissions allowing SCE to investigate and respond to deteriorated equipment prior to an in-service failure. In 2020 SCE completed an assessment of helicopter-mounted remote partial discharge detection for transmission facilities, which ultimately led to not pursuing a pilot effort, as explained below.

  How is the activity effective at reducing ignitions and how is effectiveness measured?
  Detecting partial discharge from deteriorated equipment can help identify potential failures proactively, thus reducing the risk of faults and associated ignitions. However, as part of the 2020 assessment SCE decided not to conduct a pilot for the helicopter-mounted remote partial discharge detection because other inspection tools (i.e., IR and corona detection) captures similar failure modes. Remote partial discharge detection does not provide a specific equipment issue or failure mode. Further, to verify the actual piece of equipment that has partial discharge requires a crew at the tower or conductor location to determine the exact asset. After this, a desktop analysis would need to be performed to determine if anything needs to be mitigated. Due to the increased process burden and uncertainty of actual failure mode, SCE decided to rely on existing IR and corona programs instead.

- ***2020 Activities:***

In 2020, SCE evaluated the use of a Partial Discharge assessment technology to assess the health of in-service transmission assets. SCE does not plan to continue investigation into helicopter mounted remote partial discharge technology (snapshot in time).

Early Fault Detection (EFD)

- ***Activity description and drivers:***
  The purpose of this pilot project is to evaluate new EFD technology that detects high frequency radio emissions which can occur from arcing or partial discharge conditions on the electric system. These types of conditions can represent an incipient failure, such as severed strands on a conductor, vegetation contact, or tracking on insulators. The technology requires placement of paired sensors on poles approximately every three circuit miles on a distribution voltage line, and at higher voltages sensors can be placed further apart. Each pair of sensors is able to "bi-angulate" the issue down to a specific structure.

  There are two primary benefits that come from deployment of the EFD system. Besides detection of incipient failures before they progress to a complete failure, EFD can also help monitor the overall health of the electric system which may play a role in operational decisions during high-risk conditions. For circuits that transverse both non-HFRA and HFRA, the EFD sensor pairs site selections can be prioritized to cover HFRA circuit sections over non-HFRA circuitry and does not require an entire circuit to be monitored by EFD devices.

- ***How is the activity effective at reducing ignitions and how is effectiveness measured?***
  EFD sensors can continuously monitor lines and proactively detect undesirable, degraded or pre-failure system conditions, which can reduce the probability of faults and associated ignitions.
  Effectiveness metrics include the ability to accurately detect undesirable, degraded, or pre-failure system conditions sufficiently early to allow time for remediations, assessment of technical feasibility, and assessment of maintenance needs. Threshold values have not been determined.

- ***2020 Activities:***
  In 2020, SCE developed installation standards, installed, and commissioned 33 EFD locations. The EFD installations were applied on circuits previously equipped with DFA monitoring to explore the potential complimentary aspects of these technologies.

- ***2021 Planned Activities:***
  In 2021, SCE will complete installation of 67 units (remaining of the 100 EFD units as identified in the 2020 WMP) on the distribution system to circuits previously equipped with DFA technology. In addition, SCE will consider installing up to an additional 50 units on the distribution and/or sub transmission systems for additional evaluation. The locations for the remaining units will be determined by June 2021.

High Impedance Relays (Hi-Z)

- ***Activity description and drivers:***
  SCE aims to develop a layered protection scheme that will provide different protective elements within the relay controller to reduce wildfire ignition risks by detecting High Impedance conditions such as a down conductor or arcing event that can lead to ignitions. Through lab testing SCE has demonstrated that the Hi-Z technology can detect for Hi-Z conditions; however, it needs to capture actual Hi-Z events to prove that the technology is effective in detecting the Hi-Z conditions.

- ***How is the activity effective at reducing ignitions and how is effectiveness measured?:***
  Protection schemes that can detect Hi-Z conditions can reduce the propagation of faults and therefore reduce ignition risk. Effectiveness assessment includes review of relay event data to determine if the relay alarmed correctly for the majority of Hi-Z events.

- ***2020 Activities:***
  In 2020, SCE investigated and deployed two controllers/relays in SCE's Huntington Beach District with Hi-Z elements and is continuing to monitor and analyze Hi-Z activity on these pilot installations.

- ***2021 Planned Activities:***
  In 2021, SCE plans to pilot the high impedance (Hi-Z) element at an additional 15 locations to assess the effectiveness of detecting Hi-Z conditions such as down conductor or arcing conditions. The remaining locations will be determined by March 2021.

Satellite and Other Imaging Technology for Fire Spotting

- ***Activity description and drivers:***
  Satellite and other imaging technology can be used to help determine the point of ignition origin and perform threat assessments.

- ***How is the activity effective at reducing ignitions and how is effectiveness measured?:***
  SCE will use this technology to detect and follow changes in fire locations and the spread of a fire. SCE will communicate that information with stakeholders/SCE resources impacted by the area of threat. This technology will allow SCE to reduce the impact of wildfire and can potentially be measured by counting the number of wildfires from year to year.

- **2020 Activities:**
  In 2020, SCE benchmarked Pacific Gas and Electric Company (PG&E's) Wildfire Situational Operational Center (WSOC) to understand how PG&E uses these tools and technologies to detect wildfire. SCE also conducted an analysis of existing satellite fire detection capabilities and identified the gaps between public data sources and what PG&E is using from vendor only data feeds. SCE used satellite detection technology during the Creek Fire restoration, piloted fire detection tools and alerts with University of California, San Diego (UCSD), referenced SCE's existing HD camera network.

- ***2021 Planned Activities:***

SCE is developing an application and system to consolidate fire detections as they arrive from satellites to disseminate alerts via internal web applications and/or e-mail notification. These data sources and applications will allow SCE Fire analysts, Meteorologists, Fire Officers, and others to be alerted and observe fire detections in near-real time, evaluate the intensity of fires, as well as monitor the general spread of fires using both satellite technology as well as leveraging SCE's Fire management team fire perimeter tool. SCE's Fire management team maintains a proprietary fire perimeter tool that integrates with SCE's wildfire operational tools. During active fires, this fire perimeter tool provides rapid and updated fire perimeters that may not be readily available from public sources. The new system will also be used with SCE's weather station network and its HD FIRE high-resolution camera network. SCE will integrate these new data sources into SCE platforms for use by SCE Fire Management and all situational awareness platforms used by SCE IMTs.

7.2 WILDFIRE MITIGATION PLAN IMPLEMENTATION

Describe the processes and procedures the electrical corporation will use to do all the following:

A. Monitor and audit the implementation of the plan. Include what is being audited, who conducts the audits, what type of data is being collected, and how the data undergoes quality assurance and quality control.

SCE exercises comprehensive and rigorous oversight of its WMP through programmatic processes that monitor and audit the implementation of the plan and the effectiveness of inspections.

SCE utilizes a performance dashboard to understand the progress on its wildfire mitigation activity goals. SCE collects data regularly from existing data repositories throughout the organization (e.g., number of weather stations and HD cameras installed, circuit miles of covered conductor deployed) and displays the data as a heat map in the performance dashboard indicating implementation status as Complete, Ahead of Plan, On Track, At Risk, or Off Track. SCE SMEs assist with performing QC checks to validate the data. The performance dashboard is updated regularly and sent to SCE senior leadership for awareness and review. Items that are Off Track or trending negatively, are brought to the attention of senior management to discuss implementation risks, ways to improve performance, and/or plans to get back on schedule. The program targets, rationale for deviances and any corrective actions if needed undergo another round of review on a quarterly basis prior to reporting to the WSD.

SCE performs QC on 100% of its vegetation line clearing work in the highest risk-consequence zones. For the remaining zones, SCE samples at a confidence level/confidence interval/sample rate of 99/1/7%. SCE's QC process for its asset inspections is described further below.

SCE's Audit Services Department (ASD) assesses WMP implementation independent of the responsible operating unit. Audits are determined via a risk assessment informed by SCE's Board of Directors (Board), senior management and regulatory requirements. ASD also conducts risk-informed audits of SCE's electrical line and equipment inspection program to provide reasonable assurance that SCE facilities are being appropriately inspected and identified conditions are timely remediated according to applicable requirements. ASD includes field inspection reviews of structures inspected, a desktop review of inspection processes and procedures, and a review of inspections evaluated under Compliance and

Quality (C&Q) processes. ASD also assesses whether any potentially significant issues observed in the field are timely communicated to operations and appropriately remediated. ASD monitors corrective actions using industry standard auditing software in accordance with the International Standards for the Professional Practice of Internal Auditing.

The Board provides oversight for all aspects of SCE's business including safety, and Board committees have responsibility for oversight of specific areas. The Board's Safety and Operations Committee (Committee) is responsible primarily for safety oversight at SCE and links oversight of safety to SCE's operational practices. The Committee oversees SCE's safety performance, culture, goals, risks (including wildfire) and significant safety-related incidents involving employees, contractors, or members of the public. The Committee members take an active role in overseeing SCE's safety and operational practices, including oversight of SCE's WMP and SCE's safety and operational goals.

B. Identify any deficiencies in the plan or the plan's implementation and correct those deficiencies.

As discussed above, SCE has implemented robust oversight of wildfire mitigation activities. Mitigation activity owners and SCE Performance Management monitor leading and lagging metrics to measure progress, review any concerns raised, issues identified through Quality Assurance/Quality Control (QA/QC) processes and audits, and recommend appropriate corrective actions to the responsible organizations. The responsible organization for each mitigation activity is accountable for implementing these corrective actions. These organizations work with the Performance Management team to report progress and corrective actions to executive leadership.

In addition, SCE field crews (SCE & contract) executing work in HFRA are empowered to suggest improvement opportunities. Field crews and grid operations staff are closest to the work and play an instrumental role in implementing SCE's wildfire mitigation programs and ensuring that work is safely executed, data is captured correctly, concerns are reported, and work methods and analyses are continually improved. Key changes to wildfire mitigation activities in 2020 are discussed in the Lessons Learned Section 4.1 in this WMP.[48]

In 2020, the WSD identified various deficiencies in SCE's 2020 WMP submittal and issued a Remedial Compliance Plan and a Quarterly Report requiring SCE to cure the deficiencies. Those deficiencies, including SCE's response and WSD's actions to SCE's response are summarized in Section 4.6.

If scope changes to wildfire programs are identified in 2021, SCE will notify the WSD of the program changes via a Change Orders report.

C. Monitor and audit the effectiveness of inspections, including inspections performed by contractors, carried out under the plan and other applicable statutes and commission rules.

SCE's T&D organization unit has a C&Q group that develops Quality Control (QC) and Quality Assurance (QA) processes to help ensure that mitigation activities are proceeding as planned. C&Q performs testing

[48] Note this is in response to requirement 7.1.B regarding lessons learned.

and assessment of wildfire and non-wildfire activities to measure conformance and drive continuous improvement throughout the organization. In 2020, distribution line/equipment inspections were performed by both SCE employees and contractors. The quality reviews to monitor and check conformance of these programs include oversight of both SCE and contract employees. Section 7.3.4.14 QA/QC of Inspections further describes the monitoring and QA program for line/equipment inspections. As described in Section 7.3.4.14, this group performs field validations of inspections completed by SCE's Transmission and Distribution Business Unit (T&D) work crews under the WMP. SCE QC inspectors conduct the reviews by performing field inspections, essentially performing the same inspection activity, and comparing the results. For 2021 C&Q currently plans to perform QC inspections of completed inspections for approximately 5,000 transmission, distribution, and generation structures in HFRA. The QC inspection scope will be based on risk-stratified sampling to assess the accuracy of the overhead inspections. Program risk rankings are in the process of being updated for 2021. Changes to program risk rankings could impact sample sizes for QC activities going forward.

D. Ensure that across audits, initiatives, monitoring, and identifying deficiencies, the utility will report in a format that matches across WMPs, Quarterly Reports, Quarterly Advice Letters, and annual compliance assessment.

SCE's reports, compliance filings, audits, etc. follow the section numbering, naming conventions (by WMP section, major program and/or initiative), and unique Activity Identifiers in its WMP. Since its first WMP, in 2019, SCE created unique Activity Identifiers to highlight its wildfire mitigation initiatives and goals and to provide easy reference for compliance filings and reports. Consistency in the use of WMP Activity Identifiers (e.g., SH-1) from the WMP to the Quarterly Reports, data request responses, Change Orders Reports, Remedial Compliance Plans, and other compliance filings ensures SCE will report in formats consistently across all its wildfire-related submissions. SCE's Activity Identifiers are a key to consistent reporting especially given that every WMP since 2019 and including the 2021 WMP Update has had different requirements with different section numbers and headings. Every WMP provides opportunity to revisit planned activities, so it's natural for new activities to be added or activities to be removed as work is completed, re-evaluated or new efforts emerge. Changes of Activity Identifiers from WMP to WMP are documented in a mapping document (see Appendix 9.3). SCE also maintains consistency in how it reports its wildfire mitigation Activity goals using consistent units of measure from one year to the next. This enables easier assessment and comparison of SCE's progress for its wildfire initiatives that span multiple years. SCE follows WSD templates and guidance in regulatory reporting. SCE's format for quarterly reports have been adopted by the CPUC as a standard for all IOUs.

7.3 DETAILED WILDFIRE MITIGATION PROGRAMS

In this section, describe how the utility's specific programs and initiatives plan to execute the strategy set out in Section 7. The specific programs and initiatives are divided into 10 categories, with each providing a space for a narrative description of the utility's initiatives and a summary table for numeric input in the subsequent tables in this section. The initiatives are organized by the following categories provided in this section:

1. Risk assessment and mapping
2. Situational awareness and forecasting
3. Grid design and system hardening
4. Asset management and inspections
5. Vegetation management and inspections
6. Grid operations and protocols
7. Data governance
8. Resource allocation methodology
9. Emergency planning and preparedness
10. Stakeholder cooperation and community engagement

- **7.3.a. Financial data on mitigation initiatives, by category**

In the following sections (7.3.1 - 7.3.10) is a list of potential wildfire and PSPS mitigation activities which fit under the 10 categories listed above. While it is not necessary to have initiatives within all activities, all mitigation initiatives will fit into one or more of the activities listed below. Financial information—including actual / projected spend, spend per line miles treated, and risk-spend-efficiency for activity by HFTD tier (all regions, non-HFTD, HFTD tier 2, HFTD tier 3) for all HFTD tiers which the activity has been or plans to be applied—is reported in the attached file quarterly. Report any updates to the financial data in the spreadsheet attached in Table 12.

- **7.3.b. Detailed information on mitigation initiatives by category and activity**

Report detailed information for each initiative activity in which spending was above $0 over the course of the current WMP cycle (2020-2022).

7.3.1 Risk assessment and mapping

SCE's wildfire risk models have advanced significantly over the past three years. Detailed descriptions of these models can be found in Chapter 4.

7.3.1.1 Risk Assessment and Mapping Initiatives

In 2020, SCE's risk assessment and mapping initiative (RA-1) focused on the development of Technosylva's improved wildfire consequence modeling and the implementation of the geospatial viewer tool. This was achieved, giving SCE the capability to analyze and visualize wildfire risk. In the following narrative, SCE combines the three WSD initiatives[49] under the Risk Assessment and Mapping section:

- **Initiative 7.3.1.1:** A summarized risk map showing the overall ignition probability and estimated wildfire consequence along electric lines and equipment
- **Initiative 7.3.1.3**: Ignition probability mapping showing the POI along the electric lines and equipment
- **Initiative 7.3.1.5**: Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment

The figures below provide illustrative outputs showing ignition probability (Figure SCE 7-1), a summarized risk map combining wildfire consequence and POI (Figure SCE 7-2), and individual consequence simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment (Figure SCE 7-3). Figures SCE 7-2 and SCE 7-3 are outputs of SCE's WRRM. These outputs correspond with the WSD initiatives identified above and demonstrate some of the capabilities of the geospatial viewer tool.

[49] Directed by the WSD's revised 2021 WMP Guidelines Template issued on January 22, 2021, SCE has omitted the initiative 7.3.1.6 "Weather-Driven Risk Map and Modelling Based on Various Relevant Weather Scenarios" from its 2021 WMP Update.

Figure SCE 7-1
Illustrative Wildfire Risk Map along Distribution Lines - Ignition Probability

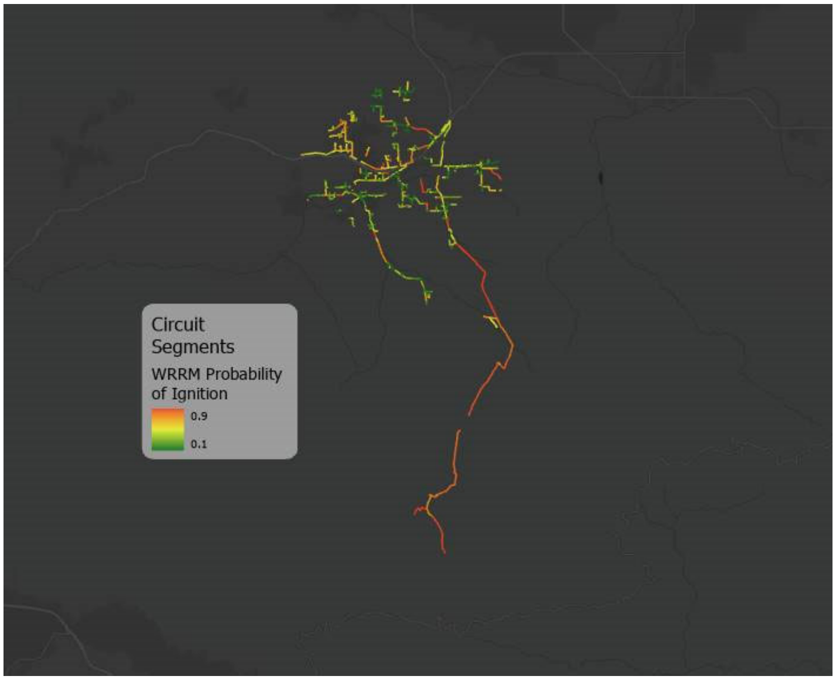
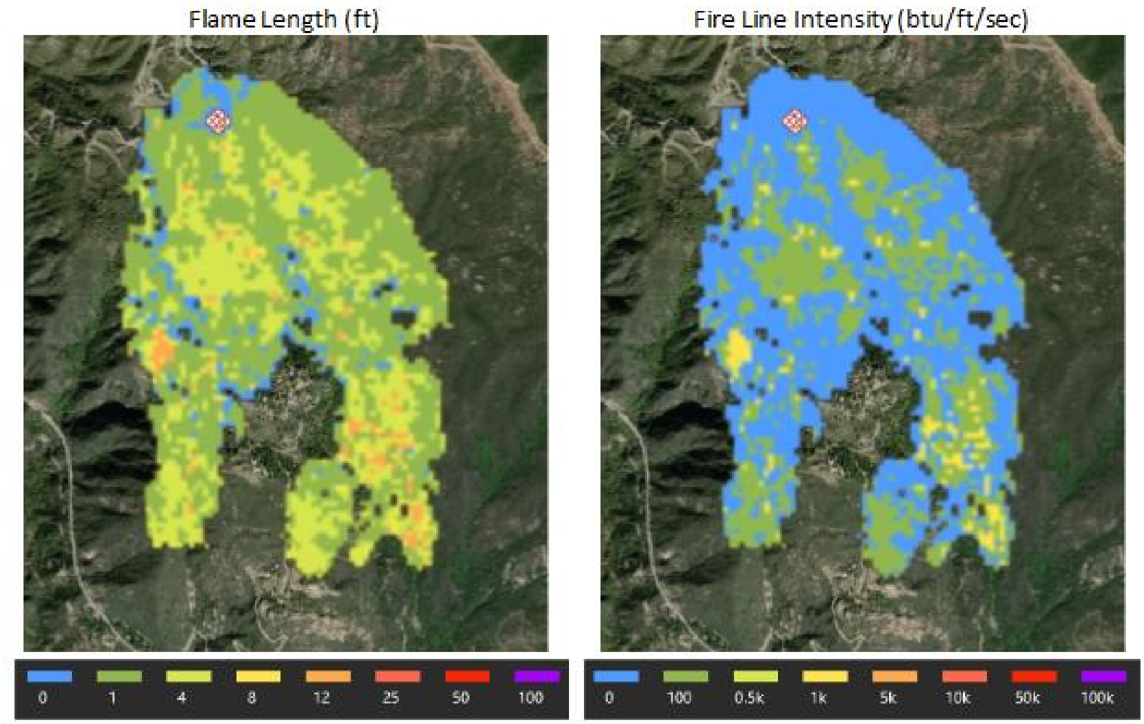


Figure SCE 7-2
Illustrative Wildfire Risk Map from WRRM along Distribution Lines (Consequence and Probability of Ignition)

Figure SCE 7-3
Illustrative example of an individual consequence simulation



As discussed in Section 4.3.3, the WRRM provides advanced wildfire modeling capabilities that quantifies risk through: (1) the integration of historical weather data, topography, and ground fuels; (2) the location of SCE overhead assets; and (3) the potential for fire propagation and impact to population and building structures. As the WRRM is now implemented, SCE will no longer list RA-1 as a WMP Activity.

1. Risk to be mitigated / problem to be addressed:
Prior to 2019, SCE did not have a comprehensive risk quantification model to allow for both portfolio and program level prioritization and analysis of wildfire risk. The development of this model would be foundational to SCE establishing a robust risk reduction capability.

2. Initiative selection:
This initiative developed modeling capabilities that indirectly reduce risk. With the enhanced modeling capability in WRRM including location- and asset-specific wildfire risk quantifications, this initiative enhanced SCE's ability to prioritize and target deployment of wildfire mitigations, thus accelerating the reduction of wildfire risks. Because these mapping and risk modeling simulations do not themselves directly reduce wildfire or PSPS risk, SCE did not calculate an RSE score for them. The risk reduction benefits of this initiative are captured in the respective mitigations that are deployed as a result of these tools.

3. Region prioritization:

The WRRM is used to determine the wildfire risk score (probability and consequence) of an asset or group of assets to identify and prioritize the deployment of mitigation alternatives.

4. Progress on initiative (amount spent[50], regions covered) and plans for next year:
SCE's 2020 WMP Goal for this activity (RA-1) was to implement Technosylva consequence values and a geospatial viewer. This goal was achieved. For more details about the WRRM implementation and timeline, see SCE's response to recurring deficiency SCE-5 in its Second Quarterly Report submitted on December 9, 2020 and Section 4.3. In 2021, SCE will continue to expand its risk modeling capabilities by identifying new features contributing to ignition events discovered through engineering root cause analysis, field observations, and subject matter expertise. The consequence model will also be refreshed in the first quarter to reflect changes to the territory vegetation profile and 2020 fire scars. Additionally, the model's algorithms for POI will be further refined as 2020 data is added to validate the model's accuracy. SCE will also seek to add additional improvements to the WRRM model on both the POI and consequence side.

5. Future improvements to initiative:
Moving beyond 2021, SCE will focus efforts on the automation of the WRRM. Today, each refresh of the WRRM components occurs only after significant changes or additional variables are discovered which had typically resulted in two or three major updates per year. For example, the conductor sub-model within the EFF element of the wildfire component was refreshed two times in 2019 and three times in 2020. The process is manual and requires significant effort by SCE's data science team. Over the coming years, each of the data inputs to the model will be evaluated for automation capabilities and methods and tools will be implemented to allow for near real-time updating.

7.3.1.2 Climate-driven risk map and modelling based on various relevant weather scenarios
SCE used historical climatology in its WRRM model and intends to evaluate the capability to develop forward-looking climate scenarios to inform SCE's wildfire mitigation strategies and programs.

1. Risk to be mitigated / problem to be addressed:
Climate change is a primary driver of a range of underlying factors that affect wildfire initiation, spread, and intensity and, in turn, wildfire consequences. Climate projections by Westerling (2018)[51] point to a future defined by intensifying and, at times, expanding areas of elevated wildfire risk, that are strongly driven by changes to underlying climate conditions. Other research, notably by Williams et al. (2019),[52] further strengthens the primary link between climate change and wildfire activity in California.

2. Initiative selection:

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[50] *See* Table 12 for amount spent and forecasted for all initiatives in Sections 7.3.1 to 7.3.10.

[51] Westerling, Anthony Leroy. (University of California, Merced). 2018. Wildfire Simulations for California's Fourth Climate Change Assessment: Projecting Changes in Extreme Wildfire Events with a Warming Climate. California's Fourth Climate Change Assessment, California Energy Commission. Publication Number: CCCA4-CEC-2018- 014.

[52] Williams, A. P., Abatzoglou, J. T., Gershunov, A., Guzman-Morales, J., Bishop, D. A., Balch, J. K., & Lettenmaier, D. P. (2019). Observed impacts of anthropoenic climate change on wildfire in California. Earth's Future, 7, 892–910. https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2019EF001210

To account for a wide range of historical weather scenarios, SCE uses 41 weather scenarios across a 20-year historical climatology in the consequence component of its WRRM. By using a wide range of models, SCE can determine the relative risk of wildfire consequence for each location under the maximum likely weather conditions, based on a historic climatology for any given location. The result is a relative ranking of locations by ignition consequence across SCE's service HFRA. Because this mapping and modeling does not itself directly reduce wildfire or PSPS risk, SCE did not calculate an RSE score. The risk reduction benefits of this initiative are captured in the respective mitigations that are deployed as a result of these tools.

3. Region prioritization:
The weather scenarios used for the WRRM apply to SCE's entire HFRA with a 20-mile buffer.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE used 41 weather scenarios across a 20-year historical climatology in its WRRM consequence model. In 2021-22, SCE plans to integrate additional weather scenarios to increase the range and magnitude of possible wildfire related outcomes.

5. Future improvements to initiative:
In addition to leveraging a historical climatology, SCE intends to evaluate the capability to develop forward-looking climate scenarios to inform SCE's wildfire mitigation strategies and programs.

7.3.1.4 Initiative mapping and estimation of wildfire and PSPS risk-reduction impact
SCE is estimating the reduction in PSPS risk.

1. Risk to be mitigated / problem to be addressed:
The WSD defines PSPS Risk as "[t]he potential for the occurrence of a PSPS event expressed in terms of a combination of various outcomes of the event and their associated probabilities." [53] While PSPS is an effective fire-ignition mitigation measure, it also introduces other potential risks to safety and reliability. Prior to 2020, SCE did not have a robust method to calculate the risk and risk reduction achieved at the asset level.

2. Initiative selection:
As described in Chapter 4, it is now possible to quantify the PSPS risk through the WRRM. The WRRM is used to determine the wildfire risk score (probability and consequence) of an asset or group of assets to identify and prioritize the deployment of mitigation alternatives. SCE estimates the wildfire risk reduction of its deployed mitigations using the WRRM. The WRRM is capable of quantifying the risk reductions, based on the result of a deployed or planned mitigation. For example, replacing a segment of bare conductor with covered conductor will result in a decrease in the POI of the segment, since there is a lower probability that the new conductor will fail or that vegetation or animal contact will result in a spark.

[53] *See* the WSD's 2021 WMP Guidelines Template, Glossary of Defined Terms "PSPS Risk."

This calculation is performed at the individual asset level for all assets in the WRRM. It also serves as the basis for calculating the risk reduction potential, which can help SCE prioritize the deployment of mitigations or determine the risk reduction realized after execution of the mitigation. Similarly, the WRRM is capable of quantifying the PSPS risk associated with each segment of conductor based on the backcasting using historical weather data and SCE's current PSPS operation protocols. For example, when an isolable segment is fully covered with covered conductor, the wind/gust thresholds on that segment will increase compared to today's wind/gust thresholds, hence reducing the PSPS frequency and PSPS risks associated with those conductor segments. Because this mapping and modeling does not itself directly reduce wildfire nor PSPS risk, SCE did not calculate an RSE score.

3. Region prioritization:
Within HFRA, SCE uses the WRRM (where possible) to identify specific assets and segments for wildfire and PSPS mitigations and for calculating RSE values for portfolio planning.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE's 2020 WMP goal for this activity (RA-1) was to implement Technosylva consequence values and geospatial viewer. This goal was achieved. For more details about the WRRM implementation and timeline, see SCE's response to recurring deficiency SCE-5 in its Second Quarterly Report submitted on December 9, 2020 and Section 4.3.

In 2021, SCE will continue to expand its risk modeling capabilities by identifying new features contributing to ignition events discovered through engineering root cause analysis, field observations, and subject matter expertise. The consequence model will also be refreshed in the first quarter to reflect changes to the territory vegetation profile and 2020 fire scars. Additionally, the model algorithms for POI will be further tuned as 2020 data is uploaded to test for accuracy.

5. Future improvements to initiative:
The future improvements are the same as those anticipated for the WRRM. Please see SCE's response in "5. Future improvements to Initiative" in Section 7.3.1.1. above.

7.3.2 Situational Awareness and Forecasting

Report detailed information for each initiative activity in which spending was above $0 over the course of the current WMP cycle (2020-2022).

7.3.2.1 Advanced weather monitoring and weather stations (Weather Stations SA-1)

Weather stations are used to provide critical situational awareness for PSPS decision-making and help improve weather models.

1. Risk to be mitigated / problem to be addressed:

Due to the large size and diverse topography of SCE's service area in HFRA, weather conditions can be significantly different from location to location at any given time. For example, Southern California's mountains have rapid elevation changes and differing canyon orientations, which create localized weather zones. SCE needs to monitor and analyze weather data at a granular level across over 1,500 circuits in HFRA to inform critical operational decisions such as deploying PSPS protocols, during elevated weather conditions. IMT personnel rely on real-time weather data from weather stations to inform initiation of PSPS events, customer notifications, and de-energization decisions for SCE circuits and circuit segments.

2. Initiative selection:

To improve the resolution of existing weather models and access more granular real-time information during wildfire risk conditions, SCE increased the number of weather stations across distribution and transmission circuits in its HFRA. A higher density of weather stations on SCE distribution circuits allows SCE to validate real-time conditions in the field during elevated fire-weather conditions. Adding weather stations to transmission circuits will also help improve the visibility of the service area for PSPS decision-making for transmission and sub-transmission lines that currently often rely on distribution-sited weather stations for situational awareness. More stations also add more expansive and increasingly granular data that supports improved weather forecasting capabilities at the circuit and sub-circuit level that, in turn, improves the accuracy and precision of PSPS activations, de-energization and re-energization decisions. To support weather modeling, SCE also maintains the current network of 166 HD cameras installed on its system. Finally, by installing weather stations on specific segments of circuits, SCE can sectionalize circuits and reduce the scope of PSPS events.

Currently, SCE has over 1,050 weather stations deployed across its HFRA, primarily on the distribution system with 11 weather stations currently installed on the transmission and sub-transmission system. When the activity was initiated in 2018, SCE originally had a goal to install 850 weather stations, based on benchmarking efforts with other California IOUs. SCE used industry equipment standards and placement technique to capture the wind profiles of its circuits, siting two stations per circuit to account for variations in terrain, based on practices used by SDG&E's weather program (which had been established just over seven years prior). The original target was also based on the number of known high fire risk circuits within SCE's HFRA at the time. In 2018, SCE was limited to the use of cellular connection, which constrained the range, placement and number of stations that can be placed on a circuit. In 2019, a satellite communication system was developed that allowed for more range and placement of stations on circuits with limited cell connection. This helped increase the areas in which SCE could place stations in HFRA.

Additionally, the 2019 fire season demonstrated the need for additional weather stations. SCE is currently in the process of studying how to better account for factors such as spatial gaps in the data that, if addressed, may lead to improved situational awareness and weather modeling (known as the Weather Station to Circuit Mapping Project, described further below). In addition, as SCE works to sectionalize circuits, additional weather stations along those circuit segments will allow SCE to limit the number of impacted customers.

SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, weather stations enable more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect the benefits of having weather stations.

3. Region prioritization:

SCE prioritizes weather station installations on HFRA circuits that are most likely to breach PSPS wind criteria. All distribution circuits that have met or exceeded PSPS wind criteria in the past five years now have a weather station installed. In addition, SCE may prioritize segments of high-frequency PSPS circuits that are subject to increased fire danger conditions to enhance SCE's ability to segment and isolate the specific portion of the circuit during a PSPS. Finally, SCE may prioritize installations in areas of low visibility as identified by the IMT during PSPS activations and in accordance with SCE's response to Action SCE-14. Additional considerations for weather station placement may result from its Weather Station to Circuit Mapping Project described below.

In late 2020, SCE began implementing its Weather Station to Circuit Mapping Project for all HFRA circuits to identify the optimal locations for its weather stations. The project involves conducting a statistical proximity analysis for the correlation between observed and forecasted sustained windspeed and wind gusts, number of times circuits have reached PSPS criteria in the past, and ability to sectionalize. Each station is ranked by circuit according to the statistical analysis results. The information will be used to determine where spatial gaps in observations may exist in areas where strong winds historically have occurred. Placement of weather stations along the circuits depends on several factors that include, but are not limited, to the following:

- Location is in a wind prone area (SCE prioritizes those circuits in wind-prone locations where the potential consequences of a catastrophic fire are high)
- Location is easily accessible to maintenance crews
- Location has a clear view of the southern horizon for solar power recharge purposes
- Location is free from major obstructions such as trees and buildings

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020, SCE deployed 575 weather stations, primarily focused on circuits that have met or exceeded PSPS wind criteria for these deployments. Although SCE surpassed its original WMP goal of 375 in 2020, SCE is prioritizing stabilization of its existing network of stations, prior to expanding its real-time weather monitoring and analysis capability. Thus, SCE will be deploying 375 to 475 additional weather stations in both 2021 and 2022 along distribution, transmission and sub-transmission circuits. These targets may be modified, however, based on the results of the Weather Station to Circuit Mapping report and the outcome of the existing network stabilization.

At the beginning of 2021, SCE will develop a report showing which weather stations are most representative of specific circuits. The reports' findings will help inform how to prioritize and strategically place the next group of weather stations in 2021.

5. Future improvements to initiative:

SCE is working to expand its proximity analysis to sub-transmission and bulk transmission circuits to determine where weather stations should be installed. Later this year and in 2022, SCE will be using weather station data to help build machine learning models for better forecasts at these specific locations. The siting strategy may change based on circuit sectionalization.

As part of SCE's expedited grid hardening effort explained in the PSPS Action Plan, SCE plans to install new weather stations on some of the frequently impacted circuits[54].

7.3.2.2 Continuous monitoring sensors (Distribution Fault Anticipation SA-9)

DFA technology incorporates electrical system measurements to alert on the potential for pending equipment failures by continually monitoring circuits to detect, assist with locating and categorizing electrical events such as incipient and traditional faults.

1. Risk to be mitigated / problem to be addressed:

Faults are the primary source of utility-caused ignitions. One way to prevent faults to fix them before they occur (i.e., incipient faults). In addition, SCE estimates that it experiences around 650 annual outages across the HFRA circuits where conventional circuit patrols were unable to detect the cause or the location of the fault event. For example, circuit patrols may find it difficult to detect where a momentary fault from wind-blown conductors may result in minimal damage. This type of fault may repeat itself in the future, potentially resulting in a more damaging event. Similarly, distribution capacitor banks are devices on the distribution system that have the potential to produce large reactive power imbalances; however, it is difficult to detect potential problems with these devices. In such cases the damage cannot be immediately repaired nor the conditions that caused the event rapidly mitigated, leading to arcing or equipment failure, which in turn can become ignition sources of wildfires.

2. Initiative selection:

DFA helps SCE to detect events early, by utilizing intelligent electronic devices that monitor electrical system measurements to recognize current and voltage signatures indicative of potential incipient failures. This capability supports timely completion of remedial actions to avoid faults and potentially reduce ignition incidents. Due to its ability to remotely access and retain data for grid events, DFA also enables SCE to collect and analyze large amounts of fault data for potential repairs and/or mitigations.

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[54] To support the Expedited Grid Hardening corrective action (SCE PSPS Action Plan), SCE identified a list of circuits frequently impacted by PSPS. These 72 circuits experienced at least 4 de-energizations from the start of 2019 through SCE's most recent PSPS event in January 2021.

Finally, DFA technology allows SCE to closely monitor the operation of its distribution capacitor banks, providing alerts when issues are detected. As an example, a correlation of SCE historical CPUC reportable ignitions dating back to 2014 with capacitor banks was recently identified to be caused by catastrophic capacitor switch failures. This correlation continues to be evaluated, though preliminary information suggests DFA to be effective at timely detection of incipient arcing conditions.

SCE applied DFA technology to 60 circuits which traverse HFRA as pilot implementations in 2019 and 2020. The pilot program helped to understand the costs and complexities of DFA adoption, as well as verify the lack of appreciable false grid event detections. SCE used data from this pilot, along with data from other utilities that have implemented DFA, to estimate an RSE for DFA. SCE determined that DFA has a relatively high RSE. SCE notes, however, that the RSE calculations are based on low volumes to date and recent deployment. Accordingly, as the technology is implemented more widely and more data is gathered, the RSE calculation will be re-evaluated. SCE will expand installations beyond the small-scale deployment to cover a larger circuit base to aid in avoiding faults and ignitions. DFA is one of the few commercial systems available to provide capabilities to detect pre-fault conditions prior to system failures and providing fault or other event data for assessments.

The alternative is that much of the data regarding faults is manually retrieved by SCE personnel visiting substations and other relay sites, which is both more costly and time intensive, since SCE would have to send a person to manually retrieve the data without automation. Data that is collected through DFA technology requires far less manpower than conventional methods and provides for early detection to enable timely remediation. Further, circuit patrols, without the assistance of DFA, may miss the slight damage that results from temporary faults. EFD is currently being piloted and SCE is evaluating the complementary and duplicate features of these technologies. For more on EFD, see Section 7.1.D.

For more justification on SCE's planned utilization of DFA, please see SCE's response to Critical Issue SCE-02 in Section 9.9.

3. *Region prioritization:*

SCE prioritized distribution lines in HFRA for this activity, which were selected based on circuits with an increased number of momentary and sustained outages (activity), number of HFRA circuits within a substation, percentage of overhead circuit miles, and available rack equipment space.

4. *Progress on initiative (amount spent, regions covered) and plans for next year:*

In 2020, SCE monitored and evaluated reported events for the initial 60 units that were installed in 2019 and early 2020. In 2021, SCE plans to install 150 additional units in HFRA areas and continue monitoring the 60 installed unit base. The progress made in installing an additional 150 units in 2021 will help SCE further realize and evaluate the benefits of DFA, and make progress towards greater coverage of SCE HFRA

5. *Future improvements to initiative:*

SCE is working with the vendor to further develop current and voltage signatures to enable more automation and to enhance SCE's ability to identify significant events. The integrated use of other systems such as smart meters, remote monitored intelligent electronic devices (IEDs), and power system analysis modeling software is expected further improve benefits from the remote data provided by DFA. DFA also provides data collection capabilities that can be integrated into ignition investigations improving opportunities to learn from both close calls and actual events. The 2021 installation plans across the greater HFRA circuit coverage will help realize these benefits with operating DFA systems.

7.3.2.3 Fault indicators for detecting faults on electric lines and equipment

Fault indicators are included in SCE's standards and continue to be installed on new and existing circuitry. Installation targets and specific efforts for fault indicators are not a part of this WMP update as a specific wildfire mitigation activity.

1. Risk to be mitigated / problem to be addressed:

Restoration of load with the use of sectionalizing devices following a fault event generally occurs in a sequence of steps of opening and closing devices with an end result of minimizing the section that remains de-energized. As part of the electric service restoration process patrols, SCE also looks for causes of the fault or electric service interruption. Fault indicators can aid in providing initial indication to circuitry sections where the cause can be located. Outside of high fire conditions, this information can aid in faster electric service restoration.

2. Initiative selection:

Fault indicators generally activate based on elevated fault currents, which aid in electric service reliability by providing information on the fault locations and thus provide intelligence on grid operations. SCE has two general versions of fault indicator that can be differentiated based on whether they provide indication remotely to system operators through the Distribution Management System (DMS).

An RSE was not developed and no alternatives were identified for this initiative, because fault indicators are installed and used as part of SCE's standard grid operations and are not specifically deployed for wildfire mitigation purposes.

3. Region prioritization:

Fault indicators are common equipment in SCE's standard circuit design and thus their installations are not prioritized by high fire region.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020, SCE continued to apply accepted industry available technologies for both local and remote fault indicators in alignment with SCE standards. SCE records show a total of 1,566 installations for fault indicators of which 395 were applied in HFRA. SCE plans to continue with the same approaches 2021 and 2022.

5. Future improvements to initiative:

SCE is leveraging the advances in fault indicator technology to provide better intelligence of its grid operations, such as modifications to practices for automatic circuit reclosing and circuit patrolling activities. Further, as the technology advances and projects such as the Rapid Earth Fault Current Limiter (REFCL) change the benefits associated with the application of such technologies, SCE is evaluating how to optimize these benefits for customer electric service reliability and detection of incipient faults.

7.3.2.4 Forecast of a fire risk index, fire potential index, or similar

7.3.2.4.1 Fire Potential Index (FPI) (SA-2)

SCE is improving the accuracy of its FPI through the integration of historical weather and vegetation data for more precise PSPS decision-making.

1. Risk to be mitigated / problem to be addressed:

SCE's current FPI is a direct input into PSPS calculations and provides an estimate of the potential risk of fire ignition and spread at the circuit level. To enable more targeted PSPS decision-making that has the potential to reduce the number of customers impacted by a PSPS, the FPI needs be first calibrated to better understand the index output in the context of historic fire activity. The FPI can then be enhanced to develop more accurate estimates of the potential risk of fire ignition and spread at the circuit level, including at the transmission and sub-transmission circuit level.

2. Initiative selection:

SCE will implement its FPI improvements into two phases. In the first phase, SCE focused on the calibration of the FPI to contextualize the index with respect to historic fire activity, by correlating each discrete value of the index output (i.e., historical FPI values) with certain levels of previous fire activity (i.e., fire sizes). These calibrations allow for a potential recommendation to be made to PSPS activation FPI thresholds and will help to document what the index output values mean in terms of potential fire activity.

In the second phase, SCE will formulate a new FPI 2.0, which will put more emphasis on wind speeds and a new fuels component that accounts for the diversity of fuel conditions across the SCE's service area such as fuel type. FPI 2.0 will capture more detailed environmental conditions than the current FPI and will provide a more accurate representation of fire potential across the SCE service area.

Finally, SCE has worked to calculate the maximum FPI along virtual segments of its transmission and sub-transmission circuits. This helps to reduce the number of instances that FPI is underestimated along these circuits and allows SCE to deploy pre-patrols and LFOs more efficiently to only those segments that are expected to meet or exceed PSPS activation criteria.

SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, FPI improvement enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect the benefits of FPI improvement.

3. Region prioritization:

All FPI-related projects will be developed for all of SCE's service area. Within HFRA, SCE is calculating an FPI for each of its circuits.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE provides in the following descriptions of progress to date on each of its efforts related to FPI:

- FPI Calibration: In 2020, SCE completed its FPI Calibration so that the index output (with numbers ranging from 1-17) would have meaning and context with respect to historic fire occurrence data. The term "calibrate" simply refers to this process and the subsequent output shows that each FPI index value is associated with a certain amount/type of fire activity. While an initial calibration was performed using historical data from 2001 to 2017, a more in-depth calibration will be performed in 2021 as more historic data becomes available.

- FPI 2.0 Development, Testing (Backcasting) and Evaluation: FPI 2.0 will incorporate inputs capturing more detail and nuance than the current FPI in assessing where large fires may occur. To determine the performance and ability of FPI 2.0 to accurately describe fire potential across the SCE service area, in 2020 SCE began an extensive development and testing phase to calculate FPI 2.0 over a 40-year period, back to 1980 (i.e., backcasting). In 2021, SCE will rigorously evaluate the new FPI, by running FPI 2.0 in parallel with the current FPI to demonstrate the difference and improvements over the current index. By mid-2021, SCE will have FPI 2.0 calculated for each Fire Climate Zone (and potentially each circuit) back to 1980 and operationalized to produce daily circuit-level output. If FPI 2.0 demonstrates a significant improvement over the current FPI, SCE expects that FPI 2.0 will replace the current FPI before the start of the 2022 fire season and the 2022 WMP Update.

- Transmission & Sub-Transmission FPI: In 2020, SCE began to develop a more realistic assessment of the fire potential along its sub-transmission and bulk transmission circuits. By dividing the circuits into relatively small virtual segments for which the maximum FPI could be calculated, SCE was able to produce operational products twice a day to show which circuit segments are forecasted to reach or exceed PSPS criteria within the next five days. In 2021, SCE's activities will include backcasting of FPI along these virtual segments for a select number of weather events to show the levels of improvement in this approach compared with previous methods.

- Data Manager by Atmospheric Data Solutions (ADS): An offsite data platform will be developed in 2021 to house and manage SCE's 40-year historical dataset of weather and fuels. This will allow the data retrieval process to be quick and efficient using a graphical interface that will be able to quickly query the data. Users will be able to extract only the data necessary for analysis without having to apply additional filtering processes to further distill the requested subset of data. This will increase the performance of data analysis as users will be able to interact with SCE's historical data set quickly and efficiently to retrieve only the data this is needed for analysis. As the reliance on this data set increases over time, having the Data Manager Platform will provide SCE with quick and easy access to over 2.7 trillion data points.

5. Future improvements to initiative: Since the FPI is a derived calculation based on output values from SCE's in-house weather and fuels modeling, any improvements to SCE's modeling efforts will result in a better assessment of fire potential across the service area.

7.3.2.4.2 Fuel Sampling (SA-5)

SCE takes semi real-time measurements of vegetation moisture for 15 sites across its service area.

1. Risk to be mitigated / problem to be addressed:

SCE decisions to de-energize consider information about the areas that are impacted by wildfire risk, such as fuel conditions. Although models can be used to estimate fuel dryness, results from fuels sampling can be used to assess vegetation dryness in near real-time, help train models, and serve as an input for fire spread and fire potential calculations.

2. Initiative selection:

While local fire agencies conduct fuel sampling, SCE determined it would be beneficial to sample in areas where major gaps exist both spatially and temporally. Fuels sampling consists of going out into the field and physically collecting small portions of the native vegetation which is then brought to a lab to be weighed, dried, and then weighed again to determine the vegetation's moisture content. SCE makes certain that the fuels sampling program is properly managed and there is little interruption of data, by checking that all samples are collected and analyzed properly and on time and resolving problems that may arise at any of the sites with the vendor as quickly as possible. This helps to ensure that the fuel sampling data is high-quality and will result in better model solutions and outputs.

This activity helps SCE target the areas that have the greatest fire potential and allows for more informed PSPS decision-making. SCE uses the data from its fuel sampling to develop and train machine learning models to approximate live fuel moisture, which serves as one of the inputs into the FPI. SCE also uses the data to calibrate FPI (increasing the precision of PSPS decision-making) and to adjust inputs for fire spread calculations (improving the accuracy of fire consequence modeling).

SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.

3. Region prioritization:

The 15 fuel sampling sites in SCE’s HFRA were selected by determining where spatial gaps in data sampling currently exist. Once these areas were identified, specific sites were selected based on SCE’s right-of-way access, proximity to major roads, and the amount, type, and health of the vegetation at each location.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020, SCE performed updated fuel sampling at the sites once every two weeks (weather permitting). SCE also used the sample data to train develop its machine learning models to approximate live fuel moisture, calibrate its FPI and adjust inputs for fire spread calculations.

In 2021 and 2022, SCE intends to continue sampling moisture levels within the live vegetation at all 15 locations through its Fuels Sampling Program. SCE will need to conduct a detailed evaluation to determine if the program could expand to cover other areas of SCE’s service area within HFRA where observation gaps may still exist and will work with the fuels sampling vendor to determine the location of potential additional sampling sites.

5. Future improvements to initiative:
SCE will be striving to make the process more efficient over time and potentially adding more sampling sites where gaps are identified.

7.3.2.4.3 Remote Sensing (SA-7)

SCE is implementing remote sensing technology to collect additional information on weather, fuels, and fire activity to enhance SCE's wildfire modeling capabilities.

1. Risk to be mitigated / problem to be addressed:
SCE is continually looking for ways to bolster its situational awareness in remote areas, including, among other factors, improvement of SCE's ability to monitor the health of its environment, estimate the risk to its system, and make informed decisions about potential PSPS de-energizations.

2. Initiative selection:
SCE is implementing remote sensing technology using satellite imagery to collect additional information on weather, fuels, and fire activity in order to enhance SCE's overall risk modeling and situational awareness capabilities. Remote sensing, using LiDAR technology, will be leveraged for a pilot project to obtain additional data points above ground level to support de-energization decisions. Where circuit level windspeeds are difficult to predict due to complex terrain, monitoring wind speeds above these circuits will provide insight into the behavior of the wind and the potential for stronger winds to surface down to the circuit level. Also, this data could be extremely useful for improving model predictability in areas where challenges in accuracy exist.

Also, SCE will use remote sensing technology to assist with early wildfire detection to enable faster fire agency response time. Finally, remote sensing will be used to assist SCE with restoration efforts in areas affected by fires/natural events, by enabling SCE's ability to monitor the health of the environment. In assessing how circuits have performed against models in the past, SCE determined that additional remote sensing technology would be useful to improve its modeling capabilities.

SCE develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.

3. Region prioritization:
Remote sensing technology will be used across all of SCE's service area, although deployment will be prioritized in HFRA due to elevated fire risk.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE initiated the procurement process for remote sensing technology in 2020. Beginning in 2021 through 2022, SCE will implement a lower atmospheric wind profiler pilot project in connection with San Jose State University (SJSU). The pilot will profile winds in the lower atmosphere using LiDAR technology to collect wind observations above ground level, using multiple deployments of SJSU's LiDAR system to sample wind speeds at specific locations on demand. This will provide SCE with the ability to measure winds above the

ground at high frequency intervals during PSPS events, contributing to greater situational awareness. In addition, SCE will work with Earth Lab in association with the University of Colorado at Boulder to scope out several projects regarding vegetation regrowth and vegetation susceptibility to fire, including two remote sensing projects. These projects will provide SCE with the ability to see changes in the service area on a quarterly basis, by processing frequently updated imagery into vegetation indexes specifically designed for SCE service area to monitor the health of the environment, which assists with restoration efforts in areas affected by fires/natural events.

5. Future improvements to initiative:
SCE will analyze the new data collected from the pilot work with SJSU and the work with the University of Colorado at Boulder in 2021 to scope out additional remote sensing projects, which may, subject to further evaluation, include the development of the Fuels Regrowth Model and the Fuels Potential Model, described further below.

- Fuels Regrowth Model*:* A vendor would produce a map at a semi-annual cadence and at 1-km resolution or less, showing the probabilistic time before vegetation will return to its pre-fire state. This product will approximate the time it will take for a fire of similar size, spread rate, and burn intensity to occur across an area that has burned previously. This effort will help SCE prioritize strategic work activities (i.e. grid hardening, vegetation management, etc.) based on information about how long it will take before fuels conditions in an affected area reappear.

- Fuels Potential Model*:* A vendor would produce a map at a bi-monthly cadence and at 1-km resolution or less, of the approximate areas where the dynamic combustibility of fuels is greatest, by considering the summation of vegetation moisture, type, and amount as well as taking into account the long-term climatological affects upon the vegetation. This product will allow for an objective, quantifiable process to inform where and when to perform inspections and if any potential remediations should be accelerated.

7.3.2.4.4 Fire Science Enhancements (SA-8)
SCE's fire science enhancements[55] improve SCE's ability to estimate various outputs, including the number of PSPS events and the number of circuits that may be in scope for PSPS events.

1. Risk to be mitigated / problem to be addressed:
Upgrading the ability to contextualize current weather information will enhance the interpretation of weather conditions and development of models to estimate weather impacts, improving SCE's ability to make informed real-timed decisions for PSPS events. decisions for PSPS events.

2. Initiative selection:

[55] The Weather and Fuels Climatology project, along with other projects, contributes towards enhancing SCE's fire science capabilities.

SCE's Weather and Fuels Climatology project aims to provide historical context for current weather events, by developing a climatology of temperature, wind, humidity, vegetation moisture, and many other parameters at each grid cell across the SCE service area, based on access to an unprecedented and unique 40-year historical data set of weather and fuels. The data set was created using SCE's in-house Weather Research and Forecasting model to approximate the initial state of the atmosphere in the past, back to 1980. This historical database provides the information necessary to develop predictive models that will improve the overall understanding of environmental factors (weather and fuels) and their relationship with ignition drivers for utility-caused wildfires. SCE will then use these models to inform wildfire mitigation activities and real-time decision-making for PSPS events.

SCE did not develop an estimate the RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.

3. Region prioritization:
Weather and Fuels Climatology projects will include data sets that span the entire SCE service area.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE used historical data to help refine PSPS forecasts, by determining how many and which circuits met PSPS activation criteria in both windspeed and FPI. By the 2nd quarter of 2021, SCE will create a climatology of various weather and fuel parameters for each grid cell in the 2-km weather model domain.

5. Future improvements to initiative:

SCE will leverage its 40-year historical weather data set to help with future development and improvement of AI (Machine Learning) models to forecast winds, temperatures, etc. at specific locations across SCE's service area.

7.3.2.5 Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions
SCE trains and deploys personnel to perform line patrols and LFOs, providing critical situational awareness during elevated fire risk conditions to inform PSPS decision-making.

1. Risk to be mitigated / problem to be addressed:
When elevated fire risk conditions are identified in specific areas of SCE's service area, real-time information about the impacted areas can help determine the need for various just-in-time wildfire mitigations efforts, such as PSPS, vegetation remediation and infrastructure repairs. In-person observations may help to identify flying debris, wire slap and other hazardous conditions that may be present at the impacted area. Prior to re-energization, in-person observations may also help to identify whether lines are clear of potential hazards. Without these observations, SCE would miss some valuable inputs, compromising its ability to make informed decisions about potential PSPS de-energizations and re-energizations.

2. Initiative selection:

Line patrols and live field observations (monitoring) provide critical sources of situational awareness that allow for the execution of SCE's PSPS protocols before and during a PSPS event, and after weather conditions have abated. Before an event, line patrols are carried out by qualified personnel (e.g., troublemen, senior patrolmen, etc.) to examine SCE assets for any potential concerns that may be exacerbated by the upcoming wind event. During an event, qualified personnel can be deployed to high-risk portions of the grid to take live wind readings and to watch for other inclement hazards (e.g., airborne debris). These live field observations are performed to provide real-time data back to SCE's Emergency Operations Center. After concerning weather conditions have abated, SCE must dispatch qualified personnel again to perform restoration patrols on all circuits that experienced a PSPS de-energization to ensure that re-energization is very unlikely to cause a spark or ignition and is safe for service restoration.

These protocols are imperative to SCE's decision making and will continue to be a part of SCE's WMP for the foreseeable future. Even with expanding automation and new technology, providing SMEs with visibility to grid and weather conditions provides invaluable situational awareness on local hazards like airborne debris or vegetation. Field observers can also provide real time weather reads using portable devices, supplementing weather station coverage of SCE's HFRA circuits. As line patrols are a necessary component of implementing PSPS events, a separate RSE for just this activity was not calculated.

3. Region prioritization:
Line patrols and field observations are performed throughout the HFRA on any circuit that is in scope for PSPS consideration.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE trained 2,103 qualified personnel at SCE and select personnel from its contract company partners to perform line patrols and live field observations for PSPS events. SCE deployed 1,904 pre- and post-event patrols during the 2020 PSPS events.

SCE will continue these processes for future events. As the processes, procedures and technology mature, the use of additional situational awareness devices—such as weather stations and High-Definition cameras—may further influence where resources are stationed.

5. Future improvements to initiative:
SCE is testing the use of UAS, or drones, and remote sensing capabilities to determine whether and how UAS can assist in data gathering for situational awareness. For instance, UAS in the coming years may be able to supplement in-person patrols, allowing qualified personnel to more quickly assess circuit conditions beyond visual line of sight. Additionally, remote sensors installed on SCE equipment have the potential to help assess a circuit's readiness to return to service.

7.3.2.6 ***Weather forecasting and estimating impacts on electric lines and equipment***

7.3.2.6.1 Weather and Fuels Modeling (SA-3)

SCE is preparing to implement the Next Generation Weather Modeling System (NGWMS), which will provide an extensive upgrade to SCE's current in-house weather modeling capabilities.

1. Risk to be mitigated / problem to be addressed:

In order to meet the increasing demands of PSPS and other activities, SCE must address some of the deficiencies associated with its modeling output. SCE currently computes information used for PSPS based on a single deterministic model, which may miss some circuits when compared with an ensemble modeling approach. In addition, SCE requires more computing power to be able to model the atmosphere at a higher resolution in order to produce additional forecasts for improved PSPS decision-making.

2. Initiative selection:

In Q4 of 2020, SCE began to implement Ensemble forecasting which demonstrated marked improvement over the single deterministic model output. In 2021, SCE is implementing the NGWMS, which will provide an extensive upgrade to SCE's current in-house weather modeling capabilities and enhance SCE's ability to make more targeted PSPS decisions. The benefits to the NGWMS are multifold, but in general, SCE expects a marked improvement in accuracy, particularly in areas where current modeling efforts are challenged. Whereas the current weather modeling produces twice daily forecasts at 2-km horizontal resolution with hourly outputs out to five days, the NGWMS will increase model output resolution to 1-km, which will help resolve terrain issues to a certain degree, for example. The NGWMS will consist of an optimal blend of ultra-high-resolution numerical weather modeling and machine learning (AI) technology. This will include expanding ensemble forecasting to incorporate more members at a higher resolution for the first three-and-a-half days ahead. AI models will be developed for select SCE weather stations to improve wind forecasts in areas where current modeling capabilities have difficulties resolving local circulation features within complex terrain. Finally, the NGWMS will help improve confidence in and provide stability to the weather forecast.

These efforts will require the procurement and purchase of additional hardware, i.e., two additional High-Performance Computing Clusters (HPCCs), which will allow for faster computing times and the ability to project weather and fuel conditions further out into the future.

SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.

3. Region prioritization:

The NGWMS will include weather forecasts and historic weather data spanning the entire SCE service area.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020, SCE installed two HPCCs and completed the associated weather and fuels modeling. In 2021, SCE will procure and install two additional HPCCs, which will considerably increase the resolution and accuracy of its forecast capabilities. SCE will also implement the NGWMS which will allow for more accurate forecasts of weather and fuels to obtain a more accurate assessment of risk. Developing the AI models for the NGWMS will be an effort that will extend through 2022. As part of this effort, SCE intends to make improvements and add functionality to its existing weather and fuels visualization portal. The Weather Visualization Portal will display the data from the NGWMS in a more efficient and expedited manner. In addition, a more robust GUI will allow users to view more data in a shorter period of time as compared to what is currently being used.

5. Future improvements to initiative:

SCE will be expanding the development and implementation of AI models to provide high-level forecasting capabilities at site-specific locations representing circuits. SCE is also continuing to re-evaluate alternatives and refinements to its weather and fuels modeling and will include changes in approach, scope or cost in Change Order Reports to this WMP.

7.3.2.6.2 Fire Spread Modeling (SA-4)

SCE will continue to use Technosylva's fire spread modeling products, FireCast and FireSim, to understand and quantify potential wildfire impacts to communities based on an informed scenario analysis.

1. Risk to be mitigated / problem to be addressed:

SCE's fire spread modeling capabilities must be able to provide adequate risk and consequence information for SCE to be more precise in its PSPS decisions and limit the number of customers impacted by de-energizations. Depending on the location, some wildfires will be more impactful, regardless of size, due to the presence of populations, buildings, and utility assets in the area, among other factors. This type of information could help fire spread models better estimate where the greatest impacts will take place during critical fire weather events and enable more targeted, proactive de-energization decisions.

2. Initiative selection:

SCE plans to use advanced fire spread modeling tools—Technosylva's FireCast and FireSim [56] applications—to simulate "what if scenarios" to predict various fire ignition and consequence outputs such as fire perimeter size, structures impacted, populations affected, and injury and death. Prior to deployment, SCE is undertaking an extensive evaluation of FireCast and FireSim for the applications' ability to estimate the impacts that fire activity will have on a particular area (i.e., wildfire consequences). The evaluation process will inform how these applications should be integrated into PSPS protocols.

SCE is working on a fuels mapping project that will provide an updated, realistic assessment of fuel amount and type across the landscape. Surface fuels and canopy characteristics data are key inputs into producing accurate fire behavior and risk outputs for both daily risk forecasts and on-demand spread predictions and can have dramatic effects on the modeling output. SCE will add a subscription service to keep the surface and canopy fuels layer current to ensure that the latest vegetation information (e.g., reflecting landscape changes caused by fires, landslides, blowdown, urban growth, etc.) is incorporated into the fire simulations going forward. The alternative to having an updated fuels layer is to rely on existing data sets. However, when FireCast and FireSim were first implemented in 2020, SCE used a LANDFIRE 2016 fuels dataset. This dataset produced less than accurate fire behavior modeling results (when compared to

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[56] As described in SCE's 2020 WMP, FireCast is an application that provides a 3-day forecast of potential fire ignitions across the SCE service area and FireSim provides real-time simulation modeling to derive potential fire impacts for active suppression response or weather event planning.

actual events) necessary to meet SCE's operational needs, leading SCE to conclude that more enhanced and accurate fuels were needed.

Finally, SCE will add supporting services and undertake additional analyses to further advance its ability to model fire spread in its service area. While this initiative does not reduce ignition risk or consequence directly, the output of these models will help SCE coordinate response to protect critical assets during active wildfire events and may be used as an input into PSPS decision-making.

SCE develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.

3. Region prioritization:
The Technosylva modules will be used to run scenarios across SCE's HFRA.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE implemented both FireCast and FireSim. Technosylva provided licenses to SCE's Fire Scientist and Fire Meteorologist and conducted extensive training on the FireCast and FireSim applications.

SCE also moved forward with its Fuels Mapping Project (previously SA-6 Surface & Canopy Fuels Mapping in SCE's 2020 WMP) to update the surface fuels and canopy characteristics within these applications. As part of this project, SCE is developing methods for fuels classifications, assessing non-burnable areas, updating land disturbances, and conducting a thorough assessment of vegetative conditions across the SCE service area using publicly available remote sensing data. Performing such an update increases the accuracy of fire spread modeling simulations.

Finally, SCE in 2020 initiated its evaluation of the FireCast and FireSim applications for potential integration into PSPS decision-making. The evaluation will provide insight into how the risk and consequence scores are tied back to specific assets and test the applications' features and functionality. Additionally, the evaluation will help to determine the accuracy and trustworthiness of the models, by running fire simulations for current incidents and "what if" scenarios and comparing the outputs with observed fire behavior and spread. In 2021, SCE will implement FireCast/FireSim consequence data into the PSPS decision-making during a test phase. SCE will also work to incorporate additional layers and analyses to support the maturation of the FireCast/FireSim models.

SCE's fire spread modeling efforts will be of increasing importance moving forward as information about wildfire impacts on communities will be key in reducing the de-energization footprint during PSPS events. As a result, SCE anticipates the need to undertake a number of projects and enhancements in 2021 to take wildfire modeling to the next step:

- The Surface and Canopy Fuels Layer Subscription Service will allow Fuels Mapping updates to be performed at a regular cadence, improving the accuracy of the fire simulation outputs. The subscription may include regular updates to land disturbances that incorporate burn scar perimeters and new land development projects.

- The Risk Associated with Value Exposure (RAVE) Analysis will produce service area-wide risk metrics that uses advanced prediction modeling to support the analysis of how populations and assets will be affected by a utility-caused ignition, based on a set of static and dynamic risk factors. Static risk factors incorporate conventional attributes such as population demographics, population socioeconomics, social vulnerability and egress, while dynamic risk factors take into account exposure modeling that leverages the SCE weather and climatology data to define *exposure firesheds* that vary as weather conditions change.

- The Herbaceous Live Fuel Moisture Model Subscription Service will ensure that SCE has regular access to the modeling output that estimates live fuel moisture, which serves as a critical, direct input into all fire spread modeling calculations.

- SCE will perform a PSPS Asset Risk Analysis and Integration to determine if potential PSPS de-energization of assets is necessary when considering the possible consequence provided by FireCast asset risk metrics. By analyzing the correlation between the 2020 PSPS events and FireCast risk metrics, SCE will be able to better evaluate de-energization candidates. Fire Science will develop a methodology to incorporate this information into the PSPS decision making process.

- SCE will enlist Fire Behavior Analysis Consulting Support to assist with the daily monitoring of fires throughout the SCE service area by a qualified Fire Behavior Analyst (FBAN). The support will include on-demand FBAN services to document, monitor, and simulate large fire events with advanced analysis and reporting during large fire outbreaks.

- SCE plans to make FireCast, FireSim, and WRRM Upgrades[57] to address new and emerging needs that may require the use of new metrics, analytic tools, and additional data. The upgrades will also cover changes that will likely be needed to account for the new output from the NGWMS, such as higher resolution data.

The updated fuels layers (Surface and Canopy Fuels, Herbaceous Live Fuel Moisture) will improve the accuracy of the FireSim calculations, while the RAVE and PSPS Asset Risk analyses will inform how to integrate FireCast and FireSim into PSPS decision-making by creating a single composite score of asset risk. The Fire Behavior Analysis Consulting Support will provide additional support to help SCE monitor fire activities and run fire simulations. Finally, the FireCast, FireSim and WRRM upgrades will provide necessary software upgrades.

5. Future improvements to initiative:
Depending on the results of the evaluation phase, SCE will look to perform a full integration of FireCast/FireSim into its PSPS operations. SCE is also continuing to re-evaluate alternatives and

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[57] The implementation of WRRM (RA-1 - Expansion of Risk Analysis in SCE's 2020 WMP) was previously a WMP activity and was discussed in this chapter in the 2020 WMP. SCE includes a write-up of the WRRM implementation within the Risk Assessment and Mapping Chapter in SCE's 2021 WMP. Please refer to Section 7.3.1 for more details.

refinements to its fire spread modeling and will include changes in approach, scope or cost in Change Order Reports to this WMP.

7.3.3 Grid Design and System Hardening

Report detailed information for each initiative activity in which spending was above $0 over the course of the current WMP cycle (2020-2022).

In 2021, SCE advances many of its proven Grid Design and System Hardening activities presented in its 2020 WMP. In addition, SCE will implement several new risk mitigation activities identified and evaluated through lessons learned and further risk and engineering analyses. Finally, SCE has completed certain Grid Design and System Hardening activities presented in its 2020 WMP and therefore will not be continuing these programs in 2021. Those completed activities reduced wildfire risk for the company and helped to inform SCE's 2021 WMP.

SCE notes that there are a number of WSD-identified initiatives in this section that are not driven by wildfire risk mitigation and are performed by SCE as part of its routine operations (e.g., capacitor maintenance and replacement) or are conducted as part of other mitigation activities [e.g., crossarm maintenance, repair and replacement in HFRI are conducted as part of HFRI inspections and Remediations (IN-1.1 and IN-1.2) as described in Sections 7.3.4.9.1 and 7.3.4.10.1]. As such, SCE does not have specific WMP activities corresponding to these, and notes this in more detail for each activity.

7.3.3.1 Capacitor maintenance and replacement program

Capacitors are a critical component and SCE has historically had maintenance and infrastructure replacement programs for capacitors preceding dedicated wildfire mitigation activities. SCE does not view this activity as a specific wildfire mitigation effort and will continue with capacitor maintenance and replacement as described in further detail in SCE's 2021 GRC[58].

1. Risk to be mitigated / problem to be addressed:

In addition to voltage support, capacitors play a critical role in helping avoid or limit overload conditions on distribution circuits during times of high electricity demand. Aging increases the potential for capacitor bank equipment failures, as does normal degradation during operations.

2. Initiative selection:

To help avoid in-service malfunction or failure, SCE routinely inspects capacitors as part of its compliance-based inspection programs. If any degradation in capacitor condition or associated hardware is observed, they are remediated as part of the compliance-based maintenance programs. These inspection and maintenance programs are described in Section 7.3.4.10.1. Capacitors are also replaced when field personnel or engineers identify capacitors that are not functioning or have failed in service. Since capacitor maintenance and replacement activities are not driven by wildfire or PSPS risk reduction, but

[58] A.19-08-013[E14], Exhibit SCE-02, Vol. 1, Pt. 1, pp. 71-74

rather performed as part of traditional programs, program selection and design was not driven by risk analysis or RSE calculations.

3. Region prioritization:

There is no regional prioritization for capacitor maintenance and replacements. They are performed across SCE's service area based on inspection results and priority assigned to the findings. Since overhead detailed inspections are combined with HFRI inspections in SCE's HFRA, regional prioritization in HFRA follows the same approach as described in Section 7.3.4.10.1. Capacitors that are replaced based on field or engineering feedback are replaced in the order they are identified. However, if there is an identified voltage issue on the circuit, the capacitor replacement for that circuit is prioritized.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020, SCE continued to refine its monitoring system to aid with maintenance and inspections of capacitor applications. SCE details its near- and longer-term plans for capacitor maintenance and replacement in its 2021 GRC.

5. Future improvements to initiative:

Over the next three years, SCE expects to refine its ability to remotely monitor capacitor performance to improve its inspection and maintenance efforts. The industry has developed guidance for fusing to minimize the impacts of capacitor unit failure modes,[59] and SCE uses this guidance to select fuses for its capacitor banks.

7.3.3.2 Circuit breaker maintenance and installation to de-energize lines upon detecting a fault

Circuit Breaker Relay Hardware for Fast Curve (SH-6)

In 2019, SCE initiated a program to deploy Fast Curve (FC) settings at substation CB relays and developed a plan for upgrading non-compatible and/or older vintage electrochemical and microprocessor relays for HFRA feeder circuits between 2020-2022.

1. Risk to be mitigated / problem to be addressed:

When a fault on the line occurs, it takes a circuit breaker and relay time to detect and respond. The duration of the CB response time contributes to fault duration and energy that can lead to ignitions due to heating, arcing, and sparking.

2. Initiative selection:

Fault durations can be reduced with FC operating settings at the substation CB relay by enabling quicker fault detection and fault clearing. FC settings reduce fault energy by increasing the speed with which a relay reacts to most fault currents, and can reduce heating, arcing, and sparking for many faults compared to conventional settings. For SCE to have the capability to toggle between normal and FC operating

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[59] For example, IEEE Std C37.43 – IEEE Standard Specifications for High Voltage Expulsion, Current-Limiting, and Combination-Type Distribution and Power Class External Fuses, with Rated Voltages from 1 kV through 38 kV, Used for the Protection of Shunt Capacitors.

settings during high fire threat conditions, it requires CB relays to have the newer microprocessor-type relays. In prior years, SCE targeted updates to circuits serving HFRAs that had CBs with existing microprocessor-based relays. These previous activities concentrated on relay setting updates and not relay hardware replacements. In 2021-2022, the targeted scope requires new and replacement hardware to accommodate the updated operational settings.

A greater portion of the 2021 activity requires relay hardware upgrades to accommodate the FC settings integration, which are more costly than setting upgrades that do not require hardware replacement. Despite this, the RSE for this activity is high, therefore, SCE deemed it prudent to undertake this activity now to reduce the number of faults that could lead to ignitions.

3. Region prioritization:
Prioritization is based on construction and scheduling feasibility rather than region. Relays that require extensive engineering or that have operational considerations are planned for 2021-2022.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2019, SCE met its WMP goal of updating settings for existing, compatible microprocessor CB relays and performed the field analysis to determine continuing scope of work. In 2020 SCE installed FC settings on 109 relays and associated FC settings, exceeding its target of 55 relays. SCE's current plan includes 60 relay unit replacements and upgrades in 2021, and up to 86 if operationally feasible. SCE's goal is to have FC settings capability for every CB in SCE's HFRA by 2022.

5. Future improvements to initiative:
SCE expects to complete upgrades to all CBs in HFRA by 2022. SCE does not have specific improvements planned at this time but is exploring increasing the sensitivity of the relay settings while avoiding false operations.

7.3.3.3 Covered conductor installation

7.3.3.3.1 Covered Conductor (SH-1)

In 2021 SCE continues its Wildfire Covered Conductor Program (WCCP), a multi-year program initiated in 2018 that replaces bare overhead conductor with covered conductor in HFRA. SCE also continues installing covered conductor in HFRAs during post-fire restoration work (outside of the WCCP). Poles that require replacement as part of WCCP are replaced with Fire Resistant Poles (FRP).

1. Risk to be mitigated / problem to be addressed:
Analysis of historical ignition and fault data in SCE's HFRAs showed that contact from objects (such as vegetation, metallic balloons, or debris) and wire-to-wire faults were associated with approximately 60% of suspected wildfire initiating events. In addition to those drivers, fault conditions can weaken and sometimes cause conductor failures, resulting in energized wire-down events, which in turn could result in electrical arcing in the air or on the ground leading to ignitions. From 2015 to 2019, 10% of ignitions were due to conductor failures.

Wood poles supporting overhead equipment and conductors are susceptible to ignitions caused by equipment on the pole failing, structural damage due to woodpeckers, or from damage from fire on the ground. Burned poles can also cause other equipment on the pole to fail making service restoration after a fire more difficult.

2. Initiative selection:

Based on benchmarking and industry research, SCE identified insulated or covered conductor as a viable alternative to reduce overhead conductor faults associated with CFO or adjacent conductors, thereby reducing the risk of ignitions. SCE evaluated the effectiveness of covered conductor deployment in its HFRA based on historical analysis of ignitions, expert judgment, and industry benchmarking analysis[60]. This included conducting lab tests of covered conductor under different types of contact with foreign objects (such as metallic balloons and vegetation) and wire-down fault current. SCE utilized its enterprise-level RAMP risk model to evaluate the scale of deployment of covered conductor, and validated this initiative as the most practical option to reduce ignitions in SCE's HFRA considering expected risk reduction, cost, time to deploy, resource availability, and ease of long-term maintenance and repair. SCE evaluated alternatives such as reconductoring with heavier gauge wire that would be less prone to faults and undergrounding that would eliminate most fault conditions. However, bare wire is less effective in reducing faults or ignitions associated with contact with wires or foreign objects, and undergrounding requires more upfront costs and has a long lead time for deployment, making expedient risk reduction challenging.

To reduce the risk of fires and fire damage to poles and equipment, when poles need to be replaced in HFRA, SCE replaces them with fire resistant composite poles if the pole supports equipment or is in a woodpecker prone area. If the replaced pole is not supporting equipment and is not in a woodpecker prone area, or if there are supply shortages of fire-resistant composite poles, SCE wraps the new wood pole with fire resistant wrapping. This approach is applied for several programs that require pole replacement, including WCCP. This includes FRPs installed in HFRA but outside of WCCP. Fire resistant composite poles reduce the POI by providing tracking and arcing resistance at the pole top from electrical equipment. Fire resistant composite poles and fire resistant wrapped poles also increase grid resiliency by preventing the pole from burning and failing during a ground fire at the pole, protecting electrical equipment from fire damage and facilitating restoration after a wildfire.

The RSE[61] for this initiative is among the highest of all WMP activities analyzed because covered conductor is effective at mitigating several types of ignition drivers such as contact from object and wire to wire contact, as well as reducing equipment failures associated with older distribution system equipment and hardware. Even when excluding operational considerations, such as time and feasibility to deploy, the alternative mitigations such as reconductoring with bare wire and undergrounding have RSEs lower than that for covered conductor.

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[60] A.19-08-013[E14], Exhibit SCE-04, Vol. 05A, Part 1, pp. 178 - 223 – An Engineering Analysis on Impacts of Contact from Objects (CFO) on Bare vs. Covered Conductors; Exhibit SCE-04, Vol. 05A, Part 1, pp. 242-246 – SCE Summary of Covered Conductor Touch Current NEETRAC Report (refer to Exhibit SCE-04, Vol. 05A, Part 1, WP, pp. 224-241 – NEETRAC Report); and Exhibit SCE-04, Vol. 05A, Part 1, pp. 4 - 177 – Covered Conductor Compendium.

[61] The RSE for this activity also includes fire resistant wrapped poles and tree attachments.

For more justification on SCE's planned utilization of covered conductor, please see SCE's response to Critical Issues SCE-02 and SCE-03 in Sections 9.9 and 9.10, respectively.

3. Region prioritization:
Beginning in 2019, SCE used the risk scores from the WRM to prioritize the circuit segments for replacing bare conductor with covered conductor. Besides using risk scores, operational efficiencies in bundling work were also considered when scheduling covered conductor deployment. The underlying POI and consequence score models have undergone several refinements and SCE continues to incorporate these enhanced risk scores into its deployment strategy to the extent practicable. In late 2020, SCE transitioned from using the Reax ignition consequence model to Technosylva, which resulted in some reprioritization of the circuit segments. To realign covered conductor scope to the improved risk model, all conductor segments that had higher risk scores than those using the previous were identified and placed into the mitigation process for 2022 construction.

This was done by ranking all conductor segments using the WRRM with the new Technosylva consequence scores and identifying which of those segments had been previously scoped through prior methods such as using the 2019 WRRM model. Any segments that ranked higher in the WRRM than the previous risk models and were not already scoped for construction were prioritized for 2022 construction. This method will ensure all the highest risk segments identified in our updated risk model will be completed by the end of 2022.

The method just described used the wildfire component of the WRRM only and did not include the PSPS component described in Chapter 4. This was due to timing for operational purposes because the PSPS component was not completed in time for the WRRM risk ranking evaluation. Covered conductor scope beyond what is currently in-flight will use the updated WRRM model with both wildfire and PSPS components.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE completed 965 circuit miles, exceeding its WMP program target of 700 circuit miles. In 2020, SCE also replaced approximately 6,090 poles with FRPs in HFRA, exceeding its WMP program target of replacing 5,200 poles. The regions covered were based on the prioritization approach described above. SCE has already seen real-world success from covered conductor. For example, when a vehicle hit a pole and caused energized 16kV covered conductor to fall into adjacent trees, no fault or ignition occurred.

With the ongoing wildfire risks in California and the expected risk reduction benefits of covered conductors, SCE is accelerating this program to the extent feasible within operational and resource constraints. In 2021, SCE's goal is to install 1,000 circuit miles of covered conductor in HFRAs, primarily driven by WCCP. The deployment location prioritization will follow the approach described above. If operationally feasible SCE will strive to install 1,400 circuit miles.

In 2021, when identified for replacement in WCCP or otherwise (such as in post-fire restoration work), SCE will continue to install FRPs in HFRA.

5. Future improvements to initiative:

In 2020, SCE improved the Wildfire Risk Model that is used to determine WCCP scope by using updated asset data (including conductor age, outage information, circuit loading, and additional circuit-level information), fire spread algorithm, weather/climatology data, ground fuel data, population and structure data, fire simulation model, and the ignition and consequence resolution. SCE also updated WCCP construction standards based on lessons learned from two years of installations. These updates include addressing requirements and providing clarity on wildlife cover requirements for covered conductor systems, and requirements for appropriately sized jumper covered conductor.

Approximately 5,000 circuit miles are forecasted to be installed within the next three years (2021-2023). The need for additional programmatic Covered Conductor installation beyond 2023 will be reevaluated, although installation in other programs due to new design standards in HFRA will continue. 2020 was the first full year after a material amount of covered conductor was deployed in SCE's HFRA, and SCE plans to further evaluate the effectiveness of covered conductors in reducing ignition risks based on fault and ignition data. This will help improve the risk models used to determine scope and prioritization of WCCP. SCE is also pursuing cross-mitigation optimization where covered conductor has been deployed as described in Section 4.3.9 Resource Allocation and Prioritization Methodology. This includes assessing changes in PSPS protocols where covered conductor has been deployed as described in further details in Chapter 8, and potentially changes to vegetation management practices.

In 2020, SCE assessed vibration dampers for covered conductor application (AT-4 in SCE's 2020 WMP) and concluded that vibration dampers mitigate the risk of premature failure of covered conductors due to vibration. SCE published vibration damper design and construction standards for covered conductor application and in 2021, vibration dampers will be part of standard covered conductor installations. Please refer to Section 7.1.D (How New Technologies and Innovations will affect SCE's Wildfire Mitigation Strategy and Implementation Over the Next Three Years) for more details on SCE's vibration dampers effort.

SCE is continuing to re-evaluate alternatives and refinements to support covered conductor installation and will include changes in approach, scope or cost in Change Order Reports to this WMP.

As part of SCE's expedited grid hardening effort explained in the PSPS Action Plan, SCE plans to install approximately 700 miles of covered conductor on 52 of the 72 identified frequently impacted circuits.

7.3.3.3.2 Tree Attachment Remediation (SH-10)

In 2021, SCE will continue its program that removes overhead conductors that are currently attached to trees instead of poles.

1. Risk to be mitigated / problem to be addressed:

Older construction methods used in SCE's forested service area used existing trees to support overhead conductors instead of installing utility poles. These "tree attachments" no longer meet SCE's design standards. The integrity of the trees cannot be verified using inspections and assessment techniques for poles. In addition, tree attachments increase the probability of faults and damages from vegetation contact and "fall-ins."

2. Initiative selection:
This activity relocates tree attachments to a pole to reduce the probability of faults and consequence of a spark close to vegetation. It is typically done in conjunction with covered conductor deployment for operational efficiency. Note that if there is aerial cable that is in good condition, SCE will relocate the aerial cable to a pole instead of installing covered conductor.

An alternative to this activity is to leave the utility attachments to the tree and/or reinforce the tree attachment. However, because this work is typically done in conjunction with covered conductor deployment and because tree attachments do not meet SCE's current design standards, SCE intends to continue to replace all tree attachments.

SCE included this activity in the calculation of the Wildfire Covered Conductor Program RSE score. Leaving overhead conductors attached to trees, especially in HFRA, is inherently risky and it is imperative to expeditiously transfer overhead conductors to poles.

3. Region prioritization:
Tree attachments remediated in 2021 will be in HFTD Tier 2 and Tier 3, with most locations in the San Joaquin and Rural region. Most tree attachment remediations for 2021 and 2022 were prioritized based on Reax risk scores while remaining attachments, although limited in number, will be prioritized based on Technosylva.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2019, SCE remediated 101 tree attachments, and in 2020, SCE remediated 405 tree attachments (exceeding its 2020 WMP target of 325). The regions covered overlapped with the WCCP work, which is done primarily in conjunction with covered conductor installation.[62]

In 2021, SCE aims to remediate approximately 500 tree attachments and, subject to resource availability and continuing evaluation of remaining risk, will strive to exceed this goal by remediating over 600 tree attachments.

5. Future improvements to initiative:
Approximately 650 tree attachments remain across SCE's HFRA, all of which are expected to be remediated by the end of 2022.

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[62] SCE reported SH-10 as "Behind Plan" in its AB 1054[E15] Q3 2020 Advice Letter (Advice 4327-E) but was able to advance and exceed its tree attachment remediation work during the fourth quarter of 2020 due to fire restoration efforts.

7.3.3.4 Covered conductor maintenance

SCE does not have a separate covered conductor maintenance program. On-going covered conductor inspection and maintenance is included in HFRI inspections and Remediations (IN-1.1) discussed in detail in Section 7.3.4.9.1, and will follow the same approach, schedule, and prioritization. As covered conductor installation is relatively new, SCE will continue to analyze installation practices to identify any additional inspection and maintenance required.

7.3.3.5 Crossarm maintenance, repair, and replacement

SCE does not have a separate crossarm maintenance program. Crossarm inspection, repairs, and replacements are primarily conducted as part of compliance-driven detailed inspections and corresponding maintenance in non-HFRA locations. In HFRA, crossarm inspections, repairs, and replacements are part of HFRI inspections and remediations (IN-1.1 and IN-1.2) discussed in Sections 7.3.4.9.1 and 7.3.4.10.1. Crossarms are also replaced as part of covered conductor deployment when insulators need to be replaced. Crossarm inspections, repairs, and replacements follow the same prioritization approaches as these other activities. In light of the wildfire risks, SCE now replaces wood crossarms with composite crossarms where feasible.

7.3.3.6 Distribution pole replacement and reinforcement, including with composite poles

WCCP Fire Resistant Poles

In SCE's 2021 WMP, the WCCP Fire Resistant Poles (FRP) activity[63] is merged with the Covered Conductor program (SH-1), as covered conductor scope determines when new FRP installations are required. Please refer to Section 7.3.3.3 for additional details.

SCE programmatically replaces poles primarily as part of the Deteriorated Pole Program based on the results of intrusive pole inspections performed in compliance with GO 165[E16], and the PLP based on the results of pole loading assessments. Both programs are described in Section 7.3.4. Poles are also replaced as part of compliance-based HFRI detailed inspections and maintenance programs (see Sections 7.3.4.9.1 and 7.3.4.10.1). In addition, poles may be identified for replacement during miscellaneous activities if they do not meet pole loading criteria when new equipment is added or if visual damage is identified by field personnel. All these programs span all of SCE's service area, except for HFRI inspections and maintenance which are only in SCE's HFRA. In HFRA, degraded poles will be replaced with FRPs using the same strategy as WCCP described above. The details of each of the programs above are described in Section 7.3.4. SCE does not consider pole replacements to be a WMP initiative but will continue to replace poles as part of its system hardening and asset management activities. FRPs are installed in HFRAs as part of WCCP and non-WCCP activities (such as post-fire restoration work).

7.3.3.7 Expulsion fuse replacement

7.3.3.7.1 Branch Line Protection Strategy (SH-4)

SCE standardized on current limiting fuses (CLFs) for branch line protection and replaces conventional fuses as part of its branch line protection strategy launched in 2018. SCE initially focused efforts for

[63] Fire Resistant Poles is SH-3 in SCE's 2020 WMP

installing fuses at branch lines where fusing did not exist, followed by fusing replacements with a focus on current limiting fuse technology to reduce fault energy.

1. Risk to be mitigated / problem to be addressed:
Arcing and currents associated with faults commonly produce incandescent particles that can contribute to ignition and increased probability of equipment failure such as downed wire. Additionally, some existing fuses do not meet the Cal Fire “Exempt” classification and can expel molten material when they operate creating the potential for ignitions.

2. Initiative selection:
SCE’s efforts focus on replacing existing conventional fuses to bring them up to the Cal Fire “Exempt” classification, and target fuses with operational issues such as liquid fuses which are obsolete and unsupported by suppliers. “Non-Exempt” fuse designs can produce expulsion products that can lead to ignitions. Existing fuses are typically replaced by CLFs or branch line automatic reclosers, although larger branch circuits may use other Cal Fire “Exempt” fuse designs. The replacement devices generally clear faults faster and reduce the fault energy. This minimizes arcing and sparks during fault events and minimizes the impact of a fault on electrical equipment along the circuit. The RSE for this activity is moderately high. Given this and the relatively low cost of this activity, SCE deems it prudent to continue these fusing upgrades to limit ignition risks, improve protection coordination with circuit breaker relay FC operational settings, and improving customer electric service reliability.

SCE considered single phase reclosers for branch line protection as an alternative to branch line fusing but concluded the needed infrastructure upgrades are not as cost effective as fusing.

3. Region prioritization:
In 2021 SCE is continuing the focus on fuse replacement efforts to help reduce ignition risk. Prioritization for fuse replacements includes both ignition risk and geographic bundling. Geographically close locations allow SCE to bundle work and improve application efficiencies. For combining risk and geographic location, SCE aggregates the fuses at the circuit level for scope selection.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2019, SCE achieved its target of installing current limiting fuses in at least 7,500 locations by completing 7,765 locations. In 2020, SCE achieved its target of installing/replacing fuses at 3,025 locations (393 new installations and 2,632 replacements). SCE also installed S&C Solid Material (SMU-20) fuses, which are Cal Fire “Exempt” like CLFs. The SMU-20 fuses are SCE standard when elevated load currents on a branch line circuit exceed CLF designs and are an alternative to CLFs when material availability may impact installation. Installing fuses (whether CLF or SMU-20) on non-fused circuitry reduces fault energy and benefits fault detection sensitivity, helping minimize ignition risks.

In 2021 SCE plans to install or replace fusing at 330 locations, and up to 421 locations subject to constraints. In prior years, SCE conducted the work with dedicated crews in targeted areas, which enabled the higher number of locations. The smaller scope in 2021 allows the work to be distributed across HFRAs instead of being focused on targeted areas.

5. Future improvements to initiative:
SCE does not have any planned improvements to this program at this time. The branch line fusing initiative is expected to be completed over the next three years and SCE is targeting to install fuses at over 13,000 locations by the end of 2022 (cumulative from inception of program in 2018).

7.3.3.8 Grid topology improvements to mitigate or reduce PSPS events

7.3.3.8.1 Circuit Evaluation for PSPS Driven Grid Hardening Work (SH-7)

This activity entails *evaluation* of circuits highly impacted by PSPS to develop targeted plans for grid hardening and circuit modifications to reduce PSPS impact.

1. Risk to be mitigated / problem to be addressed:
PSPS de-energizations are disruptive and can have an impact on customers and communities. While PSPS may have to be relied on under extreme weather conditions, reducing the frequency, scope, and duration of PSPS events is very important to SCE. Since PSPS is heavily influenced by real-time windspeed, and wildfire risk scores are influenced by average windspeed, circuit segments at high risk of PSPS do not necessarily coincide with circuit segments with high wildfire risk scores. Therefore, other initiatives for reducing ignition risks do not necessarily target areas that experience PSPS.

2. Initiative selection:
Targeted efforts such as covered conductor deployment, undergrounding circuit segments, and adding switching devices to facilitate circuit reconfigurations can help reduce or eliminate the need for PSPS or reduce the number of customers impacted by PSPS. For example, these efforts will reduce the impact of PSPS on customers located in non-HFRA that are connected to circuits that traverse HFRA, and customers located on certain underground circuit segments within HFRA that are fed from overhead circuitry within HFRA. Targeted covered conductor deployment can also potentially help increase windspeed thresholds for PSPS de-energization in some circumstances. Developing these tailored solutions requires circuit-specific analysis. The results of these analyses are used to develop work scope to be completed within other relevant activities (e.g., covered conductor deployment in SH-1 or remote automatic reclosers in SH-5). Risk analysis was not performed for this initiative as the analysis by itself does not reduce ignition or PSPS risks. The risk reduction and costs for the work undertaken because of this activity are included in the risk analyses of the corresponding activities, as appropriate.

3. Region prioritization:
SCE previously targeted circuits that experienced PSPS de-energization in 2019, prioritizing those that were most impacted. Of the identified work that could help reduce PSPS frequency and scope, SCE further prioritized switching projects (installing sectionalization equipment or transferring load to other circuits) as these were quicker to implement prior to the 2020 fire season. Sections identified for covered conductor installation or undergrounding were ranked against other projects being scoped as part of SH-1 and SH-2 using the WRRM PSPS module to quantify benefits. Going forward, SCE will prioritize circuits that have not been assessed for PSPS-driven grid hardening (approximately 50% of circuits in HFRA) using the estimated probability of PSPS de-energization and customer impact. SCE will continue to refine

existing analytical approaches used to estimate future impacts of PSPS de-energizations, including the new PSPS RSE framework implemented in this WMP filing, and prioritize highly impacted circuits.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE completed its program target of reviewing 50% of circuits in HFRA including circuits impacted by PSPS in 2019. The analysis from 2020 resulted in SCE identifying mitigations/projects that could be implemented in other system hardening activities such as SH-1 (Covered Conductor) and SH-5 (Remote Controlled Automatic Reclosers Settings Update). In 2021, SCE will expand the circuit-specific assessment to the remaining 50% of circuits in HFRA and based on refinements described in "Region prioritization" above, will adopt a more targeted approach by evaluating highly impacted circuits.

5. Future improvements to initiative:
There are no planned improvements for this activity except the prioritization method described above based on expected PSPS probability and consequence.

7.3.3.8.2 Microgrid Assessment (SH-12)[64]

The first track of CPUC's Microgrids and Resiliency Strategies Order Instituting Rulemaking (OIR) (R.19-09-009)[E17] sought to facilitate resiliency planning using microgrids in areas that are prone to outage events and wildfires. SCE is planning to install a microgrid in a heavily PSPS impacted location.

1. Risk to be mitigated / problem to be addressed:
De-energizations during PSPS events, though necessary to reduce wildfire risks during extreme weather conditions, have adverse impacts on customers, especially when critical facilities or critical care customers are impacted. De-energizations during PSPS events, though necessary to reduce wildfire risks during extreme weather conditions, have adverse impacts on customers, especially critical facilities and critical care customers.

2. Initiative selection:
Microgrids that can island from the grid during de-energization events may provide opportunities to provide backup power and increase community resilience. Microgrids can island from the grid during PSPS events and provide backup power to increase community resilience. Legislators, regulators, industry stakeholders, and communities are increasingly interested in the potential of this technology, and SCE continues to assess the viability of microgrids in mitigating PSPS impacts. SCE evaluated options for cost effective and clean microgrids for PSPS resilience, including detailed analysis that considered local system configurations, costs, air quality requirements, policy objectives, and regulatory requirements. There are other alternatives to reducing PSPS frequency and scope as described above, but a microgrid solution may be more appropriate in certain circumstances. SCE did not perform risk analysis on this initiative since it is a pilot. If microgrids move beyond the initial stages of development, RSEs will then be appropriate for evaluating broader deployment.

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[64] Formerly PSPS-8 in SCE's 2020 WMP.

3. Region prioritization: SCE identified circuits

Locations with a high frequency of circuit outages due to PSPS were first identified, which corresponds to a high HFRA tier. with a high frequency of PSPS events, which corresponded to a high HFRA tier. From this list, a cost benefit analysis was performed to select locations that would receive the most benefit from a microgrid. The final circuit selected is in HFRA Tier 3 and includes 189 residential customers, 26 low-income customers, and 16 non-residential customers. SCE is exploring using a microgrid to establish a CRC at one of the non-residential customer locations.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In early 2020, a Request for Proposal (RFP) was issued for six microgrid installations. However, the RFP was unsuccessful in identifying cost-effective options. SCE continued to explore alternative microgrid sites that could be safely and economically islanded and issued a second RFP for a single site. The second RFP resulted in multiple responses that are currently under evaluation. If land for requisite new DERS is successfully secured and if SCE can execute a mutually agreeable contract with the selected vendor, SCE will work with the selected vendor to approve the site design package by end of 2021.

5. Future improvements to initiative:

Over the next three years (2021-2023) SCE aims for the substantial completion of a microgrid site and to gain improved understanding of the value of microgrids for mitigating PSPS impacts. SCE is continuing to evaluate alternatives and refinements to its microgrid activities and will include changes in approach, scope or cost in Change Order Reports to this WMP.

7.3.3.9 Installation of system automation equipment

Remote Controlled Automatic Reclosers Settings Update (SH-5)

SCE has traditionally installed automation equipment to improve reliability and provide operational flexibility and has expanded its distribution automation activities as part of wildfire and PSPS mitigation.

SCE has completed the RAR and Remote Controlled Switch (RCS) scope identified in GSRP, the 2021 GRC filing, and last year’s 2020-2022 WMP. While no additional scope is currently identified for 2021, SCE will continue to assess locations that could benefit from these devices in 2021, most notably as part of the ongoing review of circuits impacted by PSPS, outlined in SH-7. To the extent that additional locations are found, SCE will continue expanding its system automation equipment strategy in 2021 to target both RARs and additional sectionalizing devices to provide important isolating capabilities that could minimize the frequency of customer outages during PSPS and other outage events. SCE will inform WSD of any additional scope identified in 2021 under SH-7 through the Change Orders Report process.

1. Risk to be mitigated / problem to be addressed:

Distribution circuits span many miles and cross through multiple risk consequence zones, contain assets at various levels of resiliency, and are subject to varying weather conditions based on specific asset locations. During PSPS events, portions of circuits or circuit segments that do not pose ignition risks also have to be de-energized along with portions that present ignition risks as there is no available means of isolating these segments from each other. Having manual switches also increases the time and resources needed for de-energization, testing, and re-energization.

2. Initiative selection:

Installing more automated fault detection and sectionalizing equipment is a time-tested approach that SCE and other utilities have successfully implemented. SCE installed additional RARs on circuits across its HFRA. In some instances, SCE installed RCSs instead of RARs when they were deemed to be more cost-effective solution in those locations. Adding these automated sectionalization devices helped SCE limit PSPS de-energization to fewer and smaller circuit segments. In addition to minimizing the effects of PSPS events, RARs also minimize outage impacts to customers by isolating or restoring power quickly to circuit segments not impacted by weather conditions. RARs also reduce ignition risks allowing reduced fault energy and increased fault sensitivity by way of the operational settings which includes the capability of toggling to fast curve operating settings during concerning weather conditions. SCE did not perform risk analysis or calculate an RSE for this activity as it currently does not have identified scope for 2021. As noted above, if additional scope is identified, SCE will inform WSD through the Change Orders Report process. SCE plans to perform RSE calculations for any identified scope and will report on this through the Change Orders Report process.

3. Region prioritization:

In 2020, all HFRA circuits were in scope and further prioritization was not necessary. There is no identified scope for this activity currently.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020, SCE completed all identified scope and met its WMP goal of installing 45 RARs/RCSs by installing 49 devices. In 2021, the need for additional sectionalizing devices such as RAR and RCS applications will be identified as part of Circuit Evaluation for PSPS Grid Hardening efforts (SH-7). Should additional scope be identified under SH-7 for additional sectionalizing devices, SCE will notify the WSD in a future Change Orders report.

5. Future improvements to initiative:

SCE does not have additional improvements identified for this activity besides the prioritization approach discussed for SH-7. However, SCE is continuing to re-evaluate alternatives and refinements to installation of automated sectionalizing devices and will include changes in approach, scope or cost in Change Order Reports to this WMP.

As part of SCE's expedited grid hardening effort explained in the PSPS Action Plan, SCE plans to install new switches on some of the frequently impacted circuits.

7.3.3.10 Maintenance, repair, and replacement of connectors, including hotline clamp

SCE regularly performs remediations, adjustments, and installations of connectors such as hotline clamps.

1. Risk to be mitigated / problem to be addressed:

Connector failures can result in conductor failures which pose high risk for ignitions.

2. Initiative selection:

SCE does not have a separate WMP activity to target connector maintenance, repair, and replacement, but rather identifies deteriorated connectors as part of its detailed visual inspections (aerial and ground) and using infrared or corona inspections across its service area. Given the low frequency of connector failures, having a separate program is not cost effective. The risk analysis for connector inspection and repair or replacement is included in the risk analysis for HFRI inspections detailed in Sections 7.3.4.9.1 and 7.3.4.10.1. The infrared inspection programs are detailed in Section 7.3.4.4 and 7.3.4.5.

3. Region prioritization:

Since connector inspection and maintenance is included in the inspection programs mentioned above, it follows the same regional prioritization as those within HFRA.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

SCE does not account for counts or costs of connector inspections and maintenance separately, but they are routinely conducted as part of its detailed inspection and infrared/corona inspection programs. This approach will continue in 2021 as well.

5. Future improvements to initiative:

SCE reported on DFA and EFD alternative technology pilots in the 2020-2022 WMP. The continuous monitoring provided by DFA and/or EFD could improve identification of degraded connections more expeditiously and create alerts to prompt maintenance, repair, or replacement. In the future, SCE plans to replace vintage connectors during its reconductoring efforts, such as during covered conductor installation.

7.3.3.11 Mitigation of impact on customers and other residents affected during PSPS event

To improve access to electricity for customers and other residents during PSPS events, SCE provides backup power (including mobile generators) or assistance to access backup generation. These efforts are described in Section 8.2 under Protocols on Public Safety Power Shut-off.

7.3.3.12 Other corrective action

SCE historically conducts maintenance based on findings from its inspection programs. SCE performs "other corrective actions" for various reasons, including safety, reliability, and compliance (e.g., insulator washing on its transmission system, which includes a visual inspection of a circuit for contamination and subsequent washing, when needed). SCE does not consider other corrective actions to be WMP activities but will continue to do this as part of SCE's role as a prudent operator of the grid. Section 7.3.4 describes SCE’s transmission, distribution, and generation structure inspections and corresponding remediation work in HFRA in greater detail[65]. Described below is SCE’s Long Span Initiative, a new WMP activity building on long span inspections completed as part of SCE’s ground based EOI efforts in 2019 and aerial inspections in 2020.

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[65] SCE’s Transmission, Distribution, and Generation Remediation activities (SH-12.1, SH-12.2 and SH-12.3 respectively) were previously WMP activities included in the “Other Corrective Action” section in SCE’s 2020 WMP.

7.3.3.12.1 Long Span Initiative Remediation (SH-14)

SCE is using LiDAR to identify potential "long-span" risks on the distribution overhead system and remediate the highest risks upon field validation. "Long-spans" consist of distribution circuit spans of certain length or configuration that can have a high chance of conductor clash in adverse weather conditions (e.g., wind).

1. Risk to be mitigated / problem to be addressed:

Conductor clashing (wire-to-wire contact) could result in sparks and wire-down events, potentially leading to ignition.

2. Initiative Selection:

SCE completed conductor blow-out studies to evaluate risk factors and determine worse case conditions that could lead to wire-to-wire contact on over sagged conductors. SCE selected this initiative due to the speed of deployment for certain remediations and high RSE. SCE is using LiDAR to identify locations with potential issues and plans to remediate the highest risk locations upon field validation. Long-spans can include spans of a certain length, spans with mixed conductor, spans that have a sharp angle, or spans that transition between vertical and horizontal configuration. Options for remediation include line spacers between conductors, alternate construction standards (such as ridge pin or box construction) to increase spacing, wider crossarms to increase spacing, interset poles, and covered conductor. The type of remediation selected will be determined by the specific details of each span and field conditions.

In 2020, SCE started to process LiDAR information on its distribution long-spans on the highest risk locations within HFRA to identify initial scope for field validation and remediation. In 2021, SCE will continue this work under its LSI Remediation program, continuing to use LiDAR to identify remaining spans of concern followed by field validation and remediation. The RSE for this activity is moderately high due to the relative low-cost and effectiveness of line spacers to remediate the highest risk locations.

3. Region Prioritization:

SCE is using risk-ranking from the WRRM to prioritize long span mitigations in all HFRA tiers based on the type of span issue and risk score. The highest risk locations are prioritized by using the probability of the issue leading to an ignition and the fire consequence score (e.g., Reax/Technosylva).

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2021, SCE expects to field validate and remediate approximately 300 locations, and up to 600 locations, subject to the completion timeline for field validations, resource constraints, and other execution risks. Long-spans previously identified in 2019 as needing remediation will be evaluated and included in this activity, as determined by SCE's analysis of each. SCE will notify WSD of any changes to this remediation target in a future Change Orders Report.

5. Future improvements to initiative:

Over the next three years, SCE plans to remediate the highest risk spans, with the remaining remediations to occur through 2024 or through the WCCP.

7.3.3.13 Pole loading infrastructure hardening and replacement program based on pole loading assessment program

Pole replacements based on pole loading assessments are conducted as part of SCE's PLP described in Section 7.3.4 - Asset Management & Inspections. Please see Section 7.3.4.13 (Pole loading assessment program to determine safety factor) for further details on SCE's PLP assessments and remediations.

7.3.3.14 Transformer maintenance and replacement

SCE does not have a separate transformer maintenance and replacement program as a WMP initiative. Transformers are inspected and repaired or replaced based on inspection findings as part of overhead detailed inspection outside HFRA and as part of HFRI inspections in HFRA (see Section 7.3.4.10.1). Transformers are also replaced as part of pole replacements (e.g., Deteriorated Pole Replacement and PLP). When a pole supporting a transformer is replaced, it is often more cost effective to replace the transformer instead of mounting the old transformer on the new pole. While replacing covered conductor on circuit segments, SCE is also replacing overhead distribution transformers that are filled with mineral oil, with new transformers filled with ester fluid, thus reducing the flammability and the environmental impact in case of spillage. This is now a system-wide practice (even outside of HFRAs) to allow SCE to simplify standards and inventory of overhead distribution transformers. SCE will also install transformer bushing covers where appropriate. These system hardening measures are intended to reduce certain equipment and contact from object ignition drivers. To the extent transformer replacements are performed as part of other activities for which RSEs have been calculated (such as the WCCP), the benefits and costs are included in those calculations.

7.3.3.15 Transmission tower maintenance and replacement

SCE does not consider its structure maintenance programs to be a WMP initiative but will continue to do this as part of SCE's role as the prudent operator of the grid. Tower inspections and maintenance are included in transmission compliance-based detailed inspection and maintenance programs outside HFRA and included in HFRI Inspections and Remediations in HFRA (see Section 7.3.4.10.1). SCE also performs testing and assessments on transmission towers for corrosion. These programs include inspection, repair, and replacements of towers, poles, conductor, and other transmission assets.

7.3.3.15.1 C-Hooks Insulator Attachment Hardware Replacements (SH-13)

In 2021, SCE is initiating a program to replace C-Hook insulator attachment hardware from transmission structures in HFRA.

1. Risk to be mitigated / problem to be addressed:

C-Hook failure can lead to downed high voltage wire which can pose wildfire and public safety risks. The 2018 Camp Fire is believed to have been started by the failure of a C-Hook. The C-Hooks installed on SCE's system are aged and are expected to be deteriorated over time due to the excessive wear that occurs when a C-Hook rubs against the hanger plate of the tower. C-Hooks are also difficult to inspect, even using aerial inspections, which increases the uncertainty of the probability of failure.

2. Initiative Selection:

Though C-Hooks are not part of SCE's construction standards, SCE inherited a limited number of C-Hooks from its past acquisition of Cal Electric. C-Hooks will be replaced with new hardware, insulators, and steel attachments. There are no alternatives to C-Hook replacement. The RSE estimated for this activity is low as SCE's risk analysis relies on historical incident data in SCE's service area and there are no records of failed C-Hooks in SCE's service area. However, given the inability to ascertain the hardware condition, lessons learned from the 2018 Camp Fire, the risks associated with C-Hook failure, and the relatively low costs, SCE is proactively replacing its remaining C-Hooks to be compliant with current standards and to mitigate against potential ignition.

3. Region Prioritization:
Replacements of hardware and necessary steel attachments will be prioritized by cumulative risk scores at the circuit level, driven by structure POI scores and fire consequence scores from Technosylva.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE is replacing a portion of the C-Hooks in its HFRA during planned maintenance work on the structures they are mounted on, or during other planned project-related work. Only the remaining C-Hook replacements are included in this WMP activity. SCE aims to replace C-Hooks on at least 40 structures in 2021 and will strive to exceed this goal by removing all C-Hooks in SCE's HFRA (currently estimated at 50 to 60 structures) by the end of the year. In 2022, SCE will complete any C-Hook replacement work that may carry over from 2021.

5. Future improvements to initiative:
SCE does not have additional improvements identified for this activity.

7.3.3.16 Undergrounding of electric lines and/or equipment

7.3.3.16.1 Undergrounding Overhead Conductor (SH-2)

In 2021, SCE continues its evaluation and installation of targeted undergrounding of overhead conductors in HFRA to reduce wildfire risks.

1. Risk to be mitigated / problem to be addressed:
As described in SH-1 above, analysis of historical ignition and fault data in SCE's HFRAs showed that overhead wire contact with objects (such as vegetation, metallic balloons, or debris) and wire-to-wire faults were associated with approximately 60% of suspected wildfire initiating events. In addition to those drivers, fault conditions can weaken and sometimes cause conductor failures, resulting in energized wire-down events, which in turn could result in electrical arcing in the air or on the ground leading to ignitions. From 2015 to 2019, 10% of ignitions were due to conductor failures.

2. Initiative selection:
Undergrounding can be a very effective mitigation for faults associated with overhead conductors, but it is not always cost-effective, easy to deploy, or easy to maintain and repair. However, given the risk mitigation benefits and interest among external stakeholders to consider undergrounding, in 2019 SCE undertook an effort to selectively target circuit segments that would most benefit from undergrounding. SCE is continuing this activity in 2021 and beyond. The RSE for the undergrounding conversion of targeted circuit segments is modest due to the higher upfront costs associated with the design, permitting, and deployment of underground cabling.

Undergrounding is specifically targeted in areas where SCE believes covered conductor would not sufficiently mitigate wildfire risk. SCE believes that in these cases, undergrounding is a prudent strategy. The two primary alternatives to this include covered conductor and bare conductor. Covered conductor is the primary mitigation for most circuit segments where the benefits of undergrounding are not commensurate with the costs or speed of deployment to buy down as much risk as possible in the shortest amount of time. Another alternative is replacing existing conductor with new, appropriately sized, bare conductor; however, this does not sufficiently reduce the risk of ignitions.

3. Region prioritization:
SCE evaluated circuit segments based on multiple criteria including wildfire risk scoring from WRRM, PSPS impacts (including circuits that have experienced multiple PSPS events), terrain, grid topography, construction complexity associated with undergrounding, and cost. SCE also consulted with its local districts and reviewed egress in areas where poles and overhead facilities may make it challenging to evacuate should a fire occur. In addition, SCE worked with communities to assess areas where customers may require electric service to provide essential public health and safety services. In 2021 SCE will continue to refine its evaluation methodology and work with local communities to pursue undergrounding in HFRA.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE's efforts were focused on developing and refining the methodology for targeted undergrounding that balances risk reduction with the costs and operational timing. In 2021, SCE plans to complete four miles of targeted undergrounding and will strive to exceed this goal by completing six miles in 2021.

5. Future improvements to initiative:
SCE expects to complete 22 miles of targeted undergrounding between 2021-2023. SCE is refining its analysis to compare mitigation effectiveness and costs of targeted undergrounding (including evaluating total life-cycle costs) and covered conductor replacement at a granular level and may expand undergrounding scope in HFRA based on the results.

In addition, SCE is continuing to re-evaluate alternatives and refinements to targeted undergrounding and will include changes in approach, scope or cost in Change Order Reports to this WMP.

7.3.3.17 Updates to grid topology to minimize risk of ignition in HFTDs

7.3.3.17.1 Transmission Open Phase Detection (SH-8)

In 2021 SCE will continue its deployment of transmission open phase detection, a protection scheme to detect an open phase (broken conductor) condition on its transmission system.

1. Risk to be mitigated / problem to be addressed:
Through 2019, SCE's mitigation programs to reduce the probability of downed wire were focused on its distribution system, which is substantially larger than SCE's transmission system in terms of circuit miles and had historically experienced more downed wire incidents. However, there have been 12 transmission

and sub-transmission downed wire incidents from 2015-2019 across SCE's service area. While the frequency of incidents remains low, the consequence of energized down wire incidents on the transmission system can be high.

2. Initiative selection:

In 2019, SCE evaluated the use of a protection scheme to detect an open phase (broken conductor) condition on its Transmission system. Through simulation, SCE optimized the detection scheme for an open phase condition, allowing de-energization of the line before it could contact a grounded object and result in a fault. SCE did not perform a risk analysis or calculate an RSE for this initiative as it is a pilot deployed on a very limited number of lines. The results of this small-scale deployment can help with risk analysis prior to any broad scale deployment.

3. Region prioritization:

At the time of scope selection, the WRM did not have models for transmission assets. Transmission lines in HFRA were therefore selected based on system characteristics including whether they had single conductor per phase (instead of bundled conductor) and the type of relays. This list was further narrowed down by considering where Open Phase Detection logic could be deployed. Finally, engineering judgement and knowledge of existing relay schemes was used to identify the locations for 2020 and 2021.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020, SCE achieved its WMP goal of deploying open phase detection pilots on six transmission and sub-transmission lines. In 2021, SCE is targeting an additional ten lines on which to deploy the Transmission Open Phase Detection Logic. These lines in HFRA can accommodate the technology with minimal infrastructure upgrades.

5. Future improvements to initiative:

In 2021, SCE expects to learn from the six pilots installed in 2020, including how the open phase logic operates for real-time events and how the logic may be refined. Currently the open-phase detection logic sends an alarm when a fault is detected. Based on learning from the pilot installations, SCE will also evaluate readiness to transition from alarm-mode to trip-mode. In 2022, SCE is planning to pilot the open phase logic on an additional 20 transmission lines, expanding the criteria to include multi-terminal transmission lines. SCE notes that future pilots will be limited by relay hardware capabilities (e.g., relay upgrades may be needed to deploy the Transmission Open Phase Detection logic). In 2023, based on pilot learnings, SCE will evaluate the possibility of standardizing the logic for transmission lines in HFRA.

7.3.3.17.2 Legacy Facilities (SH-11)

In 2021, SCE will continue its program at hydroelectric facilities to assess a variety of assets/sites and identify ways to reduce fire ignition risk through system hardening, including updating hydro control circuits, hardening low-voltage sites, and assessing identified sites for grounding grids and wildlife guards.

1. Risk to be mitigated / problem to be addressed:

Through 2019, SCE's wildfire mitigation strategies and programs were more focused on SCE's distribution system largely because of historical ignition sources being predominately from its distribution system. However, given the increasing risk of wildfires, SCE started assessing all potential sources of ignitions associated with electrical equipment, including generation facilities, for completeness of review of potential drivers. Legacy facilities primarily refer to high and low voltage equipment supporting hydroelectric operations. Findings from the 2019 enhanced inspections of generation assets uncovered potential risks that needed further assessment to help ensure adequate wildfire risk mitigation.

2. Initiative selection:
In 2020, SCE pursued detailed assessments of legacy facility assets to determine asset health and the potential for faults and ignition risks due to equipment failure and contact from foreign objects. This included assessing existing protections in place such as grounding grids and lightning arrestor systems to ensure their adequacy and identify necessary modifications. SCE did not calculate an RSE for this initiative as SCE does not have historical ignition data from these types of facilities to develop a risk model. Data gathered from this activity will help inform future risk modeling efforts and Technosylva's WRRM will assist in simulating and developing wildfire consequences for SCE's generation assets. While SCE develops risk modeling around this activity, discussion and evaluations with T&D engineering personnel involved in various programs validated the need to continue to monitor and assess these assets.

3. Region prioritization:
SCE is prioritizing system hardening in HFRA Tier 2 and 3 for this activity using the Reax consequence scores of the closest available overhead structure along with the legacy asset's age, last major overhaul date, and operating voltage. Other factors (e.g., unique asset characteristics, HFRA Tier, years since last assessment) were included in prioritization efforts depending on the specific workstream or activity. The WRRM was not used as it was not in production at the time scope was developed.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE met all milestones identified for SH-11, including evaluating risk, scope, and alternatives for identified circuits, and evaluation of additional system hardening mitigation for wildlife fault protection and grounding/lightning arrestors.

In 2021, SCE will begin to execute system hardening projects on identified Generation assets/facilities based on evaluations and continue grounding/lightning arrestor studies. SCE expects to complete approximately one-third or more of the grounding and lightning arrestor studies as well as several projects within the low voltage sites and hydro control circuits.

5. Future improvements to initiative:
SCE will use lessons learned from project completion in 2021 to plan subsequent projects.

7.3.3.17.3 Vertical Switches (SH-15)
In 2021, SCE will initiate a program to replace vertical distribution switches in HFRA.

1. Risk to be mitigated / problem to be addressed:
Engineering analysis of legacy vertical distribution switches concluded that older switches may generate incandescent particles if not properly adjusted. A study revealed that the wooden cross arms, upon which these switches are mounted, may shrink over time. This may allow the switch system to move out of

adjustment. An improperly adjusted switch may not perform nominally and within its ratings. Findings from vertical switch inspections performed in 2019 in HFRA reinforced the need to replace the vertical switch population.

More specifically, the mounting hardware for these vertical switches clamp and bolt to the wood crossarms. If the wood crossarms change dimensions over time as the wood dries out, the mounting hardware may loosen and correspondingly cause the vertical switch contacts to be out of alignment. This misalignment may lead to failures. The concern with vertical switch failures is the production of sparks associated with misaligned contacts. If a vertical switch fails, arcing may generate sparks with sufficient heat content to reach grade. For example, in 2020 SCE observed a vertical KPF switch failure that was likely due to misalignment in the switch crossarm system. The top crossarm of the structure was "scissored" which may have resulted in misalignment of the KPF switch contacts on the top phase position. Thru-fault current that resulted from a downstream cable failure likely caused the contacts of the KPF switch to burn up and result in an arcing connection dropping incandescent particles.

The replacement of vertical switches in SCE's HFRA may reduce the number of arcing and spark shower events, and therefore reduce the risk of ignitions that can lead to wildfires.

2. Initiative Selection:

To reduce the above-mentioned risk, SCE is replacing the older vertical switches with new ones that are factory assembled onto composite crossarms. The new switch designs reduce the probability of incandescent particle generation and the challenges with wood deformations over time. SCE's vendor will pre-mount vertical switches onto SCE-approved composite cross-arms prior to field installation. The estimated RSE for replacing vertical switches is low as it is a targeted mitigation for switch and crossarm failures, but given the relatively low cost of the program, SCE deemed it prudent to undertake this activity to reduce a known source of ignition risk. The absence of a historical ignition associated with this risk driver does not mean an ignition will not occur in the future, especially considering the incandescent particles that can result from the asset's failure.

3. Region Prioritization:

In 2021, SCE will use the following factors in prioritizing replacement of vertical distribution switches: 1) an appropriate switch design form factor is available for the specific location, 2) equipment condition based on prior inspection findings, 3) the location's Technosylva risk score, and 4) the geographical proximity with other switch replacements**.**

4. Progress on initiative (amount spent, regions covered) and plans for next year:

SCE completed inspections of vertical switches in 2019 and identified 190 vertical switches in HFRA. In 2020, SCE focused on switch development, working closely with its supplier and documenting performance of installed pilot next generation vertical switches to optimize design for each subsequent installation. In 2021, SCE will focus on scoping, planning, and material receipt, and aims to replace vertical switches at 20 sites in HFRA in the North Coast Region districts and will strive to exceed this goal by installing 30 switches in HFRA.

5. Future improvements to initiative:

In 2022, SCE is targeting replacing vertical switches at 60 to 70 sites, and in 2023, will focus on scoping, planning, material receipt, and installation of the remaining 100 sites**.**

7.3.3.17.4 Transmission Overhead (TOH) Review

In 2020, SCE completed its proactive review of its transmission and sub-transmission construction and design standards (SH-9) to address issues that can lead to phase-to-ground and phase-to-phase events associated with overhead facilities with voltages above 50kV. SCE started modifying its Transmission Overhead (TOH) standard based on this review and expects to complete it by Q2 2021. Modifications include increased clearance for crossarm construction, adding insulated guy wires for transmission, revising grounding for light weight steel poles, updating standards for horizontal to vertical construction, inverted v-brace construction for high wind areas, and updated tension tables for covered conductor installations. Given the successful completion of TOH review SCE is not including it as a WMP activity in this WMP update.

7.3.4 Asset Management and Inspections

Report detailed information for each initiative activity in which spending was above $0 over the course of the current WMP cycle (2020-2022).

7.3.4.1 Detailed inspections of distribution electric lines and equipment

This program is part of SCE's portfolio of standard inspection activities. SCE performs inspections of SCE's overhead distribution electric system in compliance with GO 165 [E19].

1. Risk to be mitigated / problem to be addressed:

Degradation of equipment and structures as part of wear and tear during normal operations and due to external factors such as weather or third party caused damage increases the probability of in-service malfunction or failure which can have safety and service reliability impacts. GO 95[E18] provides guidance on overhead electric line construction standards and GO 165[E19] provides guidance on the minimum timing for inspections and maintenance that SCE is required to comply with. SCE performs inspections that go beyond the GO 95[E18] requirements and GO 165 [E19] as described in Section 7.3.4.9.1.

2. Initiative selection:

To identify asset conditions that may lead to malfunction or failure, and to comply with GO 165[E19] requirements, SCE performs Overhead Detailed Inspections (ODI) on assets in HFRA and non-HFRA. ODI entails detailed ground-based visual inspections conducted by qualified inspectors. Issues identified during ODI are prioritized for remediation and remediations are completed within compliance timelines. This program is driven by compliance requirements, not wildfire risk reduction. Though SCE does not calculate RSEs for compliance programs which have to be undertaken regardless of RSEs, SCE supports risk informed evaluation of compliance requirements in collaboration with the Commission. Funding for this program has been consistently approved by the CPUC as part of SCE's GRCs.

3. Region prioritization:

SCE's distribution system is divided into grids and approximately one-fifth of the grids undergo ODI annually. Each grid is re-inspected five years after its previous inspection to meet GO 165[E19] compliance timelines. Standard ODI inspections continue to be performed in SCE's non-HFRA. In HFRA, ODI is combined with High Fire Risk Informed Inspections (IN-1.1), which is described in detail in Section 7.3.4.9.1 below and is performed following the same prioritization approach as IN-1.1.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

SCE's ODI program in 2020 conducted 56,895 inspections within its HFRA using the same inspection process as its risk-informed inspections. The compliance-due inspections identified:

- 80 Priority 1 conditions requiring remediation
- 5,362 Priority 2 conditions requiring remediation

Inspection counts in HFRA are included in IN-1.1 counts.

In 2021, SCE will continue to inspect compliance-due structures. SCE plans to inspect approximately 27,000 compliance-due structures in HFRA. This scope is included in the target for IN-1.1.

5. Future improvements to initiative:
SCE does not have specific improvements planned for the standard ODI program. Detailed inspections performed in HFRA are being enhanced as described in Sections 7.3.4.3 and 7.3.4.9.1.

7.3.4.2 Detailed inspections of transmission electric lines and equipment
SCE performs detailed inspections of SCE's overhead transmission electric system in compliance with regulatory requirements as part of SCE's portfolio of standard inspection activities including GO 165[E19], the North American Electric Reliability Corporation (NERC)[E20], Western Electricity Coordinating Council (WECC)[E20] rules and regulations and the California Independent System Operator's (CAISO)[E20] Transmission Control Agreement.

1. Risk to be mitigated / problem to be addressed:
As described in the previous section, degradation of equipment and structures as part of wear and tear during normal operations and due to external factors such as weather or third party caused damage increases the probability of in-service malfunction or failure which can have safety and service reliability impacts. CPUC, NERC, WECC and CAISO regulatory requirements drive the type and frequency of inspections to be performed. SCE performs inspections that go beyond the regulatory requirements as described in Section 7.3.4.10.1.

2. Initiative selection:
To identify asset conditions that may lead to malfunction or failure, and to meet regulatory requirements, SCE's Transmission Inspection and Maintenance Program (TIMP) has been instituted to perform visual detailed inspections for overhead transmission and sub-transmission assets and are conducted by qualified inspectors every three years. GO 95[E18] provides guidance on overhead electric line construction standards and GO 165[E19] provides guidance on the minimum timing for inspections and maintenance that SCE is required to comply with. Though SCE does not calculate RSEs for compliance programs which have to be undertaken regardless of RSEs, SCE supports risk informed evaluation of compliance requirements in collaboration with the Commission. This program has been consistently approved by the CPUC as part of SCE's GRCs.

3. Region prioritization:
SCE inspects approximately one-third of its service area annually. Resource allocation and work prioritization is driven by GO 165[E19] compliance requirements. Circuits are selected for inspection when they are due based on the last inspection date. Inspections in HFRA are combined with HFRI inspections of transmission assets (IN-1.2) and prioritized using the same approach described in more detail in Section 7.3.4.10.1.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020 SCE inspected 9,717 HFRA transmission assets using the same inspection process as its risk-informed inspection. In 2021 SCE will continue to inspect compliance-due structures. SCE plans to inspect approximately 7,900 compliance-due structures in HFRA. This scope is included in the target for IN-1.2.

5. Future improvements to initiative:
SCE does not have specific improvements planned for the standard inspection program. Detailed inspections performed in HFRA are being enhanced as described in Sections 7.3.4.3 and 7.3.4.10.1. SCE will evaluate the need for adjustments in scope and methods for this activity over the next three to ten years.

7.3.4.3 Improvement of inspections

7.3.4.3.1 Inspection and Maintenance Tools (IN-8)

Section 7.3.7 describes SCE's efforts to enhance the quality and consistency of its wildfire risk mitigation initiative data, including development of a centralized cloud-based data repository and data platform that integrates information from disparate sources. As part of these efforts, SCE is initiating technology solutions for inspection work and data management to support inspectors in the back office and in the field with improved processes and data. The software solutions aim to better integrate the Aerial and Ground inspection business processes for both Distribution and Transmission, as well as provide information and analytics on field assets across the process of data collection, inspection, and remediation on a single digital platform. In the maintenance/remediation area, SCE will continue implementing software to gain efficiency and productivity, incorporate risk-based scheduling, achieve better visibility to covered conductor circuit miles from planning to installation and, improve asset management functions in HFRA.

1. Risk to be mitigated / problem to be addressed:
Critical inspection processes are conducted through various decentralized, non-integrated systems that have limited scheduling and work management capabilities across the inspection processes. The current systems are a customized patchwork to meet near-term needs given the urgency of wildfire mitigation, but these manual workarounds are not sustainable, especially given the volume and type of data (such as images). In addition, they can introduce greater risk of human error, data consistency issues and process inefficiencies.

2. Initiative selection:
The selected portfolio of technology projects involves implementing a single digital platform to support end-to-end Aerial and Ground inspection processes for Distribution and Transmission and includes:

- Collection of asset data (images, video, LiDAR, meta data, etc.) and work management of the end-to-end inspection process;
- Integration with systems of record (e.g. SAP);
- Accessing and inspecting structures and completion of structure inspection surveys in the field;

- In-application creation of notifications for issues identified;

- Incorporation of advanced technologies including assisted and augmented reality as well as artificial intelligence/machine learning (AI/ML) models (ex. detect the type of asset, condition and severity) to reduce human error, improve the consistency and quality of inspections, improve inspection efficiency, and improve data quality.

Enablement of AI/ML-assisted business processes are expected to enhance SCE's ability to mitigate wildfire risk. As an example, incorporation of AI/ML models for asset defect detection and hazard identification in the Aerial Inspection processes could result in decreased time for problem identification with increased confidence in risk/issue detection. In addition, the use of AI/ML will allow SCE to gain new insights from collected data that are not easily revealed using traditional algorithms and analysis techniques.

Additional technology projects will provide a Geospatial view of work assignments and is part of the enterprise Geospatial system, and integrate with real time inspection, notification, and work order data from the SCE enterprise work management applications (e.g., SAP). Besides making the necessary changes to the enterprise system, it also includes deployment of iPads to support Distribution and Transmission contractor field crews. Once deployed, the improvements will replace the current longer-cycle time paper-based process with a digital solution and reduce the cycle time for inspections, notifications and remediation. In addition to improved efficiency, the solution will also help with performance management and training by providing the ability to monitor work scheduled by field crews and document the user identifications of the field personnel performing each activity.

An RSE was not calculated for this initiative. These are technology solutions which alone cannot reduce wildfire or PSPS risks but can improve the efficacy and efficiency of HFRI inspections and remediations, which does have its own RSE.

3. Region prioritization:
The inspection capabilities are prioritized to support the HFRI Inspections that will be performed both from the ground and aerially (using drones and helicopters) in SCE's HFRA. The maintenance capabilities will be also prioritized to support HFRA.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE is implementing the inspection and maintenance tools in a phased approach, focusing on building minimum viable products to rapidly increase near-term capabilities while also developing foundational capabilities that will drive long-term benefits to its wildfire mitigation activities.

<u>2020 Activities</u>

- Replaced and improved upon interim tools deployed for EOI through implementation of the Inspection Application for Distribution Ground inspections;

- Discovery workshops for the consolidation of Aerial and Transmission Ground processes onto the single technology platform;

- Development and implementation of the first release for Aerial inspections;

- Assisted Reality photo capture capabilities integrated into the distribution ground inspection application, improving the quality and consistency of the photos captured;

- Artificial intelligence/machine learning (AI/ML) models were implemented in an advisory mode for the aerial program to evaluate the quality of the images captured by vendors, to detect and read the pole tag from the image (validating that the photos are linked to the correct asset), and to detect the condition of the pole and cross arm;

- Developed a scope mapping and risk-based scheduling tool providing GIS map-based visualization to improve prioritization, scheduling, and execution of work in the field; and

- Development and pilot testing or the remediation mobile field tool with field crews.

<u>Work in Progress and Plans for 2021</u>

- Iterative development and release of additional functionality for the Aerial and Transmission Ground inspection processes;

- AI/ML models to identify and detect condition of additional field assets to improve efficiency, and consistency of inspections;

- Deploy scope mapping tool with GIS visualization and bundling capability to Distribution Planning and Engineering users through additional integrations and features. Initiate the design and development for Distribution and Transmission Poles visualization and bundling features; and

- Software and iPad deployment by region of the mobile filed tool for remediation, and the automation related to notification policy changes for remediation work for transmission and distribution.

5. Future Improvements to initiative:
After the completion of the current scope of capabilities, SCE will evaluate the need for additional capabilities and enhancements to see if adjustments in scope or methods are necessary over the next three to ten years. In addition, SCE will evaluate the opportunity to roll out these capabilities for use on non-HFRA as well.

7.3.4.4 Infrared inspections of distribution electric lines and equipment

Infrared Inspection of Energized Overhead Distribution Facilities and Equipment (IN-3)
This is a continuation of a program SCE initiated in 2020. In 2021, SCE intends to complete infrared inspections along all its distribution overhead lines in HFRA that were not inspected in 2020.

1. Risk to be mitigated / problem to be addressed:

Deteriorated connection points on electrical equipment such as conductors, insulators, splices or connectors can cause localized hot spots that over time can lead to failures if left unmitigated and pose ignition risks. These conditions are often not visible to the human eye and can go undetected during detailed visual inspections.

2. Initiative selection:

SCE determined through benchmarking that PG&E had implemented a successful program that uses infrared technology to detect thermal differences and identify hot splices and connectors that can be leading indicators of asset failure. SCE piloted infrared inspection of energized distribution lines and equipment in 2017 and 2018 to help reduce the risk of conductor failure. Though the number of ignition events associated with conductor and connector failures have been low in SCE's service area, given the increasing risk of potential wildfires associated with downed wire incidents and the relatively low cost of infrared inspections on distribution circuits, SCE decided to continue inspecting all distribution facilities in HFRA over a two-year cycle.

The RSE for this initiative is moderate. As the costs are low and potentially valuable data is being gathered in conjunction with other inspection programs, SCE is continuing this program in 2021.

3. Region prioritization:

Tier 3 and Tier 2 structures in HFRA will be inspected every other year. Circuits will be inspected by district with the highest risk districts being inspected in the first year of the two-year cycle and the lower risk districts being inspected in the second year of the two-year cycle.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

The 2020 goal was to inspect 50% of overhead distribution circuits in HFRA (i.e. the circuits that were not inspected in 2019). SCE exceeded the goal by completing inspections of 5,900 circuit miles. The goal was exceeded due to the addition of 1,454 circuit miles in AOCs, which are areas that posed increased fuel-driven and wind-driven fire risk primarily due to elevated dry fuel levels, as described in SCE's Second Change Order Report submitted on December 11, 2020. In 2021, a new two-year cycle begins with the goal to inspect 50% of the overhead circuits.

5. Future improvements to initiative:

In 2022 SCE plans to inspect the remaining 50% of distribution circuits in HFRA. SCE will evaluate the continued need for this program and if adjustments in scope and methods are necessary for this activity over the next three to ten years.

7.3.4.5 Infrared inspections of transmission electric lines and equipment

Infrared Inspection, Corona Scanning, and High Definition Imagery of Energized Overhead Transmission Facilities and Equipment (IN-4)

SCE plans to perform infrared and corona inspections for 1,000 transmission circuit miles per year as part of this activity.

1. Risk to be mitigated / problem to be addressed:
Deteriorated connection points on electrical equipment such as conductors, insulators, splices, or connectors can lead to failures and pose ignition risks. These conditions are not visible to the human eye and therefore cannot be detected during detailed inspections.

2. Initiative selection:
In 2019, SCE started a program to perform infrared and corona inspections of its overhead Transmission system to detect thermal abnormalities that are leading indicators of faults. This program was started because in recent years SCE experienced a number of splice failures. Helicopters are used for these inspections due to the long distances between structures and because these assets are frequently located on rugged terrain.

Although the RSE for this initiative is relatively low due to the low number of observed connector or splice failures on the transmission lines in SCE HFRA, given the potential for catastrophic ignitions related to transmission assets and the relatively low cost of these inspections, this program was deemed prudent. Furthermore, SCE plans to review the inspection process to identify improvements that may increase detection of potential conditions.

3. Region prioritization:
The circuit miles inspected in this activity for 2020 were prioritized based on ignition consequence risk scores using the Reax model. For 2021 scope, SCE will be using the Technosylva consequence scores and the POI scores to select the highest risk transmission circuit miles in and adjacent to its HFRA. The final scope and prioritization may be adjusted based on operating constraints including but not limited to circuit loading and ambient temperature.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE's transmission infrared and corona inspection program inspected 1,178 circuit miles in and around SCE's HFRA, slightly exceeding its 2020 WMP goal of inspecting 1,000 transmission circuit miles. Because individual circuits may traverse in and out of HFRA, some of the high-risk circuits that were inspected were located both within and outside of HFRA. Of the 1,000 circuit miles inspected, 1,005 miles were located in HFRA and 173 miles were located outside of HFRA. Although 2020 fires caused some delays in inspections due to restrictions on helicopter flights and SCE resources being diverted to fire response and recovery, SCE was able to meet its 2020 WMP goal of inspecting 1,000 transmission circuit miles. In 2021, SCE's goal is to perform infrared and corona inspections on 1,000 transmission overhead HFRA circuit miles.

5. Future improvements to initiative:
In 2020, SCE leveraged Reax's consequence scores to select the scope. Since then SCE has enhanced its risk modeling capability using Technosylva instead of Reax (see Section 7.3.7.3). In addition, the risk modeling for 2021 incorporated POI models for transmission and sub-transmission structures that were

not available in 2020. SCE will evaluate the results of the current program to determine appropriate scope and methods for this activity over the next three to ten years.

7.3.4.6 Intrusive Pole Inspections

This is a traditional inspection program SCE performs in compliance with GO 165[E19].

1. Risk to be mitigated / problem to be addressed:

The strength of wood poles can diminish over time due to insect infestation or material deterioration increasing the probability of structure failure which is a safety hazard given the electrical equipment supported by the poles and proximity of these poles to the public.

2. Initiative selection:

The Intrusive Pole Inspection (IPI) program is a preventative program designed to identify deteriorated poles that may require remediation to meet with GO 95[E18] requirements, while maintaining the safety of personnel, public and environment. The IPI program was established in accordance with GO 165[E19], to evaluate SCE's wood poles using visual and internal examination of the poles (by drilling into the pole and testing the extracted wood) to identify damage or decay, analyze the remaining strength of the pole and determine remediation required. As an industry practice approved by the Commission, the program performs remedial treatments during intrusive inspections to prevent poles from deteriorating and to extend the useful lives of the poles. Remediations resulting from IPI include installation of steel stubs to increase pole strength and pole replacement. GO 165[E19] requires intrusive inspections for all poles at least 15-years in service or older and with no prior intrusive inspection, to be completed using a 10-year cycle. If the pole has passed the initial intrusive inspection within the first 25-years of age, GO 165[E19] requires subsequent intrusive inspections on a 20-year cycle. SCE completes intrusive inspections on a 10-year cycle, which is in line with industry benchmarking and is approved by the Commission. Additionally, pole asset attributes are verified and/or updated to ensure system data integrity related to in field assets and/or mapping. Lastly, in accordance to GO 95 Rule 44.295[E18], the IPI program fulfills requests to provide intrusive test results for ongoing construction and addition of facilities that necessitates pole loading. Though SCE does not calculate RSEs for compliance programs which have to be undertaken regardless of RSEs, SCE supports risk informed evaluation of compliance requirements in collaboration with the Commission. This traditional program is not driven by wildfire risk reduction and has consistently been approved in SCE GRCs.

3. Region prioritization:

Inspections are performed annually across the SCE service area. SCE utilizes a 10-year grid approach to maintain operational and resource allocation efficiencies and compliance throughout the system. Small portions of annual work is prioritized to address constrained poles unable to be inspected previously for various reasons (e.g. unable to access and/or obstructions). Additionally, Rule 44.2[E18] ad hoc inspections are performed through the IPI program annually as requested in conjunction with construction activities.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

SCE performed 146,621 transmission and distribution intrusive inspections in 2020, and forecasts performing 143,600 inspections in 2021.

5. Future improvements to initiative:

There are no improvements currently planned. SCE will evaluate the continued need for this program and if adjustments in scope and methods are necessary for this activity over the next three to ten years.

7.3.4.7 LiDAR inspections of distribution electric lines and equipment

SCE does not have a separate LiDAR program for inspecting distribution lines and equipment. SCE uses LiDAR as part of its inspection programs described in Section 7.3.4.9.1 below. SCE also uses LiDAR for vegetation management as described in Section 7.3.5.7.

7.3.4.8 LiDAR inspections of transmission electric lines and equipment

SCE does not have a separate LiDAR program for inspecting transmission lines and equipment. SCE uses LiDAR as part of its inspection programs described in Section 7.3.4.10.1 below. Use of LiDAR for inspecting vegetation encroachment and clearance is described in Section 7.3.5.8.

7.3.4.9 Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations[66]

7.3.4.9.1 **Distribution High Fire Risk-Informed (HFRI) Inspections and Remediations (IN-1.1)**

To effectively target wildfire risks, SCE has undertaken distribution asset inspection programs in its HFRA that go beyond compliance requirements. In its previous WMP, SCE presented two separate activities for distribution enhanced inspections – ground based HFRI inspections (previously IN-1.1 in SCE's 2020 WMP) and aerial HFRI inspections (IN-6.1 in SCE's 2020 WMP). Given these activities have the same drivers and approach and the findings from these inspection programs are consolidated for remediation work, SCE is combining these into one activity (IN-1.1) in this 2021 WMP update. Moreover, as inspections themselves do not reduce wildfire risk unless followed by appropriate and timely remediations, SCE is presenting Distribution Remediations (SH-12.1 in SCE's 2020 WMP) within this activity.

1. Risk to be mitigated / problem to be addressed:

Deterioration of overhead structures and assets such as poles, crossarms, transformers, fuses, conductors, etc. increases the probability of failures and faults and the associated risk of ignition associated with electrical infrastructure. SCE's Distribution EOI program in 2019 demonstrated that the requirements, scope and frequency of compliance-driven grid patrols and overhead detailed inspections were insufficient in detecting a large number of potential hazards, that if not remediated would increase the risk of wildfire ignition in HFRA. Moreover, some equipment conditions or deterioration are not visible during detailed inspections from a ground-based perspective. Examples include woodpecker damage to the top of crossarms, deteriorated electrical connections on top of transformers, or missing/deteriorated insulator pins.

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[66] Unmanned Aerial Operations Training (OP-3 in SCE's 2020 WMP) was previously a WMP activity and was discussed in this section the 2020 WMP. SCE consolidated the description of training efforts within the "Adequate and trained workforce for service restoration" initiative, and now will include a write-up of Unmanned Operations Training within SCE Emergency Response Training (DEP-2) activity in SCE's 2021 WMP. Please refer to Section 7.3.9.1 for more details.

2. Initiative selection:
In light of increased ignition risks in HFRA, SCE has supplemented its GO 165[E19] compliance inspections of the overhead distribution system with risk-informed inspections. These HFRI Inspections are performed both from the ground and aerially (using drones and helicopters) to provide a 360-degree view of the assets. The inspection criteria include questions that are set based on fault, near misses and ignition analyses to help identify equipment conditions or attributes that potentially increase wildfire risks.

SCE continually enhances its HFRI inspections based on the latest data and ignition risk analysis. As described in SCE's Second Change Order Report, prior to the start of the 2020 fire season, SCE's Fire Science team identified 17 AOCs in its HFRA, which are areas that posed increased fuel-driven and wind-driven fire risk primarily due to elevated dry fuel levels. This threat can be magnified during periods of high wind, high temperatures and low humidity, as forecasts predicted for Fall 2020 in Southern California. The methodology used to identify the AOCs was based on several factors, including fire history, weather conditions, fuel type, exposure to wind, and egress, among others. Further details on methodology and risk can be found in Section 7.3.7.3. The AOC inspections can also be used to inspect high-risk lines before peak Santa Ana events later in the year to capture any defects that may have occurred intra-year or identification of any new fire risks not previously captured as part of the original HFRI inspections.

Besides identifying equipment-related hazards, these inspections also help with collecting valuable data regarding asset conditions that can be analyzed, stored, evaluated, and used for risk modeling and asset management activities.

To identify equipment or structure degradation that occur between compliance cycles due to natural wear and tear or emergent events such as weather or third party caused damages, HFRI inspections are performed more frequently than the requirement of once every five years. The frequency of inspections varies by the location specific risk within SCE's HFRA and emergent conditions. HFRI inspections result in notifications if remediations are necessary. The notifications are prioritized based on estimated severity and impact, and higher priority notifications are remediated faster. The prioritization approaches for inspections and remediations are described in the next section. Remediations can be repairs to the existing assets or replacements depending on asset condition. If risk analysis deems any asset type to be high risk, these are replaced as well. For example, SCE replaces wood crossarms with composite crossarms where feasible to increase resistance to wear and tear or damage.

The RSE calculations for Distribution HFRI Inspections (ground and aerial) and corresponding distribution remediations were combined as inspections by themselves do not reduce risk but are necessary to identify equipment conditions that require remediations which reduce risks. The relatively high RSE value supported the continued need for this program to proactively identify equipment failures and potentially hazardous conditions before an ignition could occur.

For more justification on SCE's planned utilization of HFRI inspections, please see SCE's response to Critical Issue SCE-02 in Section 9.9.

3. Region prioritization:

As risk levels vary across SCE's HFRA, a targeted quantitative approach is being deployed to balance risk reduction, resource availability and costs. Structures are prioritized for inspection based on POI and consequence. In determining the 2021 inspection scope, SCE incorporated the latest risk modelling as well as the need to reserve execution capacity for emergent AOCs. While the 2020 scope for inspections was based on the Reax consequence model, the 2021 scope is based on the Technosylva model. For a description of the benefits of using the Technosylva model, see Section 7.3.7.3. SCE created a 4 x 4 matrix with one dimension of the matrix representing four levels of POI risk and the other dimension representing four levels of consequence. Each structure was scored and mapped to a box in the matrix based on its POI and consequence. The highest risk structures (i.e., those mapped to the red boxes) will be inspected in 2021 as shown in Figure SCE 7-4. In addition, any structures due for a compliance inspection in 2021, regardless of which box they mapped to, will be included in 2021 scope.

Figure SCE 7-4
Visualization of Risk Analysis

Probability of Ignition	Consequence (TS): Level 4	Level 3	Level 2	Level 1
Level 1	2.3% Annual 0.1%	1.1% Annual 0.6%	0.6% Annual 2.4%	0.5% Annual 15.2%
Level 2	4.6% Annual 0.1%	2.2% Annual 0.6%	1.5% Annual 2.8%	1.2% Annual 19.8%
Level 3	7.5% Compliance 0.1%	3.9% Annual 0.6%	3.0% Annual 3.2%	2.5% Annual 23.6%
Level 4	25.7% Compliance 0.1%	15.9% Compliance 0.6%	14.5% Annual 3.6%	13.0% Annual 26.3%

% of Total Population
% of Total Risk

Priority 1 (P1) issues require remediation as soon as the issue is discovered, either by fully remediating the condition, or by temporarily repairing the equipment or structure to allow for follow-up corrective action. Examples of P1 issues include vegetation touching lines, broken crossarms or insulators, burned connectors, or wires laying on crossarms. Priority 1 issues are typically made safe within 24 hours and remediated within 72 hours. Priority 2 (P2) issues are lower risk and therefore may be resolved within 24 months based on the existing safety or reliability condition and location. If the P2 issue is located within HFRA and poses a potential fire risk, remediation work is scheduled to be completed within 12 months. In an extreme fire threat area of Tier 3, the maximum remediation time is within 6 months. Examples of P2 issues include vegetation near lines, deteriorated crossarms or splices, or insufficient pole depth. Priority 3 (P3) issues do not require near-term remediation as they do not pose material safety, reliability, or fire risks, and will either be repaired or re-evaluated at or before the next detailed inspection. P3 issues require remediation within 60 months pursuant to GO 95, Rule 18[E21]. Examples of P3 issues include missing items such as reflector strips, ground moldings, guy wire guards, or high voltage signs.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

Table SCE 7-2 summarizes 2020 progress and 2021 plans for IN-1.1. SCE's goal to inspect 165,000 structures by ground and air as identified in the First Change Orders Report filed September 11, 2020 is substantially complete. Ground inspections were completed on 199,050 structures which includes inspections in AOCs as identified in the Second Change Order Report and compliance due inspections in HFRA. Aerial inspections were completed on a total of 168,017 structures.[67] Ground and aerial both inspected a total of 157,136 structures for a complete 360-degree view.

Table SCE 7-1
Distribution Ground and Aerial Inspections (2020 – 2021)

	2020		2021	
Activity	**Units**	**Comments**	**Units**	**Comments**
Ground Inspections	199,050	Exceeded WMP goal of completing approximately 165,000 inspections as outlined in SCE's First Change Order Report. The count includes inspections in AOC and compliance in HFRA.	Between 163,000 and 198,000	Approximately 136,000 risk-informed inspections, approximately 27,000 to meet compliance due dates (since ODI in HFRA has been consolidated into this activity), and 30,000 in AOC (Because this AOC scope is related to risks that are not identified at the time of filing this WMP, the number of inspections will likely vary from what is estimated here.)
Aerial Inspection	168,017	Exceeded WMP goal of completing approximately 165,000 inspections.	Between 163,000 and 198,000	Approximately 163,000 risk-informed inspections and 30,000 in AOC (Because this AOC scope is related to risks that are not identified at the time of filing this WMP, the number of inspections will

[67] The completed inspection count for aerial includes inspections where further research is required to associate the structure number to the images. It also includes inspections based on images that were captured in 2020 with the inspections completed in the first week of January.

				likely vary from what is estimated here.)

5. Future improvements to initiative:

In planning the execution of the 2021 scope, SCE will incorporate lessons learned from 2020. First, SCE has found that helicopters can capture images faster than drones and provide LiDAR data but drones provide certain benefits that helicopters cannot. Because a large amount of distribution structures are located in close proximity to our customers, drone inspections reduce the amount of noise our customers experience. Drones also have the advantage of closer proximity to the structures and in some cases allows for better picture resolution. Second, the 2019 inspection survey questions were revised for 2020 and included pop up alerts to improve quality and consistency of responses. Third, process improvements were made to speed remediation when certain conditions were discovered (e.g., bird's nests).

SCE will also use the Grid Resiliency (GR) Viewer, and the AI/ML models to review photographs received from the helicopter and drone vendors described previously.

SCE is continuing to re-evaluate alternatives and refinements to expedite maintenance opportunities to reduce PSPS events and will include changes in approach, scope or cost in Change Order Reports to this WMP.

7.3.4.9.2 **Generation High Risk Informed Inspections and Remediations in HFRA (IN-5)**

In 2021 SCE continues its inspection program of relevant generation-related assets in HFRA, including powerhouses, substations, pumps to identify remediations to reduce the risk of wildfire ignition. As inspections themselves do not reduce wildfire risk unless followed by appropriate and timely remediations, SCE is presenting Generation Remediations (formerly SH-12.3 in SCE’s 2020 WMP) within this activity.

1. Risk to be mitigated / problem to be addressed:

Deterioration of electrical lines and equipment in generation facilities pose the same fault and ignition risks described in the Distribution HFRI Inspection program (IN-1.1). Because SCE’s generation facilities are often located in or near heavily forested areas, wildfire propagation in these areas could affect critical power generation infrastructure and equipment.

2. Initiative selection:

In March 2019, SCE began to inspect all electrical lines, equipment, and wiring associated with generation infrastructure, including secondary and control lines feeding ancillary generation assets in HFRA. These inspections included ignition-focused assessments of low-voltage ancillary assets and their associated overhead lines, supporting structures, and any exposed wiring and/or threats from vegetation that require additional mitigation. In addition, high-voltage facilities were inspected to ensure that all overhead connections from the last inspection(s) of transmission and distribution structures had been evaluated and assessed for vegetation clearance buffers, using relevant criteria from transmission and distribution inspections. In 2020, SCE continued to inspect Generation-related assets and worked towards integrating this inspection program into its current inspections routines to streamline field efforts.

Once asset deterioration or other corrective actions are identified during inspections, timely remediations of these conditions are imperative to reduce the probability of faults and potential ignitions and thus achieve the ignition driver reduction benefits.

This activity follows the best practices of Distribution and Transmission inspections and therefore no alternatives were considered. Because there are a limited number of assets in scope for this initiative, SCE has included costs of this program in the same RSE calculation for Distribution HFRI Inspections (IN-1.1) and Remediations.

3. Region prioritization:
HFTD Tier 2 & 3, with prioritization of Tier 3.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
Table SCE 7-2 summarizes 2020 progress and 2021 plans for IN-1.5. In 2020 SCE also conducted a risk assessment and determined that the Big Creek area should complete both the 2020 and 2021 planned inspections by year-end 2020 given its higher risk profile and amount of vegetation.

Incorporating lessons learned in 2020, SCE intends to perform its 2021 generation risk-based inspections *after* the typical vegetation growth and annual vegetation maintenance has been completed.

Table SCE 7-2
Generation Inspections (2020 – 2021)

	2020		**2021**	
Activity	**Units**	**Comments**	**Units**	**Comments**
Generation Inspections	268	Exceeded 2020 goal of inspecting 200 assets; participated in the Emergent Dry Fuels Initiative (EDFI) that brought 11 inspections forward from the 2021 plan and re-inspected 20 assets.	181	~50% of identified assets based on current low finding rates in 2020.

5. Future improvements to initiative:
Over the next three years (2021-2023) SCE will re-evaluate and determine the frequency of these Generation asset inspections based on the previous year's results. SCE will also review remediation trends to identify common/reoccurring issues and develop projects, plans and processes that could minimize future occurrences. Over the next ten years (2021-2031) SCE will continue to review this program for ways to improve effectiveness and efficiency including looking into fully incorporating WMP inspections into its existing O&M inspections program.

7.3.4.10 Other discretionary inspection of transmission electric lines and equipment, beyond inspection mandated by rules and regulations

7.3.4.10.1 Transmission Risk-Informed Inspections in HFRA (IN-1.2) (including Aerial Inspections and Transmission Remediations)

In its 2020 WMP, SCE presented two separate activities for its transmission inspections: Transmission Risk-Informed Inspections (previously IN-1.2 in SCE's 2020 WMP) and Transmission Aerial Inspections (previously IN-6.2 in SCE's 2020 WMP). Given these activities have the same drivers and approach and the findings from these inspection programs are consolidated for remediation work, SCE is combining these activities into one activity (IN-1.2) in its 2021 WMP update. Moreover, as inspections themselves do not reduce wildfire risk unless followed by appropriate and timely remediations, SCE is presenting Transmission Remediations (previously SH-12.2 in SCE's 2020 WMP) within this activity.

In 2021, SCE will continue its ground inspection program of transmission structures in addition to those required by GO 165[E19] and that represent the highest risk based on POI and consequence. SCE is continuing a more comprehensive inspection program for its transmission overhead facilities in HFRA to detect equipment anomalies and mitigate ignition risks that cannot be detected during compliance-driven programs alone. SCE will also continue to complement its ground-based inspections in HFRA with aerial inspections using helicopters and drones to provide a 360-degree view of the assets to detect equipment/structure conditions which could lead to faults and ignitions.

Ignition risks identified through these HFRA inspections will be remediated in accordance with CPUC requirements.

1. Risk to be mitigated / problem to be addressed:

As discussed in IN-1.1, the deterioration of transmission (and sub transmission) structures and equipment can lead to faults and ignitions that can have similar impacts as the risks associated with distribution structures. SCE's Transmission Enhanced Overheard Inspection program in 2019 demonstrated that the requirements, scope and frequency of compliance-driven grid patrols and overhead detailed inspections were insufficient in detecting a large number of potential hazards that, if not remediated, would increase the risk of wildfire ignition in HFRA.

2. Initiative selection:

Inspections identify conditions in need of remediation, conditions are prioritized, and items are remediated before they fail and cause a fault. As noted in its 2020 WMP, SCE performs routine inspections of SCE's overhead transmission electrical system in compliance with GO 165[E19]. However, in 2019 SCE realized the need to shift towards more risk-informed inspections and accordingly has increased its normal inspection population in HFRA. Aerial inspections are typically performed at the same locations as ground inspections and provide a 360-degree view of the assets to detect equipment/structure conditions which could lead to faults and ignitions. This initiative also helps collect valuable data regarding asset conditions that can be analyzed, stored, evaluated, and used for risk modeling and asset management activities. Once the need for corrective actions are identified during inspections, timely remediations of these conditions are imperative to reduce the probability of faults, potential ignitions and thus achieve the ignition driver reduction benefits.

SCE continually enhances its HFRI inspections based on the latest data and ignition risk analysis. As described in SCE's Second Change Order Report, prior to the start of the 2020 fire season, SCE's Fire Science team identified 17 AOCs in its HFRA, which are areas that posed increased fuel-driven and wind-driven fire risk primarily due to elevated dry fuel levels. This threat can be magnified during periods of high wind, high temperatures and low humidity, as forecasts predicted for Fall 2020 in Southern California. The methodology used to identify the AOCs was based on several factors, including fire history, weather conditions, fuel type, exposure to wind, and egress, among others. Further details on methodology and risk can be found in Section 7.3.7.3. The AOC inspections can also be used to inspect high-risk lines before peak Santa Ana events later in the year to capture any defects that may have occurred intra-year or identification of any new fire risks not previously captured as part of the original HFRI inspections.

Similar to distribution remediations, planned maintenance work identified through HFRA inspections is comprised of repairs to SCE's equipment and structures recorded as Priority 2 and Priority 3 items (i.e. level 2 and level 3). These repairs can be performed by inspectors or qualified electrical workers for electrical assets and cable splicers for telecom assets and completed based on the established due date. Unplanned activities, also referred to as breakdown maintenance, include the repair of SCE equipment and structures that are damaged, compromised or have failed while in service. These items are typically identified as Priority 1 conditions and are performed in response to damaged caused by equipment failures, the public, metallic balloons, animals, or other causes. Repairs are either completed or made safe to the public within 24 hours of identification.

The RSE calculation for Transmission HFRI inspections (ground and aerial) was combined with the corresponding remediation (as inspections alone do not reduce risk but are necessary to identify equipment conditions that require remediations which reduce risks).

This program scored a lower RSE than Distribution inspections and remediations because the historical number of EFF that resulted in an ignition in SCE's service area has been low, which translated to a calculated low risk reduction. However, because California has witnessed the catastrophic results of ignitions related to Transmission assets in recent years, SCE determined it was critical to move beyond compliance-driven minimum requirements to enhanced and more frequent inspections of transmission facilities to appropriately mitigate ignition risks in SCE's HFRA.

3. Region prioritization:

As risk levels vary across HFRA, a targeted quantitative approach is being deployed to balance the costs of inspections and the catastrophic fire risk. Structures are prioritized for inspection based on POI and consequence. In determining the 2021 inspection scope, SCE incorporated the latest risk modelling as well as the need to reserve execution capacity for emergent AOCs. While the 2020 scope for inspections was based on the Reax consequence model, the 2021 scope is based on the Technosylva model. For a description of the benefits of using the Technosylva model, see Section 7.3.7.3. Additionally, when determining the 2020 scope, SCE did not have POI scores for transmission structures. Since then, POI models for transmission and sub transmission assets have been developed for use in determining the 2021 scope. SCE created a 4 x 4 matrix with one dimension of the matrix representing four levels of POI risk and the other dimension representing four levels of consequence. Each structure was scored and mapped to a box in the matrix based on its POI and consequence. The highest risk structures (i.e. those mapped to the red boxes) will be inspected in 2021 as shown in Figure SCE 7-5. In addition, any structures due for a compliance inspection in 2021 and other structures in the vicinity for operational efficiency purposes, regardless of which box they mapped to, will be included in 2021 scope.

Figure SCE 7-5
Visualization of Risk Analysis

Probability of Ignition	Consequence (TS): Level 4	Level 3	Level 2	Level 1
Level 1	0.2% Annual 0.0%	0.2% Annual 0.3%	0.3% Annual 2.2%	0.3% Annual 18.8%
Level 2	0.4% Annual 0.0%	0.2% Annual 0.3%	0.2% Annual 1.3%	0.2% Annual 25.6%
Level 3	0.5% Compliance 0.0%	0.3% Annual 0.3%	0.1% Annual 0.8%	0.2% Annual 21.8%
Level 4	39.8% Compliance 0.0%	22.1% Compliance 0.2%	18.9% Annual 0.8%	16.2% Annual 27.5%

% of Total Population
% of Total Risk

4. Progress on initiative (amount spent, regions covered) and plans for next year:

Table SCE 7-4 below summarizes 2020 progress and 2021 plans for IN-1.2. As described in SCE's Change Orders report, SCE increased its 2020 goal from 22,500 to 33,000 inspections. The original targeted inspections that would have addressed all high risk and approximately *half* of the medium risk assets. With the proposed change, *all* high or medium risk structures were inspected in 2020. This increase in inspections, which is aligned with the number of aerial inspections, will further reduce wildfire risk.

SCE's goal to inspect approximately 33,500 structures by ground and air as identified in the First Change Orders Report filed September 11, 2020 is substantially complete. Ground inspections were completed on 35,561 structures which includes inspections in AOCs as identified in the Second Change Order Report and compliance due inspections in HFRA. Aerial inspections were completed on a total of 31,381 structures.[68] Ground and aerial both inspected a total of 30,666 structures for a complete 360-degree view.

[68] The completed inspection count for aerial includes inspections where further research is required to associate the structure number to the images or where one component was not able to be viewed during the inspection review. It also includes inspections based on images that were captured in 2020 with the inspections completed in the first week of January.

Table SCE 7-3
Transmission Ground and Aerial Inspections (2020-21)

	2020		2021	
Activity	**Units**	**Comments**	**Units**	**Comments**
Ground Inspections	35,561	Exceeded 2020 goal of approximately 33,500 inspections identified in the First Change Orders Report filed September 11, 2020 (SCE increased its original goal of approximately 22,500 ground-based inspections to approximately 33,500 inspections). Inspection count includes AOC and compliance in HFRA.	Between 16,800 and 22,800	Comprised of approximately 8,900 risk-informed inspections and other structures in the vicinity for operational efficiency, approximately 7,900 compliance inspections and approximately 3,000 in AOC (Because this AOC scope is related to risks that are not identified at the time of filing this WMP, the number of inspections will likely vary from what is estimated here.)
Aerial Inspection	31,381	Slightly below its WMP goal of completing approximately 33,500 inspections.	Between 16,800 and 22,800	Comprised of approximately 16,800 risk-informed inspections and an allowance for approximately 3,000 inspections of emergent AOC similar to the AOC inspections described in SCE's Second Change Order Report (Because this AOC scope is related to risks that are not identified at the time of filing this WMP, the number of inspections will likely vary from what is estimated here.)

In planning the execution of the 2021 scope, SCE will incorporate lessons learned from 2020. In particular, SCE has found that helicopters can capture images faster than drones and provide LiDAR data, but drones provide more detailed pictures and capture angles that a helicopter cannot. Therefore, SCE plans to use drones more frequently for inspecting transmission structures in 2021. In 2021, SCE also intends to begin its aerial inspections earlier in order to allow for sufficient time for operational planning. Scheduling inspections earlier in the year will also allow more time for remediation prior to the start of the 2021 fire season. In addition, inspection survey questions will be revised in 2021 based on input from engineering and investigation of ignitions in order to improve the quality and consistency of responses.

Building on lessons learned in 2020, SCE is evaluating ways to overcome construction restrictions (e.g. circuit loading, environmental prohibitions, permitting). SCE is also working to incorporate newly identified scope and group it with existing notifications to ensure efficiency so that all pending maintenance on a structure is completed. Finally, SCE is working to establish better relationships with agencies to inform them of the need/urgency to complete maintenance.

5. Future improvements to initiative:
As noted above, SCE has collected two-years' worth of high-resolution images from this activity which provide opportunities to enhance its AI/ML capabilities. Over the next three to ten years, SCE will continue to evaluate the appropriate scope and methods for this activity based on then-current risk modeling and analysis and further explore ways to evolve from compliance-driven remediations to risk-based remediations.

7.3.4.11 Patrol inspections of distribution electric lines and equipment
This program is part of SCE's general portfolio of inspection activities. SCE performs patrol inspections of SCE's overhead distribution electric system in compliance with GO 165[E19].

1. Risk to be mitigated / problem to be addressed:
A patrol inspection is a simple visual inspection that is designed to identify obvious structural problems or hazards.

2. Initiative selection:
SCE performs patrols of SCE's overhead distribution electric system in compliance with GO 165[E19]. GO 165[E19] requires SCE to perform an annual patrol inspection of all overhead distribution electric assets that are located in SCE's HFRA. Though SCE does not calculate RSEs for compliance programs which have to be undertaken regardless of RSEs, SCE supports risk informed evaluation of compliance requirements in collaboration with the Commission.

3. Region prioritization:
Resource allocation and work prioritization is driven by compliance requirements. Annual Patrols are performed on structures within specified grids in HFRA throughout SCE's service area.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE completed annual grid patrol of the required grids in 2020. SCE plans to inspect all required grids in 2021. SCE has engaged contractors to perform the grid patrol inspections to free up capacity among its inspectors and allow them to focus on the higher value detailed inspections.

5. Future improvements to initiative:
SCE will continue to evaluate changes to the methods and data collections tools to improve the efficiency and risk mitigation of patrol inspections.

7.3.4.12 Patrol inspections of transmission electric lines and equipment

This program is part of SCE's portfolio of inspection activities. SCE performs patrol inspections of SCE's overhead transmission electric system in compliance with GO 165[E19], NERC, WECC rules and regulations and CAISO's Transmission Control Agreement.

1. Risk to be mitigated / problem to be addressed:
A patrol inspection is a visual inspection that is designed to identify potential risk associated to structure.

2. Initiative selection:
SCE performs patrol inspections of SCE's overhead transmission electric system in compliance with GO 165[E19], NERC, WECC and CAISO rules and regulations. Though SCE does not calculate RSEs for compliance programs which have to be undertaken regardless of RSEs, SCE supports risk informed evaluation of compliance requirements in collaboration with the Commission.

3. Region prioritization:
Resource allocation and work prioritization is driven by compliance requirements. Compliance inspections are performed at the same time as high fire inspections. For circuits that traverse both in and out of HFRA, SCE may separately inspect the assets of circuits outside of the HFRA to complete the patrol inspection.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE completed annual grid patrol of the required circuits in 2020. SCE plans to inspect all required circuits in 2021.

5. Future improvements to initiative:
SCE will continue to evaluate changes to the methods and data collections tools to improve the efficiency and risk mitigation of patrol inspections. SCE currently records completion of transmission patrol inspections by circuit. In the future, SCE will move towards recording patrol inspections on each structure. This will provide more accurate data on completed inspections.

7.3.4.13 Pole loading assessment program to determine safety factor

SCE's PLP was initiated in 2014 and is a comprehensive program to assess pole loading of all pole in SCE's service area (HFRA and non-HFRA) for GO 95[E18] safety compliance, and repair, remediate or replace poles that do not meet adequate safety factors. Although PLP improves safety and reliability including reducing ignition risks associated with pole failure from overloading, PLP is primarily a compliance program and not one driven by wildfire risk reduction or one of SCE's wildfire mitigation initiatives. The PLP's goal is to assess the structural loading capabilities of the approximately 1.4 million wood, composite, and light weight steel poles in SCE's service area. SCE expects to complete all remaining assessments in 2021 and will continue remediating pole overloading issues by 2025. After 2021, when additional facilities are added to a pole, a pole loading calculation will be performed to help ensure the pole will not be overloaded.

1. Risk to be mitigated / problem to be addressed:

The risk to be mitigated is overloaded poles. A pole can be overloaded due to, for example, added electrical equipment, degradation over time, or added load from third-party attachments such as telecommunications lines.

2. Initiative selection:
The PLP program was created to identify poles that do not meet the safety factor requirements of GO 95[E18] and SCE's internal design and constructions standards for repair or replacement. The program is designed to verify that structural integrity of existing poles is sufficient to withstand anticipated loads, including wind loads in high wind areas. PLPs are undertaken to meet GO 95[E18] compliance. Though SCE does not calculate RSEs for compliance programs which have to be undertaken regardless of RSEs, SCE supports risk informed evaluation of compliance requirements in collaboration with the Commission.

3. Region prioritization:
Assessments of poles in HFRA are prioritized. GO 95[E18] establishes the minimum loading requirements for overhead supply and communication lines.[69] SCE has adopted wind load design standards that exceeds the GO 95[E18] minimum requirements. SCE will continue to assess pole conditions and replace poles, and where applicable, utilize higher wind loading criteria.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE has completed over 1.3 million pole assessments since 2014, performing approximately 1,200 pole loading assessments in SCE's HFRA in 2020. SCE expects to complete assessments on the entire system in 2021 and to continue remediating pole overloading issues by 2025.

SCE provides status updates on PLP assessments completed in HFRA in quarterly reports to WSD.[70] In its quarterly reports, SCE notes that as it nears the end of PLP assessments, the remaining poles present customer and other access challenges along with increased scheduling and planning uncertainty. SCE is actively resolving these challenges. For example, customers sometimes deny admission to their properties where poles are located or are not available when needed, requiring additional process steps to negotiate access or resolve disputes, sometimes through litigation. SCE has also experienced access issues due to customer COVID-19 concerns and anticipates these concerns will continue to manifest until the pandemic has subsided. Additionally, hard-to-access poles that are unsafe to patrol by foot require an aerial assessment. SCE's PLP team has collaborated with SCE's Air Operations team to develop a schedule to conduct these assessments but notes that Air operations can be diverted to higher priority work that can require re-scheduling these PLP assessments.

5. Future improvements to initiative:
SCE expects to complete the remaining assessments on the entire system in 2021 at which time this program will cease, noting SCE will continue to remediate pole overloading issues by 2025.

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[69] See SCE's 2020-2022 WMP Section 5.3.4.13 for details on Commission minimum loading requirements.
[70] See SCE's First Quarterly Report on 2020-2022 WMP for Class B Deficiencies, filed September 9, 2020 and SCE's Second Quarterly Report on 2020-2022 WMP for Class B Deficiencies, filed December 9, 2020. Please also see the Q4 2020 QDR that includes the current status of SCE's PLP.

7.3.4.14 Quality assurance / quality control of inspections

In 2021, SCE continues its independent QA/QC initiative conducted on a sample of distribution, transmission, and generation structure inspections in HFRA.[71]

1. Risk to be mitigated / problem to be addressed:

Since 2019, the work scope and complexity of incremental inspections of overhead lines, structures and equipment in HFRA (IN-1.1, IN-1.2 and IN-5) has increased substantially. The number of inspectors has increased, and many are new to SCE's service area and operational practices. For SCE's ODI program all inspectors have been trained but started performing detailed inspections under the enhanced process for the first time in 2020. These factors can increase the potential for errors and work not being performed to SCE standards (which often exceed minimum requirements established in GO 95[E18]).

2. Initiative selection:

SCE deemed it important to institute a formal risk-based QC initiative that relied on statistical sampling to identify work errors and target corrective actions including improving training and tools. The inspection QC program ensures that inspections conform to the requirements of SCE's overhead inspection programs by evaluating the results of the inspection after the fact. Since this initiative has been operationalized and does not directly mitigate ignition risk, but rather promotes effectiveness of inspection programs, SCE has not calculated an RSE for this initiative.

The QA/QC program helps ensure high quality of inspection as described in IN-1.1, IN-1.2 and IN-5, which in turn reduces the probability of equipment failure and ignitions when issues identified by those activities are remediated. SCE's inspection QA/QC program helps drive continuous improvement and is deemed effective when it identifies non-conformance with SCE standards, determines causes of non-conformance, or implements necessary corrective actions. SCE follows the progress of the formal action plans to corrective actions, which can include such things as changes implemented to inspection processes, training, etc. to continuously improve the inspection programs based on QA/QC findings. Increases in conformance rates over time also reflect the effectiveness of the program.

3. Region prioritization:

Inspection samples are being conducted and prioritized based on a combination of program risk ranking and Reax scores, noting SCE is in the process of transitioning from Reax to Technosylva, which will likely replace Reax in 2021.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020, SCE performed more than 17,000 quality inspections in HFRA, exceeding its target of 5,000 inspections. SCE typically provided monthly quality scores at the program level, and in some cases provided quality scores at the inspector level to help drive performance improvement.

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[71] The inspection QA/QC initiative was discussed as WMP activity IN-2 in SCE's 2020 WMP. As this activity is formalized and operationalized, it will be discussed in this section and remain a part of SCE's WMP but will not have program targets specifically tracked by SCE to monitor wildfire mitigation implementation.

In 2021, SCE is targeting to perform 5,000 quality inspections on distribution, transmission, and generation structures. SCE is currently working to update risk ranking scores based on the evolution of program risk ranking criteria and development of Technosylva as an alternative to Reax, which could impact the goal target of 5,000 inspections.

5. Future improvements to initiative:
SCE will utilize the Salesforce-based application described previously to provide enhanced functionality to SCE inspection programs and quality inspectors. As previously mentioned, SCE is currently working to update risk ranking scores based on the evolution of program risk ranking criteria and development of Technosylva as an alternative to Reax. SCE's inspection QA/QC program will continue to be evaluated as it matures over time.

7.3.4.15 Substation Inspections

Substation Failure Modes and Effects Analysis (FMEA)[72]
In 2020 SCE undertook a study to help identify potential sources of ignition from major substation assets and develop recommendations for substation equipment inspections and maintenance (IN-7 in SCE's 2020 WMP). This study concluded at the end of 2020 and found animal contact to be the failure mode with the highest risk of causing a fire which spreads outside the substation. As a result, SCE plans to install additional animal protective covers at various substations and will be increasing inspections at certain substations which are located in high fire areas.

1. Risk to be mitigated / problem to be addressed:
Through 2019, SCE's wildfire mitigation strategies and programs were more focused on SCE's overhead distribution system largely because of historical ignition sources being predominately associated with overhead lines. Historically, SCE has experienced few instances of substation fires spreading beyond the premises. Given the increasing risk of catastrophic wildfires, SCE is assessing all potential sources of ignition associated with electrical equipment including substation facilities for completeness of review of ignition probability drivers.

2. Initiative selection:
In 2020, prior to incurring any costs associated with wildfire mitigation activities at substations, SCE completed a study to assess the risks of substation equipment failure, whether failure could lead to an ignition, and determine if current inspection and maintenance standards are adequate to identify equipment failures proactively. The purpose of this study was to develop recommendations for substation equipment inspection and maintenance based on qualitative analysis of probability and consequence of failure and associated ignition. SCE did not calculate an RSE for this initiative as it cannot reduce wildfire

[72] The Substation FMEA initiative was discussed as WMP activity IN-7 in SCE's 2020 WMP. This activity concluded at the end of 2020 and will no longer be an activity in the 2021 WMP.

risk as a standalone item but can inform wildfire risks analysis when used for field inspections and maintenance activities.

3. Region prioritization:
Substations in HFRA.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
The Failure Modes and Effects Analysis was finalized the end of 2020 and found the following failure risks:

- Foreign object contact was found to be the highest risk failure mode, of which animal contact comprised the majority of this risk, with mylar balloons and vegetation also accounting for substantial equipment failure
- Other risks which scored highly include failures of oil circuit breakers and failures of DC systems which disable the substation protection

The total level of risk from these failures is substantially lower than for distribution and sub transmission assets. Since this risk is heavily concentrated, any programs should target the substations and failure modes representing the highest risks. As a result of this study, additional animal protective covers will be installed at approximately fifteen substations which have switchracks located near the fence line.

5. Future improvements to initiative:
In 2020, SCE completed this analysis and implemented findings by adding additional protective covers. Additionally, based on findings, SCE will be increasing the frequency of Predictive Maintenance Assessments (PMA) at 40 substations which are in particularly HFRA. The additional PMA inspections are anticipated to occur starting in 2022.

7.3.5 Vegetation Management and Inspections

Report detailed information for each initiative activity in which spending was above $0 over the course of the current WMP cycle (2020-2022).

7.3.5.1 Additional efforts to manage community and environmental impacts

SCE has processes in place to mitigate the customer and environmental impact of its vegetation management activities.

1. Risk to be mitigated / problem to be addressed:

Planned or pending vegetation management create disturbances or otherwise impact communities and/or the environment in which the work is performed, especially when affected communities lack awareness about the vegetation management work scope.

2. Initiative selection:

When vegetation mitigation is necessary, SCE's standard process is to leave a door hanger at the time of inspection with information on the work to be performed and contact information for questions or concerns. Additional notification is then provided several days in advance of the vegetation work. The purpose is to provide multiple opportunities for the customer to ask questions or express concerns. Further, SCE also makes note of individual customer requests for items such as advance phone calls or appointment requests before conducting work and notates the tree inventory accordingly to satisfy customers' wishes as much as possible. Interim supplemental inspections and corresponding mitigations follow a similar process. For SCE's Dead & Dying Tree Removal (formerly Drought Resolution Initiative (DRI)) and HTMP, SCE also sends a certified letter to customers before any work is performed. The above notification processes do not apply if the inspection identifies an imminent threat to public safety – these are typically remediated within 24 hours, which does not allow for advance notification. For all situations, when the customer objects to the work being performed, SCE or its contractors will engage in phone calls or in person visits to explain the reason for the work, evaluate the risk associated with a different mitigation, and attempt to come to mutual agreement. SCE staffs at least one ISA-certified arborist in each district across its service area to address such concerns. In cases where the safety risk cannot be mitigated without superseding the customer's wishes, SCE will exercise its legal right to protect its infrastructure and community safety with the support of local law enforcement and/or fire authorities. Additionally, in some cases the customer engagement process may take enough time that the tree grows into the electrical facilities or otherwise declines to become an imminent public safety risk. If that occurs, the necessary mitigation is then prioritized to occur within next 24 hours, and additional notification may not be made.

For new or expanded initiatives that are expected to have significant public impact, SCE meets with the affected city, county, and/or the homeowner associations, as well as schedules and attends public meetings, and prepares and distributes educational materials. Public activities may also include the use of targeted social media campaigns to increase the local public's awareness of vegetation management work taking place in the community. More targeted engagement activities may also be warranted, such as coordinating field visits with certified arborists employed by local agencies to demonstrate SCE's program and the risk mitigation approach. Any of these of community engagement activities may also occur based on the passing of new local regulations or increased customer inquiries. Community initiatives are supported by vegetation management operational experts (existing labor) and the outreach and/or materials are provided by SCE's Corporate Communication team. Based on the feedback from this outreach, SCE may manage impacts to the community by, for example, adjusting the pace of vegetation work to limit the number of pruning crews or the hours worked. However, localized demands may delay critical vegetation management activities and schedules.

Prior to conducting vegetation mitigation activities, SCE conducts an environmental review, obtains environmental permits, and performs environmental field support. SCE leverages GIS layers that integrate with its work management tools to identify environmentally sensitive areas, automating the process where feasible. An environmental review includes SCE's SMEs to review the work activities for potential disturbance to protected natural and cultural resources and identification of environmental protection measures. In some cases, field surveys to assess for biological and cultural resources at the work site are performed. Environmental permitting or agency consultations, as applicable, are also performed as part of the environmental review phase to ensure appropriate agency authorizations are obtained prior to construction. Additionally, SCE provides vegetation contractors with annual training on environmental requirements and procedures and may supplement that with ad hoc training for specific projects where reinforcement is prudent.

Environmental field support includes (1) deployment of environmental specialists to conduct pre-activity surveys prior to the start of work to identify protected biological and cultural resources; and (2) conducting field monitoring during work activities, such as monitoring nesting birds, waterways, or archaeological sites. Environmental and public land agency permits can take 3 – 12 months, or longer, to obtain depending on the scope of work (e.g., new and enhanced programs) and the type of environmental review and permitting required. The environmental review and permitting timeframes may delay critical vegetation management activities and schedules. For example, hazard trees that require removal due to structural defects and fall within the Yosemite Toad habitat in Sierra National Forest might be on hold for over one year. However, given SCE's commitment to environmental compliance, no work is performed without appropriate review or permitting unless it has progressed to an imminent threat to public safety. Instead, SCE works with environmental agencies through their processes to obtain relevant permits to mitigate the wildfire risk.

SCE strives to work with individual communities and environmental permitting agencies to identify ways to reduce or eliminate barriers to scheduled vegetation management. Managing community impacts and environmental compliance is fundamental to SCE's work in this area, and as such, there are no feasible alternatives to this initiative. SCE did not perform risk analysis or calculate an RSE for this activity as it does not directly mitigate wildfire or PSPS risks but supports other vegetation management activities.

3. Region prioritization:

For the initiatives described previously, prioritization is based on communities with increased mitigation activities, such as hazard tree assessments and the need to obtain deeper trims, and those that have historically required greater engagement to overcome community resistance.

SCE prioritizes efforts to manage environmental compliance by integrating schedules of environmental/agency permitting timeframes, bundling of permit package submittals, pursuing programmatic agency permitting, and regularly engaging agencies with upcoming work activities.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
Despite the impacts of COVID-19 in 2020, SCE was able to perform approximately 20 engagements with communities and USFS Region 5 Agencies representing National Forests. SCE determined that this number of engagements was appropriate based on prior attendance and feedback along with resource constraints. Communications that would typically occur in person were transitioned to phone or web based. Additional creative adjustments were used, including utilizing large white boards while on customers' property to allow communication while also providing assurance of appropriate physical distance. In addition, SCE's environmental experts performed environmental evaluations for approximately 218,000 work points in 2020.

In 2020, SCE conducted an extensive marketing campaign to reach customers and share information about its upcoming wildfire mitigation work, including vegetation management. For more information about the 2020 progress and 2021-22 goals for the marketing campaign, please see Section 7.3.10.

Current software tools do not currently support the integration of different vegetation management work streams which can result in multiple visits to customers' properties. For 2021, SCE is developing processes to integrate its DRI and HTMP programs in a manner that reduces the number of visits for both inspections and mitigations. As discussed in Section 7.3.5.19 a comprehensive vegetation management platform is expected to improve SCE's ability to coordinate vegetation management across all sources and drivers so that identified mitigations can be performed by the same crew in one visit.

In 2021, SCE will explore expanding its overall customer service evaluation effort to measure customer interactions associated with its vegetation management work, such as including vegetation management-specific questions in its Voice of the Customer surveys. The specific measurements are still under development but will establish a baseline and allow for valuable feedback in the future on how SCE can improve its customer interactions.

5. Future improvements to initiative:
As technology develops, SCE will continue to seek opportunities to integrate vegetation management work with electrical construction and maintenance activities, to further reduce customer impact.

To provide reasonable assurance that SCE continues to comply with environmentally sensitive areas, SCE will continue to manage contractors in accordance with environmental compliance plans and perform post-work validations in partnership with SCE environmental department. Environmentally sensitive areas will be identified for environmental review and field support, further enhancing environmental compliance controls. Additional agency consultations will be performed to enhance agency engagement and further demonstrate environmental compliance.

7.3.5.2 Detailed inspections of vegetation around distribution electric lines and equipment

SCE inspects all distribution and transmission lines for vegetation encroachment and clearances annually.

1. Risk to be mitigated / problem to be addressed:
Vegetation close to electrical assets can grow, fall, or blow into electrical equipment and conductors and potentially lead to outages or ignitions.

2. Initiative selection:
Inspections are performed by SCE's vegetation management contractors to verify that clearance requirements are in accordance with regulatory requirements and SCE's program standards, and that clearance will be maintained until the next annual inspection cycle. SCE also inspects most of its tree inventory along distribution and transmission lines approximately six months following the planned annual inspection to ensure system compliance with regulation and identify any vegetation encroachments that may have grown faster than expected at the time of the annual inspection.

This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Vegetation management to achieve clearances around electric lines and equipment (Section 7.3.5.20), that directly mitigates wildfire and PSPS risk.

3. Region prioritization:
To facilitate vegetation management work, SCE divides its service area geospatially into approximately 2,700 Grids. SCE's inspections are scheduled such that each of these Grids in SCE's HFRA or non-HFRA is inspected annually. Inspection schedules for the grids take into account resource availability, appropriate allocation of work throughout the year, permitting lead times and permit availability, and challenges with access to worksites based on seasonal weather conditions. SCE schedules higher risk HFRA locations for inspection in the months leading up to peak fire season to the extent that resources are available, and it is feasible to schedule the work during this time period. This prioritization used outputs from WRM. For 2021 inspection year, SCE utilized Reax-based consequence information. For 2022 and beyond, SCE will use risk modeling outputs informed by Technosylva WRRM consequence modeling to prioritize vegetation management activities.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In its HFRA, SCE inspected approximately 470,000 trees adjacent to distribution lines and approximately 180,000 trees adjacent to transmission lines in 2020 and met its regulatory requirements of inspecting all FERC-jurisdiction lines.[73] The volume of work is expected to be similar in 2021 and 2022 for annual inspections. Costs for this initiative can be found in Table 12.

5. Future improvements to initiative:

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[73] SCE's 2020 costs incurred for this activity and 2021-22 cost forecasts are noted in Table 12.

Currently, these detailed inspections for distribution are performed manually by inspectors on foot patrols. Detailed inspections for SCE's Bulk Electric System are performed using a combination of LiDAR and manual foot patrols by inspectors. SCE is currently exploring the feasibility of supplementing the Distribution inspection practices with LiDAR or other remote sensing data, as described in Section 7.3.5.7 for distribution lines. Additionally, SCE is developing a Tree Risk Index model which ranks tree growth patterns based on species, locations, etc. Once validated, SCE plans to use this model to initiate discussions on potential modifications to frequency of vegetation inspection based on specific vegetation characteristics.

7.3.5.3 Detailed inspections of vegetation around transmission electric lines and equipment

SCE's vegetation inspection program for transmission is the same as that for distribution lines. Please see the description above in Section 7.3.5.2 for this activity.

7.3.5.4 Emergency response vegetation management due to red flag warning or other urgent conditions

Over the summer months in 2020, California experienced a combination of factors that led to an unprecedented fire season with wildfires, at the time, burning over 3.5 million acres (3% of the state). Firefighting resources were stretched to the limit with additional resources being brought in from other areas outside of California including Mexico. To further reduce wildfire risk over the peak season, SCE identified multiple AOCs where major wildfires (size or community impact) could occur within the remainder of the 2020 fire season. To further reduce wildfire risk over the peak season, SCE identified multiple AOCs where major wildfires (size or community impact) could occur within the remainder of the 2020 fire season. As part of mitigating the increased risk, SCE initiated incremental vegetation inspection and remediation in certain locations within its HFRA during the 2020 fire season.

SCE does not engage in any emergency response vegetation management in response to RFWs but has protocols in place to mitigate the risk of performing vegetation management work during those conditions.

1. Risk to be mitigated / problem to be addressed:
Fire weather conditions such as high wind or extended heat during periods of low fuel moisture have greater potential to generate significant fire events if an ignition occurs. The 2020 fire season was exceptional, with numerous large fires occurring across the state during the summer months that were driven by dry fuels. SCE identified 17 AOCs in its HFRA in 2020, which posed increased fire risk.

2. Initiative selection:
As described in SCE's second Change Order Report, filed December 11, 2020, in order to mitigate the potential risk posed by dry fuels during fire weather conditions, SCE identified 17 AOCs based on 1) the last time the area has burned, 2) fire history [frequency and seasonal occurrence], 3) vegetation type and amount, 4) then current and expected fuel and weather conditions, 5) impact to communities and SCE infrastructure, and 6) circuit health and performance. The outcome of this risk-informed modification to

its HFRI resulted in accelerated inspections, remediation and vegetation trimming and removal in the identified areas. See Section 7.3.4.9.1 (IN-1.1) for greater detail of SCE's HFRI. SCE also risk-ranked the AOCs based on a combination of the probability and consequence of wind-driven, fuels and topography driven fire potential. These efforts helped mitigate the increased ignition probability and consequence associated with dry fuel. Please see Section 7.3.4.9 for the RSE information on HFRI.

SCE also modifies its vegetation management activities during RFW periods to help mitigate potential risks, including pausing non-emergency work in HFRA (e.g., use of chainsaws) that have the potential to cause sparks, and instead working in non-HFRA areas. Additionally, for any PSPS events during high fire risk days, vegetation management crews are on standby to mitigate any vegetation-related ignition risks identified during PSPS pre- or post-patrols. SCE also performs incremental vegetation management work in preparation for Santa Ana wind events as described in Section 7.3.5.11. SCE did not develop an RSE for vegetation management protocols during RFW periods because they support the safe and prudent performance of vegetation management work and are not specific wildfire initiatives.

3. Region prioritization:
Emergency response vegetation management inspections and mitigations are targeted to the locations that experience specific increased wildfire risks conditions such as specific AOCs associated with elevated dry fuel levels. These AOCs are identified due to a combination of factors such as age of the fuels, current and forecasted state of fuel moisture, and the area's subjectivity to fire during periods of high wind, high temperatures and low humidity. As explained above, the AOCs were risk-ranked to prioritize the work.

SCE also implements its response to RFW whenever an RFW is in effect.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
Vegetation management inspectors in 2020 performed over 12,000 additional inspections across 2,000 circuit miles in the AOCs in October 2020, resulting in approximately 700 work records expedited for mitigation. Additionally, vegetation management crews performed vegetation clearances for approximately 600 more structures identified by Electrical Inspectors in these AOCs. In 2021-2022 SCE will re-evaluate to determine if more or less AOCs should be identified.

5. Future improvements to initiative:
As more vegetation management is performed across SCE's HFRA, the need for some incremental work such as responding to dry fuels during fire season or PSPS patrol-driven mitigations are expected to decrease. SCE is also exploring using remote sensing technology for more efficient identification of vegetation issues in targeted locations during high fire risk or emergency events.

7.3.5.5 Fuel management and reduction of "slash" from vegetation management activities:
SCE reduces slash (e.g., cut limbs and other woody debris) from vegetation management activities by chipping and hauling the material away to be disposed or recycled by pruning/removal contractors.

1. Risk to be mitigated / problem to be addressed:

Vegetation management activities produce woody debris that can act as fuel around or near electrical equipment increasing the probability for ignition and spread of wildfire. Weeds or brush growing near electrical equipment poses similar hazards.

2. Initiative selection:
SCE's pruning/removal contractors abide by standard cleanup and disposal expectations for work sites. Removal and disposal of all debris generated during SCE vegetation management activity, except as requested by the customer (e.g., for firewood or mulch) or logistical constraints exist (e.g., steep slope with no vehicular access), is typically performed the same day. For example, where possible, all debris post prune or removal is chipped with trailer chippers and hauled away from the work site. In some cases, debris is moved the following day due to project volume or is not removed at all due to logistical constraints. Where logistical constraints exist, SCE will work to mitigate the potential fuel risk, by scattering the debris according to best management practices or any existing fuel management plan applicable to the work site. Concerted efforts are made to rake up and dispose of green or freshly removed leaves and work sites are to be left in a condition consistent with the condition prior to vegetation management activity.

SCE's weed abatement program focuses on SCE-owned property and transmission ROW, keeping them clear of brush and other live fuel plants. Similarly, SCE's Pole Brushing program abates vegetation from around SCE's Distribution poles as specified in Section 7.3.5.5.1 below.

Reducing slash from vegetation management initiatives is a standard, prudent practice that is conducted in the course of vegetation management activities. SCE's weed abatement activities are required by California Government Codes, County and Local ordinances. SCE has been executing both activities for years. They are not specifically wildfire mitigation initiatives and thus do not have an RSE associated with them.

3. Region prioritization:
This work is performed for all of SCE's service area in accordance with its annual schedule.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE followed all standard operating procedures and removed slash from jobsites where applicable. At the end of 2020 SCE procured a consultant to conduct a study for determination of best practices for fuel management.[74] Results of the study are expected to provide a combination of risk-based and environmentally sound options for fuel management within SCE's diverse service area.

Through 2021, SCE plans will review and analyze the results of the study and implement more regionally appropriate fuel management standards. Additionally, SCE has partnered with one of the USFS agencies on a program for sustained fuel management measures, e.g., putting in low-growing "utility-friendly" vegetation to undesirable tree species growth.

5. Future improvements to initiative:

[74] Please reference Section 7.3.10.4 Forest service and fuel reduction cooperation and joint roadmap.

SCE is currently exploring environmentally sound and cost-effective means to promote desirable, stable, low-growing vegetation that are resistant to undesirable tree species. These methods can include a combination of chemical, biological, cultural, mechanical, and/or manual treatments. The use of these methods can provide long-term cost reductions and reduce the risk of outages and fires while improving wildlife habitat.

7.3.5.5.1 Expanded Pole Brushing (VM-2)

SCE removes vegetation around poles to create 10-foot radial clearings (when attainable) at the base of its poles in HFRA.

1. Risk to be mitigated / problem to be addressed:

Fast growing vegetation at the base of poles and structures can provide the fuel needed to convert a spark from equipment failure into a fire and also supports the fire propagation, especially during dry and windy conditions. This risk is recognized by Cal. Pub. Res. Code § 4292[E24] which requires utilities in certain areas to "maintain around and adjacent to any pole or tower which supports a switch, fuse, transformer, lightning arrester, line junction, or dead end or corner pole, a firebreak which consists of a clearing of not less than 10 feet in each direction from the outer circumference of such pole or tower." Moreover, poles with adjacent brush are more likely to be affected during a wildfire, impeding power restoration and reconstruction efforts. SCE has historically brushed approximately 80,000 distribution poles annually, but given the increasing wildfire risks, SCE considers all poles in HFRA to be at risk.

2. Initiative selection:

The expanded pole brushing program removes fast-growing vegetation at the base of distribution poles to reduce the chance of ignition and/or fire spread due to a spark or contact with failed equipment. This activity goes beyond the minimum regulatory requirements in PRC 4292[E24] for pole brushing to be performed on specific poles with "non-exempt" equipment installed. SCE has approximately 80,000 of these PRC 4292[E24] poles, however, to adequately address wildfire risks, SCE increased its pole brushing population to approximately all distribution poles in HFRA.

Application of fire retardant at the base of the poles was initially considered but was determined to not be a practical/effective or environmentally friendly alternative.

Although the RSE for expanded pole brushing is relatively low, given that this is the only WMP activity targeting fuel reduction at the base of SCE's distribution poles and the relatively low cost of implementation, SCE is continuing this activity.

3. Region prioritization:

Expanded pole-brushing is focused in HFRA. Since SCE plans to perform pole-brushing annually, subject to availability of resources to perform the work, regional prioritization within HFRA is not required. The main prioritization factor for the program is the pole's non-exempt status, which requires it to be mitigated in accordance with PRC 4292[E24]. The second priority is geography, as performing work using SCE's geographical grid approach is more efficient than prioritizing by risk each year, which would require moving crews to non-adjacent locations. If available crews become constrained, SCE will prioritize the poles subject to PRC 4292[E24] first. Any HFRA distribution pole not brushed in a given year is prioritized the next year.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

SCE's goal in 2020 was to perform pole brushing on approximately 200,000 to 300,000 distribution poles. SCE brushed approximately 230,000 poles as part of this goal. In 2021 and beyond, SCE expects to exceed 230,000 distribution poles brushed in HFRA.

5. Future improvements to initiative:

Current expanded pole-brushing efforts are focused on the distribution system, but SCE is exploring additional pole brushing of transmission poles and towers beyond the requirements of regulation PRC 4292[E24].

In the future, data gathered through other initiatives such as the fire science enhancements will allow for a more targeted approach in the scheduling process. SCE is currently evaluating the WRRM for insights to vegetation growth rates and weather conditions, in addition to consequence and POI.

7.3.5.5.2 Expanded Clearances for Legacy Facilities (VM-3)

SCE creates larger vegetation-free buffers around its Legacy Facilities.

1. Risk to be mitigated / problem to be addressed:

Many of SCE's Legacy Facilities including powerhouses and switchyards are located in or near heavily forested areas and therefore create a risk for ignition. Analysis of historical events identified increased risk of faults from vegetation contact with electrical facilities and increased risk of fires spreading through vegetation in close proximity to SCE's generation facilities in the event of any ignition (i.e., even if caused by avian/wildlife contact, CFO, etc.). Cal. Pub. Res. Code § 4291[E23] recommends maintaining 10-30 feet of bare ground and up to 100 feet of clearance from high voltage electrical facilities.

2. Initiative selection:

SCE's analysis determined achieving and maintaining these recommended clearances was a prudent practice to reduce the risk of vegetation contact with electrical equipment at these facilities, especially given the increased wildfire risks. SCE did not calculate an RSE for this initiative as relevant historical ignition information for these types of facilities was not readily available.

3. Region prioritization:

SCE performs these clearances around Legacy Facilities in HFRA Tier 2 and 3 over non-HFRA regions. Since WRM does not yet include risk models for generation assets (current focus being distribution and transmission assets), an alternative risk-informed approach that considers the HFRA tier level, voltage levels and existing vegetation buffer was utilized to risk rank the locations. The approach combined desktop review and field visits. Tier 3 locations, facilities with higher voltage levels and areas with less existing vegetation buffer were considered higher risk.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020, all 156 Legacy Facilities in scope were assessed and SCE completed treatment of 61 of the highest risk locations, based on HFRA tier and assessment findings. The remaining 95 locations are scheduled for treatment in 2021 and 2022 during this 3-year plan. The expanded clearances project will be completed in 2022 and sites will maintain the clearance with the existing O&M annual vegetation management program.

5. Future improvements to initiative:
SCE will examine current standards, best practices, vegetation trends from completed inspections (IN-5) and remediations (SH-12.3) to determine if more vegetation management is needed. New vegetation issues will be identified with the inspections (IN-5) and resolved with the remediations (SH-12.3), all other vegetation should be part of the O&M annual vegetation program and conclude this activity.

By 2021, SCE plans to include its Legacy Facilities and locations in the WRRM model. As enhancements to probability and consequence of ignition scores become available in the WRRM model, SCE will evaluate the possibility of replacing the current prioritization method with the risk ranking using the WRRM risk score. Once all identified locations have the appropriate expanded clearances (buffer zones) established and post-treatment quality control (QC) and monitoring have been completed, this program will be complete. Maintenance of the expanded buffer will then move into annual vegetation maintenance.

7.3.5.6 Improvement of inspections
SCE implemented plans to improve the quality and consistency of inspections performed around its transmission and distribution systems to ensure vegetation is maintained in accordance with regulatory requirements.

1. Risk to be mitigated / problem to be addressed:
Vegetation may grow faster than anticipated or otherwise make contact with energized conductors.

2. Initiative selection:
Pre-inspections (inspections) are performed by SCE's vegetation contractors to verify that clearance requirements are in accordance with regulatory requirements and program standards, and that clearance will be maintained through the annual inspection cycle. In 2018, SCE's Vegetation Management program underwent a comprehensive redesign where it replaced the Vegetation Management Operations Manual with the Transmission Vegetation Management Plan (TVMP) and Distribution Vegetation Management Plan (DVMP) to provide specific guidance to help drive consistency in inspections, in addition to other measures.[75] SCE also added a Hazard Tree program, which is codified in the HTMP.[76] The DVMP and TVMP incorporated the CPUC's GO 95 Appendix E[E22] recommended clearances, while the HTMP was created specifically to address residual risk associated with green trees further away from the conductors that pose a risk of falling or blowing into them. All three documents more clearly identified regulatory and risk drivers for the inspection standards. For example, the TVMP specifically identified the need to address

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[75] *See* SCE's response to WSD Data Request 52 (SCE-43895-I-367) filed March 2020 for copies of the DVMP and TVMP.
[76] The Hazard Tree program and HTMP are described in greater detail in Section 7.3.5.16.1.

conductor dynamics when determining correct clearance distance. To ensure the overall quality of the vegetation management program and the effectiveness and performance of SCE's vegetation contract workforce, SCE's QC Program performs inspection sampling and identified conditions are remediated. SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.

3. Region prioritization:
The TVMP and DVMP apply to SCE's entire service area. QC inspection is performed in HFRA and non-HFRA using sampling methodology. QC in HFRA is based on risk-stratification models (e.g., Reax) and the highest risk areas receive the most QC inspection.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
The QC program completed approximately 6,000 HFRA and 2,000 non-HFRA circuit mile inspections in 2020. SCE conducts regular discussions with inspection contractors to review the QC results and action plans to improve performance, where appropriate. SCE plans to do a similar amount of QC inspections in 2021 and 2022.

As part of SCE's continuous improvement efforts, in 2020 SCE began increasing contractor engagement to ensure that inspectors are appropriately identifying and prescribing tree maintenance. Additional efforts implemented to support continuous improvement included holding executive level meetings with contractor management to share results of quality performance, increased training for both internal and external personnel involved with inspections, and requesting contractors to onboard additional contractor QC to provide reasonable assurance contractors are identifying issues before SCE's independent QC identifies them.

5. Future improvements to initiative:
SCE will continue to explore the feasibility of implementing different inspection methodologies, such as the future integration of LiDAR or other remote sensing data beyond where currently implemented. Additionally, as SCE expects to obtain data-driven modeling that will help determine when and how to inspect and trim based on various risk factors. For example, SCE may identify locations where more frequent inspections are warranted and adjust inspection cycles accordingly. SCE may also use its Tree Risk Index[77] (after the modeling capability develops and matures) to identify the POI from specific types of trees in specific locations to determine trims.

7.3.5.7 LiDAR inspections of vegetation around distribution electric lines and equipment

SCE is analyzing the feasibility of broad implementation of LiDAR on its distribution systems, given that distribution LiDAR data was captured outside of the vegetation trim cycle.

1. Risk to be mitigated / problem to be addressed:

[77] *See* response to Deficiency SCE-13 for more information about SCE's Tree Risk Index.

Vegetation contact with energized conductors can result in outages or ignitions. It is possible for vegetation to grow faster than expected over the course of a trim cycle and grow within the minimum clearance distance, resulting in vegetation encroachment onto lines. Also, trimming work can require modification if not performed to sufficiently maintain minimum clearance distances. SCE needs the ability to monitor vegetation and its proximity to the lines and validate vegetation crew work.

2. Initiative selection:

LiDAR vegetation inspections are typically not performed around distribution electric lines and equipment, and the current inspection process is performed manually using foot patrols. However, LiDAR flown around Distribution lines and equipment for other purposes did collect vegetation data outside of the vegetation management inspection cycle. SCE is currently processing the significance of the data collected and how it can be optimized for vegetation inspections of its distribution system. The vegetation management inspection cycle considers whether vegetation is trimmed appropriately to last until at least the time of the next inspection, making it difficult to discern the significance of whether trims had achieved the clearances required for a full inspection cycle, based on LiDAR data that was collected outside of that cycle. This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Vegetation management to achieve clearances around electric lines and equipment (Section 7.3.5.20), that directly mitigates wildfire and PSPS risk.

3. Region prioritization:

Because the LiDAR was prioritized and collected for non-vegetation purposes, SCE used the sample data from the LiDAR flown around Distribution electric lines and equipment to determine the validity/usefulness of the resultant data and the feasibility of implementing LiDAR in the broader distribution population of equipment. Prioritization of data was based on the reported distance between the vegetation and the electrical equipment.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2019, SCE completed some LiDAR data capture around distribution facilities for the purpose of determining geospatial locations and long spans. LiDAR data obtained in 2020 is currently being reviewed for validity and usefulness and to determine the future continued use of LiDAR in and around distribution systems. While the data did identify encroachment conditions for mitigation, it also generated numerous “false positives” such as misidentifying the target as a primary conductor when it was not or having multiple data points for a single tree. Moreover, because the light points cannot currently be accurately mapped to SCE’s tree inventory, it does not identify exceptions such as Major Woody Stems.[78] SCE will continue to explore the broader implementation of LiDAR in the distribution sector based on results of 2019 and 2020 data analysis. SCE is analyzing whether it is feasible to have more frequent LiDAR data

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[78] Woody Stems, as defined in CPUC GO95 Rule 35, Exceptions, are “[m]ature trees whose trunks and major limbs are located more than six inches, but less than the clearance required by the applicable regulation from primary distribution conductors are exempt from the minimum clearance requirement under this rule. The trunks and limbs to which this exemption applies shall only be those of sufficient strength and rigidity to prevent the trunk or limb from encroaching upon the six–inch minimum clearance under reasonably foreseeable local wind and weather conditions.”

capture that aligns with the inspection and trim schedule to provide advance data to inspectors, validate work completed by trimmers and/or for more narrow uses, such as long spans or cross-country terrain.

5. Future improvements to initiative:
Initial results are expected in 2021, but any change in the process may not be implemented until 2022 or beyond, due to ongoing vegetation software development and the establishment of contractual agreements for flights and data processing.

7.3.5.8 LiDAR inspections of vegetation around transmission electric lines and equipment

SCE utilizes LiDAR technology to inspect select transmission and sub-transmission lines for appropriate clearances between SCE's lines and vegetation.

1. Risk to be mitigated / problem to be addressed:
The primary risk to be mitigated is vegetation contact with energized conductors. Vegetation to conductor clearance for SCE's Bulk Electric Transmission System requires calculation of conductor dynamics (i.e., sag and sway) which can be difficult to accurately perform for pre-inspectors given terrain and access issues.

2. Initiative selection:
Inspections of SCE's Bulk Electric Transmission System are performed by SCE's foot patrols and LiDAR data is the preferred and most accurate data source the inspectors use to identify potential encroachments. In contrast to LiDAR use for SCE's distribution system (as described in the prior section), LiDAR is flown on SCE's transmission system specifically for vegetation management purposes. As such, SCE utilizes LiDAR technology to inspect select transmission and sub-transmission lines with respect to FAC 003-4, GO 95-Rule 35[E22] and PRC Section 4293[E25], to maintain appropriate clearances between SCE's lines and vegetation. Implementation of LiDAR for Bulk Transmission Lines was a 2019 WMP initiative. After the success of the initiative and effectiveness of using LiDAR for transmission Right-of-Way inspections, the use of LiDAR was operationalized in 2020. This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Vegetation management to achieve clearances around electric lines and equipment (Section 7.3.5.20), that directly mitigates wildfire and PSPS risk.

3. Region prioritization:
LiDAR around transmission systems is prioritized based on the potential for ground inspection inaccuracy – specifically vegetation density and accessibility challenges. Each Transmission circuit is rated accordingly, and flights are conducted every 1 - 10 years, with the circuits rated higher risk being flown more frequently. Because of flight efficiencies, the data is collected for entire circuits, independent of HFRA status, although the majority of Transmission line miles that are flown frequently fall within HFRA.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
Approximately 45 LiDAR transmission circuit inspections were flown in 2020, accounting for approximately 1,700 miles. SCE will continue using LiDAR in 2021 in accordance with SCE's LiDAR inspection plan, as described above. SCE expects approximately 80 transmission circuits to be flown in 2021.

5. Future improvements to initiative:
SCE will continue to use LiDAR for transmission inspections and will explore if there are additional locations where it makes sense for LiDAR to supplement transmission inspections.

7.3.5.9 Other discretionary inspection of vegetation around distribution electric lines and equipment, beyond inspections mandated by rules and regulations

The Hazard Tree Management Program (HTMP)deploys inspections to detect fall-in and blow-in risk.

1. Risk to be mitigated / problem to be addressed:
Trees outside of the compliance clearance zone still pose a threat of falling during high wind conditions and striking SCE facilities depending on condition of the tree and other site-specific factors. Branches or fronds getting dislodged from trees near electrical facilities also have a higher probability of blowing into the lines and equipment and causing faults that can potentially initiate an ignition.

2. Initiative selection:
SCE conducts detailed inspection and evaluation of trees outside of the compliance zone but still within striking distance that pose risks despite trimming and pruning, and appropriate mitigations up to removal of these trees. See Section 7.3.5.16.1 HTMP for more details.

3. Region prioritization:
See Section 7.3.5.16.1 HTMP Program for more details.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
See Section 7.3.5.16.1 HTMP Program for more details.

5. Future improvements to initiative:
See Section 7.3.5.16.1 HTMP Program for more details.

7.3.5.10 Other discretionary inspection of vegetation around transmission electric lines and equipment, beyond inspections mandated by rules and regulations

Discretionary vegetation management inspections for transmission line are the same as those performed for distribution lines. Please see Section 7.3.5.9 above for additional details.

7.3.5.11 Patrol inspections of vegetation around distribution electric lines and equipment

SCE conducts supplemental patrols to provide assurance that vegetation encroachments do not occur during peak fire season and high wind conditions.

1. Risk to be mitigated / problem to be addressed:

The probability and consequence of vegetation contact with electrical equipment and lines is higher during certain times of the year such as in summer as the peak fire season starts and during Santa Ana high wind events. The risks are also higher in certain locations such as the canyons which experience higher winds.

2. Initiative selection:

SCE performs supplemental vegetation inspections to verify certain circuits are free from vegetation encroachments into the minimum vegetation clearance distance. Supplemental vegetation inspections are part of SCE's Summer readiness verifications to provide added assurance that vegetation encroachments will not occur during peak fire season and high wind conditions. These patrols include Canyon Patrols, At-Risk Circuit Patrols, and Operation Santa Ana. Canyon Patrols are performed annually, where downslope, off-shore winds have greater potential to compromise trees conditioned to growing under primarily on-shore winds, to verify that certain circuits located in canyons are free from vegetation encroachments. At-Risk Patrols are performed on circuits that have a history of multiple vegetation-caused circuit interruptions. Operation Santa Ana is a joint patrol effort with state and local fire authorities to perform patrols of overhead powerlines and poles in the HFRA. This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Vegetation management to achieve clearances around electric lines and equipment (Section 7.3.5.20), that directly mitigates wildfire and PSPS risk.

Additionally, inspectors performing work for SCE's Overhead Detailed Inspection program throughout the year also inspect the structure for potential vegetation encroachments (Section 7.3.4.9.1 Distribution High Fire Risk Informed Inspections and Remediations (IN-1.1.) provides more details on SCE's risk-informed inspections program). When they are identified, notifications are created and dispatched to vegetation crews to mitigate.

3. Region prioritization:

These patrols are performed in HFRA and focus on electrical facilities and adherence to PRC Section 4292[E24] and 4293[E25] vegetation-related requirements. In some cases, patrols may be scheduled close together, such that there is the potential for overlap in inspections over a given area that would need mitigation to avoid re-inspection of a recently inspected area. Patrol scope is determined each year based on risk considerations such as HFRA tier, Reax risk prioritization, stage in growth cycle, QC results and overlap of other supplemental activities.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

2020 patrols have been completed and continue to be planned for subsequent years. These included Canyon and Summer Readiness patrols which identified approximately 1,500 trees requiring mitigation and were included in the total Line Clearing inspection costs. In 2021, SCE will maintain the same scope for these patrols. SCE will also begin to move from using the risk consequence prioritization in the Reax model to the WRRM model to prioritize patrol scope. Though SCE does not currently anticipate significant changes for 2022, the patrol scope will be dependent on the implementation of the WRRM and any new risk areas identified.

5. Future improvements to initiative:

Currently, these patrols are performed manually on foot or driving by specific locations. SCE will continue to explore the feasibility of supplementing these patrols with LiDAR or other remote sensing technology.

7.3.5.12 Patrol inspections of vegetation around transmission electric lines and equipment

This activity for transmission line is the same as those performed for distribution lines. Please see Section 7.3.5.11 above for additional details.

7.3.5.13 Quality assurance / quality control of inspections

Arborists certified by the ISA inspect vegetation based on a risk-informed sampling of HFRA circuit miles to provide assurance that vegetation management standards are being achieved.

1. Risk to be mitigated / problem to be addressed:

Trimming crews may not prune enough of a tree to maintain the minimum clearance distance, thus presenting a risk of vegetation contact with energized conductors.

2. Initiative selection:

Given the compliance requirements and the risk of vegetation related faults that can potentially cause ignitions, SCE deemed it important to institute an independent QC initiative in 2019, where arborists certified by the ISA inspect vegetation based on a risk-informed sampling of HFRA circuit miles to verify that the vegetation contractors (pre-inspectors and trimmers) are achieving established internal and regulatory clearance requirements, thereby increasing SCE's assurance that standards are being achieved. After data from the sampled areas are collected, the QC inspections results are analyzed and SCE provides contractors with feedback for performance improvement. The alternative to this initiative is to rely on existing in-house resources to provide these inspections. Prior to the implementation of independent QC in 2019, oversight of contractor work was performed by in-house certified arborists as part of normal operational practice. SCE determined that having a more robust and structured QC process was required. An independent QC resource to perform the inspections would provide an unbiased lens on the results. This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Vegetation management to achieve clearances around electric lines and equipment (Section 7.3.5.20), that directly mitigates wildfire and PSPS risk.

3. Region prioritization:

QC is performed using a risk-based approach for sampling. QC uses the Reax risk-stratification model to determine the volume and location where to perform its sample inspections. 100% QC inspection is performed in the highest Reax areas which represent approximately 94% of the risk-consequence for SCE. In the remaining 6% of Reax risk-consequence areas, QC is performed using judgmental sampling techniques with a Confidence Level/Confidence Interval of 99/1.7% to identify where to inspect.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020, SCE had a goal to perform 3,000 risk based HFRA circuit mile vegetation management QC inspections (per VM-5 in SCE’s 2020 WMP). SCE exceeded the goal by achieving over 6,000 HFRA circuit mile inspections, based on better than expected production rates and the ability to onboard qualified resources to perform the QC work. SCE plans to perform approximately 5,000 miles in 2021-22.

5. Future improvements to initiative:
SCE is exploring the feasibility and resources required to perform more risk-based circuit mile inspections, in addition to performing QC in other VM activities such as HTMP (VM-1) and DRI (VM-4). Additionally, SCE is exploring the use of additional risk-models such as Technosylva and SCE's WRRM to replace the current Reax risk model. Finally, SCE is exploring the feasibility of using alternative technologies in the future such as LiDAR to supplement the QC inspection process.

7.3.5.14 Recruiting and training of vegetation management personnel (Class C Deficiency: SCE-16 Lack of ISA-Certified Arborists)

SCE recruits and trains qualified personnel, including ISA-certified arborists, to perform quality and timely vegetation management work.

1. Risk to be mitigated / problem to be addressed:
A shortage of vegetation management personnel, including internal and external ISA Certified Arborists, can put SCE's ability to perform high quality and timely vegetation management at risk.

2. Initiative selection:
SCE received a deficiency on its 2020 WMP filing that stated,

> *Condition (SCE-16, Class C): In SCE's 2021 WMP update, SCE shall:*
>
> *i) describe whether SCE has sufficient ISAs to properly conduct vegetation management work; and*
>
> *ii) provide an analysis of the expected incremental cost and incremental risk reduction benefit of hiring, training, or subcontracting additional ISAs.*

WSD Deficiency SCE-16 compared the number of SCE's ISA Certified assessors with SDG&E's and concluded that SCE had a lack of ISA-certified assessors, which raised concerns about SCE's ability to effectively implement its vegetation management programs. However, it is important to clarify the comparison. Although the data WSD referenced for the disparity between SDG&E and SCE was not provided in WSD-004, SCE understands that SDG&E typically uses ISA-certified arborists to conduct assessments for its hazard tree program and pre-inspections for its line clearing and thus the comparison may not be comparing the same positions. The deficiency only references hazard tree inspections, for which SCE had contracted with an average of 18 ISA-certified assessors in 2020. SCE plans to contract with approximately 40 ISA-certified arborists to perform hazard tree assessments in 2021. This is a sufficient number to perform the targeted number of assessments and more would be unnecessary, especially given certain parties' opposition to hazard tree removals.

For the rest of SCE's vegetation management program, SCE employs or contracts with ISA-certified arborists or persons close to certification when it is necessary to do so. For example, SCE requires that its vegetation QC inspectors are ISA-certified arborists. SCE also employs a number of ISA-certified arborists for internal positions to provide guidance to contractors for SCE's vegetation management activities.

For line clearing work, SCE requires any person supervising or advising pre-inspection activities in the field to be ISA-certified. For workers performing pre-inspections without supervision responsibilities, SCE requires a two-year degree or four years' worth of field experience in arboriculture or related field.

Pre-inspections requires a worker to accurately determine distances between vegetation and SCE's facilities as well as estimating annual growth rates of different types of trees. Currently, SCE does not believe this work requires an ISA-certified arborist at the time of hire to perform. Further, SCE strongly recommends that each pre-inspector who is eligible to become a Certified Arborist does so within twelve months of becoming eligible.

SCE provides annual training to all vegetation management employees and vegetation contractor lead personnel, called "Utility Vegetation Management (UVM) Core Plans Training." This training is intended to provide program knowledge to SCE's certified arborists and others to enhance understanding of the specific requirements of SCE's VM program. VM has a training and qualification advisor to organize its training programs. Vegetation management contractors are responsible for training their own crews on vegetation management work to meet SCE's standards specified in the contract scope of work.

And as stated in SCE's 2020 WMP, in late 2019, the Vegetation Management organization underwent a comprehensive redesign into four distinct departments: Operations; Resource Planning and Performance Management; Long Range and Strategic Planning; and Compliance. The reorganization generated new positions and vacancies for which SCE has been actively recruiting and staffing. While this population did include ISA certified arborists, many of these positions were more focused on skillsets such as project management and data analysis. SCE continues to evaluate the effectiveness of the reorganization and adjust as needed.

SCE did not perform risk analysis or calculate an RSE for this activity as it does not directly mitigate wildfire or PSPS risks but supports other vegetation management activities.

3. Region prioritization:
Recruiting and training vegetation personnel is an ongoing activity and not subject to region or other prioritization efforts. Staffing levels are continuously evaluated and adjusted based on identified needs and implementation of future programs.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
Based on the currently defined program needs and skills, SCE in 2020 had a sufficient amount of ISA-certified assessors to effectively manage its applicable programs, as described below:

<u>HTMP</u> – In 2020, SCE performed approximately 100,000 HTMP assessments with an average of 18 assessors. The number of assessors needed is a function of the planned assessments to be performed as ISA-certified arborists are needed to help identify defects in HTMP. Throughput varies, and SCE has observed that 25-35 assessments can be performed by an individual assessor each day, depending on terrain and density of vegetation. In 2021, SCE conservatively anticipates it will perform 150,000 to

200,000 HTMP assessments and will require a year-end total of approximately 40 ISA Certified assessors to achieve this goal. Although the 2020 average was 18, SCE currently has 27 ISA Arborists to perform HTMP and has contracted with vendors to add 13 additional assessors beyond SCE's current contracted staffing level. SCE expects to onboard the additional assessors in Q2 2021 and expects the 13 assessors will be staffed from three or four companies from a competitive Request for Proposal process. Based on contract commitments during the bidding process, SCE does not foresee any risks associated with staffing for HTMP.

Quality Control – SCE's QC inspections are performed by an independent contractor which uses ISA Certified Arborists to perform the inspections and published QC production goals. SCE's contractor was able to successfully onboard an additional ten resources in 2020, for a total of 26 to allow SCE to exceed its VM-5 activity target of performing 3,000 risk-based HFRA circuit mile inspections. Therefore, since the number of assessments SCE expects to perform in 2021 is in line with those performed in 2020, SCE does not foresee any risks associated with staffing for its additional QC activities.

Contractor Guidance Activities – SCE uses internal Senior Specialists (SSPs), who are ISA-certified arborists, to provide oversight and general guidance to contractors for SCE's compliance activities. SSPs are responsible for coaching and performing work verification on a sample of completed vegetation work performed in their respective work districts to verify contractors are meeting SCE's performance expectations. SCE currently has approximately 41 SSPs across its service area. To address future needs and potential industry-wide shortages of ISA-certified arborists, SCE created a pipeline for future grooming of ISA-certified arborists with sufficient skills, knowledge and experience needed to support all SCE VM activities. SCE started hiring experienced, but non-certified personnel as Specialists (SPs), with the intent that SPs will be mentored by SSPs in arboriculture and SCE program standards. After acquiring sufficient experience, the SPs will be prepared to take the required examinations to become ISA-certified.

SCE continues to evaluate the effectiveness of the reorganization and adjusts as needed. SCE sees advantages to increasing the skillset of its large contract workforce developing more ISA-certified arborists while being mindful that the rapid expansion of vegetation management work, in California and across the country, can constrain resource availability.

5. Future improvements to initiative:
SCE will continue to evaluate resource requirements necessary to effectively perform work across its vegetation management programs and will continue to address those needs through a combination of internal and external staffing solutions. SCE will continue to onboard and staff internal ISA certified arborists for SSP roles and mentor SPs to become SSPs/ISA Certified Arborists. Longer term, SCE will also explore the benefit of ISA certification for line clearing inspectors and potential incentives for contractor companies and their individual employees for obtaining ISA certification.

7.3.5.15 Remediation of at-risk species
SCE takes steps to mitigate the risk of at-risk species coming into contact with energized conductors.

1. Risk to be mitigated / problem to be addressed:

Certain tree species, due to their characteristics, have the potential to cause “grow-in”, “blow-in” or “fall-in” incidents that could lead to an ignition or an outage.

2. Initiative selection:
SCE manages at-risk species and implements clearances to reduce the probability of vegetation contacting electric facilities. One objective of this initiative is to avoid “grow-ins” into the area directly beneath the line by allowing a greater buffer for individual tree growth rates that may be faster than typical or anticipated. Another objective is to reduce “blow-ins,” by reducing opportunity for nearby trees to shed limbs or branches that can blow into conductors, especially during heavy winds.

SCE considers other factors, but primarily focuses on tree growth rates, to identify at-risk tree species. SCE has categorized its tree inventory species with three growth rate selections (fast, medium, slow). In addition, SCE has documented the list of species contained in SCE’s service area that have historically caused problems such as Tree Caused Circuit Interruptions. Some of the risk attributes associated with these species include, but are not limited to, being prone to trunk failure, branch failure, limb sway during windy conditions, frond drop, root failure and tree flammability. SCE’s vegetation crews are knowledgeable about both tree growth rates and tree risk attributes. Crews are instructed to factor risk attributes into the decision-making process when determining the right tree prescriptions, to ensure compliance clearances are maintained, or when determining if a tree removal is warranted. Additionally, all fast-growing species in grow-in zones are removed, if possible, when the species has the capacity to encroach into the clearance distance at the time of tree maturity. When practical, SCE removes immature vegetation in the drop-in zone (e.g., overhangs) within HFRA and removes or makes safe palms that have the potential to dislodge fronds. This is not currently an activity separate from Vegetation management to achieve clearances around electric lines and equipment (Section 7.3.5.20) and thus SCE did not develop an RSE for it.

In June 2019, SCE began performing line clearances across its transmission and distribution facilities in HFRA that are aligned with the guidance in Commission Decision D.17-12-024[E27] and in conformance to the recommended clearances in GO 95 Rule 35, Appendix E[E22]. While SCE has implemented these practices, SCE is working to apply recommended clearances to the individual trees and property where the owner had refused to grant SCE authority to make the recommended clearances.

SCE’s HTMP has a separate set of criteria for mitigating palm trees that have the potential to strike SCE’s facilities. For a detailed discussion of HTMP, please refer to Section 7.3.5.16.1. below.

3. Region prioritization:
Remediation of at-risk species is implemented throughout SCE’s service area, in HFRA and non-HFRA.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In August 2020, SCE completed its first cycle of enhanced clearances for all distribution lines in its HFRA. Over the next few years, SCE will continue to strive for the implementation of enhanced clearances in transmission areas. Managing at-risk species based on individual tree risk factors and growth rates is part of SCE’s normal vegetation management practices and will continue to be implemented and refined as new information is gathered. As described in its response Class B Deficiency SCE-14, SCE collected its first set of data in support of its analysis to determine the effectiveness of its at-risk species. The initial results

of the analysis on at-risk species will be provided in SCE's response to Class B Deficiency SCE-14, Action Statement SCE-21 to be submitted February 26, 2021.

In 2021, SCE will develop and initiate a palm tree removal program to help mitigate the risk of vegetation-related ignitions and faults caused directly by palms. SCE currently has an inventory of approximately 80,000 palms that pose significant operational challenges, which include: (1) the palm is a major driver of emergent work and outages (e.g., palm fronds drop onto primary wire); (2) the palm represents a wildfire threat, as dead palm fronds are highly flammable and are easily blown long distances by winds; and (3) the palm is fast-growing (upwards) and may require multiple trims per year to maintain compliance. Furthermore, trimming a palm poses worker safety risks. Approximately 40% of palm inventory requires climbing the tree to trim it. To further remediate public and worker safety risks associated with trimming palm trees, palms near lines should eventually be removed.

SCE's current approach to palm removals is more conservative than some peer utilities. However, customers have proven to be very resistant to removals. SCE's goal is to develop an integrated approach across stakeholder groups to address palm challenges, with strategies to make improvements immediately, over the next year, and longer-term. For example, immediate improvements will reinforce and consistently apply SCE's existing tree standards. Near-term improvements in 2021 will involve prioritizing a subset of palm inventory for removal based on multiple factors: (1) their simultaneous location in HFRA and threat to worker safety due to the need for climbing; and (2) contact events. Longer-term, SCE will adjust its overall strategy with stakeholders to ensure SCE has support and the required resources to address palm inventory.

The full scope and size of the palm removal program is still being defined, but for some portion of its service area, SCE intends to pilot efforts to gain removal authority from property owners and community engagement regarding extreme actions such as trimming deep enough to kill the palm when other alternatives are not available.

5. Future improvements to initiative:
SCE will continue to look for additional measures to mitigate risks associated with at-risk tree species and refine its methodology for the identification of at-risk species and subsequent remediation. For example, based on the data collected from SCE's analysis of its expanded clearances, SCE may be able to identify tree species that continue to cause TCCIs even with greater clearance distance and then target them for special remediation measures. SCE also expects to gain intelligence from the risk modeling associated with the Tree Risk Index. While it is challenging to anticipate what level of granularity will be available before the model has been put into place, SCE anticipates the data will help inform operational decisions on appropriate mitigations. In addition, SCE will consider the benefits of the removal program, as it relates to palms, and determine whether more removals or expanded clearance are effective.

7.3.5.16 Removal and remediation of trees with strike potential to electric lines and equipment

7.3.5.16.1 Hazard Tree Mitigation Program (VM-1)
SCE takes steps to remove trees that represent a significant fall-in or blow-in risk.

1. Risk to be mitigated / problem to be addressed:

Analysis of TCCI data revealed that a significant number of faults were caused by live trees "falling in" or branches / fronds from green trees "blowing in" to SCE lines and equipment. These trees were typically outside of the compliance clearance zone. Some visually healthy trees that were far enough from SCE lines and equipment to meet clearance requirements still pose a fall-in risk, depending on condition of the tree and other site-specific factors. Branches or fronds getting dislodged from trees near electrical facilities also have a higher probability of blowing into the lines and equipment and causing faults that can potentially initiate an ignition.

2. Initiative selection:
SCE's annual line clearing and dead and dying tree removal activities are insufficient to adequately address the risk described above. SCE initiated the HTMP which entails detailed inspection and evaluation of trees that pose risks despite trimming and pruning, and appropriate mitigations up to removal of these trees. Detailed inspections for HTMP involve a two-level assessment process. A Level 1 limited visual assessment is performed to determine if the tree is within the USZ and has the capability to strike SCE facilities if it fails. If a tree meets these criteria, a Level 2 assessment of the tree is conducted using SCE's tree risk calculator. SCE deems this a valuable initiative, given that this activity implements permanent solutions for contact from high risk trees, even though its RSE is relatively moderate.

In the third quarter of 2020 an independent study was performed by engineering consultants to evaluate the effectiveness of SCE's "tree risk calculator" for hazard tree identification and mitigation. The report concluded SCE's program is an effective and needed measure in reducing risks from hazard trees.

For more justification on SCE's planned utilization of HTMP, please see SCE's response to Critical Issue SCE-02 in Section 9.9.

3. Region prioritization:
HTMP is focused in HFRA. SCE prioritizes locations within HFRA based on HFRA tier and density of vegetation surrounding SCE's facilities, combined with Reax consequence scores.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE performed approximately 100,000 assessments in 2020, exceeding the target of 75,000 assessments. The number of assessments that can be completed is dependent on a variety of factors, such as the number of available qualified personnel, tree density/productivity per circuit, and number of subject trees per circuit (sufficiently tall that have strike potential).

SCE plans to continue HTMP in 2021 and anticipates finishing this work in the HFRA by December 2024. Current plans are to perform between 150,000 to 200,000 HTMP assessments in 2021. This amount is a conservative estimate based on the 27 ISA-certified assessors currently on property, each performing 25 assessments/day. In January 2021, SCE entered into new contractual agreements to perform this scope. Although the contractors have committed to supplying 40 assessors, the resources have not yet been onboarded. SCE has observed daily assessor counts vary from 25 to 35 per day, dependent on tree density and terrain. Faster onboarding and higher daily assessment throughput will result in a greater number of assessments.

SCE plans to transition the basis of circuit prioritization from Reax consequence scores to WRRM results. It also plans to incorporate a sample of QC inspections for HTMP in 2021 to verify the quality of assessments and remediations.

5. Future improvements to initiative:

SCE plans to further explore risk mitigation strategies/methods to implement any potential quality enhancements. Additionally, SCE will continue to evaluate the benefits of SCE's HTMP in areas where other grid hardening and risk mitigation strategies such as covered conductor are being implemented.

7.3.5.16.2 **Dead and Dying Tree Removal (VM-4)**

SCE removes trees that have a high probability of failing due to drought or other conditions such as insect infestations.

1. Risk to be mitigated / problem to be addressed:

Dead, dying and diseased trees have higher probability of failing, and if within striking distance of SCE lines and equipment, can cause fault conditions, sparks and ignition.

2. Initiative selection:

The Dead & Dying Tree Removal program (formerly called the Drought Relief Initiative) was established as a result of the epidemic of dead and dying trees brought on by climate change and years of drought. Moreover, both GO 95[E22] and Public Resources Code 4923[E25] require that SCE mitigate the hazards posed by dead trees or those that are identified as significantly compromised. Under this program, SCE conducts patrols in HFRA to identify and remove dead, dying, or diseased trees affected by drought conditions and/or insect infestation. SCE performs inspections in accordance with program requirements. All trees within strike distance of SCE overhead facilities that are dead or expected to die within a year are removed.

SCE deems this a valuable initiative, given that this activity implements permanent solutions for contact from dead, dying and diseased trees, even though its RSE is relatively moderate.

3. Region prioritization:

SCE patrols the entire HFRA areas several times a year as conditions warrant to identify and remove compromised trees. For example, insect infestation can move quickly, and all trees within strike distance of SCE overhead facilities that are dead or expected to die within a year are removed.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

SCE performs all inspections in accordance with Dead & Dying Tree Removal program requirements and in 2021 targets to remove 90% of active inventory within six months. Active inventory reflects trees for which SCE has both access and authorization to perform the removal. In 2020, SCE completed its planned Dead & Dying Tree Removal assessments in accordance with the schedule and at year end had mitigated 95% of active inventory. SCE plans to continue Dead & Dying Tree Removal program efforts in 2021 and 2022.

5. Future improvements to initiative:

SCE may expand the program's scope of work to include new invasive species, such as the invasive shot hole borer, which was recently identified in SCE's southern service area, and the golden spotted oak borer. If expanded, SCE will provide training on species identification and mortality indicators such as canopy die back and bark spotting. SCE would also respond with incremental patrols and partnering with contract resources on approved mitigation methodologies and fuel management (e.g., proper disposal of infested debris).

7.3.5.17 Substation inspections

SCE inspects vegetation around its substations for potential mitigation.

1. Risk to be mitigated / problem to be addressed:

The primary risk to be mitigated is vegetation contact with energized conductors and equipment as well as preventing fire damage to substations.

2. Initiative selection:

SCE Substation Operators perform substation inspections in accordance with CPUC GO 174[E26] requirements. Although not specifically referenced in GO 174[E26], SCE monitors substations for vegetation management and conducts inspections of substation perimeter fencing for encroachment. This activity does not have its own RSE because by itself does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Substation vegetation management, which does not have an RSE due to the lack of historical data on vegetation-caused ignitions involving substation facilities.

3. Region prioritization:

All substations are inspected in accordance with GO 174[E26] except for SCE facilities subject to California Independent System Operator's control and/or subject to FERC reliability standards and Customer Substations which are exempt from GO174 requirements.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

Substation inspections are performed at each substation several times per year and will continue in 2021 and beyond.

5. Future improvements to initiative:

Substation inspections will continue to meet the requirements of CPUC GO 174[E26].

7.3.5.18 Substation vegetation management

SCE manages vegetation around its substations.

1. Risk to be mitigated / problem to be addressed:

The risks to be mitigated are vegetation contact with energized conductors and equipment as well as preventing fire damage to substations.

2. Initiative selection:

SCE manages vegetation in proximity to substation equipment, outside the fence line for potential encroachment, or fall in risk by performing pruning, removal, and weed abatement. Due to the lack of historical data on vegetation-caused ignitions involving substation facilities, SCE did not develop an RSE for this activity. However, SCE determined that it was prudent to manage the vegetation around its substations and will continue to do so for the foreseeable future.

3. Region prioritization:

Any necessary vegetation management for substations are performed annually in HFRA Tier 2 and Tier 3.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020 SCE completed all vegetation management for substations as planned. Based on the demonstrated success of SCE's substation perimeter clearing during the 2020 Creek fire, SCE will continue performing vegetation management for substations in 2021. SCE will also focus on obtaining human resource and scheduling efficiencies by integrating substation inspections with Transmission inspections. While ground inspections around substation perimeters have been performed by SCE's internal vegetation management personnel, the transmission circuit inspections have substation start and end points, which indicates that inspections of both can be performed at the same time. Due to the lack of historical data on vegetation-caused ignitions involving substation facilities, SCE did not develop an RSE for this activity. However, SCE determined that it was prudent to manage the vegetation around its substations and will continue to do so for the foreseeable future.

5. Future improvements to initiative:

SCE may commence including inspections in non-HFRA pending sufficient resources.

7.3.5.19 Vegetation Inventory System (VM Work Management Tool – Arbora – VM-6)

SCE is in the process of consolidating its vegetation programs into a single digital tool to streamline its view and management of vegetation risks.

1. Risk to be mitigated / problem to be addressed:

Vegetation management is a very important component of SCE's WMP and includes several separate high-volume activities, mostly managed using contract resources. It is challenging to assign work, monitor progress, and manage performance and quality without adequate tools to monitor and analyze work management data. SCE maintains multiple digital tools for Vegetation Management, including Collector/Survey 123 for line clearing inspections and FULCRUM for HTMP, Dead & Dying Tree Removal and Pole Brushing. Housing data from different vegetation management programs on different platforms, as well as the limited nature of the data analytic options on those platforms, constrains advances in efficiency and risk-optimization.

2. Initiative selection:

SCE plans to consolidate these various digital tools into an integrated vegetation management platform, Arbora, in order to enhance efficiency, risk modeling, communication, reporting, planning and scheduling. The platform's underlying, cloud-based software will include process orchestration, automation, mobile tools, and an integrated repository across all programs to support collaboration with customers, arborists, environmental regulators, and utility regulators.

Given the criticality and scope of vegetation management programs, SCE wants to have more quantitative tools to analyze work allocation, scheduling, and execution bottlenecks so that it can focus on the right issues at the right time to get work completed more efficiently. This platform will provide that, not only within individual workstreams but across workstreams. An integrated platform will also facilitate alignment with electrical infrastructure mapping and findings from other types of inspections, such as aerial inspections. Finally, the platform can be used to leverage artificial intelligence, remote sensing tools and predictive modeling to drive vegetation management decision-making based on various risk characteristics. SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.

3. Region prioritization:
Currently, the platform is being piloted for SCE's Dead & Dying Tree Removal program in District 77, which is in SCE's HFRA. In this case, implementation risk associated with documenting and completing the prescribed work is the major driver for the location and program prioritization. A phased approach provides opportunities to adjust and advance the platform in accordance with user feedback, which provided added assurance of success when rolled out to broader audiences and/or larger programs.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
The new platform is currently being piloted for Dead & Dying Tree Removal work. After demonstrating early success in scheduling functionality, the pilot is now focused on reducing cycle time for inspections and remediations in the field. The crews will have comprehensive mapping tools with offline capability to view assignments and progress. The tool also allows users to use fewer screen clicks to obtain data critical for identifying and planning to perform required mitigations. Contingent on satisfactory piloted results in District 77, SCE will expand use of the program to all Dead & Dying Tree Removal program.

SCE is taking a phased approach to the platform's implementation to include more locations and vegetation management programs. If all goes as planned in the phased rollout, SCE expects to have the new platform deployed for the entire vegetation management portfolio. For 2021, the platform's agile development and releases will be implemented in accordance with the project plan, will perform a complete full rollout of Dead & Dying Tree Removal and Hazard Tree Mitigation, and conduct discovery and design architecture associated with Line Clearing.

5. Future improvements to initiative:
The platform uses an agile approach to development which integrates continuous improvement through frequent product updates based on prioritized or changing business needs. After platform implementation, future improvements are anticipated to include integration of the Tree Risk Index and other wildfire risk modeling to drive specific mitigations.

7.3.5.20 Vegetation management to achieve clearances around electric lines and equipment
SCE performs line clearances to mitigate the risk of vegetation contact with energized conductors.

1. Risk to be mitigated / problem to be addressed:

The primary risk to be mitigated is vegetation contact with energized conductors. For distribution line voltages between 2.4 kV to 69 kV, vegetation can create a risk to SCE facilities when the vegetation is located in grow-in zones (i.e., beneath the conductors), blow-in zones (i.e., within general blow-in proximity to conductors), and side grow-in zones (i.e., adjacent to conductors). For transmission line voltages greater than 115 kV, SCE has a "wire-zone" which is defined as the area directly beneath the conductors and includes the distance of the conductors at maximum sway condition (line dynamics). Vegetation within this zone has the potential to grow-in and fall-in which creates risk to SCE equipment and facilities.

2. Initiative selection:

To mitigate the risk of wildfire and reduce the probability and consequence of potential ignitions, vegetation management activities to maintain clearance distances from transmission and distribution lines and equipment are conducted in HFRA and non-HFRA. In HFRA, this work includes three distinct activities: (1) expanding clearances, where achievable, to GO95 Rule 35 Appendix E recommendations; (2) maintaining expanded clearances from SCE's lines for trees that have previously been trimmed; and (3) maintaining the required 4 feet clearance within HFRA for distribution lines and the required 10 feet clearance within HFRA for transmission lines, when SCE cannot achieve deeper trims (enhanced clearances) due to constraints such as customer refusals. Additionally, within the wire-zone, fast-growing species are removed if the species has the capability to encroach into the clearance distance at tree maturity. SCE began performing expanded clearances in June 2019 across its distribution facilities in HFRA.

SCE's line clearance forecasts include these three activities in HFRA. The forecasts included are subject to change as there are considerable uncertainties associated with the scope of work (number of trees trimmed or removed). Although risk analysis guides some line clearance activities, as described in the Sections 7.3.5.2 and 7.3.5.11 above on inspections and patrols, the line clearance scope in HFRA is driven by the CPUC requirement and GO 95 Rule 35 Appendix E[E22] recommendations to mitigate wildfire risks. Similarly, while the RSE for this activity is high, SCE's performance of it is driven by state and CPUC requirements.[79]

As discussed earlier, SCE performs annual inspections for clearance around conductors in accordance with applicable regulations such as GO 95 and SCE's TVMP and DVMP. Independent parties perform QA reviews and QC inspections to validate work quality and adherence to internal program and regulatory requirements.

3. Region prioritization:

Vegetation management activities to maintain clearance distances from transmission and distribution lines and equipment are conducted throughout SCE's entire service area on an annual basis. Because

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[79] See CPUC's GO 95 Rule 35[E22] and PRC 4293[E25].

inspections are performed annually, region prioritization is only performed to help ensure inspections and required trimming can be performed in consideration of certain access conditions (e.g., snow).

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE performed planned 2020 transmission and distribution inspections for all Transmission circuits and Distribution grids. SCE is continuously striving to expand areas within its HFRA where enhanced clearances can be achieved and is currently observing approximately 60% achievement based on the sampling results from its QC inspections within the service area.[80]

WSD issued a deficiency (SCE-12) SCE's 2020-2022 WMP filing because it found that SCE had not adequately discussed nor provided evidence of the effectiveness of increased vegetation clearances on decreasing utility near misses (i.e., outages) and ignitions. In response to SCE-12, SCE is performing a trend analysis on the reduction in TCCI and ignition events over time and plans to perform an analysis correlating TCCI and vegetation-caused ignition events to trees in the vicinity of these incident locations that are with and without enhanced post-trim clearances. The first evaluation was performed using TCCI data from December 2019 through December 2020. During this initial evaluation period, SCE documented 118 TCCIs in its HFRA, compared to 162 and 231 TCCIs for the same periods in 2018 and 2019 respectively. Although the TCCI volume in 2020 is lower than prior years, there is insufficient data at this time to formulate any meaningful conclusions that the reduced volume of TCCIs is a direct result of the implementation of enhanced clearances. SCE expects it will take approximately two to three years of data analysis to determine the effectiveness of enhanced clearances on reducing vegetation caused outages and ignition events. The results and methodology used in the initial analysis will be used to refine SCE's approach as appropriate.[81]

To improve the overall effectiveness of these mitigations, commencing in late 2020 and continuing through first quarter of 2021, SCE is holding quality performance meetings with all pre-inspection and pruning contractors to determine what additional measures can be implemented to improve the overall quality of vegetation work. In 2021 and beyond, SCE will analyze the clearance distances obtained, specifically when GO95 Rule 35 Appendix E enhanced clearances are not achieved, to understand the cause of not achieving enhanced clearances. In 2021 and beyond, SCE will analyze the clearance distances obtained, specifically when GO 95 Rule 35 Appendix E enhanced clearances are not achieved, to understand the cause of not achieving enhanced clearances. SCE will also implement its palm removal program which will help drive system reliability from vegetation caused outages caused by palm related events. In 2021 and 2022 SCE will continue evaluating the use of LiDAR into distribution infrastructure and potential QC activities, onboarding qualified resources for a variety of Vegetation Management roles and refine risk modeling to better prioritize and focus SCE's vegetation efforts to the highest risk areas.

5. Future improvements to initiative:

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[80] See SCE's response to Action SCE-17 for further explanation of these targets.
[81] Additional detail on the plan to analyze the data collected is provided in SCE's response to Action Statement SCE-16 (addressed in this WMP filing) and the methodology for the effectiveness analysis is provided in SCE's response to Action Statement SCE-18 (to be submitted on February 26, 2021).

As described in section above, SCE plans to implement several methods in 2021-2022 to improve the overall effectiveness of its line clearing practices. In addition, SCE will implement methods to increase efficiency in its work, by evaluating how work is scheduled to maximize use of available crews by reducing revisits to sites. The development and implementation of the integrated vegetation management platform will be key to this by providing visibility to all mitigations that need to be performed, independent of the mitigation driver. Additionally, it will provide better data about how emergent work relates to SCE's tree inventory and its trim cycle. Continuous improvement efforts will also build on current analyses to determine which trees and/or conditions are causing safety hazards and/or require more frequent mitigation more due to species, geography, trim distance achieved, etc. The development and implementation of the integrated vegetation management platform will also drive more efficient scheduling and deployment of resources.

7.3.6 Grid Operations and Protocols

Report detailed information for each initiative activity in which spending was above $0 over the course of the current WMP cycle (2020-2022).

7.3.6.1 Automatic recloser operations

SCE's SOB 322 describes, among other things, the criteria for making reclosers non-automatic and implementing fast curve settings for designated overhead transmission, sub-transmission and distribution circuits or circuit sections that traverse SCE's HFRA during a RFW declared by the National Weather Service, and/or a Fire Weather Threat (FWT), Fire Climate Zone (FCZ), Thunderstorm Threat (TT) or PSPS Proximity Threat declared by SCE.SCE's SOB 322 describes, among other things, the criteria for making reclosers non-automatic and implementing fast curve (FC) settings for designated overhead transmission, sub-transmission and distribution circuits or circuit sections that traverse SCE's HFRA during a RFW declared by the National Weather Service, and/or a FWT, FCZ, TT or PSPS Proximity Threat declared by SCE.

1. Risk to be mitigated / problem to be addressed:

RFWs, FWTs, FCZs, TTs, or PSPS Proximity Threats may signify an elevated risk of fire ignitions from SCE's electrical system. Additionally, blocking reclosers means that no attempted re-energization can take place automatically, potentially leading to a second relay and more potential ignition sources. Lastly, the implementation of operating restrictions provides testing and patrolling requirements for circuits and circuit sections that traverse HFRA following a relay operation, which helps to ensure qualified personnel identify and mitigate any conditions that could potentially lead to a wildfire ignition upon re-energization.

2. Initiative selection:

SOB 322 ensures consistency in execution of PSPS and other HFRA protocols by having them all documented in one bulletin, on which key stakeholders are trained. Updated operational protocols and standards for safe operations for HFRA circuits in the SOB 322 influence WMP execution response during wildfire events and PSPS operations which help mitigate and reduce wildfire ignitions. The application of FC settings during a RFW, FWT, TT or PSPS Proximity Threat ensures that any potential relays during a time of high wildfire risk release as little electrical energy as possible. Additionally, blocking reclosers means that no attempted re-energization can take place automatically, potentially leading to a second relay and more potential ignition sources. Lastly, the implementation of operating restrictions provides testing and patrolling requirements for circuits and circuit sections that traverse HFRA following a relay operation, which helps to ensure qualified personnel identify and mitigate any conditions that could potentially lead to a wildfire ignition upon re-energization. SCE's present remote control capabilities allow it to block reclosing relays for CBs and RARs with group commands of hundreds of devices at once – thus there is virtually no incremental cost to execute the commands. Further, the settings are already established – as such, SCE did not develop an RSE for this activity.

3. Region prioritization:

The protocols are in place for all HFRA throughout SCE's service area and can be applied to a single circuit, or all circuits within a particular switching center jurisdiction, county or fire climate zone.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE completed a review and performed an update to SOB 322 to reflect lessons learned from past elevated fire weather threats/PSPS events and integrated new and improved situational awareness data, improved threat indicators, and applicable regulatory requirements in an effort to reduce wildfire risk and the impact of outages on customers. Principal among these changes was the inclusion of parameters to make reclosers non-automatic and to apply fast curve settings by FCZ. This allows SCE's Expert Fire Scientist and risk professionals to identify certain FCZs where wildfire risk is especially high (due to environmental and/or fuel conditions) so that recloser operations can be appropriately altered.

In 2021, SCE will implement a new Hazard Event Restriction and Management Emergency System to automate operating restrictions on the distribution system, which will remove human error and greatly reduces the time needed to implement changing business requirements. It will also ensure forthcoming advanced applications will adhere to SCE's operating restrictions.

5. Future improvements to initiative:
SCE will continue to monitor SOB 322[82] for areas of improvement and will update it as necessary, as well as continue to build in flexibility to further automate/restrict reclosers when hazardous conditions are identified.

7.3.6.2 **Crew-accompanying ignition prevention and suppression resources and services**
When SCE crews are performing maintenance work in the field, especially if it is "hot work," there is a small chance of sparks or arcs while this work is being performed. "Hot work" is defined as any activity that is capable of initiating a fire or generating potential ignition sources.

1. Risk to be mitigated / problem to be addressed:
The risk to be mitigated is the potential of an ignition when crews perform hot work in the field because sparks and arcs can occur as a result of this work.

2. Initiative selection:
A set of "hot work" restrictions and mitigation measures are in effect whenever performing hot work activities in SCE's HFRAs. SCE and contract crews are provided with equipment to support incipient stage suppression of crew or equipment caused fires that may occur while crews are performing hot work in the field.

SCE performed benchmarking studies with other utility companies ground suppression programs and determined that the number and size of ignitions first encountered by field crews did not support pursuing professional, private firefighting resources at this time. SCE will continue using its existing "hot work" restrictions protocols that are in place to help prevent crew or equipment caused ignitions, and in the event of an ignition, the crews will use their equipment, such as fire extinguishers, shovels, and rakes, to

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[82] The Annual SOB 322 review initiative was discussed as WMP activity OP-1 in SCE's 2020 WMP. As this ongoing annual review is formalized and operationalized, it will be discussed in this section and remain a part of SCE's WMP but will not have program targets specifically tracked by SCE to monitor wildfire mitigation implementation.

put out fires. SCE will also continue to monitor the risks posed by ignitions first encountered by its field crews and consider professional firefighting crews as an option in future iterations of its WMP.

3. Region prioritization:
Not applicable.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
Not applicable.

5. Future improvements to initiative:
Not applicable.

7.3.6.3 Personnel work procedures and training in conditions of elevated fire risk

SCE crews are responsible for de-energizing and re-energization power lines during PSPS events based on decisions made by the IMT. SCE has implemented procedures that the crews follow during de-energizing and re-energizing power lines. The crews are trained in these procedures, so they are better prepared to perform their duties during conditions of elevated fire risk.

1. Risk to be mitigated / problem to be addressed:
Lack of training for personnel performing high risk grid operating procedures in elevated fire conditions may lead to poor decision-making during hazardous weather conditions and increase the chance of utility-associated fire initiation and growth that would impact communities, customers or property.

2. Initiative selection:
SCE has implemented work procedures that empower qualified employees to 1) request temporary de-energization of a line or line segment, or 2) restrict or delay field work when conditions call for such action. SCE also provides these employees the training necessary to safely perform these activities. The HFRA Hot Work Restriction and Mitigation Measures program applies to both SCE employees and contractors and is intended to reduce their risk of causing an ignition during the normal course of work in HRFA when the weather and fuel conditions are more susceptible to fire ignitions.

SCE revised its HFRA Hot Work Restriction and Mitigation Measures program in 2020 and implemented the Work Restrictions During Elevated Fire Conditions Program, (formerly Work Restrictions During Elevated Fire Conditions Programs and the Red Flag Fire Prevention Program), to restrict or delay field work. This program applies to both SCE employees and contractors and is intended to reduce their risk of causing an ignition during the normal course of work in HRFA when the weather and fuel conditions are more susceptible to fire ignitions. These are procedures followed by SCE as a prudent utility operator and is not informed by an RSE.

3. Region prioritization:
The training activities are delivered across all HFRA within SCE's service area and are not region specific. SCE delivers training to all employees engaged in wildfire mitigation activities and promotes year-round awareness of the company's HFRA operating protocols, i.e., Hot Work Restrictions and Mitigation

Measures. HFRA training is not region specific, as it is consistent across all HFRA within SCE's service area. When HFRA operating protocols are declared, the protocols then become region specific.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE provided training to field personnel (both employees and contractors) performing patrols and live field observations prior to 2020 wildfire season. This training included all updates to SOBs, which encompass operating protocols, remedial actions, communication and notification protocols, ratings and limits of lines and equipment, and system protection schemes. This training will be refreshed for all field personnel performing the same types of patrols in 2021, which includes both experienced and new resources.

5. Future improvements to initiative:
SCE will continue to provide training to field personnel prior to every wildfire season, as there are additional resources that are onboarded every year that will need to be trained. The annual training will include updates to all SOBs and any updates in work restriction procedures. SCE continues to refine its training program based on feedback from field employees and its QC program.

7.3.6.4 Protocols for PSPS re-energization

SCE has established protocols to patrol its lines after a PSPS deactivation to enable the swift and safe restoration of power.

1. Risk to be mitigated / problem to be addressed:
Restoring power after a PSPS deactivation both quickly and safely presents challenges because when a circuit is de-energized, SCE does not have the same indicators of potential hazards that it might normally. For example, if a foreign object were to come in contact with a line while energized, SCE would see a fault on the system and would be alerted to the hazard, but this alert is not available when a circuit is de-energized. Therefore, prior to re-energizing a line, SCE must patrol the line to ensure it is free from CFO, damaged equipment, and other conditions that could create hazards leading to ignitions when the line is re-energized.

2. Initiative selection:
When SCE de-energizes circuits during PSPS events, all de-energized circuits are required to be patrolled prior to re-energization in order to mitigate possible ignitions. For larger-scale PSPS events SCE also activates an Electric Services Incident Management Team (ES IMT) to assist with restoration planning and strategy. The ES IMT focuses on circuits that are safe to begin restoration while the PSPS IMT continues to monitor circuits of concern. Once field resources confirm that it is safe to re-energize the circuit(s), power is restored, and Public Safety Partners[83] and customers are notified of the re-energization. The

[83] The term 'public safety partners' refers to first/emergency responders at the local, state and federal level, water, wastewater and communication service providers, affected community choice aggregators and publicly-owned utilities/electrical cooperatives, the Commission, the California Governor's Office of Emergency Services and the California Department of Forestry and Fire Protection Public safety partners will receive priority notification of a de-energization event, as discussed in subsequent sections.

order in which circuits are re-energized -depends on many factors including, but not limited to, customer safety and wellbeing, consideration of impacted essential services, damage to electrical and other infrastructure, and circuit design/topology. SCE endeavors to restore power within 24 hours of the subsidence of dangerous weather conditions. This activity is an essential step of the PSPS process and an RSE associated with it would be the RSE for PSPS. However, consistent with the WSD's directive, SCE does not rely on rely on RSE calculations as a tool to justify the use of PSPS.

3. Region prioritization:
This initiative covers all circuits in HFRA that are in scope for any given PSPS event.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE initiated 12 PSPS events with 16 periods of concern, i.e., periods of time when de-energization was likely to occur due to forecast weather and fuel conditions. Through the course of these events, SCE continued to revise its processes and protocols to incorporate lessons learned during the de-activation and re-energization activities. For example, SCE refined its re-energization procedures for inspecting its facilities and determining when it is safe to restore power to circuits based on prevailing conditions, and how to avoid undue delays (e.g., restoration plan developed beforehand, restoration patrols completed, etc.). SCE also implemented a process to identify specific actions taken to address delays in circuit restoration that could result in a circuit not being returned to service within 24 hours of the termination of the de-energization event. SCE also conducted several table-top simulation exercises, and incorporated learnings from these activities into PSPS processes.

In 2020, SCE performed 424 restoration patrols on circuits that were de-energized.

In 2020, SCE staffed its PSPS IMT from a large pool of company-wide resources, to manage and coordinate potential responses. IMTs were placed on rotations, and on-call teams were required to respond to the Emergency Operations Center (EOC) within two hours, with limited exceptions. These teams were specifically structured to have multiple backups available, so that response and recovery efforts could be conducted 24 hours-a-day for several days or even weeks.

SCE determined that, in 2021, it needs a fully dedicated PSPS IMT, trained in PSPS event management following Incident Command System (ICS) standards and procedures in order to improve its PSPS readiness capabilities, reduce employee fatigue, and help improve coordination, consistency and execution of PSPS events, SCE is proposing an increase in scale for its Wildfire Infrastructure Protection Team to include 18 additional full-time employees. Based on lessons SCE learned in 2019 and early 2020, having variable resources from PSPS event to event created inefficiencies in operations and decision-making. Additionally, a dedicated full-time PSPS IMT reduces stress on company-wide employees being "activated" for PSPS events and allows employees to focus on their regular roles, including many employees who are working on other wildfire mitigation efforts, uninterrupted by "activations."

5. Future improvements to initiative:
SCE is exploring and testing the use of UAS and remote sensing capabilities to assist in data gathering for situational awareness. UAS could prove valuable in the coming years to supplement in-person patrols, allowing qualified personnel to more quickly assess circuit conditions beyond visual line of sight (BVLOS).

SCE's use of UAS is described in more detail in Section 7.3.9.1 of this WMP. In addition, SCE intends to explore the potential for installing remote sensors on SCE equipment to help assess a circuit's readiness to return to service.

7.3.6.5 PSPS events and mitigation of PSPS impacts[84]

SCE recognizes the impact that PSPS de-energizations have on its customers. As discussed in Section 7.3.10, SCE conducts extensive community outreach to educate its customers on SCEs' use of PSPS and ways to improve customer resiliency. Also as described in Section 8.2, SCE uses the Emergency Outage Notification System (EONS) to send targeted notifications to customers in areas potentially subject to PSPS. For non-customers, SCE uses a variety of targeted communication channels such as Nextdoor. As discussed further below, SCE employs a number of initiatives to help mitigate the impacts of PSPS to our customers, ranging from providing incentives for installing backup generation, and activating CRCs for customers to receive services and information during PSPS events.

7.3.6.5.1 PSPS Incident Management Team

Execution of the PSPS protocol is overseen by a specialized task force in the ICS overseen by the PSPS IMT. The PSPS IMT is responsible for monitoring and considering conditions and relevant information before recommending the de-energization or re-energization of any SCE circuit(s). New in 2020, was the inclusion of the dedicated PSPS IMT Customer Care Team that is activated during PSPS events with primary responsibility of mitigating customer impact of a de-energization during a PSPS event.

1. Risk to be mitigated / problem to be addressed:

Specially trained staff and specific protocols are necessary to ensure timely, safe, and limited PSPS de-energizations. A well-trained team also provides better coordination and interactions with other emergency management entities, such as local police, fire and emergency service departments.

2. Initiative selection:

SCE has established and trained a dedicated PSPS IMT team staffed solely for the purpose of responding to PSPS events and advancing operational protocols and enhancements during normal daily operations. A dedicated team creates greater consistency across PSPS activations when communicating with customers and public safety partners. Additionally, this specialized team is able to more quickly adapt and make changes from one event to another. The ICS is typically utilized by private and public organizations across the country as a best practice for emergency response, regardless of incident size or type. As the ICS has been successfully utilized within SCE for several years, it allows for all IMT members to respond in a cohesive manner during IMT activations, including those related to wildfires and PSPS events.

The IMT oversees and executes PSPS protocols, which detail how PSPS activation, notification, de-energization and service restoration processes work (e.g., roles and responsibilities, decision making processes, and execution). As described in Section 8.2, when SCE forecasts that windspeeds will breach

[84] In SCE's 2020 WMP, this chapter included a WMP activity for Wildfire Infrastructure Protection Team Additional Staffing (OP-2). The hiring of staff to increase PSPS capabilities at SCE was complete in 2020; as such the OP-2 goal will not be refreshed for this 2021 WMP Update.

circuit-specific thresholds for activation and monitoring of a PSPS event, SCE readies its PSPS IMT and begins preparations for the upcoming event (notifications, pre-patrols, etc.). The IMT will use a variety of factors to guide its decision on whether or not to implement a de-energization, including FPI and real-time data from weather stations and field observers (if available). When fire risk conditions subside to safe levels and safe conditions are validated by field resources, SCE will begin patrolling impacted circuits to check for any condition that could potentially present a public safety hazard when re-energizing circuits. Once field resources confirm that it is safe to re-energize the circuit(s), power will be restored, and local government and customers will be notified of re-energization. The order in which circuits are re-energized will depend on many factors including, but not limited to, customer safety and well-being, consideration of affected essential services, damage to electrical and other infrastructure, and circuit design/topology. SCE has established processes and procedures that outline how to handle critical business decisions during a Public Safety Emergency. The PSPS IMT implementing PSPS protocols are an essential part of the PSPS process and an RSE associated with it would be the RSE for PSPS. However, consistent with the WSD's directive, SCE does not rely on RSE calculations as a tool to justify the use of PSPS. SCE views PSPS as an important and necessary tool, while recognizing that there are serious concerns associated with its use.

3. Region prioritization:
Protocols for initiating PSPS events cover all circuits in HFRA that are in scope for any given PSPS event. At a circuit level, SCE uses PSPS judiciously based on de-energization wind speed triggers that are unique to each circuit and are dynamic based on evolving environmental and circuit-specific characteristics. Some factors that are taken into consideration when setting de-energization triggers include wind speed, FPI, ignition consequence modeling, circuit conditions, length of conductor, and other technical characteristics for the applicable circuit. Please see Section 8.1 for more details.

IMT resources are trained to handle major incidents, such as wildfires, PSPS events and earthquakes, that arise across SCE's service area. As such, IMT resources are not region specific, and regions are not prioritized differently.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE staffed its PSPS IMT from a large pool of company-wide resources, to manage and coordinate potential responses. IMTs were placed on rotations, and on-call teams were required to respond to the EOC within two hours, with limited exceptions. These teams were specifically structured to have multiple backups available, so that response and recovery efforts could be conducted 24 hours-a-day for several days or even weeks.

The PSPS IMT was activated 12 times[85] in 2020 to prepare for and monitor PSPS conditions, perform customer notifications, ensure resource coordination and implementation of compliance requirements. When the decision is made to activate the PSPS IMT, the team begins executing the PSPS protocol, and mitigations to deploy CCVs and/or activate CRCs, deploying mobile generation to essential customers for life safety emergencies (where appropriate) and initiating pre-patrol activities to assess

[85] Activation of a PSPS IMT does not imply that customers were de-energized during the event. In addition, a PSPS event may result in multiple circuits being de-energized over a consecutive period of time.

safety hazards on impacted circuits. These PSPS execution activities are critical for minimizing impacts and public safety risks to customers and communities before and during a PSPS event.

SCE determined that, in 2021, it needs a fully dedicated PSPS IMT, trained in PSPS event management following ICS standards and procedures in order to improve its PSPS readiness capabilities, reduce employee fatigue, and help improve coordination, consistency and execution of PSPS events, SCE is proposing an increase in scale for its Wildfire Infrastructure Protection Team to include 18 additional full-time employees. Based on lessons SCE learned in 2019 and early 2020, having variable resources from PSPS event to event created inefficiencies in operations and decision-making. Additionally, a dedicated full-time PSPS IMT reduces stress on company-wide employees being "activated" for PSPS events and allows employees to focus on their regular roles, including many employees who are working on other wildfire mitigation efforts, uninterrupted by "activations."

5. Future improvements to initiative:
SCE continuously refines its ICS and PSPS protocols as real-world incidents occur in order to ensure best practices are captured and trainings are as up to date as possible. As such, SCE will update its processes and protocols in 2021 and beyond to incorporate any best practices identified.

7.3.6.5.2 Customer Care Programs (PSPS-2)
SCE routinely assesses the needs of our customers and may introduce new solutions as needed for Customer Care programs. For 2021, SCE offers customer care programs to help mitigate the impacts of PSPS to our customers. These programs are described further below:

- Community Resource Centers
- Community Resiliency Programs
- Customer Resiliency Equipment

7.3.6.5.2.1 Community Resource Centers
SCE activates CRCs and CCVs as locations where SCE representatives provide information and services to customers in an effort to reduce the impact of PSPS de-energization events.

1. Risk to be mitigated / problem to be addressed:
During PSPS de-energization events, customers often need access to services such as power sources for the charging of devices and medical equipment and overall information on the event including event duration.

2. Initiative selection:
CRCs provide services such as access to device charging and restrooms, water, snacks, and resiliency kits (which contains a tote bag, LED lightbulb or flashlight, pre-charged phone battery, ice voucher, personal protective equipment (e.g., masks, hand sanitizers, etc.)). Contents of the resiliency kits provided to customers may be adjusted as needed. CRCs also provide an opportunity for customers to sign up for PSPS alerts, update their SCE contact information, and receive answers to PSPS, SCE program or customer account questions.

SCE also uses mobile CCVs to reach impacted communities that do not have a CRC location in their community or as a supplement to CRCs, as needed to support impacted communities. SCE has designed and outfitted eight cargo transit vans and box trucks as CCVs with the required equipment and technology to enable SCE staff to transport and distribute water, snacks, and resiliency kits to communities potentially impacted by a PSPS de-energization event. CCVs can be quickly activated to serve customers and can be set up in open areas without a standing facility and/or in remote areas. CCVs may be especially useful in limiting indoor interactions in light of the COVID-19 pandemic.

To continue to serve customers during the COVID-19 pandemic, SCE has made certain modifications to the operation of CRCs and CCVs to enforce social distancing. For example, instead of allowing customers to help themselves to snacks, fact sheets, and other amenities, SCE has pre-packaged these items into a resiliency kit, as described above. SCE is also prepared to set up alternatives to indoor CRCs such as drive-through or outside walk-up CRCs as space permits to further enforce physical distancing mandates. Although the RSE for this initiative is relatively low due to only mitigating the impacts of PSPS and not wildfire, SCE determined that it should still implement it as CRCs and CCVs fill an important need unaddressed by other initiatives in providing customers a space with electricity where they can receive services and information.

CRCs and CCVs can reduce the impacts associated with PSPS risk. SCE performed an RSE calculation on this initiative, which resulted in a relatively low RSE score. However, RSEs were not used to directly inform the implementation of this activity, as SCE deems this activity to be critical in supporting our customers who are impacted by PSPS events.

For more justification on SCE's planned utilization of CRCs/CCCs, please see SCE's response to Critical Issue SCE-02 in Section 9.9.

3. Region prioritization:
CRCs are activated and CCVs are dispatched to communities that are impacted by a PSPS de-energization event. When contracting with sites to host CRCs, SCE targets communities using the following factors: (1) analysis of circuit locations impacted during the prior wildfire seasons, (2) analysis of circuits likely to be impacted by PSPS events in the coming year (this analysis considers AFN and other essential customers groups), (3) population density, and (4) special needs within the community. SCE first prioritized securing locations that were previously impacted by PSPS events. This was followed with the identification of rural locations that might have a higher need for CRC's that would include resiliency in the form of a transfer switch installation and temporary mobile backup generator provided by SCE. We then expanded the priority to include locations in neighboring communities within a reasonable distance from a HFRA circuit where customers would go during a PSPS event. Looking forward into the next 2-4 years, SCE will adjust CRC needs and locations based on grid hardening efforts and the reduced need to rely on PSPS to reduce the ongoing impact to our customers and to their safety.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
As of December 2020, SCE has contracted 56 CRCs, 43 of which can operate 8am-10pm (CPUC mandated hours for non-governmental facilities)

In 2020, SCE activated CRCs 58 times and deployed CCVs 88 times in multiple counties (Mono, Inyo, Kern, Ventura, San Bernardino, Orange, Los Angeles, Santa Barbara and Riverside) in support of community members during PSPS events. Approximately 6,000 customers visited the CRCs and CCVs during the months of May through December 2020 during PSPS activations. SCE also started providing its CRC and CCV activation and availability information on SCE's website in the second quarter of 2020.

For 2021, SCE is evaluating circuits that will likely be impacted by PSPS events in order to determine how many CRCs and CCVs will be needed to support its customers in these areas during de-energization events.

5. Future improvements to initiative:
SCE will plan to enable some additional CRCs in or near HFRAs including more remote locations to receive back-up power by installing a transfer switch to CRC sites and providing a backup portable generator to provide temporary power to the site while the circuit is de-energized due to PSPS. SCE continuously improves upon the services provided through its CRCs and CCVs based on current conditions and customer feedback, for example in 2020, customers were provided blankets during cold weather conditions, bulk water in 1-to-2.5-gallon containers and firewood in certain locations where the need was evident. SCE will also continue to seek feedback from community stakeholders on the siting, services, and experiences at the CRCs and continue to adapt to new emerging needs. SCE is continuing to evaluate alternatives and refinements to its customer support approach and will include changes in approach, scope or cost in Change Order Reports to this WMP.

7.3.6.5.2.2 Customer Resiliency Programs
SCE has also made available programs to our customers that can assist with building resiliency to reduce the impact of PSPS events. SCE continues to communicate with our customers the importance of building resiliency to prepare for PSPS events. As part of this effort, SCE provides additional programs to assist customers and communities with backup generation solutions. Two such customer resiliency programs offered by SCE are listed below:

(a) Resiliency Zones Pilot: Provides in-front-of-the-meter and behind-the-meter temporary generation during PSPS events

(b) Customer Resiliency Equipment Incentive (CREI: provides a financial incentive towards the installation cost of a microgrid control system for customers willing to allow the use of their facility as a CRC during PSPS events.

1. Risk to be mitigated / problem to be addressed:
SCE is pursuing multiple customer resiliency programs that will help mitigate the impacts of PSPS on our customers and communities. The Resiliency Zones program allows customers to have temporary generation during PSPS events. The CREI program provides financial assistance to customers that are interested in installing a microgrid system and willing to serve as a CRC during PSPS events.

2. Initiative selection:

As part of the Resiliency Zones pilot program, SCE explored the creation of resiliency zones which would utilize in-front-of-the-meter and behind-the-meter generation to provide power for our impacted remote communities to have access to basic essential services such as food, fuel, medicine, and other public safety services in remote communities.

For the CREI program, SCE initiated a pilot to provide funding to two commercial customers. SCE's 2021 GRC included a request to provide an incentive to help pay for part of the installation costs of a microgrid control system for customers willing to increase resiliency within HFRA by islanding and redirecting the energy in the storage battery to a designated building on site for use during PSPS or other emergencies. These facilities are required to be open to the public during PSPS events or other emergencies. SCE did not develop an RSE for these activities as they are both pilots and SCE will monitor them closely to determine if they should be expanded in the future.

3. Region prioritization:
For the Resiliency Zones program, priority is given to customers in remote locations impacted by multiple PSPS events and sites are selected in collaboration with participating communities. For the CREI program, customers in HFRA that already have installed solar generation and energy storage capabilities or solar generations with plans to install energy storage capabilities on the site will be given priority.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
For the Resiliency Zones program, SCE identified seven remote communities as having the most frequent PSPS events in 2019. Using the results of the analysis performed using the 2019 PSPS events, SCE developed a goal of providing up to three essential service sites (e.g., grocery stores, gas stations) in each community with backup generation. SCE is currently targeting installation of backup generation for essential services in the following seven communities listed below:

- Los Angeles County: Acton and Agua Dulce
- Kern County: Tehachapi
- Mono County: Mammoth and Bridgeport / Lee Vining
- Riverside County: Cabazon and Idyllwild

At this time, SCE has completed three resiliency sites in Agua Dulce and one site in Cabazon. Two additional agreements have been reached (one in Mammoth and one in Lee Vining). SCE will continue to work with county and community leaders to identify additional sites.

For the CREI program, SCE is currently in the piloting process to inform the development of this program based on two types of projects:

- Customers that already have installed solar generation and power storage capabilities (retrofit design)
- Customers that have solar generation and are in the process of adding power storage capabilities (upfront design)

In 2020, although not specifically for customers impacted by PSPS, SCE funded ~$200k as a pilot to add a microgrid control system to the San Jacinto High School's existing resiliency system to create an emergency shelter for the community and to get a better understanding of the CREI retrofit project. In 2021, SCE will implement another pilot microgrid control system for a school in Rialto to gain learnings for the CREI upfront design project, which will also have an added benefit of being used as a CRC.

These installations will enable SCE to assess various aspects of the Resiliency Zones program and to evaluate the differences between the retrofit and new build installations for the CREI program.

5. Future improvements to initiative:
For the Resiliency Zones program, SCE will assess the installations and the benefits derived by the community with respect to energizing essential services during PSPS. If SCE deems this program to be successful and the benefits support the costs, SCE may recommend expanding this program to other communities in a phased approach beginning in 2022. The mechanism for assessing benefits of the pilot will include customer feedback from impacted communities.

For the CREI program, SCE plans to closely study the initial installations to learn about the complexity of the islanding design, costs, and customer participation and what modifications the program may need.

SCE also entered into an agreement with Kordyak Elementary in the City of Fontana within the Rialto Unified School District for a microgrid, targeted for completion in 2021. SCE understands that this school site will secure battery storage assets by September 2021, and complete construction by December 2021.

7.3.6.5.2.3 Customer Resiliency Equipment
SCE has also developed various programs to provide customers with financial assistance in developing their resiliency to prepare for the impact from PSPS de-energizations. These programs provided by SCE include:

a) Critical Care Backup Battery (CCBB) program
b) Residential Battery Station Rebate program
c) Well Water and Water Pumping Backup Generation program

1. Risk to be mitigated / problem to be addressed:
PSPS de-energization events can have impacts on our customers, including those relying on critical life sustaining medical devices, those dependent on well water pumping, as well as household appliances. This initiative does not reduce the probability nor consequence of ignitions, but rather reduces the consequence of PSPS events.

2. Initiative selection:
The CCBB program targets income-qualified customers residing in HFRA and enrolled in the Medical Baseline program. This program does not reduce wildfire risk or consequence but reduces the consequence of PSPS and an RSE has been calculated based on this benefit. Despite the relatively low RSE for the CCBB program, the decision to undertake this initiative was driven by the needs of SCE’s income qualified MBL customers residing in HFRA and was designed to fully fund the cost of a battery-powered portable backup solution to operate critical medical equipment during PSPS de- energization events. SB 167[E28] authorized electrical corporations to deploy backup electrical resources or provide financial

assistance for backup electrical resources to those customers identified as MBL and who meet specified requirements.

The Residential Battery Station Rebate Program promotes resiliency by providing a $50 rebate to customers for purchasing a portable battery backup for their general home resiliency use including PSPS events. This program was initiated when SCE identified the need for battery backup to power small appliances including lighting, TVs, routers and modems, as well as the ability to charge devices such as cell phones, laptops and tablets, in the event of an extended outage such as a PSPS event. This program is still new and in the pilot phase; SCE does not yet have substantial data evaluating the benefits of the program. In the future when more data is available, if the program appears successful and SCE determines to continue or expand it, SCE plans to calculate an RSE for the program based on its reduction of PSPS consequence.

The Well Water and Water Pumping Backup Generation program was developed to assist customers who have a dependency on electricity to pump water for basic use in their home or business, with the purchase of a portable backup generator. During Community Meetings facilitated by SCE in 2019 and 2020, specifically in areas dependent on electricity to pump water, SCE learned that some customers may not be able to access water during PSPS de-energizations. SCE launched a program offering $300 on the purchase of a qualified backup generator, and further enhanced the rebate amount to $500 for income qualified customers (enrolled in CARE or FERA). Customers must reside in a HFRA or have been previously impacted by a PSPS event. Customer eligibility includes a dependency on well water or electricity for pumping water for basic needs. SCE did not develop an RSE for Well Water and Water Pumping Backup Generation as it is a pilot, and SCE will monitor it closely to determine if it should be expanded in the future. If the program is successful and SCE determines to expand it, SCE will plan to calculate an RSE based on the reduction of PSPS consequence.

In addition, SCE also has an ongoing Self-Generation Incentive Program (SGIP), which is a Statewide program that provides financial incentives for the installation of new qualifying technologies that are installed to meet all or a portion of the electric energy needs of a facility. To help address the need for resiliency and better prepare our customers for outages and PSPS events, SGIP offers incentives for the installation of self-generating energy storage systems designed to offset the customers energy use and work as backup power when an outage or a PSPS occurs. The SGIP handbook outlines in detail the eligibility requirements for the Equity Resiliency budget for both residential and non-residential customers. The SGIP is a state-mandated program that SCE is required to implement and is not driven by a risk analysis.

3. Region prioritization:

The CCBB Program is available to customers who reside in HFRAs, are enrolled in the MBL program, and are enrolled in either the CARE or FERA programs. The Residential Battery Station Rebate Program is available to all SCE customers in SCE's service area that may benefit from having a battery backup for their home resiliency and electric device charging needs. For the Well Water program, SCE targeted customers living in well water dependent communities, or communities not having access to municipal water suppliers.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

For the CCBB program, SCE sent direct mailers to all eligible customers to inform them about the program and provide them with contact information for an applicable battery deployment vendor to assist with enrollment into the program. In conjunction with this outreach, battery deployment vendors were provided eligible customer contact information for additional outreach about the program. Each month, SCE identifies newly eligible customers and sends direct mailers encouraging them to enroll in the program and provides customers with direct contact information to assess eligibility for program enrollment. In 2020, the program was offered to all then-eligible customers, limited to the Critical Care subset of Medical Baseline customers (~2,500). Of the then-eligible customer population, 837 have enrolled in the CCBB Program and 723 batteries were deployed to customers in 2020 from the launch of the program in July 2020. In 2021, SCE expanded the CCBB program to include all eligible MBL customers enrolled in either the CARE or FERA programs and residing in HFRA. SCE will continue to offer this program to newly identified eligible customers, enroll and deliver backup batteries to all eligible customers who choose to participate in the program, and will adjust the program outreach (e.g., expand marketing and outreach, onboard additional vendors and or engage with Community Based Organizations) to increase program enrollments.

In 2020, 820 customers have redeemed the $50 Residential Battery Station rebate and ~185 customers have been approved via online applications processed for the Well Water program. SCE plans to continue to offer these rebates into 2021.

5. Future improvements to initiative:

SCE will expand CCBB eligibility to all income-qualified program enrolled MBL customers located in HFRA, rather than just income-qualified program enrolled Critical Care customers in HFRA. SCE will also explore opportunities to work with CBOs to help educate customers about the CCBB program.

SCE will explore working with a third-party vendor to test batteries from various manufactures and provide feedback to the IOUs on safety, proposed battery standards, battery life, and other important information.

SCE will assess the effectiveness of the Well Water program through surveys and community feedback and adjust the program accordingly to improve effectiveness. SCE plans to begin the outreach including the customer survey in the first quarter of 2021.

SCE will assess the effectiveness of the portable battery program to identify opportunities to enhance the offering and to increase customer interest and participation. Consideration will be given to adjustments to the rebate amount, eligibility criteria, and to the list of eligible products. SCE conducted customer research in March of 2021 to obtain feedback about this program forums and an evaluation is currently underway on future suggested improvements.

In addition, SCE is continuing to evaluate alternatives and refinements to its customer resiliency equipment programs and may include changes in approach, scope or cost in Change Order Reports to this WMP.

As part of its PSPS Action Plan, SCE has made significant progress on expanding its CCBB program. In 2021, SCE expanded the CCBB program to include all eligible Medical Baseline customers (not just Critical Care customers) that are enrolled in CARE or FERA and reside in HFRA. Progress in 2021 has not been impeded by the initial delays experienced in 2020, as inventory is no longer a constraint and SCE has expanded its marketing efforts. To increase battery deployments to eligible customers, SCE has reached out to all additional eligible customers (approximately 12,000) who had not yet enrolled in the program.

SCE assumes that approximately 30 percent of total eligible customers will choose to enroll this year. and will continue marketing and outreach efforts to reach as many eligible customers as possible. SCE has expanded marketing and outreach using direct mail, phone calls, email, and digital channels (sce.com, social media, etc.) and is working with CBOs and other agencies to increase awareness about the CCBB program.

By expanding the eligible customer population, SCE has increased back-up batteries deployed to vulnerable customers in HFRA.

SCE's marketing and outreach activities for 2021 include:

- Sending direct mailers and email communications to all eligible customers including those that did not commit to participate in the CCBB program in 2020; communications also request customer feedback on the program
- Tracking enrollments and attempts to contact customers to determine if additional outreach calls are needed
- Identify and conducted outreach to newly eligible customers every month
- Deploying social media posts to market the program through SCE's social channels
- Deploying targeted posts on platforms such as Nextdoor or similar social media platforms to share information about the program
- Engaging with CBOs, local and tribal governments, and other agencies to help educate customers in PSPS impacted areas about the CCBB program
- Providing CBOs with training and program information to help educate customers about the program
- Performing in-person visits, to engage customers who are non-responsive or have not yet agreed to participate in the program.

SCE deployed 2,164 back-up batteries and enrolled 2,614 customers as part of the CCBB program between January 1, 2021, and May 15, 2021. 2,884 batteries have been deployed and 3,394 customers have been enrolled since the launch of the CCBB program in July 2020.

7.3.6.6 Stationed and on-call ignition prevention and suppression resources and services

SCE does not utilize stationed and on-call ground-based ignition prevention and suppression resources and services. As stated previously, SCE provides workers with fire suppression equipment and training to extinguish incipient-stage ignitions. SCE also restricts work during elevated fire weather conditions and relies on the expertise of its fire agency partners to support fire suppression activities throughout its service area.

1. Risk to be mitigated / problem to be addressed:
Not applicable

2. Initiative selection:
Not applicable

3. Region prioritization:
Not applicable

4. Progress on initiative (amount spent, regions covered) and plans for next year:
Not applicable

5. Future improvements to initiative:
SCE continues to evaluate various wildfire mitigation options, including the use of stationed and on-call ground-based ignition prevention and suppression resources and services.

7.3.7 Data Governance

Report detailed information for each initiative activity in which spending was above $0 over the course of the current WMP cycle (2020-2022). For each activity, organize details under the following headings:

7.3.7.1 Centralized repository for data (Wildfire Safety Data Mart and Data Management DG-1)

SCE is undertaking the following activities to progress our wildfire mitigation capability maturity with centralization of wildfire-relevant data, the development of more rigorous data governance processes, and integrated, real-time data access.

1. Implementation of an integrated wildfire safety data mart and portal: centralized repository of wildfire datasets to support comprehensive analysis, data utilization across wildfire programs, and wildfire data portal for reporting and secure data sharing.
2. Implementation of a Cloud Big Data and Artificial Intelligence platform: this will enable SCE to (a) effectively ingest, organize, store, analyze, and visualize remote sensing Big Data collected for wildfire mitigation initiatives and (b) enable SCE's data scientists to develop, train, test, and deploy machine learning models within business processes.

1. Risk to be mitigated / problem to be addressed:

The data and information associated with SCE's wildfire risk mitigation initiatives such as asset inspections, system hardening, vegetation management, situational awareness and PSPS, and risk events – are currently contained in distributed and disconnected information technology systems and databases, that are not currently integrated. With the volume and complexity of wildfire mitigation activities and decision making, more efficient access to consistent data about assets, asset conditions, and work performed on assets is needed for risk analysis, program execution and reporting.

SCE's wildfire mitigation initiatives generate very large volumes of remote sensing data, such as images, videos, and LiDAR (Light Detection and Ranging) data, to help identify and remediate asset conditions and hazards that are potential ignition risks. The scale of this data collection makes it too large and/or complex to be stored, managed, and analyzed using traditional data-processing solutions.

Key challenges in the current state include:

- Data availability in silos, creating a bottleneck of accessibility that limits its usage.
- Heavy reliance on manual analysis of inspection imagery, leading to inefficient utilization of QEWs and potential for inconsistencies.
- Inefficiencies in performing comprehensive analysis across wildfire datasets.
- Inability to support customizable real-time data sharing with external stakeholders

- Limited ability to fully operationalize and benefit from AI and ML analytics for improved and faster decision making.

- Manually intensive reporting activities, such as those in support of spatial (GIS) and non-spatial data delivery for WSD's QDR.

- Manually intensive reporting impacts process efficiency, data consistency, and timeliness of reporting to third parties.

2. Initiative selection:
Wildfire Safety Data Mart and Portal (WiSDM)

To address these risks, SCE is implementing a scalable, cloud-based, and geospatial enabled centralized wildfire data repository or data mart, aligning with the Wildfire Mitigation Capability Maturity Model for Data Governance. This data mart will consolidate datasets from federated data sources to enable the following benefits:

- Strengthen SCE's ability to perform comprehensive analysis based on asset, situational, operational, and risk data, leading to more robust risk-informed decisions to mitigate ignition risks and minimize the use of PSPS.

- Provide a single source for wildfire data analytics and reporting, improving data consistency and quality.

- Reduce manual efforts required to consolidate and aggregate data, leading to improved data accuracy, improved work efficiency and response times, and more effective use of data to inform wildfire mitigation strategies.

- Increase data traceability and auditability.

- Improve data availability, with near real time/event driven integration for various datasets

- Sharing of data in real-time with internal and external stakeholders using APIs (Application Programming Interface) and a secure wildfire data portal.

- Improve ability to comply with the GIS (Geographic Information Systems) data reporting standards established by the WSD.

Cloud Big Data and Artificial Intelligence Platform (Ezy Data)
Ezy Data will allow SCE to:

- Effectively ingest, store, organize and analyze massive volumes of remote sensing data (for example, SCE's wildfire mitigation initiatives have produced over one petabyte of imagery data over the past year, and this volume of data is growing). Current processes to manage this data are highly manual.

- Improve data sharing and ability to visualize and utilize remote sensing data across a wide array of initiatives and business processes such as inspections, remediations, work planning, and asset data management.
- Automate data analysis functions, such as detection of equipment failure or structural issues from photographs.
- Improve the quality of its asset data. Data quality issues are hampering the advancement of SCE's goals by having to make assumptions instead of relying on actual data.

An enterprise AI Platform will allow SCE's data scientists to develop, manage, and deploy AI/ML models within business workflows to aid in decision-making. Enablement of AI/ML-assisted business processes are expected to enhance SCE's ability to mitigate wildfire risk as outlined in Section 7.3.4.3 Improvement of Inspections.

SCE did not develop an RSE for WiSDM or Ezy Data because they do not directly mitigate the risk of wildfire or PSPS. Rather they provide capabilities required for various activities that reduce the risk or consequence of wildfire or PSPS as envisioned in the WSD's Wildfire Mitigation Capability Maturity Model and help inform how other risk mitigation activities are selected and deployed.

Alternatives include maintaining status quo which would not be prudent given the challenges described previously. Other alternatives would be implementing on-premise solutions and hiring additional resources to continue manually-intensive processes, which were deemed impractical due to the technical challenges of duplicating the cloud-based vendor (e.g., Microsoft, Google, Amazon) infrastructure in SCEs Data Centers to support advanced analytics of unstructured data. Over time given the increase of the data SCE is collecting, approximately 1PB/year it is likely that we would exceed the capacity of our data centers if we were to build out this infrastructure requiring the construction of additional data centers as such we felt that this approach was too costly in the long-run as well.

3. Region prioritization:
SCE's centralized data repository and data governance solutions are planned to be implemented for the management of wildfire data across distribution, transmission, generation, customer service throughout SCEs service area.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE is implementing its data management strategy in a phased approach, focusing on building minimum viable products to rapidly increase near-term capabilities while also developing foundational capabilities that will drive long-term benefits to our WMP.

<u>Completed in 2020</u>

- Foundational infrastructure set up for a cloud platform, with network connectivity established to Edison data center along with basic cyber tools.

- Solution Architecture Definition for remote sensing data management and AI Platform enablement on a cloud platform.

- Implementation of an image visualization application to automatically detect and organize over six million images collected during the year for Aerial Inspections, to enable inspectors to easily search and retrieve structure-specific images needed for desktop electric system inspections. The resulting capabilities improved the efficiency of Aerial Inspections and was instrumental in ensuring SCE's ability to continue performing and evaluating the results of Aerial Inspections under shelter-in-place conditions in 2020.

- Discovery workshops to gather information on as-is processes and tools that are used to manage and report out on the following wildfire datasets: assets, wildfire mitigation initiatives (vegetation management inspections, vegetation management projects, asset inspections, and grid hardening), PSPS events, and risk events (e.g., wire-down events, ignitions and unplanned outages).

- Development of a technology roadmap and conceptual design for a centralized wildfire data repository to enable advanced analytics and support real-time sharing of this data.

- Establishment of the manual reporting process for spatial (GIS) and non-spatial data delivery in support of WSD's QDR, with delivery of data for the two QDRs in 2020 and the QDR contemporaneously submitted with this 2021 WMP Update.

<u>Work In-progress and Plans for 2021</u>

- WiSDM:
  - Complete the WiSDM solution analysis and design for centralized data repository and data portal.
  - Initiate staggered consolidation of datasets from SCE Enterprise systems.

- Ezy Data:
  - Implement the cloud platform infrastructure for Ezy Data.
  - Build a scalable solution for intake, storage, analysis, and visualization of inspection data (LiDAR, HD video, photograph).
  - Complete the design and initiate the build of an Artificial Intelligence platform.

5. Future improvements to initiative:
SCE will build upon efforts completed in 2020 and planned for 2021 for its data management strategy in 2022 and beyond to realize full benefits over the five-year period. This will principally involve the continued development of WiSDM and Ezy Data.

Plans for 2022

- WiSDM
  - Complete the integration of source systems of record with the centralized data repository for key situational, operational, and risk datasets.
  - Deploy the wildfire data portal with multi-level access.
  - Enable automation in wildfire data reporting.
- Ezy Data
  - Beyond Aerial Inspections, expand the deployment of cloud Big Data solution for other asset inspection, remediation, and asset data processes.
  - Operationalize initial set of Artificial Intelligence-based analytics use cases.

Plans for 2023-2025

- WiSDM
  - Enable real-time sharing of data using API protocols.
  - Ability to ingest and utilize new sources of data needed for decision making; continue intake of new datasets into centralized repository as needed for wildfire risk mitigation.
  - Additional automation in reporting with expansion in delivered reports.
  - Implement dashboards to understand and monitor data quality, with support for data audit checks to ensure data consistency and completeness between the source systems and the target data mart.
- Ezy Data
  - Increased application of advanced analytics for short and long-term decisions.

7.3.7.2 Collaborative research on utility ignition and/or wildfire

SCE collaborates with academic institutions and research groups on co-sponsored research projects, as well as provides input in the form of data or technical expertise in studies around the country. Please refer to Section 4.4 for more information on SCE's approach to collaborative research.

1. Risk to be mitigated / problem to be addressed:

Collaboration with non-utility partners such as academic institutions, government agencies, and private industry can help to enhance utility perspectives and reduce the risk of duplicative research efforts related to various wildfire topics. Addressing the continued wildfire threats in California will require new and innovative ideas that could be generated through cross-industry research partnerships.

2. Initiative selection:
Please refer to Section 4.4 for more information on SCE's approach to collaborative research. SCE did not develop an RSE for this activity because it does not directly mitigate the risk of wildfire or PSPS but rather supports and enables the future improvement of wildfire mitigation.

3. Region prioritization:
Please refer to Section 4.4 for more information on SCE's approach to collaborative research.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
Please refer to Section 4.4 for more information on SCE's approach to collaborative research.

5. Future improvements to initiative:
Please refer to Section 4.4 for more information on SCE's approach to collaborative research.

7.3.7.3 Documentation and disclosure of wildfire-related data and algorithms
SCE documents and updates its probability of failure and fire spread algorithms pursuant to its model creation, test and validation processes. And as described in section 7.3.7.1, in 2021 SCE will begin to implement a centralized repository of wildfire datasets to support comprehensive analysis, data utilization across wildfire programs, and wildfire data portal for reporting and secure data sharing.

1. Risk to be mitigated / problem to be addressed:
Important data such as SCE's machine learning algorithms or wildfire risk mitigation initiatives information should be stored in a manner that makes them readily accessible for utilization and updates.

2. Initiative selection:
SCE's machine learning algorithms to assess an asset's probability of failure are stored and utilized on SCE's secure SharePoint Sites and GitHub platforms; the probability of failure data is securely stored on SCE's SAS databases. SCE's fire spread algorithms and input data are stored and utilized on Technosylva's cloud platforms. For more information on SCE's centralized database for its wildfire mitigation information, please see Section 7.3.7.1.

SCE did not develop an RSE for these activities because they do not directly reduce the risk of wildfire or PSPS but rather support and enable SCE's risk modeling and implementation of its wildfire mitigations.

3. Region prioritization:
SCE's algorithms are used to inform and prioritize some of SCE's wildfire mitigation activities such as covered conductor scoping and wildfire inspections across HFRA. For its wildfire-related data, please see Section 7.3.7.1.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE created predictive models for its transmission and sub transmission systems and updated its existing models for the distribution asset risk models and its process for updating and documenting them.

In 2021, SCE plans to update its existing models and create new models as new data becomes available. For its wildfire-related data, please see Section 7.3.7.1.

5. Future improvements to initiative:
SCE continues to update its existing models by using the latest and best suitable data science algorithms with the latest available data. Also, SCE will continue to expand its risk modeling capabilities by identifying new features contributing to ignition events discovered through engineering root cause analysis, field observations, and subject matter expertise. For its wildfire-related data, please see Section 7.3.7.1.

7.3.7.4 Tracking and analysis of risk event data

In April 2019, SCE launched the Fire Incident Preliminary Analysis (FIPA) process to perform more in-depth investigations into all ignitions that occurred in connection with SCE facilities.

1. Risk to be mitigated / problem to be addressed:
The problem being addressed is the need to document and analyze risk event data to gain insights and learn lessons to help reduce or prevent those risk events from occurring again. Currently, data collection on faults and failures events can be captured on several forms that do not collect data in a standardized, electronic format. This can result in inconsistent data capture and the need to use linguistical analysis to capture trend data from free text responses.

2. Initiative selection:
SCE currently accounts for risk events in several databases:

- Wire Down Database – Monitors wire-downs based on wire-down calls and repair orders across the entire SCE service area.
- ODRM – Monitors distribution, substation, and transmission unplanned outages that affect a single line transformer or more on SCE's grid.
- FIPA Database – Collects and annually reports certain information that would be useful in identifying operational and/or environmental trends relevant to fire-related events.

The FIPA process was established to gain insights and learn lessons to help further SCE wildfire mitigation efforts. The FIPA process has three levels of investigation, depending on the complexity of the ignitions. The three levels vary in complexity, and a brief description of the actions taken for each level are listed below:

- Level 1 - May include a review of pictures, telephone interviews, and Repair Orders.
- Level 2 - In addition to Level 1, may include site visits and fault analysis.
- Level 3 - In addition to Level 2, may include evaluating the equipment/material by a root cause engineer.

During the FIPA process, the assigned staff enter the data in a database. The FIPA process has continued through 2020 and provides additional data through more in-depth investigations into ignition events, which have helped SCE's mitigation strategies. Furthermore, SCE conducted a pilot of a similar process of wire-down events. SCE did not develop an RSE for this activity as it does not directly reduce wildfire or PSPS risk. Rather, it supports and potentially improves SCE's wildfire mitigations and risk modeling. The RSEs of these activities reflect the benefits of having adequate monitoring analysis of near miss data.

3. Region prioritization:
SCE monitors this information for its entire service area. Although SCE prioritizes incidents that occur in HFRA, SCE also collects information in non-HFRA because there may be common failure modes that occur throughout the service area. SCE can then use this information to target risk mitigations where needed.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE has expanded its FIPA team and refined the tools and processes used. In 2020, the FIPA team analyzed 795 events.[86] The team added five employees to increase the level of resources focusing on event analysis. In 2021, SCE has expanded the presentation of its faults and wire-down causes to add categories not listed in the WSD list. This will allow greater visibility to causes that were previously listed as 'Other.' SCE has improved the way it finds ignition and near miss data using a software tool that searches the free form text in repair orders to find key words that indicate potential ignition or near misses.

5. Future improvements to initiative:
SCE plans to enhance its post failure data collection processes to make data collection more consistent, relevant, and efficient. SCE will also update its database for storing this information and its processes for root cause analysis. SCE is updating the failure event database to include wire-down, underground equipment failures and ignitions to assist in identifying related failures in a single database. For example, an underground equipment failure may cause an ignition burning a pole that may then result in a wire-down. Currently, these are recorded as three separate events. Under the new structure, all three events will be related and analyzed as a single incident. SCE is incorporating additional Transmission outage data as an improvement to its outage reporting.[87]

[86] This number includes: 1) CPUC reportable and non CPUC Reportable events; 2) ignition and events where there was the potential for an ignition, but no ignition occurred; and 3) events where it was subsequently determined that SCE equipment was not involved.
[87] Historical reporting has been revised to reflect the additional Transmission outage data.

7.3.8 Resource Allocation Methodology

Report detailed information for each initiative activity in which spending was above $0 over the course of the current WMP cycle (2020-2022).

7.3.8.1 Allocation methodology development and application

SCE uses risk analysis along with other operational considerations to prioritize deployment of human and financial resources.

1. Risk to be mitigated / problem to be addressed:

Labor and financial resources are limited. In addition, hiring, onboarding, training, deploying, and managing resources requires oversight and coordination. Given the volume of work to meet compliance requirements and address customer safety and reliability risks, including wildfire risk mitigation, SCE must prioritize its available resources to complete the required work.

2. Initiative selection:

SCE uses risk analysis to determine the key drivers of ignition risk, develops mitigation options and evaluates these options using risk and other analysis to select preferred mitigation options and the scope of work necessary. Once an activity is selected, SCE uses granular risk analysis to prioritize deployment. For example, SCE used its enterprise level RAMP risk model to determine distribution overhead conductors to be a driver of ignitions associated with electrical infrastructure. Alternatives such as reconductoring with bare wire, undergrounding and covered conductor installation were considered and evaluated. Covered conductor installation has the highest RSE, reduces more risk that bare conductors, is less expensive than undergrounding, and is quicker to deploy compared to undergrounding. Therefore, Wildfire Covered Conductor Program (WCCP) was determined to be the best allocation of resources and funding to quickly reduce ignition risk in SCE's HFRA. SCE's WRRM (described in detail in Chapter 4) is used to prioritize circuit segments by risk scores along with other considerations such as bundling work geographically for crew efficiency. An RSE was not calculated for this activity as it needs to be undertaken irrespective of RSE score, it is impractical to estimate risk reduction from risk reduction modeling. Further, this activity helps inform how other risk mitigation activities are selected and deployed. The RSEs of these other activities reflect the benefits of having an adequate allocation methodology.

3. Region prioritization:

Region prioritization for this activity is not applicable as it applies to all of SCE's HFRA.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

The work completed to advance SCE's risk modeling capability is discussed in detail in Chapter 4. SCE augmented the analysis to provide more granular RSE results. For the 2020 WMP, SCE provided system level RSEs based on uniform risk buydown across the system. For the 2021 WMP update, SCE is using a new model (the WRRM) to calculate RSEs at either the segment level or structure/pole/tower level (depending on the mitigation). These results can be aggregated to any level of granularity – circuit, region, HFRA tier, etc. To date, the focus has been implementing the new model and adding incorporating new initiatives to RSE framework. Over the course of 2021, the analysis will be augmented to more clearly provide RSE results that illustrate how RSE varies across the system, (e.g., as deployment proceed down the risk buy-down curve).

In order to operationalize the most effective suite of mitigations utilizing the risk-informed analyses, SCE utilizes program management support and an Organizational Change Management (OCM) program. Program management support personnel provide oversight for all wildfire mitigation activities and is responsible for: (1) executing near-term actions to further mitigate increased wildfire risk; (2) developing enhancements to its operational plans for long-term wildfire, public safety, and related resiliency strategies; and (3) integrating SCE's wildfire mitigation strategies with existing operations.

OCM is a program focused on helping to identify and manage the effect of necessary changes to business processes, systems, job roles, policies and procedures, and other areas. OCM efforts primarily include employee and other operational stakeholder communications, training/development and monitoring of change adoption. For SCE's wildfire mitigation efforts, the OCM work is needed to facilitate internal and advocate for external awareness of the changes resulting from the increased wildfire mitigation efforts. Given the complexity of change inherent in the wildfire mitigation programs, it is critical to embed OCM resources into these activities to increase the likelihood of success of the programs intended outcomes.

5. Future improvements to initiative:
SCE expects to augment its RSE framework to allow comparative analysis of multiple mitigations at a granular level. Currently, while RSE results are available with high locational granularity (i.e., structure, pole, tower, or segment level), the framework is not ready to directly compare/optimize any set of mitigations at that specific location. Over the course of 2021, SCE plans to augment the WRRM model to allow direct comparison of multiple mitigations that may substitute each other or complement each other. For example, comparing RSE of covered conductor to RSE for undergrounding for each circuit segment can provide new insights into identifying undergrounding opportunities. As another example, calculating the value of expanded vegetation clearances after covered conductor is deployed will provide a potential indication of where vegetation mitigation activities can be potentially scaled back.

SCE provides more details about its WRRM and how it is advancing its ability to make data driven, risk informed decisions for prioritizing wildfire mitigation activities in Chapter 4.

7.3.8.2 Risk reduction scenario development and analysis
Please see detailed descriptions of models and risk analyses approaches used along with work completed and future improvements in Chapter 4 and Section 7.3.8.1 above. This activity does not directly reduce wildfire or PSPS risk but can inform which activities to perform and prioritize. This also does not have any incremental costs. The RSEs of the activities that use the analysis reflect the impact of this activity.

7.3.8.3 Risk spend efficiency analysis – not to include PSPS
Please see detailed descriptions of models and risk analyses approaches used along with work completed and future improvements in Chapter 4 and Section 7.3.8.1 above. This activity does not directly reduce wildfire or PSPS risk but can inform which activities to perform and prioritize. This also does not have any incremental costs. The RSEs of the activities that use the analysis reflect the impact of this activity.

7.3.9 Emergency Planning and Preparedness

Report detailed information for each initiative activity in which spending was above $0 over the course of the current WMP cycle (2020-2022).

7.3.9.1 Adequate and trained workforce for service restoration (SCE Emergency Response Training DEP-2)

SCE maintains a large, highly skilled field workforce (both employees and contractors) to provide effective emergency response and restore service during and after a major event. SCE also uses contract resources that can assist with a major event. In addition, SCE's existing mutual assistance agreements can be activated in situations where the response exceeds the capacity of SCE's crews and emergency contracting capabilities.

SCE develops technical training programs that prepare employees to perform their jobs safely, comply with regulatory requirements and laws, maintain system reliability, and meet the demands of new technology such as training qualified electrical workers to use unmanned aircraft for overhead inspections. To ensure that its employees and contractors are adequately trained for service restoration, SCE conducts specific training on an annual basis for field workers responsible for restoration of power after emergencies. SCE also provides specialized training on an annual basis for IMT members, who oversee and execute de-energization and restoration protocols.

1. *Risk to be mitigated / problem to be addressed:*

Untrained personnel may lead to poor decision making during hazardous weather conditions and may contribute to ignitions or restoration delays, potentially impacting the health and safety of the population SCE serves.

2. *Initiative selection:*

SCE conducts a robust, ongoing training program for IMT, Incident Support Team (IST), and other critical personnel to prepare for and respond to all types of hazards in the service area. IMT and IST personnel receive ICS training consistent with Federal Emergency Management Agency (FEMA) trainings, as well as trainings that incorporate Standardized Emergency Management System (SEMS) protocols, processes, and guidelines. SCE ensures that IMT and IST personnel trainings are reflective of SEMS, National Incident Management System (NIMS), and ICS – the same foundational programs which Cal OES and our Operational Area partners utilize in their emergency response structures. In addition to standard ICS trainings, IMT and IST personnel also receive training specific to their response roles (position-specific training) and, for certain personnel, hazard-specific training. SCE has trained over 500 employees as qualified IMT or IST members.

ICS training helps to ensure SCE personnel tasked with incident response and support understand the national and state frameworks and standards for emergency response and recovery. Position-specific trainings cover specific roles and responsibilities, how a position supports SCE coordination and restoration, and specific requirements or tasks the position is responsible for. Hazard-specific trainings, particularly PSPS trainings, cover specific protocols, issues, or actions associated with hazards SCE may need to mitigate or respond to.

This type of training was selected to help ensure that personnel tasked with coordinating restoration are well versed in company processes and procedures, and that the many different parts of the company that work together to restore power following a major incident are working within the same framework and structures.

SCE is also training all PSPS field personnel, including contractors, to understand the requirements and potential impacts related to PSPS protocols. Training is provided based on proactive operational changes or identified risks. We trained SCE's field personnel on the following:

- Provided employees with tools, plans, guidelines, and strategies to efficiently apply our PSPS protocols during de-energization and re-energization scenarios.

- Conducted virtual training sessions and job shadowing weeks to months in advance of the "fire season," in addition to "just in time" training.

- Obtained trainee feedback on lessons learned from PSPS event debriefings and trainings and implemented corrective action to improve the PSPS program. Examples of potential changes based on lessons learned may include revising circuit switching playbooks to minimize customer outages, improving internal communication protocols, and other improvements.

This type of training was selected based on identified risks and field personnel expertise. The purpose is to improve the consistency, efficiency and reliability of the de-energization and re-energization process. SCE has a continued focus on limiting the number of customers impacted by PSPS and improving restoration efforts.

To facilitate service restorations, SCE is also training employees to operate Unmanned Aircraft Systems (UAS). The training program is required to help ensure UAS operators can operate unmanned drones safely through a wire-environment. After a de-energization event, circuits must be patrolled to identify any potential hazards before restoration of power. SCE estimates UAS operations can potentially reduce these patrol times by 50 percent as well as reduce pole climbs from troublemen who respond to circuit outages in order to locate issues and restore service that previously could require several pole climbs to locate the problem.

SCE training its workforce to respond to emergencies is essential and is not informed by an RSE – thus SCE did not develop an RSE for this activity. The training allows SCE personnel to support vital activities (e.g., service restoration after an emergency) and/or specific wildfire mitigation initiatives (i.e., PSPS). The RSE calculations for those activities in the future will reflect these benefits.

3. *Region prioritization:*

IMT and IST members are trained to coordinate response, restoration, and recovery across any part of the SCE service area. UAS trainees are also not restricted to a specific region of SCE's service area. PSPS teams receive additional training on working in HFRAs within SCE's service area; they are not region specific within that classification. Response and restoration protocols, as well as PSPS protocols, remain consistent throughout SCE's HFRA. The PSPS restoration training protocols are applied across all HFRAs within Edison's service area; they are not region specific.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

SCE has provided incident response and restoration training to employees and contractors for years prior to the 2020 wildfire season. These trainings included procedures for conducting service restorations in response to emergencies, with specific additional trainings for personnel tasked to support PSPS de-energizations and restoration. SCE will continue to provide training to employees and contractors prior to every wildfire season, as SCE onboards new qualified personnel on an ongoing basis.

In 2020, SCE continued to evaluate areas where additional personnel were needed and held SCE IMT member training on emergency response and management protocols to develop additional SCE employees as qualified IMT members. This training consists of an ICS training program based on guidelines provided by FEMA and that follows the NIMS and SEMS models. This training is required for employees that serve in the IMT. SCE has trained over 500 employees as qualified IMT members. SCE conducted seven end-to-end PSPS de-energization exercises to prepare for the 2020 wildfire season. These de-energization exercises encompassed a complete PSPS activation scenario, simulating the situation five days prior to a potential de-energization. In 2020 SCE also trained and exercised personnel on performing their PSPS roles and responsibilities in an all-remote environment. SCE also developed the UAS training program and added 50 new UAS operators.

In 2021, SCE is aiming to have all PSPS IMT and Task Force members fully trained and qualified or requalified by mid-year (July 1, 2021) and to continue the de-energization exercises to provide realistic training for IMT members. All other IMT and IST members assigned to other teams will go through requalification trainings and exercises on an ongoing basis, with the goal of having all personnel requalified by December 31, 2021. Also, in 2021, SCE plans to expand the UAS program by an additional 50 operators over 2020 levels, although COVID-19 may limit the number of UAS operators that can be trained in 2021 due to social distancing measures.

5. Future improvements to initiative:

The annual training will be updated with current service restoration procedures and based on feedback from its employees and SCE continuously refines trainings as real-world incidents occur in order to ensure best practices are captured and trainings are as up to date as possible. As such, SCE will update IMT trainings in 2021 and beyond to incorporate any best practices identified.

7.3.9.2 Community outreach, public awareness, and communications efforts[88]

SCE uses a variety of methods to increase public awareness of emergency planning and preparedness information; distribute and translate communications; and measure those efforts.

1. Risk to be mitigated / problem to be addressed:

In times of emergency that affect the electricity supply or public safety related to the provision of electricity, it is vital that SCE's customers are able to receive timely, intelligible, and actionable communications from SCE.

2. Initiative selection:

SCE engages in a suite of outreach activities, including community meetings (DEP-1.2), marketing campaign (DEP-1.3) and customer research and education (DEP-4), as described further in Section 7.3.10.1. SCE has also increased the number of prevalent languages pursuant to OP 3 of D.20-03-004[E30] in its service area when conducting community outreach to increase public awareness of emergency planning and preparedness as discussed in Section 8.4. SCE also conducts the In-Language Wildfire Mitigation Communications Effectiveness Pre/Post Surveys, to measure the communications and outreach effectiveness prior to and coincident with the wildfire seasons by prevalent language, as discussed in Sections 7.3.10.1.4 and 8.4.

These activities are not intended to directly reduce the probability or consequence of ignitions or de-energizations, but rather support the essential task of SCE's response to emergencies, and therefore risk models were not used to select the scope of work, calculate RSE or target deployment.

3. Region prioritization:

See the sections referenced above.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

See the sections referenced above.

5. Future improvements to initiative:

See the sections referenced above.

7.3.9.3 Customer support in emergencies

In the event of a major emergency, SCE has a dedicated customer support team to help impacted customers. All customer inquiries about major emergencies, such as wildfire, are prioritized.

1. Risk to be mitigated / problem to be addressed:

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[88] A statewide information campaign was described in this section in the 2020 WMP (IOU Customer Engagement (DEP-3). That activity was suspended in 2020, as indicated in SCE's Off Ramp Report submitted June 1, 2020, as SCE determined local campaigns were more effective to increase customer awareness of wildfire mitigation efforts.

Customers may lack information on how to mitigate the safety and economic risks they might face during emergencies.

2. Initiative selection:

Phone support is available in English, Spanish, Chinese, Korean, Vietnamese and Cambodian. SCE's customer service representatives also use a translations service vendor that supports more than 150 languages for customer inbound inquires. Information about SCE's customer support resources for customers impacted by any emergency is available on its dedicated webpage for disaster support at sce.com/disastersupport and emergency preparedness information is available at sce.com/beprepared. Customers can also submit their customer information online to stay informed about wildfire status updates and resources. SCE also shares timely updates on PSPS events resources leveraging multiple communications channels such as outbound messaging, social media and NextDoor.

To mitigate customer risks that could arise after an emergency,[89] SCE utilizes the following practices and/or enacts customer protections in line with Commission directives, as appropriate:

1. Access to outage reporting and emergency communications
    - SCE uses best practices to help ensure all customer information is current so that customers can receive the most up-to-date information regarding outage and emergency communications and to ensure that resources are available for reporting outages.
2. Support for low-income customers
    - Ensuring all impacted customers enrolled in CARE/FERA have their accounts flagged to automatically prevent annual verifications and high usage verifications from executing.
3. Billing adjustments
    - Ensuring all identified impacted customer accounts do not receive estimated bills and daily minimum charges are halted/adjusted.
4. Extended payment plans
    - Working with impacted customers to provide extended payment plans through recovery from incident.
5. Suspension of disconnection and nonpayment fees
    - Ensuring all impacted customer accounts are not sent for disconnection due to non-payment, eliminating assessment of non-payment fees.
6. Repair processing and timing

[89] As declared by the Governor of California.

- Ensuring access to local planning resources to assist with expediting SCE support for rebuilding and providing up to date information about restoration timing both through contact center and web for impacted customers.

7. Access to utility representatives

   - Directing staff and resources to county and local government assistance centers during disasters and other events to provide in-person support to assist with information and consumer protections.

These activities are not intended to directly reduce the probability or consequences of wildfire and de-energization, but rather support customer needs during an emergency, and therefore risk models were not used to select the scope of work, calculate RSE or target deployment.

3. Region prioritization:
Customer support resources are provided for all regions in SCE's service area.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In alignment with an Administrative Law Judge (ALJ) ruling made in August 2020, SCE's website, which contains three wildfire pages and four PSPS pages, now provides readily available information in all prevalent languages beyond English. SCE implemented these changes in November 2020 and continues to analyze the ALJ ruling to determine if additional languages should be added to its website. Additional details on these languages are discussed in Section 8.4.2.

SCE made its first Nextdoor post in December 2019 continued to work on refining its customer notification strategy in 2020. Nextdoor is also used as a channel to reach populations who may not have access to other channels or forms of communications. In 2021 SCE will be enhancing its Nextdoor communications to further refine our targeting capabilities and ensure PSPS notifications are delivered directly to the impacted customers aligning with the segmentation of circuits impacted.

5. Future improvements to initiative:
SCE's long-term strategy focuses on continual improvement in areas that aim to increase customers' awareness before, during and following emergencies. SCE will work to improve customers' knowledge of the program offerings available and ensure customers receive critical notifications when emergencies arise. SCE will also emphasize reaching customers throughout its service area, including people present in the area that may not be an SCE customer (e.g., visitors, homeless people). SCE is launching a targeted campaign to its master-metered properties, whose residents are not direct SCE-metered customers, that will provide information regarding PSPS events, instruct on how to sign up for alerts and notifications and direct customers to SCE's website to learn more about SCE's activities, PSPS and consumer protections from disasters. These are in addition to the PSPS event notifications described in Section 8.2.4.

7.3.9.4 Disaster and emergency preparedness plan

SCE maintains disaster and emergency preparedness plans, including but not limited to its Storm Plan and Wildfire Response Plan, to facilitate restoration and a rapid return to continuity of operations.

1. Risk to be mitigated / problem to be addressed:

Comprehensive plans are needed to identify hazards and memorialize the protocols necessary to address the hazards and coordinate with internal and external stakeholders for rapid restoration of electrical service following a disaster or emergency.

2. Initiative selection:

The Storm Plan articulates the operations and policies that guide how the company plans for, addresses, and responds to emergency electrical incidents using the utility-specific ICS structure. It is designed to facilitate safe and efficient restoration of outages caused by outside forces, through the development of accurate situational awareness and the sharing of critical information during an incident. The Storm Plan outlines the communications strategy and notification procedures that SCE utilizes to communicate with its customers, the public, appropriate government agencies, essential service providers, critical care customers, and other important stakeholders in the restoration process. It also outlines how SCE will collaborate with the communities it serves in preparing for and responding to emergency events, which may include activities such as pre-positioning of field resources or equipment in advance of forecasted weather events.

The Wildfire Response Plan outlines a threat-specific strategy aimed at mitigating, planning for, responding to, and recovering from an actual wildfire event, as well as a potential fire event with the possible need for proactive de-energization through use of the PSPS protocol. It outlines the roles and responsibilities for the company leadership and incident response personnel across the enterprise for response operations during these events.

In addition to the Storm Plan and the Wildfire Response Plan, SCE also maintains an All Hazards Plan, IMT/Incident Support Team Guidelines, Earthquake Plan, Cybersecurity Plan, and several other plans, protocols, and procedures to support incident response. Depending on the incident and nature of restoration, any number of or combinations of these plans and procedures may be used to inform response and coordination.

These activities are not intended to directly reduce the probability or consequence of ignitions or de-energizations, but rather support the essential task of SCE's response to emergencies, and therefore risk models were not used to select the scope of work, calculate RSE or target deployment.

3. Region prioritization:

No region prioritization has been used for this initiative as these plans apply to the entire service area.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

The Storm Plan and Wildfire Response Plan were updated in 2020 on schedule, and they will be updated by July 1, 2021 to reflect any lessons learned or changes decided upon in 2020.

5. Future improvements to initiative:

To help ensure effectiveness, components of SCE's disaster and emergency plans are regularly quality checked. For example, each real-world event and simulation exercise is required to have an After

Action/Corrective Action plan for issues identified over the course of the incident. SCE uses these for completion and incorporates all lessons learned into existing plans and protocols through regular updates to disaster and emergency plans. SCE maintains both an annual plans maintenance schedule and a training/exercise calendar to facilitate syncing plan updates with lessons learned from existing trainings and exercises. SCE's long-term disaster and emergency plans will continue to be regularly updated to incorporate updated or additional regulations and identified corrective actions and maturity models.

SCE also actively engages key stakeholders in conjunction with maintaining its disaster and emergency preparedness plans. As previously described in Section 7.3.6.5, in the event of a PSPS activation, SCE will coordinate with local emergency management agencies and employ a variety of targeted communication channels to ensure customers are notified in a timely manner. Also, in Section 7.3.6.5, SCE describes engagement with public safety partners, including fire and law enforcement agencies, to collaborate on mitigation strategies and event protocols, as well as outreach efforts to water agencies, telecommunications companies, and healthcare providers to educate them on PSPS protocols and potential impacts.

7.3.9.5 Preparedness and planning for service restoration

SCE utilizes the Wildfire Response Plan, as well as other plans as described above in Section 7.3.9.4, to lay out the protocols for conducting inspections and remediations prior to re-energizing lines and the training described above in Section 7.3.9.1 to execute those protocols.

1. Risk to be mitigated / problem to be addressed:
Not having a comprehensive plan and well-trained personnel would impede effective service restoration and negatively impact affected customers and communities.

2. Initiative selection:
SCE provides its employees with the tools, plans, guidelines, and strategies to help ensure smooth and rapid re-energization. SCE increases resiliency by training employees to handle PSPS events. SCE utilizes plans, trainings, and exercises as described in Sections 7.3.9.1 and 7.3.9.4 to plan and prepare for all types of hazards that may impact service delivery. SCE reviews and updates plans, and conducts trainings for personnel, on an ongoing basis.[90]

As previously discussed in Section 7.3.9.1, each year SCE requires all personnel assigned to a non-PSPS IMT to receive initial or refresher training in all-hazards response operations. During this training, personnel receive instruction regarding incident response operations and plans, or updates to plans or protocols that had taken place since their last training session. This provides all personnel an opportunity to learn about and/or review and discuss best practices and lessons learned/observed during training

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[90] SCE trains its employees in emergency response so that they will be prepared in advance of any emergency, which by their nature often strike without warning. Although wildfires and PSPS events have a "season" during which it is more likely they will occur, climate change is now causing a year-round wildfire season. In addition, other types of emergencies, such as earthquakes, may strike at any time of year.

sessions, exercises, and real-world activations. These training sessions are followed by drills or exercises to ensure the training information is retained and can be successfully demonstrated. Once both requirements are fulfilled, the personnel are considered to be qualified, or requalified for their specific position. It should be noted that the Business Resiliency team is responsible for training personnel on response plans and response operations, while more technical training specific to service restoration is provided by the personnel's home organization.

Additional protocols are followed for restoring power following PSPS events. Prior to and during a PSPS event, the IMT briefs local field personnel on circuits that have a potential of being de-energized for PSPS. Existing repair notifications are given to the local field personnel ahead of the activation to help remediate issues on those circuits before the wind event begins. If a circuit is nearing the de-energization criteria, SCE reviews circuit-specific switching plans to assess how the de-energizations can be the least impactful to the customers, while isolating the area of concern. These switching plans are also used when the circuits are being re-energized. Once circuits have de-escalated from PSPS criteria, the circuits are prioritized by the restoration teams to be patrolled and re-energized in a strategic fashion. Restoration teams have the expertise to assess whether additional resources are needed to reenergize a circuit faster, especially in the hard-to-reach circuits, by proactively requesting air operations to aid in the patrolling of de-energized lines. As the lines are being patrolled and monitored for re-energization, SCE maintains clear communications with all the affected departments. Consistent with the Commission's direction in D.20-05-051[E29], SCE endeavors to restore power as soon as possible and within 24 hours from the cessation of extreme weather, when safe to do so. SCE also reports to the Commission any instances where it was unable to meet the 24-hour timeframe. SCE also informs customers, to the extent possible, that it will re-energize a circuit within one hour of knowing it will do so.

Protocols for safe restoration of power is essential and thus not informed by an RSE. The training allows SCE personnel to support vital activities (e.g., service restoration after an emergency) and/or specific wildfire mitigation initiatives (i.e., PSPS). The impact of this activity is included in the RSE calculations of the individual activities it supports.

3. Region prioritization:
No region prioritization has been used for this initiative as these plans and protocols apply to SCE's entire service area.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
Training sessions, including both initial trainings for new personnel and requalification trainings for existing personnel, were successfully conducted and completed for required personnel in 2020 as described in greater detail in Section 7.3.9.1. In 2021, SCE will continue to conduct a review of company preparedness and revise or update plans and trainings. All IMT and IST personnel will go through requalification trainings by December 31, 2021.

5. Future improvements to initiative:
Each year, training sessions are re-evaluated and actionable feedback from trainings, exercises, and real-world events are incorporated into the following years' training to ensure the information is as current and accurate as possible. SCE is currently evaluating and enhancing these training sessions. This

information is expected to be incorporated into training sessions held throughout 2021. Additionally, plans, processes, and procedures are evaluated on an ongoing basis and updated to incorporate best practices and lessons learned from exercises and real-world incidents. In 2021, SCE will continue to review and revise existing guidance materials.

For PSPS specifically, in 2020 SCE implemented numerous improvements to its PSPS related protocols, including de-energization and re-energization operations, as described in Sections 7.3.9.1 and 8.2. For 2021 to 2022 SCE will continue to focus on opportunities to improve restoration by exploring new tools and technologies that support the IMT and field staff with restoration efforts. SCE will also be reviewing the de-energization and re-energization checklists after an event to ensure that they are being completed correctly and to identify any potential areas of improvement to the form or personnel training.

7.3.9.6 Protocols in place to learn from wildfire events

Following all IMT and IST activations, regardless of hazard, SCE conducts a debriefing of response participants to solicit feedback and lessons learned.

1. Risk to be mitigated / problem to be addressed:

Without a mechanism to capture lessons learned stemming from real-world events and be integrated into SCE's emergency response plan, SCE's response would not evolve as new opportunities for improvement are identified.

2. Initiative selection:

Feedback from SCE's debriefs is incorporated into an After-Action Report (AAR), which includes an Improvement Plan or a Corrective Action Plan. SCE maintains this continuous improvement process for all IMT activations, regardless of hazard. These protocols have been successful in ensuring that successes during activations are replicated across future incidents, and that areas for improvement are captured, assigned, and monitored so that they are not duplicated in future incidents. SCE will continue to use AARs to assess opportunities for improvement, turn these opportunities into corrective actions, and assign actions to SCE personnel to remediate.

These activities are not intended to directly reduce the probability or consequence of ignitions or de-energizations, but rather support the essential task of SCE's response to emergencies, and therefore risk models were not used to select the scope of work, calculate RSE or target deployment.

3. Region prioritization:

SCE does not prioritize a region for this initiative as it is conducted regardless of where in the service area an incident occurred.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

AARs were completed or initiated for all IMT activations in 2020, including those related to wildfires or PSPS. These AARs have been successfully utilized to describe and assign necessary corrective actions and ensure the continuous improvement of SCE preparedness and response efforts. In 2021, SCE plans to continue utilizing these protocols and processes in order to assign corrective actions and continuously improve.

5. Future improvements to initiative:

SCE will continue to capture areas for improvement via debriefings and will capture these in After Action Reports in order to continuously improve emergency response capabilities. Improvements to SCE's response to emergencies may also include improvements to its feedback process as SCE remain on the lookout for opportunities to improve its lesson learned process.

On a related note, SCE received a letter from CPUC President Batjer on January 19, 2021 identifying several areas where SCE's 2020 PSPS performance was not up to the standards expected by the Commission. SCE responded in a letter on January 22, 2021 and presented on its 2020 PSPS execution and improvement plans at a public meeting on January 26, 2021. During this meeting, SCE shared with CPUC Commissioners, CAL FIRE, Cal OES, elected representatives and customers what we are doing to better prepare for the 2021 wildfire season.

SCE has clearly heard the message from the public, regulators, and partners that it must do more to reduce the need for PSPS going forward, perform PSPS effectively when it is necessary, and communicate its wildfire and PSPS-related plan, process improvements, and support programs in a clear and useful manner. SCE will submit a corrective action plan to the CPUC on February 12, 2021, followed by bi-weekly updates on our progress to implement the corrective action plan, with more concrete and detailed plans for improvement. SCE will also provide regular and as-requested updates to CPUC staff of the Safety and Enforcement Division, Safety Policy Division, and WSD about progress toward the corrective actions. SCE is committed to continuously learning and improving its emergency operations, especially for PSPS events, and to better communicating on this topic with the public, the Commission, and other affected parties.

7.3.10 Stakeholder Cooperation and Community Engagement

Report detailed information for each initiative activity in which spending was above $0 over the course of the current WMP cycle (2020-2022).

7.3.10.1 Community Engagement

SCE conducts extensive outreach to key community and government stakeholders and the public to increase awareness about SCE's wildfire mitigation work (e.g., grid upgrades, vegetation management, inspections, etc.), PSPS, emergency preparedness, customer programs and resources, and to receive feedback to make improvements to these programs where feasible. SCE also engages with jurisdictions to develop partnerships and receive assistance with expediting or resolving issues related to SCE's wildfire mitigation activities.

7.3.10.1.1 Customer Education and Engagement – Community Meetings (DEP-1.2)

SCE holds a variety of meetings and workshops to inform and educate stakeholders and customers about SCE's WMP, PSPS, customer programs and resources available to assist customers with emergency preparedness.

1. Risk to be mitigated / problem to be addressed:

Customers and communities require information to build resilience and become better prepared for SCE's wildfire mitigation work and PSPS events.

2. Initiative selection:

SCE holds community meetings (DEP-1.2) to share information about PSPS, emergency preparedness, and SCE's WMP. These meetings offer participants a chance to ask questions of SCE staff and share feedback and concerns regarding issues related to PSPS. SCE also conducts PowerTalks, which are informational sessions held across SCE's service area to educate business and residential customers about all aspects of power outages including PSPS, maintenance and repair outages. During PowerTalks sessions, customers are introduced to what types of outages exist, why they occur, how customers can prepare, and how customers can stay informed. Recent PowerTalks focused on SCE's WMP and PSPS to help educate audiences about these topics.

SCE also meets with local and tribal governments in its service area to share and provide updates on SCE's WMP, PSPS protocols and PSPS potential impacts to the community. These meetings focus on educating local and tribal governments about the PSPS de-energization process and how the SCE communicates and works with government agencies and emergency operations during de-energization events.

In addition, SCE hosts resiliency workshops to assist water, hospital, telecommunications, and K-12 school district customers with preparing their facilities. During the workshops, SCE discusses customer resiliency and highlights lessons learned from PSPS including insights received from customers. Specific discussions during these workshops include: (1) updates on SCE's grid hardening efforts and education on available customer tools and resources, (2) review of SCE's PSPS process and communication protocols, (3) sharing of technical issues encountered by customers (e.g., ensuring connection of back up generation were compatible, confirming critical equipment is connected to back-up generating sources), and (4) opportunities for mutual aid.

SCE also partners with various external business and government associations to share information about its wildfire mitigation efforts and PSPS with their members.

SCE engages with CBOs to help educate and create awareness around safety preparedness in the event of a disaster that impacts SCE customers, especially customers such as seniors, those with limited English proficiency, those with disabilities, and/or those who are transportation disadvantaged. Through its Community-Based Connections program, SCE solicits proposals from CBOs to help SCE conduct outreach and communications to help educate constituents around wildfire and how to be prepared in the event of a disaster or a PSPS activation, within their communities. Once selected, SCE will support the CBOs with training on SCE's wildfire mitigation efforts and the customer resources available; hold monthly check-ins to review engagement efforts and address any challenges and quarterly webinars; and provide monthly messages for CBOs to share through their communications channels, postings of CBO community meetings on SCE.com, digital and print resources, and a Community-Based Connection Newsletter. For those CBOs that applied but were not selected, SCE continues to share messaging and all related program information.

SCE is also working with eight Independent Living Centers (ILCs) within SCE's service area to conduct outreach activities to their respective areas and customers including providing emergency preparedness and PSPS education, accessible materials and trainings and awareness of/assistance in applying for the MBL Program.

These enabling activities do not directly reduce the probability or consequence of ignitions or PSPS, but rather inform and support SCE's customers, and therefore risk models were not used to select the scope of work, calculate RSE or target deployment.

3. Region prioritization:

SCE conducts outreach to stakeholders and communities, including community meetings, across SCE's service area but prioritizes HFRA since SCE's wildfire mitigation activities, including PSPS, are located primarily in HFRA. SCE also conducts workshops for all tribes in its service area, with specific focus on PSPS emergency preparedness. PowerTalks are held across SCE's service area and were held virtually in 2020 due to COVID-19 stay-at-home orders. Some factors in deciding the locations included historical attendance, recent major outage events and/or requests by cities.

More specific outreach activities such as the Mixteco Indigena Community Organization Project (MICOP) partnership, which prioritizes Ventura County due to the indigenous migrant communities living in the county, are based in certain regions due to demographics and physical location.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

SCE held nine virtual community meetings in 2020 due to COVID-19 stay-at-home orders. Two community meetings were held for the general public and seven community meetings were held for areas that were significantly impacted by PSPS event(s) in 2019. Recordings and materials from the community meetings are available on sce.com/wildfiresafetymeetings. In 2021, SCE anticipates hosting at least nine community meetings, which will be conducted virtually due to the ongoing COVID-19 stay-at-home orders. A majority of these community meetings will be held for specific communities that have been significantly impacted by PSPS. SCE may host additional meetings based on this year's PSPS events. For 2022, SCE will determine how many and where meetings should be held based on the impact of 2021 PSPS events to communities in SCE's service area.

In 2020, SCE also briefed 149 cities, counties, and tribes in its service area on the WMP and PSPS and made presentations to city councils and county boards of supervisors. In 2021-2022, SCE will continue to brief those cities, counties, and tribes in its service area with PSPS circuits located in their jurisdictions to provide updates and receive feedback on the WMP and PSPS.

In 2020, SCE conducted 45 PowerTalks. In 2021-2022, SCE will continue to hold PowerTalks for customers to learn more about outages, including PSPS.

In 2020, SCE selected 50 CBOs through the RFP process to partner with SCE to help educate constituents within their communities around wildfire and how to be prepared in the event of a disaster or a PSPS activation. Through the RFP process, SCE was able to select MICOP as a CBO partner, which is an organization that supports, empowers, and organizes the indigenous community. MICOP will be a key partner to help SCE engage with the indigenous community. SCE will continue to work with its database of over 1,600+ CBOs to identify other opportunities where SCE programs and tools can be shared with community members. In 2021, MICOP will continue to conduct public safety outreach activities to enable communications with indigenous communities in the languages of Spanish, Mixteco, Zapoteco and Purepecha. The progress will be measured by the number of people contacted.

In 2020, ILCs collectively had the goal to conduct at least 10 workshops/trainings to provide preparedness education and assistance in applying for the MBL Program. That goal was met with ILCs reporting collectively facilitating at least 26 workshops/trainings. In 2021, SCE expects the ILCs will continue with the goal to conduct outreach activities, including providing emergency preparedness and PSPS education, accessible materials and trainings and awareness of/assistance in applying for the MBL program. Progress will be measured by number of trainings and/or customers contacted.

5. Future improvements to initiative:
SCE will continue to make improvements to its meetings and content based on feedback received from surveys, PSPS Advisory Board/Working Groups, stakeholders, and customers, as well as lessons learned from recent PSPS events in late 2020/early 2021. SCE will also refine where it hosts community meetings based on the impact of previous PSPS events and grid hardening activities. In addition, SCE is continuing to evaluate alternatives and refinements to its community engagement activities and will include changes in approach, scope or cost in Change Order Reports to this WMP.

As part of its PSPS Action Plan, SCE has emphasized its community outreach efforts through community meetings, local and tribal government engagement, and various other workshops and working groups. In March 2021, SCE hosted three virtual community meetings for communities that were most impacted by PSPS events in late 2020 and early 2021. During these meetings, SCE presented and solicited feedback on its PSPS Action Plan. Specifically, SCE discussed the steps it is taking to address concerns raised by stakeholders and customers regarding recent PSPS events, the mitigations to reduce the need for PSPS events, and customer care programs and resources.

SCE will continue to host additional community meetings for customers in high fire risk areas across its service area. SCE has scheduled eight additional community meetings during May and June 2021.

At upcoming meetings, SCE will address customer questions and concerns about recent PSPS events. SCE will provide information on grid hardening and mitigation activities in communities that have been frequently impacted by PSPS and explain how that work will reduce future need for PSPS events in those communities. SCE acknowledges that customers also want to understand the factors SCE uses in implementing PSPS, so SCE will provide more detailed information about the decision-making process for monitoring and de-energizing circuits. SCE also understands the impact PSPS events have on customers and will provide detailed information on the various customer care programs (e.g., backup battery programs, Self-Generation Incentive Program, and generator rebates) and measures to help customers prepare for outages, including PSPS events. SCE will also encourage customers to sign up for PSPS/outage notifications and other programs, including Medical Baseline. All the meetings will be recorded and posted at www.sce.com/wildfiresafetymeetings.

As SCE has done on an annual basis, SCE sent information on its WMP and PSPS protocols to local and tribal governments in HFRA in March 2021. SCE has ongoing meetings with local and tribal governments to request feedback on various PSPS and customer-related activities, such as the needs of AFN communities, additional CRC locations, Public Safety Partner Portal, community safety needs, and confirming locations of critical facilities.

7.3.10.1.2 **PSPS Working Groups and PSPS Advisory Board**

SCE hosts PSPS Working Groups and Advisory Board meetings to expand the opportunities available to share lessons learned between IOUs and impacted communities on IOU de-energization protocols and to develop de-energization best-practices.

1. Risk to be mitigated / problem to be addressed:

The PSPS OIR Phase 2 Decision requires IOUs to (1) lead PSPS Working Groups that convene at least quarterly to help better inform the electric IOUs regarding how to plan and execute de-energization protocols and (2) coordinate service area-wide Advisory Boards to provide valuable input into a utility's planning for de-energization events.[91]

2. Initiative selection:

The PSPS Working Groups provide a forum to share lessons learned between the impacted communities and the electric IOUs on IOU de-energization protocols. At least quarterly, SCE convenes regionalized PSPS Working Group meetings. Components of the de-energization protocols that are typically addressed by the Working Groups include the following topics: the provision of CRCs, communication strategies,

[91] D.20-05-051[E31], Ordering Paragraphs 1-5.

information sharing, identification of critical facilities, strategies for supporting AFN people/communities, and contingency plans.

The PSPS Advisory Board also meets at least quarterly and leverages lessons learned from Working Group sessions to gain recommendations on how to best address those lessons. Input is also solicited on areas that may require improvement in how SCE approaches PSPS overall and provides a forum for stakeholders to propose ways to improve all aspects of PSPS.

The coordination of PSPS related activities with the Working Groups and Advisory Board is required by the Commission based on for PSPS OIR Phase 2 Decision, and therefore risk models were not used to select them.

3. Region prioritization:
Working Groups include stakeholders from across SCE's service area. SCE used the existing Cal OES regions to identify three Working Groups to represent stakeholders from the entire SCE service area and meets with small multi-jurisdictional electric utilities, community choice aggregators (CCAs), publicly owned electric utilities, communications and water service providers, CPUC staff, tribal and local government entities, public safety partners, and representatives of people/communities with AFN and vulnerable communities.

The service area-wide Advisory Board is represented by participants from Public Safety Partners, communications and water service providers, local and tribal government officials, business groups, non-profits, representatives of AFN and vulnerable people/communities, and academic organizations.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
SCE held the first set of three regional Working Group meetings on September 21, 22 and 23, 2020, respectively, covering two of the six topics identified in item 2 above per region meeting, in addition to an update from SCE on improvements made to PSPS protocols since 2019. The meetings were followed by a survey provided to the participants, which helped SCE gather information on how to improve the Working Group meetings in the future. The next set of Working Group meetings were held on December 1, 2 and 3, 2020, respectively. As a result of SCE being in the middle of PSPS activation, at the time the meetings were taking place, SCE provided a situational awareness update for each region. Additionally, SCE provided a snapshot of emergency protocols that take place between SCE and local governments/emergency management agencies during PSPS activation. Finally, SCE rotated the two topics per region meeting, and will continue to rotate each quarter so that all topics will be discussed in depth with each regional Working Group each quarter.

During the two quarterly meetings held in September and December 2020, SCE received comments and questions from members of the Working Group. Some of the questions/comments received during the Working Group meetings is provided below in Table SCE 7-5. SCE's response provided to the Working Groups during the meetings is also included in the table below.

Table SCE 7-4
SCE Response to Key PSPS Working Group Feedback received from September through December 3, 2020

Meeting Date	Working Group Comments & Recommendations	SCE's Response
September 2020	Working Group asked about the types of communication or outreach provided by SCE prior to PSPS activations to help communities address needs for their at-risk populations.	SCE provided an explanation of its PSPS notification process and how it reaches vulnerable communities.
September 2020	Members stated they are concerned about the volume, type and information contained in SCE's PSPS notifications. Working Group member suggested that in light of the summer heat storms and rotating outages, SCE should make efforts to reduce the number of repeated notifications. Working Group member suggested all IOUs should standardize PSPS notifications.	SCE will hold a focus group in the next Working Group meetings to go over PSPS notifications. Note: The focus group is planned for Q1 2021 Working Group meetings since Q4 2020 Working Group meetings took place during an SCE PSPS activation; SCE felt a shorter meeting focused on situational awareness during activation would be more useful to members and relevant. SCE will explore standardizing across the IOUs, however technology and data availability vary across the utilities. For details about the improvements being made to PSPS notifications, see Section 8.2.4.
September 2020	Working Group member stated that CCAs can help SCE identifying critical facilities because CCAs have joint customers with IOUs. The member also stated they are considering posting information on their website regarding IOU PSPS events, to help direct joint customers to the PSPS information.	SCE will follow up with CCAs before the next Working Group meeting on how best to coordinate confirmation/ exchange of information.
December 2020	Working Group member requested a list of frequently impacted circuits and a list of identified critical facilities.	SCE provided customer with this information for circuits impacting their service account.

December 2020	Working Group member requested adding circuit name to the PSPS notification	SCE will take this into consideration, along with other feedback expected during the PSPS Notification focus group meetings to take place during the Q1 2021 Working Group meetings.
December 2020	Working Group member suggested organizing PSPS zip code by circuit rather than zip code.	SCE will take this into consideration, along with other feedback expected during the PSPS Notification focus group meetings to take place during the Q1 2021 Working Group meetings.
December 2020	Working Group members asked for more detail regarding REST GIS services	SCE reached out to members to provide more details on REST GIS services, as often PSPS Working Members are different than those (e.g., Public Safety Partners) who are familiar with ArcGIS software and the services SCE offers.
December 2020	Working Group members requested links to SCE maps	SCE reached out to members to ensure they knew where and how to access the maps, as well as ensure they understood how to reach and leverage maps for their planning purposes.

SCE held its first PSPS Advisory Board meeting on October 20, 2020. SCE provided an overview of the status of SCE's grid hardening activities and other program improvements and a presentation by SCE's Fire Scientist on the Advanced Weather Modeling system and how SCE uses this technology to develop and refine weather forecasts. The second PSPS Advisory Board meeting was held on December 15, 2020. SCE discussed three topics at this meeting: a year-end forecast presented by SCE's Fire Scientist; an overview of 2020 PSPS activations with data points on impacted customers who received notifications and number of actual customers de-energized; and a facilitated conversation to discuss SCE's notifications process and how to strike the right balance between too many or too little notifications. SCE will continue to hold these meetings every quarter in 2021.

5. Future improvements to initiative:

After each quarterly Working Group meetings held in 2020, SCE provided a survey to the participants to solicit feedback on areas of improvement for the meetings. Based on the feedback received from the participants, SCE will continue to refine how these meetings are conducted and work to address stakeholder concerns.

SCE will work towards continuous improvement of the PSPS Advisory Board, which was recently formed in Q3, 2020, and leverage feedback from post-meeting surveys to identify potential improvement opportunities as well as ideas for future topics.

7.3.10.1.3 Marketing Campaign (DEP-1.3)

The multilingual marketing campaign, which includes radio, digital, social media, search ads and direct customer mailings, seeks to educate customers and the public on PSPS, including the conditions that trigger a PSPS, how to prepare for a PSPS, what SCE has done and continues to do to mitigate the risk of wildfires, and how to prepare for emergencies.

1. Risk to be mitigated / problem to be addressed:

The activity will address the lack of customer awareness and understanding of PSPS events and how to prepare.

2. Initiative selection:

The marketing campaign seeks to educate customers about PSPS and emergency preparedness and reduce the impact of a PSPS or a wildfire event primarily through three methods: 1) advertising campaign; 2) social media; and 3) direct customer mailings.

1) Advertising Campaign: The advertising campaign aims to convey key messages that collectively help educate customers about PSPS and emergency preparedness. These advertisements run on a variety of channels including digital banners, digital video, connected TV, social media, search, digital audio and broadcast radio. The 2020 advertising campaign centered on four message themes: Emergency Preparedness, PSPS Definition/Condition, Wildfire Mitigation, and Alert Sign-Up. The 2020 ad campaign generated about 1 billion total impressions. In 2021, SCE will run its in-language and English advertisements concurrently area-wide.[92]

2) Social Media: SCE uses social media to support its marketing campaign with paid and organic posts informing customers about PSPS, emergency preparedness tips, how to sign up for PSPS alerts and storytelling around SCE's wildfire mitigation efforts. Also, information about SCE's CCVs and CRCs is shared on Facebook, Twitter, Instagram and Nextdoor.

[92] For more information about SCE's efforts to expand its in-language capabilities, including for the marketing campaign, please see Section 8.4.

3) Direct Customer Mailings: As part of the direct customer mailing strategy, SCE sent the 2020 PSPS Newsletter[93] to all SCE customers in both HFRAs and non-HFRAs, with content adjusted for those in HFRA. The newsletter sent to customers in HFRA focused on PSPS, including SCE's notification processes and decision-making factors for PSPS. The newsletter sent to customers in non-HFRA focused on emergency preparedness and included an overview of PSPS. Both versions provided an update on SCE's wildfire mitigation efforts, helpful emergency preparedness websites and ways to sign up for alerts and/or the MBL Program. A list of SCE customer service contact numbers and PSPS website pages (in in-language versions, where available) was provided in English, Spanish, Chinese, Korean, Vietnamese, Cambodian, Tagalog, Arabic, Armenian, Farsi, French, German, Japanese, Punjabi and Russian.

Other direct customer mailings included door hangers to provide awareness of the immediate wildfire mitigation work being conducted in HRFAs to nearby residences and businesses. SCE also planned to invite customers in HFRA to attend the community meetings via postcards, but adjusted outreach tactics due to the emergence of COVID-19. SCE emailed the invitations and leveraged newspaper ads and social media to raise awareness about the community meetings instead.

While not part of the marketing campaign, SCE shares stories about its wildfire mitigation and PSPS efforts on its public storytelling platform, Energized by Edison.[94] Customers can also sign up for the monthly Energized by Edison Wildfire Mitigation e-newsletter to receive email digests to stay current on recent SCE activities. Feature stories may include topics such as wildfire mitigation activities, vegetation management, aerial and ground inspections, PSPS events, emergency preparedness, CRCs/CCVs, CCBB Program, other customer care programs, and philanthropic efforts supporting wildfire mitigation. These external stories are actively pitched to media for earned media coverage and shared on SCE's social media channels. While these enabling activities provide information to help customers prepare to respond to a PSPS or emergency, they do not directly reduce the probability or consequence of ignitions or PSPS. Therefore, risk models were not used to select the scope of work, calculate RSE or target deployment.

3. Region prioritization:

The marketing campaign is targeted to all residential and business customers throughout SCE's service area, with PSPS messaging heavily targeted to customers residing in HFRAs, including vulnerable and populations and persons speaking other prevalent languages.

4. Progress on initiative (amount spent, regions covered) and plans for next year:

In 2020, SCE met its marketing campaign goal to achieve 40% awareness about the PSPS program among the approximate 5,000,000 customers reached, based on Customer Attitude Tracking (CAT) survey results, a monthly customer survey capturing awareness and perception metrics across a representative sample of SCE's customers in its service area. Through 2020, customer awareness about the PSPS program averaged 56%, driven by dedicated advertising and an increase in news coverage and community outreach due to the number of PSPS events that occurred. Customer perception that SCE takes proactive action to protect communities from wildfires was at 64%, compared to 58% in 2019. Based on 2019 and 2020

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[93] The PSPS Newsletter was previously referenced as the Dear Neighbor Letter DEP-1.1 in SCE's 2020 WMP. As this effort is a part of SCE's overall wildfire marketing campaign it has been included with DEP-1.3 in SCE's 2021 WMP Update.

[94] *See* Energized by Edison, available at www.energized.edison.com.

performance and expectations of more severe wildfire weather, the 2021 awareness goal will be increased to 50%.

SCE began adding additional in-language webpages and ran Emergency Preparedness ads in the additional nine languages in 2020. SCE will continue to develop new ads with relevant messages and continue to communicate these messages to its customers in multi-channel and multiple languages over the next few years. In 2021, SCE will refine messages and channels based on 2020 performance data.

5. Future improvements to initiative:
SCE will continue to leverage the results of its monthly CAT survey to determine improvements in messaging, communication channels, and prioritization of customers who may need additional or targeted outreach. In addition, SCE is continuing to evaluate alternatives and refinements to its PSPS-related marketing activities to educate customers and increase program enrollment and will include changes in approach, scope or cost in Change Order Reports to this WMP.

As part of its PSPS Action Plan, SCE has significantly increased its marketing campaign, with an emphasis on PSPS readiness and customer programs, specifically for vulnerable customers. The marketing campaign is discussed in additional detail in Chapter 8.4.

7.3.10.1.4 Customer Research and Education (DEP-4)
This activity captures customer feedback on SCE's broad WMP initiatives with a special emphasis on PSPS activities.

1. Risk to be mitigated / problem to be addressed:
SCE seeks to improve its understanding of how it can make adjustments to reduce the impacts of wildfires, PSPS and wildfire mitigation work for its customers.

2. Initiative selection:
SCE develops surveys which capture customer feedback on areas of interest. The following are five such surveys:

1) The PSPS Tracker is an annual survey conducted at the end of wildfire season to assess and understand customer awareness, experience and opinions of SCE’s PSPS and wildfire mitigation activities, focusing on customers affected by PSPS events. Four customer segments are targeted:
    a) de-energized customers
    b) notified but not de-energized
    c) not notified
    d) those who do not live in a HFRA
2) Wildfire safety community meeting surveys conducted in May and June 2020 among attendees of the virtual meetings to receive feedback on their experience and the information provided.
3) CRC/CCV visitation surveys conducted among customers who visited a CRC/CCV during a PSPS event to receive feedback on their experience, and the resources and support provided.

4) Online survey for feedback on user experience on the SCE website to determine customer's ability to locate wildfire and PSPS related information, and assessment of the information provided.

5) In-Language Wildfire Mitigation Communications Effectiveness Surveys that measured the communications and outreach effectiveness prior to and coincident with the wildfire seasons by prevalent language. This survey is discussed in Section 8.4 of this WMP.

These enabling activities do not reduce the probability or consequence of ignitions or PSPS, but rather support and inform SCE's wildfire mitigation efforts, and therefore risk models were not used to select the scope of work, calculate RSE or target deployment.

3. Region prioritization:
The PSPS Tracker's primary focus is on customers who were de-energized in HFRA areas, with secondary focus on non-HFRA areas as a point of comparison.

The In-Language Wildfire Mitigation Communications Effectiveness surveys are conducted area-wide using random sampling methodology. In 2020, SCE also administered the pre-survey in GEO-targeted areas, *i.e.,* ZIP codes with high concentrations of Chinese, Korean, and Vietnamese speaking customers as an additional test to determine the types of in-language preferences or dependencies specific to these areas, which could not be easily identified in SCE's database.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
The 2020 PSPS Tracker fieldwork will commence in February 2021 and capture feedback on PSPS events that extended into December 2020. Fieldwork for these surveys, which are conducted online and by telephone surveys, will continue in February/March 2021 with insights ready in Q2 2021. SCE will administer the PSPS Tracker to 1,500 customers in HFRA (500 in each HFRA customer segment) and 500 customers in non-HFRA.

In 2020, SCE's In-Language Wildfire Mitigation Communications Effectiveness surveys were administered pre-wildfire season (August 18-October 14) and post-wildfire season (November 11-December 11) and provided in 26 languages. Combined pre/post survey sample sizes included 4,936 residential customers and 996 business customers.[95]

Additionally, SCE obtained 198 responses from customer feedback surveys conducted in May and June 2020 across its nine wildfire safety community meetings.

SCE has collected feedback from 253 customers to date who visited a CRC/CCV. Data collection is ongoing (i.e., January 2021) and scheduled to finish before the end of Jan 2021 for the 2020 period.

In 2021-22, SCE will continue to conduct customer research on PSPS-related activities to obtain insights and recommendations for enhancements to PSPS programs and services offered to customers. SCE plans

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[95] For the results of the PSPS Tracker, wildfire safety community meeting surveys, and the In-Language Wildfire Mitigation Communications Effectiveness surveys please see Supporting Documents on SCE's Wildfire Mitigation website (sce.com/wmp).

to conduct at least four PSPS-related surveys in 2021, including the PSPS Tracker, wildfire safety community meeting feedback survey, CRC/CCV feedback survey and In-Language Wildfire Mitigation Communications Effectiveness Surveys.

5. Future improvements to initiative:

SCE seeks to bolster the assessment of customer attitudes, perceptions and behaviors towards wildfire prevention programs and PSPS events, by expanding the scope of customer research conducted across various teams within SCE to grow the pipeline of customer feedback. SCE is also working to improve its ability to capture important feedback on activities with which SCE is engaged to assist and use the information to help minimize customer inconvenience and discomfort associated with PSPS resources (e.g., CRC/CCV) and/or address challenges faced by customers during those events. To accomplish this, SCE is considering adding customer focus groups or in-depth-interviews to gain more insight from its customer feedback, working to refine its assessments to capture more data as needed, and conducting and centralizing customer feedback.

7.3.10.2 Cooperation and best practice sharing with agencies outside CA

SCE's participation in industry and other forums provide consistent opportunities to share best practices in wildfire mitigations and to learn from other utilities, technology developers, communities and governmental agencies.

1. Risk to be mitigated / problem to be addressed:

SCE seeks to further improve its wildfire mitigation approaches by increasing opportunities to collaborate and exchange ideas with other utilities, technology developers, communities and governmental agencies.

2. Initiative selection:

This initiative includes memberships in industry organizations, outreach to commercial customers with national accounts, participation in technical forums and meeting regularly with electric utilities nationally and abroad. More recently, due to the COVID-19 pandemic and its associated travel restrictions, SCE has shifted to digital platforms to maintain its engagement and is participating in webinars that have audiences from outside of California.

SCE has regular check-ins with other utilities through the International Wildfire Risk Management Consortium (IWRMC). IWRMC's mission is to facilitate a system of working and networking channels between members of the global utility community to support ongoing sharing of data, information, technology, and practices, and proactively address the wildfire issue through learning, innovation, analysis, and collaboration. SCE, along with SDG&E and PG&E in the US, and Powercor and AusNet Services in Australia, is a founding member and participant in the IWRMC Executive Steering Group.

IWRMC member companies address wildfire issues through participation in tactical working groups, quarterly best practice sharing webinars, and direct discussions with their peers. Through this arrangement, the consortium is designed to accelerate learning and improve existing models and approaches by providing access to more and better data while allowing for swift re-orientation and prioritization of issues as the industry adapts to the unique set of issues that arise each year. The IWRMC is oriented around four strategic areas: 1) risk management; 2) asset management; 3) vegetation management; and 4) operations, protocols and stakeholder engagement.

These enabling activities do not directly reduce the probability or consequence of ignitions or PSPS, but rather support inform and support SCE's wildfire mitigation efforts, and therefore risk models were not used to select the scope of work, calculate RSE or target deployment. Benchmarking can help identify new mitigation activities and approaches but risks will not be reduced until those activities are undertaken.

3. Region prioritization:
SCE engages and shares best practices with agencies and industry trade associations within and outside of California, such as Electric Power Research Institute, Western Energy Institute, and Edison Electric Institute.

IWRMC's membership currently includes thirteen utilities facing the most extreme wildfire challenges in the US, Australia, Canada, and South America, with more than 25 other utilities providing program design feedback and expressing broader interest in participation in 2021 and beyond.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
In 2020, SCE engaged and shared best practices for utility wildfire mitigation and response with agencies and industry trade associations outside of California, including but not limited to: Edison Electric Institute (EEI), Electricity Subsector Coordinating Council (ESCC), Federal Emergency Management Agency (FEMA), North American Electric Reliability Corporation (NERC), Western Electric Institute (WEI), WECC, American Society of Mechanical Engineers (ASME), California Utilities Emergency Agency (CUEA), Portland General Electric, California Catastrophe Response Council, Electric Power Research Institute (EPRI), and telecommunications companies, among others. For the full list of engagements and meeting dates, please refer to Section 9.5: SCE External Engagements with Agencies Outside of California. For 2021, SCE is looking into proactive ways to continue its engagement with agencies outside of California, given current restrictions on in-person gatherings due to COVID-19.

In 2020, IWRMC held more than 20 best practices presentations shared across the peer group, established leadership positions within each Topical Working Group and conducted initial global outreach to utilities and industry associations. For 2021, IWRMC is looking to expand program participation across all markets (i.e., existing (North America, South America, Australia) and new (Europe, Africa, South Asia, etc.) and among smaller companies and Public Utility Districts, expand its outreach and strengthen relationships with industry groups, associations, and academic institutions and undertake deep-dive projects to study and address key wildfire risk mitigation issues.

5. Future improvements to initiative:
SCE will continue to look for ways to expand its engagement with agencies outside of California, including supporting IWRMC's efforts to both expand its utility membership base and appoint leaders to its Executive Steering Group.

7.3.10.3 Cooperation with suppression agencies (Aerial Suppression DEP-5)

SCE is temporarily providing standby costs for aerial suppression resources in its service area to meet fire suppression needs.

1. Risk to be mitigated / problem to be addressed:

Since 2017, the increased size and scope of fire activity has created significant resource drawdown of fire suppression resources statewide. With multiple fires occurring at the same time across the western states, aerial resource drawdown has been increasing over the past three years. With that, an increasing number of aircraft normally available to respond to fires in SCE's service area have been deployed to fires outside of SCE's service area, resulting in less resources available in SCE's service area. This led to limited availability of fire agency resources, which has hindered fire suppression activities and increased the potential for major wildfires, putting SCE's infrastructure and communities at greater risk. As such, SCE seeks to help the fire community by assisting in the acquisition of additional assets to be used during the height of fire season.

2. Initiative selection

Due to the limited availability of fire suppression resources available statewide, SCE is adding up to five aerial suppression resources to reduce wildfire risk to SCE's system and help protect SCE's infrastructure and communities. The initial funding of up to five assets, which was determined by identifying locations in reasonable proximity to critical wildland areas within SCE's service area. will be used to test the efficacy of the effort with the agencies.

While aerial suppression resources will not be able to stop a fire at the onset, they can be used to reduce the area and assets burned and enable faster response times. In addition, aerial suppression resources help lower emergency response support costs and help minimize the impact of redirecting work crews from previously scheduled maintenance and construction work to emergency response. SCE will continue to monitor the access to aerial resources in SCE's service area and will revisit annually to determine if SCE's approach in providing support should be adjusted based on the availability of statewide suppression assets.

SCE will enter into a MOU covering the duration of the highest fire risk months with CAL FIRE and/or regional fire agency partners to provide standby cost funding for up to five aerial suppression resources strategically placed around the SCE service area that will be prioritized and deployed by a regional fire coordination center. SCE will scale the program as needed up to five aerial suppression resources. In consultation with fire agencies, SCE is identifying the optimal strategy for the placement of these resources, based on SCE's budget parameters. The MOU will specify "use parameters" to ensure that the aerial suppression resources are supporting initial, incipient stage, and extended attack missions within the SCE service area. When not in use by SCE, these resources may provide additional firefighting support for communities. A regional fire agency coordination center would maintain responsibility for directing the aerial suppression resources, using their existing prioritization and deployment process and thereby providing a societal benefit to communities. The RSE calculated for this activity is relatively high. Therefore, SCE determined that it was prudent to engage in this activity because it mitigates the consequences of a wildfire, regardless of the risk drivers that caused the ignition (e.g., balloon contact, etc.). The decision to engage in this activity was further informed by fire agencies' input as well as SCE's experience with providing funding for a helitanker in 2020.

3. Region prioritization:
SCE is meeting with county, CAL FIRE, and USFS fire officials to provide updates on key elements of SCE's WMP and to solicit input on the plan's fire suppression activities. SCE will consult with CAL FIRE and local county fire departments on the optimal placement and use of the aerial suppression resources.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
Aerial suppression resource funding was secured and provided for the Orange County Fire Authority (OCFA) in 2020 towards OCFA's lease of a Coulson-Unical CH-47 helitanker, which is able to drop 3,000 gallons of water in a single pass, to help fight wildfires in Orange County. In Q4 2020, the helitanker was deployed to four fire incidents in OCFA's region. In December alone, the helitanker saw 20 hours of flight time and 528 hours of standby time, making 101 water drops for a total of 223,438 gallons of water, helping OCFA significantly reduce the consequences of wildfires, particularly in wind-driven wildfires.

For 2021-2022, SCE plans to obtain up to five aerial suppression resources to be placed at strategic locations within SCE's service area. SCE is engaging CAL FIRE and local county fire departments to refine the placements of the aerial suppression resources and scale the program up or down as needed.

SCE also met with OC Fire Authority, LA County Fire, USFS, San Bernardino County Fire, CAL FIRE Riverside County Fire Department, Mammoth Lakes Fire Protection District, Kern County Fire Department, Santa Barbara County Fire and Ventura County Fire Department to provide updates on SCE's WMP and PSPS activities.

5. Future improvements to initiative:
SCE will continue to partner with CAL FIRE and local county fire departments on deployment activity and ongoing refinement to the aerial suppression program to ensure proper coordination between SCE and other stakeholders.

7.3.10.4 Forest service and fuel reduction cooperation and joint roadmap

SCE works with federal, state and local regulatory and land management agencies on fuel reduction, vegetation management and other forest management efforts.

1. Risk to be mitigated / problem to be addressed:
There are cases in which SCE needs to coordinate its vegetation management and fuel reduction efforts with others, especially in USFS lands, in order to mitigate the risk of vegetation contact with the grid.

2. Initiative selection:
SCE has well-established relationships with the USFS and regularly interacts with its staff and leadership (at the Forest and Region 5 level). Additionally, SCE has a cost recovery agreement with the USFS to ensure resources are available to assist SCE in its fuel reduction efforts. Since mid-2019 and in support of SCE's wildfire mitigation efforts, SCE has been collaborating with all the National Forests to reduce fuels in and around powerlines. In addition, SCE is looking at ways to address fuel reduction outside of its ROW in

coordination with the USFS. An RSE was not used to inform this activity, as risk reduction stemming from these partnerships will occur once the applicable fuel reduction activities are undertaken.

SCE also works with State regulatory and land management agencies to address various forest health and safety concerns.

3. Region prioritization:

SCE continues to work with each National Forest agency to implement its vegetation management work throughout USFS lands that are within SCE's service area. In addition, SCE works closely with the USFS Regional Office to identify opportunities to partner on fuel reduction efforts outside of SCE's ROW.

4. Progress on initiative (amount spent, regions covered) and plans for next year:
As part of SCE's vegetation management program, SCE is currently working on several activities that reduce fuel within and near its existing ROWs and adjacent fire-prone corridors, including on USFS land. SCE's fuel reduction efforts on USFS land are managed under SCE's USFS Master Special Use Permit (MSUP), which was developed in collaboration with the USFS. SCE's wildfire-related activities under the MSUP include removing, thinning, or treating vegetation (as described in more detail below) and involve ongoing collaboration with the USFS.

1) Integrated Vegetation Management: SCE has long-term goals to reduce high-risk fuels within our ROW. SCE is in the early stages of developing its IVM Plan. The goal of IVM is to develop sustainable shrub or grassy areas that do not interfere with overhead power lines, pose a fire hazard, or restrict access on SCE's transmission ROW or applicable distribution easements. IVM will promote desirable, stable, low-growing plant habitat that reduces grow-in, fall-in or blow-in risk from tree species through appropriate, environmentally sound, and cost-effective control methods. These methods can include a combination of chemical, biological, cultural, mechanical, and/or manual treatments. This approach can reduce costs over the long-term and reduce the risk of outages and fires, while improving wildlife habitat. SCE is currently working with Sierra National Forest on the National Environmental Policy Act (NEPA) document associated with its IVM within that forest. The NEPA agreement further improves collaboration with the forest and key stakeholders in improving fuel reduction efforts. SCE is anticipating approval in 2021. SCE's strategy is to develop a pilot program within Sierra National Forest, with the goal of implementing the program within the other forests in the future. SCE is also exploring with Region 5 of the USFS on implementing this program region wide, to eliminate the need for a forest-by-forest approval.

2) Dead and Dying Tree Removals: The program (formerly called the Drought Relief Initiative (DRI)) was established as a result of the epidemic of dead and dying trees brought on by climate change and years of drought. Under its this program, SCE conducts patrols in Tier 2 and Tier 3 HFRA to identify and remove dead, dying, or diseased trees affected by drought conditions and/or insect infestation. SCE performs inspections at least annually, and often more frequently, in accordance with program requirements. All trees within strike distance of SCE overhead facilities that are dead or expected to die within a year are removed, including trees outside of SCE's ROWs. SCE

removed approximately 43,000 trees on USFS land from 2015-2019 and removed approximately 2,600 trees in USFS lands in 2020.

3) Hazard Tree Removals: In 2019, SCE expanded its vegetation program to include the assessment of live trees with the height and a feasible path to strike electrical lines or equipment, where significant visible defects may be present. SCE will perform mitigation, up to and including removal of the trees. SCE's plans include removing approximately 100,000 hazard trees with strike potential within our service area between 2019-2023, including trees outside SCE's ROWs. Approximately 10% of SCE's planned removals over this period are projected to be on USFS land. Tree removals on USFS land are managed through the MSUP. To-date, SCE has removed over 6,000 hazard and dead, diseased, and dying trees within our ROW's on USFS land.

4) Additionally, SCE has timber sales agreements with both the Inyo National Forest and Sierra National Forest that require SCE to compensate the forests when removing significant amounts of wood products such as during hazard tree removal.

5) Pole Brushing: SCE expanded its pole brushing activities to clear brush to a 10-foot radial clearance from distribution poles in HFRA, beyond those poles required by regulation. Of the approximately 300,000 poles in scope, approximately 20,000 poles are located within a National Forest. This activity was submitted to USFS offices under SCE's MSUP in 2020 with work anticipated in 2021.

6) Fuel Management Programs: SCE is collaborating with Region 5 of the USFS and each individual forest on preparing a fuel management program on how to dispose of fuel (i.e., left over plant matter) after routine vegetation management activities. SCE reduces slash (e.g., cut limbs and other woody debris) from vegetation management activities by chipping and broadcasting or recycled by pruning/removal contractors. Where constraints exist, SCE mitigates the potential fuel risk, by scattering the debris according to best management practices or any fuel management plan applicable to the work site (refer to Section 7.3.5.5).

In addition to the work described above, SCE is working in partnership with the EPRI to perform a study identifying global practices for fuel management. As one of the industry's premier thought leaders, EPRI's wide-ranging collaborative research, development and demonstrations help guide strategic planning and inform technical and business decision-making. SCE kicked-off the study with EPRI in early December 2020. SCE plans on submitting a copy of the report to the Commission in 2021.

The USFS, in partnership with the State of California, issued an MOU for a shared stewardship agreement for California's Forests and Rangelands. As part of this MOU, the USFS will develop a joint plan by 2021 to scale up vegetation treatment to one million acres of forest and wildlands annually by 2025. SCE has facilities and ROW encompassing over 14,000 acres within seven of the U.S. Forests. SCE has expressed the goal of contributing to the joint plan and has requested a meeting with USFS Leadership to identify areas of opportunity and next steps for partnership. SCE has met with the USFS MOU lead and is working to become a stakeholder within the joint use plan effort, to ensure vegetation treatments are done in a sustainable way and in partnership with the USFS.

SCE is also exploring opportunities for a partnership that arose out of the recently released CA Wildfire and Forest Resilience Action Plan developed by the CA Forest Management Task Force (Jan 2021). The Plan is designed to strategically accelerate efforts to: restore the health and resilience of California forests, grasslands and natural places; improve the fire safety of our communities; and sustain the economic vitality of rural forested areas. The hundred plus actions outlined in the Plan align with a $1 billion investment included in Governor Gavin Newsom's proposed 2021-2022 California state budget. The Task Force is co-chaired by the CA Natural Resources Agency Secretary, CA EPA Secretary, and CA Dept of Forestry and Fire Protection Director, with whom SCE works closely.

5. Future improvements to initiative:

The results of the best practices study with EPRI are anticipated in Q3 2021, which will coincide with the timing of the MOU partnership meetings with the USFS that are expected to start in early 2021. These meetings will help SCE to identify how best to remove fuel in partnership with the USFS with dedication to overall forest management.

8 Public Safety Power Shutoff, Including Directional Vision

Climate change has created and continues to create significant challenges for society, not least of which are the immediate and unprecedented safety risks from catastrophic wildfires, the magnitude of which even a few years ago was unforeseeable. In the face of such conditions, SCE's foremost mission is the safety of the public, our customers, and our employees.

As described in this WMP Update, SCE continues to undertake significant efforts to protect public safety and mitigate the risk of wildfires associated with electric facilities by developing a robust infrastructure program to manage wildfire-related risks. The infrastructure program is aimed at hardening the grid to reduce wildfire risks (i.e., reducing the number of ignitions) and enhancing system resiliency (i.e., reducing electrical infrastructure damage and improving power restoration time during and after a fire event) in SCE's service area. Despite the progress made in hardening our grid, proactive de-energization of power lines due to risk of catastrophic wildfire, referred to as Public Safety Power Shutoffs (PSPS), remains an important tool in protecting public safety and mitigating wildfire risk under extreme weather conditions. SCE, however, expects PSPS events to become less frequent as we implement the wildfire mitigation initiatives described in SCE's 2021 WMP Update and the additional efforts described in our PSPS Action Plan. The fundamental objectives of SCE's PSPS actions are to protect public safety while striving to keep the power on for as many customers as possible; communicate clearly and accurately before, during, and after events; and minimize the impact of de-energizations through customer programs.

SCE recognizes that while PSPS lowers the risk of wildfire ignitions, it also creates concerns, including service disruptions and other hardships associated with the loss of power. SCE expects PSPS events to become less frequent as it executes its wildfire mitigation initiatives. SCE's PSPS actions are guided by four fundamental objectives: (a) to protect public safety; (b) to keep the power on for as many customers as possible; (c) to communicate clearly and accurately; and (d) to minimize the impact of de-energizations through customer programs.

By all accounts, 2020 was an extreme weather and fire season. In fact, five of the six largest wildfires in California's history took place last year and average rainfall totals across Central and Southern California remained 50%-75% below normal through mid-January. Weather and fuel conditions in 2020 necessitated several PSPS de-energization events, and many customers were affected on multiple occasions, including holidays and while customers were trying to work and attend classes from home in compliance with stay-at-home orders. SCE understands the hardships that PSPS events cause our customers and communities, and we are consistently striving to improve while, first and foremost, protecting public safety.

Despite the adverse weather conditions, 2020 demonstrated the extraordinary efforts of our company to prepare for and conduct necessary PSPS to protect public safety, including life and property. We had many successes, but more of our customers experienced PSPS de-energizations in 2020. The feedback we received throughout the PSPS events in 2020, in President Batjer's letter on January 19, 2021, and during the public CPUC meeting on January 26, 2021, crystallized the areas we have to improve. SCE has clearly heard the message from customers, regulators, government officials, and public safety partners that it must do more to reduce the need for PSPS going forward, perform PSPS effectively when it is necessary, and communicate its wildfire mitigation and PSPS-related plan, process improvements, support programs in a clear and useful manner and support our customers—especially Medical Baseline customers and customers with access and functional needs (AFN)—with more resiliency options.

The sections below describe SCE's vision for the PSPS program, its PSPS protocols, the lessons learned, improvements made and planned, and our commitment to reduce the use and impact of PSPS. Additional details for SCE's improvement plan were provided in the corrective action plan (PSPS Action Plan) that was submitted to the CPUC on February 12th, 2021 (just after SCE's 2021 WMP Update). SCE also provides bi-weekly updates on our progress to implement the PSPS Action Plan, followed by bi-weekly meetings with CPUC staff where SCE provides an overview of the updates and key upcoming activities related to the PSPS Action Plan.

In SCE's PSPS Action Plan, we described concrete steps to reduce the frequency, scope, and impact of PSPS during the 2021 fire season. These activities address the issues raised in President Batjer's January 19, 2021 letter to SCE and during the January 26, 2021 Commission meeting as well as concerns raised by our customers and Public Safety Partners. SCE's PSPS Action Plan proposed the following five goals:

1. Reduce the need for PSPS,
2. Execute PSPS events more effectively with transparency into the decision-making process,
3. Mitigate the impacts of PSPS events,
4. Keep partners and customers clearly and consistently informed, and
5. Enhance and improve post-event reporting.

Assuming similar weather conditions as those experienced in 2020, these actions should reduce: (1) the number of circuits and circuit segments de-energized during PSPS events, (2) the duration of PSPS outages during events, (3) the number of customers de-energized during PSPS events, (4) the proportion of customers who were de-energized but did not receive PSPS notifications, and (5) the proportion of customers who received PSPS notifications but were not de-energized. We are prioritizing our efforts to implement these improvements in the communities that have been most heavily impacted by PSPS since 2019.

In addition, SCE will improve its communication with customers and stakeholders, including enhancing our coordination with emergency managers and Public Safety Partners, before, during, and after PSPS events and employing, to the extent feasible, additional means of communication to convey essential PSPS information. SCE will also measure actual improvements during and after the 2021 fire season and share the results in SCE's 2022 WMP Update.

Some of SCE's proposed activities in the PSPS Action Plan are in addition to our modifications of the PSPS-related activities outlined in SCE's 2021 WMP, submitted on February 5, 2021, and we will capture these incremental activities in the WMP Change Orders Report process. For example, significant improvements in the efficiency and accuracy of the notification process require incremental investments in technologies to integrate data sets across PSPS operations, coordinate and monitor events, increase data accuracy and automate customer and stakeholder notifications. Similarly, activities that involve providing data analytics, increasing granularity and precision of weather forecasts, establishing and monitoring performance measures, and creating enhanced visibility and traceability of decisions also require incremental investments in technologies and related resources. The incremental work is also expected to require additional resources, and SCE is re-evaluating resource allocation amongst the activities included in this plan and the WMP to assess and address potential execution risks.

8.1 DIRECTIONAL VISION FOR NECESSITY OF PSPS

Describe any lessons learned from PSPS since the utility's last WMP submission and expectations for how the utility's PSPS program will evolve over the coming 1, 3, and 10 years. Be specific by including a description of the utility's protocols and thresholds for PSPS implementation. Include a quantitative description of how the circuits and numbers of customers that the utility expects will be impacted by any necessary PSPS events is expected to evolve over time. The description of protocols must be sufficiently detailed and clear to enable a skilled operator to follow the same protocols.

When calculating anticipated PSPS, consider recent weather extremes, including peak weather conditions over the past 10 years as well as recent weather years and how the utility's current PSPS protocols would be applied to those years.

As explained above, SCE has developed a robust infrastructure program aimed at hardening the grid to reduce wildfire risks associated with its electrical infrastructure and enhancing system resiliency. However, under extreme conditions, proactive de-energizations are necessary as a last resort to protect public safety. Decisions for PSPS events are based on a complex set of factors including weather, fuel conditions, electrical asset conditions, and circuit configurations. SCE initiates such de-energizations after the weather data, confirmed by SCE crews in the field when possible, shows that there is an imminent danger of fire. For example, SCE may initiate a de-energization in an area with abundant dry fuel due to high wind conditions because tree limbs, palm fronds or other objects blowing into power lines can cause sparks or ignitions.

As discussed in Section 7.3.6 and the sections below, SCE has dedicated efforts to reduce the probability of PSPS, manage PSPS events more effectively, and mitigate the impact of PSPS on our customers.

SCE's PSPS Action Plan also outlines the proactive steps SCE is taking prior to the peak 2021 wildfire season to decrease the need for PSPS in frequently impacted communities. Once the proposed expedited grid hardening and circuit segment exception measures are implemented, the communities historically most impacted by PSPS events will see a reduction in the number of events, the duration of events, and the number of customers that experience these events, assuming the same weather and fuel conditions as 2020.

8.1.1 Describe any lessons learned from PSPS since the utility's last WMP submission

During 2020, SCE initiated 12 PSPS events with 16 periods of concern, i.e., periods of time when de-energization was likely to occur due to forecast weather and fuel conditions. Through the course of these events, SCE continued to revise its processes and protocols to incorporate lessons learned during previous de-activations and re-energization activities. In 2020, SCE also conducted several table-top simulation exercises, and incorporated learnings from these activities into our PSPS processes.

The primary lessons that SCE has learned from its execution of 2020 PSPS events is that it must do more to reduce the need for PSPS going forward, execute PSPS protocols more effectively when it is necessary including customer notifications and public safety partner coordination, and communicate its wildfire and PSPS-related plans, process improvements, and support programs to the public in a clear and useful manner.

In recent feedback from customers, their representatives, agency partners and the Commission, SCE learned that while the need for PSPS is recognized and appreciated, some specific changes are expected in terms of targeting grid hardening and adjusting protocols to reduce the number and scope of PSPS de-energizations, more transparency around de-energization decision-making criteria, rationalizing customer notifications process to mitigate communication fatigue and confusion, and strengthening coordination with public safety partners.

In 2020, SCE notified customers each time their status changed (i.e., when their circuits were dropped or added from the pre-event monitored circuit list during a PSPS event) and provided twice-daily updates to the customers. This led to customers' status sometimes changing more than once a day. Customer feedback indicated that these multiple updates created confusion and the perception of "over-notification." Other issues that were reported included unclear language, missing information, and providing worst-case, rather than more realistic estimated restoration times, which significantly overstated how long most customers should plan on being without power. SCE initiated a re-evaluation of PSPS notifications to analyze the cadence, content, language, and delivery methods, and is using the results of the analysis to more closely balance PSPS notifications with customer expectations while maintaining the need to inform to protect public safety.

SCE learned that customers in certain remote locations with poor cell phone access may have difficulty communicating during power outages. SCE will meet with county emergency management agency partners to identify and discuss potential options for amplifying PSPS messaging in remote locations through further in-event coordination with these agencies, where appropriate. SCE is also considering sharing the location of such areas with poor cell phone access with telecommunication service providers to make them aware of our communication challenges during PSPS events.

SCE also learned that we need to increase participation in customer programs, rebates and services that can help customers prepare for PSPS events as well as assist them during an outage.

To better meet customer and stakeholder expectations, SCE is undertaking a full review of its PSPS practices to identify targeted actions that can be taken expedite grid hardening to reduce the need for PSPS, enhance weather forecasting, improve communication both before and during PSPS events, and generally be a more responsive and helpful partner to all involved. SCE established these goals and developed a clear, step-by-step plan to meet the goals in its detailed PSPS Action Plan.

In the following sections, SCE describes the steps being taken as part of its PSPS Action Plan to address the lessons learned above:

- Do more to reduce the need for PSPS going forward (Section 8.1.3)
- Execute PSPS protocols more effectively when it is necessary including customer notifications and Public Safety Partner coordination (Section 8.2)

- Communicate its wildfire and PSPS-related plans, process improvements, and support programs to the public in a clear and useful manner (Section 8.2.2)
- Target grid hardening and adjust protocols to reduce the number and scope of PSPS de-energizations (Section 8.1.3)
- Provide more transparency around de-energization decision-making criteria (Section 8.2.2)
- Improve customer notification cadence and content to mitigate communication fatigue and confusion (Section 8.2.4)
- Strengthen coordination with Public Safety Partners. (Section 8.2.5)
- Reduce PSPS notification redundancies (Section 8.2.4)

Support for vulnerable customers

In 2020, SCE launched its CCBB program to support resiliency for its most vulnerable customer population by providing them free backup batteries. Critical Care customers are those customers who cannot be without life sustaining medical equipment for two hours or more. SCE identified approximately 2,500 Critical Care customers enrolled in CARE or FERA and located in its HFRA and marketed the program to these customers in 2020. However, the program had a later launch in 2020 (July), mainly due to initial inventory challenges from COVID-19. In 2021, SCE expanded this program to all income-qualified Medical Baseline customers located in HFRA, which raised the number of eligible customers to approximately 13,000 customers. In addition to direct outreach to these eligible customers through direct mail, email, and outbound calls, SCE is partnering with Community-Based Organizations (CBOs) that have existing relationships with localized populations of eligible customers, in order to identify, communicate with, and encourage them to enroll in the program more effectively.

In addition, SCE is promoting resiliency options to assist customers that may not qualify for Medical Baseline or income-qualified programs, such as portable generator and battery rebates, and pursuing expanded options such as community resiliency zones and microgrids, along with established programs that provide CRCs and CCVs as convenient locations where members of the public can charge devices and receive other amenities and services.

Another lesson SCE learned is that it can and should do more to ensure that vulnerable customers receive proper and timely PSPS notifications to ensure that they are both informed and prepared. We already have a comprehensive process to validate that notices have been delivered to our Critical Care customer population, including follow up calls and messages, and sending SCE representatives to knock on doors when other outreach is not successful. In 2020, we were able to confirm that approximately 97% of PSPS de-energization notifications to this population of critical care customers were delivered successfully, and the remaining customers were contacted via phone calls or visits by our field staff to their residence. While we have been reaching the most vulnerable population, we did not follow a similar process for all Medical Baseline (MBL) customers. In 2021, we are expanding this process to cover all impacted Medical Baseline customers. Expanding this process to all Medical Baseline customers will increase the number of customers that receive extra care during PSPS events from approximately 5,500 Critical Care customers to approximately 34,000 Medical Baseline customers (including the Critical Care subset) in HFRAs.

Fundamental to success in reaching vulnerable customers is ensuring that customers are properly identified as MBL so we can provide the services and care they need. SCE has improved in this regard as a result of making the enrollment process simpler, including the ability for customers to submit their applications online instead of by mail SCE will use CBOs and other partners more effectively to reach this population, make improvements to allow electronic signatures on the application forms, and develop partnerships with medical facilities, home health care, social workers, and other local government coordination to further boost enrollments. The activities in this section, such as expanding notification delivery verification to MBL customers, improving partnerships with CBOs and other stakeholders, and streamlining processes to increase enrollment in the MBL and other programs, are included in the PSPS Action Plan submitted to the Commission on February 12, 2021 as required in Commission President Batjer's January 19, 2021 letter to SCE. SCE will include any changes in approach, scope or cost in Change Order Reports to this WMP.

SCE recognizes the importance of reaching vulnerable populations when de-energization events occur and is committed to doing so in advance of and during events. SCE also learned that it needs to provide additional support through tailored customer care programs for customers who rely on power for medical devices, medications, mobility, or other vulnerabilities.

In the following sections, SCE describes the steps being taken as part of its PSPS Action Plan to address the lessons learned above related to our vulnerable populations:

- Increase enrollment in customer care programs and pursue additional resiliency options (Section 8.4.1)
- Do more to ensure that vulnerable customers receive proper and timely PSPS notifications (Section 8.4.1)
- Ensure that customers are properly identified as Medical Baseline so we can provide the services and care they need (Section 8.4.1)

<u>Sharing data with public entities:</u>

SCE provides information about impacted customers, including GIS mapping data, to public partners manually during PSPS events. SCE has learned that these partners are looking for an easier experience than our current process. The Commission also pointed out in its letter from President Batjer dated January 19, 2021 the need for us to better coordinate with public partners on our AFN Plans. SCE will engage its partners, including the AFN Advisory Council, and collaborate on solutions such as an online portal, for easier access to data during PSPS events. SCE may include customer-facing data portals, PSPS dataset integration generally, and engagement of partnerships with entities such as the AFN Advisory Council will include changes in approach, scope or cost in Change Order Reports to this WMP.

SCE also learned from customers and their representatives that information about SCE's WMP, including grid hardening activities in their specific areas should be readily available. SCE will share more location-specific information about planned and upcoming WMP work. SCE also acknowledges that its submittal PSPS post-event reports did not meet the Commission's expectations. SCE commits to resolving this issue promptly. SCE addressed its plan for improving its post-event reporting in the PSPS Action Plan and will include any changes in approach, scope or cost in Change Order Reports to this WMP.

SCE shares the Commission's eagerness for concrete actions and tangible improvements in outcomes. Our team is working tirelessly on analyzing the challenges and developing specific targeted solutions. As mentioned above, we have shared these in the PSPS Action Plan that SCE submitted to the Commission on February 12, 2021. We have and will continue to implement the necessary changes expeditiously and look forward to the continued partnership to better protect the safety of our customers and communities.

SCE fosters strong relationships with Emergency Management at the local and State level to effectively coordinate and manage emergency events, including PSPS events. While foundationally strong, these relationships have been strained through the frequency and magnitude of PSPS events during the 2020 fire season. To rebuild trust and continue to strengthen these relationships, SCE is working to improve engagement, ensure timely and accurate data sharing, proactively and quickly address issues, and simplify information shared with local and State Emergency Management, first responders and Public Safety Partners during PSPS events. SCE is also establishing engagement metrics, performing surveys and in-person (or virtual) after-action reviews after PSPS events and sharing the results of these surveys with partners and the Commission to measure improvement.

Given the number of late-2020 PSPS events, SCE was unable to provide the level of support expected to properly interface with Public Safety Partners at the State and local level and provide prompt resolution of issues. To provide better support and minimize further communication challenges, SCE has dedicated situational awareness staff to provide information to Public Safety Partners and promptly resolve issues during events in the 2021 fire season and beyond. This single point of contact during events will enhance information sharing and increase SCE's ability to quickly resolve Public Safety Partner issues that arise.

In the following sections, SCE describes the steps being taken as part of its PSPS Action Plan to address the lessons learned above related to sharing data with public entities:

- Engage its partners, including the AFN Advisory Council, and collaborate on solutions such as an online portal, for easier access to data during PSPS events (Section 8.2.5)
- Better coordinate with public partners on our AFN plans (Section 8.2.5)

8.1.2 PSPS Expectations

Expectations for how the utility's PSPS program will evolve over the coming 1, 3, and 10 years

SCE's PSPS-related activities will evolve in terms of (1) grid hardening measures that will over time reduce reliance on PSPS and the scale of PSPS events when they are necessary, (2) measures that will reduce the impact of a de-energization event on customers, including those customers who are most vulnerable to a power shutoff as well as those customers who provide vital services to society, and (3) operational protocols and stakeholder engagement before, during and after events.

In 2021, SCE is assessing the feasibility of replacing the current methodology for setting PSPS thresholds and triggers with a dynamic, machine-learning model that derives circuit and even circuit-segment-specific thresholds and triggers. SCE began the development of this model in 2020 and will perform rigorous analysis and validation in 2021. Assuming final verification and successful side-by-side testing of the new model against SCE's current algorithm, SCE will gradually integrate this new data model into its situational awareness tools.

SCE had previously prioritized covered conductor installation primarily based on ignition risk reduction analysis. We are transitioning to using PSPS risk as a criterion when installing covered conductor, thereby targeting select areas of the grid expected to be frequently impacted by PSPS. SCE is preparing to operationalize sub-circuit level de-energization triggers where covered conductor is fully installed on an isolatable portion of a circuit (an "isolatable segment"), even if other segments of a circuit still contain bare overhead conductor. This approach will represent an even more granular operational capability and would allow for higher windspeed thresholds for those isolatable segments, meaning that these segments are likely to be de-energized later into a PSPS event, if at all.

Lastly, SCE plans to continue its detailed and prescriptive review of frequently impacted circuits and communities. With 2020 PSPS data now available, SCE will continue to review opportunities to accelerate mitigations for circuits that are frequently subject to PSPS events. The success of these targeted mitigation efforts was demonstrated by the 2020 PSPS impacts seen on those circuits that were de-energized in 2019. 46% of circuits de-energized in 2019 were not de-energized again in 2020. For those circuits de-energized in 2019 that were also de-energized in 2020, SCE impacted 36% fewer customers, on average. SCE's additional operational enhancements will focus on the execution of PSPS events. Advancements in the granularity of PSPS forecasting will allow for greater utilization of SCE's targeted mitigations and isolatable segments, allowing for potentially smaller PSPS events. Also, SCE will make every effort to expedite restoration of de-energized circuits when it is safe to do so.

With SCE's prioritized efforts with expedited grid hardening activities and circuit segment exceptions in 2021, assuming the same weather and fuel conditions as 2020, we expect to reduce PSPS events during this year. SCE is enhancing its methodology for weather forecasting in 2021, and with these improvements, we will be able to forecast weather further in advance and with more accuracy.

In 2021, SCE is expanding our customer care portfolio to better support MBL customers by providing backup power during PSPS, by expanding our CCBB program to all eligible MBL customers that are enrolled in CARE or FERA and reside in a HFRA. Section 7.3.6.5 provides additional details about these activities.

SCE has significantly increased its marketing efforts to inform customers about SCE's customer care programs and resiliency options. Specifically, for the CCBB program, SCE has expanded marketing and outreach using direct mail, phone calls, email, and digital channels (sce.com, social media, etc.) and is working with CBOs and other agencies to increase awareness about the program, with an assumption that approximately 30 percent of total eligible customers will choose to enroll in 2021.

SCE is also re-evaluating our communication and customer/agency notifications processes to address specific concerns and feedback from local government partners, and are collaborating with frequently impacted communities for education, outreach, and critical infrastructure planning support to help other entities providing critical services be more resilient as well. The variance between customer notifications sent and actual number of customers de-energized reflects, in part, SCE's commitment to de-energize as few customers as possible while protecting public safety and adhering to notification requirements. SCE makes the final decision to de-energize based on real-time weather conditions, not forecasts, and after it takes all available mitigation steps such as switching load to other non-impacted circuits. However, SCE recognizes the importance of getting customer notifications right, and we are working to refine the granularity of our weather forecasting to narrow the gap between notifications and de-energizations and improve the clarity and accuracy of our notification processes. SCE is making significant changes in its notifications process as part of its PSPS Action Plan, including improved messages, revised notification cadence, and other process and technology improvements. These changes are discussed in Section 8.2.4.

Over the next three years, SCE will continue to make advancements in the granularity and flexibility of decision-making through additional grid sectionalization and automation, and improving circuit resiliency, primarily through expanding the network of overhead covered conductor. These improvements will begin to reap larger benefits, significantly reducing PSPS events for communities as the HFRA segments of their circuits are upgraded fully with covered conductor.

By 2030, the portfolio of SCE's planned mitigation work will be completed and PSPS de-energization events should be limited to cases of fire danger where wind speeds exceed the National Weather Service's High Wind Warning. Additionally, circuit undergrounding and urbanization may combine to lower the risk profiles of certain HFRA circuits and/or communities enough so that they can be completely removed from PSPS scope.

8.1.3 Description of the utility's protocols and thresholds for PSPS implementation

SCE recognizes that while PSPS lowers the risk of wildfire ignitions, it creates customer hardships and impacts daily lives in our communities. Based on lessons learned from 2019 and 2020 PSPS events, SCE implemented operational enhancements to reduce customer impacts of PSPS going forward. Foremost among these was the capability to isolate circuit segments and rely on real-time weather data and field conditions to minimize de-energization footprints whenever feasible. SCE is furthering these efforts by analyzing all frequently impacted circuits to deploy targeted mitigations that can raise thresholds and improve operational flexibility through additional isolatable segments. These will help our efforts to reduce the number of customers impacted by PSPS in the upcoming wildfire seasons.

SCE also has developed new technical and operational capabilities to improve our ability to strategically execute PSPS, such as assigning dedicated permanent resources to our PSPS IMT. SCE will continue to use the ICS with the dedicated IMT and other trained resources to conduct all operational activities related to PSPS. Additional details on the PSPS IMT are described in Section 7.3.6.5.1.

Prior to each PSPS event, SCE implements operational procedures that reduce the potential for a spark to occur, several of which are described in Section 7.3.6.1. When circuits are forecasted to exceed pre-determined wind speed thresholds, SCE implements fast curve settings on protective relays, which are designed to limit the fault energy and more quickly de-energize the line should a fault occur. SCE also implements operating restrictions and blocks reclosers on these lines so that if a line relays, it cannot automatically reclose. In this situation, the line has to be patrolled and have any potential safety hazards mitigated before the circuit can be re-energized. Work restrictions are also placed on circuits in scope for an upcoming PSPS event to help ensure that no SCE work activity causes a potential source of ignition during times of high fire danger. Additional details on work restrictions are described in Section 7.3.6.3.

PSPS activation is driven by two factors. The first factor used to drive PSPS decisions is the FPI, which estimates the likelihood of a spark turning into a major wildfire. FPI is calculated using forecasted wind speed, dewpoint depression, and various fuel moisture variables which are generated from SCE's customized version of the Weather Research and Forecasting (WRF) model. FPI scores range from 1 to 17, and any score at or above 12 is considered high risk. SCE reviews fire potential related products from the NWS and the GACC to confirm the wildfire threat related to PSPS.

The second factor used to drive PSPS decisions is wind speed. SCE considers the National Weather Service Wind Advisory levels (defined as 31 mph sustained wind speed and 46 mph gust wind speed) and the 99th percentile of historical wind speeds in the area to set activation thresholds. The Wind Advisory level is chosen because of the propensity for debris or vegetation to become airborne, while a circuit's 99th percentile wind speeds represent rare or extreme wind speeds that a particular circuit sees around four times per year.

Once SCE's in-house meteorologists confirm forecasts show an upcoming breach of FPI and circuit-specific wind speed thresholds, SCE activates its PSPS IMT and begins preparations for the upcoming event. Whether remotely due to the COVID-19 pandemic, or in-person at SCE's Emergency Operation Center, the IMT begins notifying affected parties. Notifications are sent to First Responders, Public Safety Partners, local governments, tribal governments and critical infrastructure providers approximately 72 hours prior to de-energization, followed by notifications to all other customers approximately 48 hours prior to de-energization. We continue to provide additional notifications as well as notifications of imminent de-energization as information becomes available during the PSPS events (discussed in Section 8.2.4), develop event and circuit-specific de-energization triggers (inputs to which are discussed in Section 8.2.2) and direct resources to perform pre-patrols of all circuits in scope. Decision-making factors and protocols for PSPS de-energization are discussed in Section 8.2.2.

SCE considers the pre-emptive de-energization of a transmission line to be the "last resort" and takes proactive measures to reduce the likelihood and impact of such occurrences. Due to the unique operating characteristics, transmission line outages have the potential to cause significant impacts to public safety and electric system reliability. To address these factors, SCE implemented PSPS protocols for transmission lines that traverse HFRAs. These operating protocols have been created to gauge the reliability risks associated with the pre-emptive de-energization of transmission lines including, analyzing forecasted fire weather conditions, identification of hazardous field conditions, application of risk evaluation models to analyze various operational scenarios, and the development of mitigation plans to address such events.

The protocols are designed to prevent testing of transmission lines when live field monitoring is taking place on a distribution line that is within one mile of a transmission line. When a distribution line is being monitored in the field due to extreme weather conditions, SCE performs a geospatial analysis to determine if there are transmission lines that run parallel to or cross over the distribution line being monitored. When a transmission line is within the one-mile boundary of the monitored distribution line, the transmission line has operating restrictions placed into effect to prevent a test if the transmission line was to relay. If the transmission line relayed it would require a patrol of the HFRA to ensure the line is safe, prior to being re-energized.

SCE has implemented the following measures as part of its PSPS Action Plan to reduce PSPS scope, scale, and frequency: installing new covered conductor and sectionalizing devices; excluding selected circuit segments out of scope based on review of circuit segment conditions; installing new weather stations;

and preparing to provide mobile generators where possible. These measures are discussed in additional detail below.[96]

Covered Conductor

Covered conductor is one of the most effective mitigations against ignitions associated with utility equipment. Covered Conductor protects utility infrastructure from high wind conditions that pose a risk to equipment, such as blown-in vegetation or other debris and damage. SCE relies on lower PSPS de-energization thresholds in the absence of covered conductor. Therefore, fully completing the installation of covered conductor within an isolatable circuit segment enables SCE to raise de-energization thresholds, reducing frequency and duration of PSPS de-energizations on that segment. Where covered conductor has been installed, SCE will begin using an increased threshold for sustained wind speed and gust wind speed.

As part of its PSPS Action Plan, SCE plans to reduce the need for PSPS by expediting grid hardening activities on its most frequently impacted PSPS circuits. SCE has identified circuits for expedited grid hardening review based on the following circuit-specific characteristics:

- Circuit-level de-energization counts due to PSPS events from 2019-2021
- Number of customers impacted by these PSPS events, and
- Number of AFN customers and Critical Infrastructure customers impacted by these PSPS events.

Each circuit identified for expedited grid hardening was evaluated by a cross-functional team of subject matter experts, including operations personnel, risk management professionals, engineers, fire scientists, customer service personnel and construction project managers. The team reviewed circuit segment-specific details, such as historical PSPS events, status of planned grid hardening projects, switching capabilities, weather station locations, and other relevant considerations. The team considered a wide variety of circuit-hardening options such as installing covered conductor, circuit exceptions process, installing and automating switches for the potential to reduce the need for PSPS on the given circuit segment. This segment-by-segment review yielded customized recommendations for each circuit, with particular emphasis placed on the feasibility of accelerating the deployments of grid hardening options. SCE has completed the review of circuit segments for expedited grid hardening. A list of these circuits selected for expedited grid hardening are available on SCE's website.[97]

After this list was finalized, we reviewed these circuits for expedited hardening opportunities to address both PSPS impacts and wildfire risks and developed our circuit mitigation plans. The mitigation plan was based on a) an analysis of proposed mitigations for each of the circuits, b) 2020 PSPS outage details, and c) backcast of 2020 performance assuming the expedited grid hardening plan had been implemented. The mitigation plan has identified covered conductor to be installed on 52 of the 72 circuits and the installation of new switches and weather stations on the frequently impacted circuits.

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[96] The measures described in this section are in response to Critical Issue SCE-04, Remedy 3,

[97] https://www.sce.com/sites/default/files/custom-files/PSPS%20Enhancement%20Circuit%20List%20wcag.pdf

SCE is working to complete the expedited grid hardening activities as quickly as possible, although some challenges remain, such as pending designs for recent scope updates, permits for several projects, and potential unforeseen conditions (e.g., environmental restrictions, summer heat storms, early fire risk weather conditions). SCE continues to monitor construction progress on expedited grid hardening plans and is reviewing and adjusting its workplan when needed. Additional details on covered conductor are discussed in Section 7.3.3.3.1.

PSPS Thresholds

Beginning with the 2021 wildfire season, the PSPS activation thresholds and de-energization thresholds for circuits where covered conductor has been installed on complete circuit segments will be increased to up to 40 mph sustained wind speed and 58 mph gust wind speed. The revised wind speed thresholds for circuits where covered conductor is installed are subject to a review of the circuit health conditions.

Sectionalizing Devices

PSPS de-energizations are designed to occur at the isolatable circuit segment level, which are defined as portions of a circuit between designated automated sectionalizing devices. Increasing the number of sectionalizing devices can allow SCE to be more targeted in its PSPS actions. For example, if there is a high wind event at the end of a circuit but the same conditions do not exist at the beginning of the circuit, a sectionalizing device in the middle of the circuit allows SCE to de-energize only the affected portion of the circuit. In this example, the PSPS event will still occur, but the additional sectionalizing device would make it possible to reduce the number of customers impacted.

Circuit Exceptions

SCE's plan to reduce the need for PSPS also involves determining additional "circuit segment exceptions." While the potential for reducing PSPS based on circuit exceptions is much more limited than grid hardening activities, the exception process does not require installation or replacement of assets and, therefore, analysis and application of this option can typically be performed quicker than grid hardening activities when the latest information supports such exceptions.

The circuit exception review process begins when SCE personnel identify a line segment which—despite being located in a high fire risk area (HFRA) as designated by the Commission—might currently pose a very low risk for wildfire ignition or fire spread. For example, a portion of a circuit found to be traversing over a recent burn scar may be a candidate for circuit exception. Circuit segments can be identified as candidates for exception review as SCE is completing detailed designs for grid hardening activities, or through specific feedback received from field personnel. The circuit exception process requires current and local knowledge of changing conditions to inform the circuit review process.

As part of the circuit exception process, identified circuit segments are reviewed by SCE's PSPS operations, fire science, and risk management experts evaluating the circuit segment's unique characteristics (e.g., construction type, outage history) and location characteristics (e.g., fuel quantity, fuel type, fuel dryness, fuel age, history of fires in the area). This may allow SCE to increase wind speed thresholds on a particular circuit or circuit-segment. Through this circuit exception review process, SCE was able to reduce customer impacts on 22 circuits in 2020. SCE is currently reviewing the latest circuit information and conducting detailed analysis for exception requests currently in queue for the 2021 wildfire season.

Weather Forecasting

SCE uses forecasts of weather and fuels information from its customized in-house atmospheric modeling to identify upcoming weather events in which circuits may be in scope for potential de-energization to protect public safety during critical fire-risk weather. SCE's in-house modeling produces detailed forecasts of wind speed, relative humidity, vegetation moisture, and other information for every 1.25 square miles, making it the preferred source for PSPS weather information. Due to the complexity of terrain and the localized nature of weather conditions in SCE's service area, all atmospheric modeling, independent of source, encounters challenges in accurately portraying details of weather events, and must be continually refined to improve accuracy. For SCE in the context of PSPS, this means that atmospheric and fire spread modeling predictions must be continually updated to minimize impacts to SCE customers.

In 2021, SCE will improve its in-house forecasting capabilities, which should in turn reduce the number of customers de-energized without prior notification. Improvements in weather forecasting will also reduce the number of customers initially in scope, which in turn should reduce the variance between the customers who are notified of potential de-energization and the customers who are actually de-energized during a PSPS event. The main source of this variance is that pre-event notifications rely on forecasting, while de-energization decisions are made in real time based on actual weather conditions.

SCE is making improvements to its in-house modeling in the following ways:

- Accelerating previously planned modeling enhancements: This includes the use of machine learning technology (Artificial Intelligence) to help improve estimations of wind speeds at specific locations where PSPS has occurred most frequently in prior wildfire seasons. In addition, SCE is acquiring additional weather model data from other sources to alleviate dependency on a single source for weather modeling information. Both efforts will increase precision in notifications and will help to identify the scope and duration of de-energizations more accurately.

- Increasing resolution of weather and fire potential predictions: SCE will acquire more computing power, which will enable SCE to make systematic changes to all its in-house modeling. This will include doubling the forecast resolution from 2km to 1km, which will allow for more precise weather and fuels forecasts and will address some of SCE's inherent challenges in capturing details in the timing and magnitude of predicted fire weather events. These improvements will collectively help to more precisely identify the scope of where, when, and how long potential de-energizations may occur, reducing the number of "short notice" and missed notifications.

- Utilizing fire spread predictions for PSPS: SCE will evaluate its capability to estimate how large fires may grow and what their subsequent impact on nearby communities may be. Following evaluation, SCE will incorporate these estimations as another factor to inform decisions to de-energize circuits during extreme weather events that lead to destructive wildfires. This will help to clarify the PSPS footprint to reflect true fire weather conditions more accurately.

8.1.4 Customers Impacted by PSPS

Quantitative description of how the circuits and numbers of customers SCE expects will be impacted by any necessary PSPS events is expected to evolve over time.

More frequent Santa Ana wind conditions and less precipitation created widespread wildfire risk in 2020. The weather conditions experienced in 2020 required 16 percent more PSPS de-energizations as compared to 2019, affecting 13 percent more customers. Certain customers and communities were particularly hard hit, with nearly 12,000 customers being de-energized five or more times in 2020 alone. However, due to different weather patterns and SCE mitigation activities, only 54 percent of the circuits de-energized in 2019 were de-energized again in 2020. When those circuits were impacted, SCE interrupted 36 percent fewer customers. Despite an overall increase in 2020 de-energizations, total and average PSPS outage durations were shorter in part due to SCE's operational flexibility and granularity (22 percent and 33 percent shorter, respectively). See 2020 PSPS impacts compared to 2019 in Table SCE 8-1 below. Updates in the table below are the result of more precise estimates derived from finalized, validated data.

Table SCE 8-1
2020 PSPS Impacts Compared to 2019

Circuits De-energization	Customers De-energized	2019 Circuits De-energized in 2020	2019 Customers De-energized in 2020	Weighted Average Duration	Overall PSPS Outages (CMI)
↑ 16%	↑ 13%	↓ 46%	↓ 36%	↓ 12%	↑ 2%

SCE recognizes the serious and ongoing impacts of PSPS on customers and is committed to programmatic improvements targeted at reducing the need for de-energizations and reducing the burden of de-energizations, should they be necessary. In 2021, SCE expects to reduce the number of customers impacted by PSPS de-energizations by at least 30 percent compared to 2020 based on the PSPS protocol improvements and expedited grid hardening completed since last year and assuming the same weather and fuel conditions as in 2020. Some of the improvements related to expedited grid hardening include installing covered conductor on approximately 700 miles on our 72 most frequently impacted circuits, installing new switches and automating existing switches, excluding sections of circuits from de-energization as a result of our circuit exception process and providing mobile generators to keep the power on at some locations during PSPS events. This equates to more than a 25 percent reduction in the number of circuit de-energizations due to PSPS in 2021 over 2020, assuming the same weather and fuel conditions as 2020. The avoided circuit de-energizations would lead to a reduction of at least 50 percent in total customer minutes of interruption (CMI). This commitment is based on known scope of mitigations and improvements expected from our expedited grid hardening initiatives and assuming the same weather and fuel conditions as in 2020.

Table SCE 8-2
2021 Anticipated PSPS Reductions[98]

Scope	Frequency	Duration
↓ 30%+	↓ 25%+	↓ 50%+

These anticipated benefits are driven primarily by three PSPS mitigations: circuit threshold adjustments, SCE's circuit exception process, and deployment of backup power. For threshold adjustments, SCE expects to raise circuit windspeed thresholds to the National Weather Service's High Wind Warning thresholds based on covered conductor installation. While few circuits have full covered conductor coverage currently, SCE expects a large number of isolatable segments to be fully covered in 2021. Further details around this analysis can be found in SCE's response to Class B Deficiency SCE-4.[99]

SCE's circuit exception process entails a detailed periodic review of circuits and circuit-segments located in HFRA to identify those with sufficiently low wildfire risk based on the latest information to warrant removal from future PSPS scope altogether. Wildfire risk changes on this scale can be brought about through deployed PSPS mitigations such as asset upgrades or circuit reconfiguration, or through fuel loading changes driven by processes like urbanization.

Mobile Generation

SCE's proactive backup power efforts are targeted to pockets of customer load served by underground cable that has been frequently impacted by PSPS from upstream overhead bare conductor. Because of the very low wildfire danger from underground cable, SCE has completed engineering solutions to provide approximately 12 mobile diesel generation units to those undergrounded circuit-segments so that they could remain energized even if their overhead source line was proactively de-energized for PSPS.

These mitigations are expected to yield the same PSPS reduction benefits in 2022 as well, though SCE will continue to monitor PSPS execution and perform analysis for further improvements that can be made based on 2021 performance.

Initiatives like modeling enhancements and the creation of switching playbooks can be implemented relatively quickly across all HFRA circuits. Many of these "quick win" type of projects have already been completed, and incremental changes in PSPS reduction will take longer. Grid hardening is one of the most—if not the most-- important mitigations that SCE can deploy to reduce PSPS. Small increases to thresholds and triggers can be expected as circuits undergo modernization and hardening, but significant

[98] The revised estimates in the table and descriptions of mitigations that follow are in response to Critical Issue SCE-04, Remedy 3,

[99] *See* SCE's First Quarterly Report on 2020-2022 WMP for Class B Deficiencies, submitted September 9, 2020, pp. 193-198.

adjustments can only be undertaken over a longer period of time, once all of the necessary upgrades have been performed on isolatable segments throughout HFRA.

Despite the progress made to date and additional progress to be completed this year, PSPS will have to remain available as a tool of last resort to protect the safety of our customers and communities. Extreme wind speeds, paired with fuels that are susceptible to fire propagation, may continue to necessitate proactive de-energization of certain circuit segments to help ensure public safety.

Table 8-1 below provides SCE's estimates about the use of PSPS protocols and specific impacts to the public over the coming decade. Forecasts in this table will be affected by any changes to Tier 2 and Tier 3 HFRAs, population and load growth, and effects of climate change on fire weather in SCE's service area.

Table 8-1: Anticipated characteristics of PSPS use over next 10 years

Rank order the characteristic of PSPS events (in terms of numbers of customers affected, frequency, scope, and duration) anticipated to change the most and have the greatest impact on reliability (be it to increase or decrease) over the next ten years. Rank in order from 1 to 9, where 1 means greatest anticipated change or impact and 9 means minimal change or impact on ignition probability and estimated wildfire consequence. To the right of the ranked magnitude of impact, indicate whether the impact is to significantly increase reliability, moderately increase reliability, have limited or no impact, moderately decrease reliability, or significantly decrease reliability. For each, include comments describing expected change and expected impact, using quantitative estimates wherever possible.

Table 8-1
Anticipated characteristics of PSPS use over next 10 years

Rank order 1-9	PSPS Characteristics	Significantly increase; increase; no change; decrease; significantly decrease	Comments
2	Number of customers affected by PSPS events (total)	Decrease; approximately 45,000 customers in 2021[100]	SCE's grid hardening efforts (e.g., covered conductor and sectionalization devices) will allow for higher thresholds and smaller de-energizations, where possible
1	Number of customers affected by PSPS events (normalized by fire weather, e.g., Red Flag Warning line mile days)	Significantly decrease	Higher reductions expected than the metric above when normalized.
4	Frequency of PSPS events in number of instances where utility operating protocol requires de-energization of a	Decrease; reduction by at least 125 circuit segment de-	10 years of grid hardening will raise thresholds on the majority of PSPS circuits, meaning de-

[100] Assumes same weather conditions as 2020.

	circuit or portion thereof to reduce ignition probability (total)	energization events in 2021[101]	energization will be necessary less often
3	Frequency of PSPS events in number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability (normalized by fire weather, e.g., Red Flag Warning line mile days)	Significantly decrease	Higher reductions expected than the metric above when normalized.
8	Scope of PSPS events in circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization (total)	Decrease; reduction by at least 125 circuit segment de-energization events in 2021.[102] No forecasted change to overall PSPS events	While extreme weather still puts fully covered conductor circuits in scope for PSPS, their higher thresholds should make this less frequent
7	Scope of PSPS events in circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization (normalized by fire weather, e.g., Red Flag Warning line mile days)	Significantly decrease	Higher reductions expected than the metric above when normalized.
6	Duration of PSPS events in customer hours (total)	Decrease; reduction by approximately 100 million CMI in 2021[103]	As demonstrated by SCE's 2019 vs 2020 PSPS durations (22% less in 2020), outages should continue to become shorter as they grow smaller in scale
5	Duration of PSPS events in customer hours (normalized by fire weather, e.g., Red Flag Warning line mile days)	Significantly decrease	Higher reductions expected than the metric above when normalized.
9	Other		

8.2 Protocols on Public Safety Power Shut-off

Describe protocols on Public Safety Power Shut-off (PSPS or de-energization), highlighting changes since the previous WMP report:

[101] Assumes same weather and fuel conditions as 2020.

[102] Assumes same weather and fuel conditions as 2020.

[103] Assumes same weather and fuel conditions as 2020.

SCE developed robust processes and protocols based on the OIR Phase 1 and Phase 2 decisions in order to reduce the impact of PSPS on its customers. We have refined these processes and protocols based on lessons learned and continue to do so in order to continue to reduce the impact to our customers and communities.

8.2.1 Strategy to minimize public safety risk during high wildfire risk conditions

Strategy to minimize public safety risk during high wildfire risk conditions and details of the considerations, including but not limited to list and description of community assistance locations and services provided during a de-energization event.

SCE's WMP strategy is designed to prevent, combat and respond to the threat of wildfires and consists of the following four main pillars: (a) enhancing operational practices, (b) bolstering situational awareness, (c) hardening the grid, and (d) services provided during a de-energization event. Each of these wildfire mitigation focus areas include initiatives designed to minimize public safety risks during high wildfire risk conditions. Operational practices, for example, include vegetation management, implementation of system operating restrictions and PSPS response protocols. During elevated fire weather conditions, SCE proactively employs a number of operational practices to mitigate against the threat of wildfires, reserving PSPS as a last resort for extreme weather conditions. Other operational practices include, but are not limited to, blocking reclosers to prevent automated reclosing devices from re-energizing circuits when conditions may be hazardous and implementing Fast Curve settings to reduce the fault energy to more quickly de-energize when a short circuit has been detected, as described in Section 7.3.3.2.

In the area of situational awareness, SCE has invested in tools, technologies, and practices to better forecast potential wildfire conditions and to be more effective in responding to fire events when they occur. These include: a Situational Awareness Center that during emergencies and incidents is staffed around the clock with meteorologists and GIS professionals, additional weather stations that provide real-time information about wind, temperature, and humidity to help SCE make decisions during potential fire conditions, and live fire-monitoring cameras to help IMTs and first responders more quickly assess and respond to reported fires. The creation of an incident commander dashboard has helped to aggregate all these crucial data points, allowing them to be presented in a PowerBI viewer so that SCE's IMTs can make the most informed, up-to-date decisions. Additionally, in 2020, SCE has installed two super computers (one at the primary location and one at the backup location) that have helped produce high-resolution weather and fuel modeling forecasts to provide IMTs with precision and granularity. In 2021, SCE will procure and install two additional super computers, which will considerably increase the resolution and accuracy of its forecast capabilities. Additional details on SCE's situational awareness improvements implemented as part of the PSPS Action Plan, such as improved in-house forecasting capabilities, are provided in Section 8.1.3.

In the area of grid hardening, mitigations to reduce the risk of ignition include installation of covered conductors that lower the probability of faults or short circuits that can lead to ignitions, fire resistant pole wraps that are more resilient than wood poles, and fast-acting fuses that can react more quickly to minimize fire risks. Finally, during PSPS events SCE provides many services to affected or potentially affected customers. These services are described in more detail throughout this document and consist of the following: Education and Outreach (see Section 8.4.1 below); Notifications and Alerts (see Section

8.2.4 below); CRC/CCV (see Section 7.3.6.5.2.1); and Customer Resiliency Equipment Incentives (see Section 7.3.6.5.2.3). All these efforts help reduce the public safety risk during high wildfire risk conditions.

CRCs are activated during de-energizations in the impacted communities. CRCs provide services such as CRCs are activated during de-energizations in the impacted communities. CRCs provide services such as access to device charging and restrooms, water, snacks, and resiliency kits (which contain a tote bag, light emitting diode (LED) lightbulb or flashlight, pre-charged phone battery, ice voucher, and personal protective equipment (e.g., masks, hand sanitizers, etc.)). SCE also uses mobile CCVs to reach impacted communities that do not have a CRC location in their community or as a supplement to CRCs, as needed to support impacted communities. SCE has designed and outfitted eight cargo transit vans and box trucks as CCVs with the required equipment and technology to enable SCE staff to transport and distribute resiliency kits, water, and snacks to communities potentially impacted by a PSPS de-energization event. SCE has additional customer care programs, such as the CCBB program, rebates for portable batteries and generators, and the Self Generation Incentive Program that are available to customers to help build resiliency in preparation for de-energization events. All these offerings are aggregated on a new customer care resources and support page that SCE's created on its website on SCE.com. More information on SCE's customer care programs, including description of community assistance locations and services provided during a de-energization event, is provided in Sections 7.3.6.5.2 and 8.4.1. SCE is continuing to evaluate alternatives and refinements to its customer support approach and will include changes in approach, scope or cost in Change Order Reports to this WMP.

In 2020, SCE deployed Community Resource Centers and Community Crew Vehicles by activating CRCs 58 times and CCVs 88 times in multiple counties (Mono, Inyo, Kern, Ventura, San Bernardino, Orange, Los Angeles, Santa Barbara and Riverside) in support of community members during PSPS events. Approximately 6,000 customers visited the CRCs and CCVs during the months of May through December 2020 during PSPS activations.

In 2020, SCE had fifty-six CRCs contracted and eight mobile CCVs available for deployment to reduce customer impacts during PSPS events. In 2021, SCE will provide certain CRCs in remote locations with a transfer switch to enable back-up power connection so they can continue to serve the community if the CRC site is de-energized during a PSPS event. To date, SCE has completed transfer switch installation at two CRCs (Acton Community Center and the James A. Venable Community Center [also known as Family Service Association] in the city of Cabazon).

SCE will continue to assess the need for additional contracted CRCs based on PSPS event history, grid hardening efforts, stakeholder feedback, and evolving needs. SCE has continued to reach out to tribal communities for interest in participating as CRCs and continues to collect customer feedback on CRCs through post-event surveys.

Table SCE 8-3
2020 CRC Locations Activated by PSPS Event

Event Date	Location
09/08/2020	Claremont - Service Center for Independent Living
09/08/2020	Simi Valley - Courtyard Marriott

09/08/2020	San Bernardino - Rolling Start
09/08/2020	Lytle Creek - Lytle Creek Community Center
09/08/2020	Tustin – Sears
09/08/2020	Tehachapi - Sears
09/08/2020	Twin Peaks - Community Center Recreation Complex
09/09/2020	Agua Dulce - Agua Dulce Women's Club
09/09/2020	Tustin - Sears
09/09/2020	Claremont - Service Center for Independent Living
09/09/2020	Simi Valley - Courtyard Marriott
10/26/2020	Orange - Sears
10/26/2020	Cabazon - James Venable Community Center
10/26/2020	Lytle Creek - Jessie Turner Community Center
10/26/2020	Acton - Acton Community Center
10/26/2020	Agua Dulce - Agua Dulce Women's Club
10/26/2020	Moorpark - Boys & Girls Club
01/26/2020	Simi Valley - Boys & Girls Club
10/26/2020	Canyon Country - College of the Canyons
10/27/2020	Orange - Sears
10/27/2020	Cabazon - James Venable Community Center
10/27/2020	Lytle Creek - Jessie Turner Community Center
10/27/2020	Agua Dulce - Agua Dulce Women's Club
10/27/2020	Moorpark - Boys & Girls Club
10/27/2020	Simi Valley - Boys & Girls Club
10/27/2020	Canyon Country - College of the Canyons
11/06/2020	Bishop - Sears Hometown Store
11/26/2020	Twin Peaks - Twin Peaks Community Center
11/26/2020	Claremont - Service Center for Independent Life
11/26/2020	Santa Paula - Santa Paula Community Center
11/26/2020	Moorpark - Boys & Girls Club
11/26/2020	Tehachapi - Stallion springs Community Center
11/27/2020	Claremont - Service Center for Independent Life
11/27/2020	Santa Paula - Santa Paula Community Center
11/27/2020	Moorpark - Boys & Girls Club
11/27/2020	Tehachapi - Stallion springs Community Center
11/27/2020	Twin Peaks - Twin Peaks Community Center
12/03/2020	Tehachapi - Stallion springs Community Center
12/03/2020	Tehachapi - Fairfield Inn & Suites
12/03/2020	Agua Dulce - Agua Dulce Women's Club
12/03/2020	Cabazon - James A. Venable Community Center parking lot
12/03/2020	Idyllwild - Idyllwild Community Center
12/03/2020	Fontana - Jessie Turner Community Center

12/03/2020	Simi Valley - Simi Valley Community Center
12/03/2020	Fillmore - Fillmore Active Adult and Community Center
12/04/2020	Agua Dulce - Agua Dulce Women's Club
12/04/2020	Fillmore - Fillmore Active Adult and Community Center
12/18/2020	Agua Dulce - Agua Dulce Women's Club
12/18/2020	Moorpark - Moorpark City Hall
12/18/2020	Simi Valley - Simi Valley Senior Center
12/19/2020	Agua Dulce - Agua Dulce Women's Club
12/19/2020	Moorpark - Moorpark City Hall
12/19/2020	Simi Valley - Simi Valley Senior Center
12/19/2020	Cabazon - James A. Venable Community Center
12/20/2020	Agua Dulce - Agua Dulce Women's Club
12/20/2020	Moorpark - Moorpark City Hall
12/23/2020	Agua Dulce - Agua Dulce Women’s Club
12/24/2020	Agua Dulce - Agua Dulce Women’s Club

Table SCE 8-4
2020 CCVs Dispatched by PSPS Event

Event Date	Location
05/30/2020	Bishop - Sears parking lot
05/30/2020	Bishop - Tri-County Fairgrounds
06/28/2020	Bishop - Sears parking lot
06/28/2020	Mammoth
08/02/2020	Lake Hughes - Lake Hughes Community Center general location
08/03/2020	Lake Hughes - Lake Hughes Community Center general location
09/08/2020	Fontana - Jessie Turner Community Center
09/08/2020	Cabazon - James Venable Community Center
09/09/2020	Acton - Acton Community Center
09/09/2020	Fontana - Jessie Turner Community Center
10/26/2020	San Bernardino - CSUSB
10/26/2020	Rancho Cucamonga - Central Park
10/27/2020	San Bernardino - CSUSB
10/27/2020	Rancho Cucamonga - Central Park
11/06/2020	Lucerne Valley - Pioneer Park
11/06/2020	June Lake - June Lake Community Building
11/06/2020	Bridgeport - Superior Court
11/17/2020	Bridgeport - Superior Court
11/17/2020	Bishop - Sears Hometown Store
11/17/2020	Frazier Park - Frazier Mountain Park
11/18/2020	Bishop - Sears Hometown Store
11/18/2020	Bridgeport - Superior Court

11/26/2020	Fontana - Jessie Turner Community Center
11/26/2020	Cabazon - James A. Venable Community Center parking lot
11/26/2020	San Jacinto - Sallee Park Parking Lot
11/26/2020	Agua Dulce - Agua Dulce Women's Club Parking Lot
11/26/2020	Acton - Acton Community Center
11/26/2020	Lake Forest - Portola Park
11/27/2020	Agua Dulce - Agua Dulce Women's Club Parking Lot
11/27/2020	Acton - Acton Community Center
11/27/2020	Cabazon - James A. Venable Community Center parking lot
11/27/2020	Fontana - Jessie Turner Community Center
12/03/2020	Acton - McDonald's Parking Lot
12/03/2020	Santa Clarita - College of the Canyons
12/03/2020	Lake Forest - Portola Park
12/03/2020	Rancho Santa Margarita - Monte Vista Park
12/03/2020	Calimesa - Calimesa City Hall Parking Lot
12/03/2020	San Jacinto - San Jacinto Community Center Parking Lot
12/03/2020	San Bernardino - CSUSB
12/03/2020	Thousand Oaks - Grant R. Brimhall Library Parking Lot
12/03/2020	Moorpark - Arroyo Vista Recreation Center
12/04/2020	Acton - McDonald's Parking Lot
12/04/2020	Thousand Oaks - Grant R. Brimhall Library Parking Lot
12/07/2020	Tehachapi - Stallion springs Community Center
12/07/2020	Agua Dulce - Agua Dulce Women's Club Parking Lot
12/07/2020	Acton - Acton Community Center Parking Lot
12/07/2020	Orange - El Modeno High School Parking Lot
12/07/2020	Idyllwild - Idyllwild Community Center Parking Lot
12/07/2020	San Bernardino - CSUSB Parking Lot
12/07/2020	Santa Barbara - Louise Lowry Davis Center Parking Lot
12/07/2020	Simi Valley - Simi Valley Community Center Parking Lot
12/08/2020	Tehachapi - Stallion springs Community Center
12/08/2020	Agua Dulce - Agua Dulce Women's Club Parking Lot
12/08/2020	Acton - Acton Community Center Parking Lot
12/08/2020	Orange - El Modeno High School Parking Lot
12/08/2020	Idyllwild - Idyllwild Community Center Parking Lot
12/08/2020	San Bernardino - CSUSB Parking Lot
12/08/2020	Simi Valley - Simi Valley Community Center Parking Lot
12/11/2020	Bishop - Sears HomeTown Store Parking Lot
12/13/2020	Acton - Acton Community Center Parking Lot
12/13/2020	Agua Dulce - Agua Dulce Women's Club Parking Lot
12/13/2020	Chatsworth - Chatsworth Lake Church
12/13/2020	Cabazon - James A. Venable Community Center parking lot
12/13/2020	Fontana - Jessie Turner Fitness Center Parking Lot

12/18/2020	Acton - Acton Community Center Parking Lot
12/18/2020	Lake Forest - Portola Park Parking Lot
12/18/2020	San Bernardino - CSUSB Parking Lot
12/19/2020	Acton - Acton Community Center Parking Lot
12/19/2020	Lake Forest - Portola Park Parking Lot
12/19/2020	San Bernardino - CSUSB Parking Lot
12/20/2020	Acton - Acton Community Center Parking Lot
12/20/2020	Lake Forest - Portola Park Parking Lot
12/20/2020	San Bernardino - CSUSB Parking Lot
12/20/2020	Simi Valley - Simi Valley Senior Center
12/23/2020	Tehachapi - Golden Hills Community Center Parking Lot
12/23/2020	Acton - Acton Community Center Parking Lot
12/23/2020	Lake Forest - Portola Park Parking Lot
12/23/2020	Beaumont - Beaumont Civic Center Parking Lot
12/23/2020	Fontana - Jessie Turner Fitness Community Center Parking Lot
12/23/2020	Fillmore - Fillmore Community Center Parking Lot
12/23/2020	Simi Valley - Simi Valley Senior Center
12/24/2020	Tehachapi - Golden Hills Community Center Parking Lot
12/24/2020	Acton - Acton Community Center Parking Lot
12/24/2020	Lake Forest - Portola Park Parking Lot
12/24/2020	Beaumont - Beaumont Civic Center Parking Lot
12/24/2020	Fontana - Jessie Turner Fitness Community Center Parking Lot
12/24/2020	Fillmore - Fillmore Community Center Parking Lot
12/24/2020	Simi Valley - Simi Valley Senior Center

8.2.2 Tactical and strategic decision-making protocol for initiating a PSPS/de-energization.

SCE's de-energization decisions are made on a circuit-by-circuit basis, often on a sub-circuit level, only when current conditions in the immediate area warrant action. De-energization wind speed triggers are unique to each circuit and are dynamic based on evolving environmental and circuit-specific characteristics. Some factors that are taken into consideration when setting de-energization triggers include wind speed, FPI, ignition consequence modeling, circuit conditions, length of conductor, and other technical characteristics for the applicable circuit. The IMT takes characteristics such as a higher FPI, multiple historical outages or outstanding maintenance items into account when determining if wind speed thresholds for recommending de-energization should be modified. Please see Chapter 4 for additional details on SCE's risk models.

Execution of de-energization protocols is managed by the IMT in alignment with nationally recognized ICS principles. Please see Sections 7.3.6.5.1 and 8.1.3 for additional details on the IMT. The following considerations are intended to provide a framework to assist the IMT in exercising this discretion:

- National Weather Service alerts or warnings for counties that contain SCE circuits in HFRA

- Ongoing assessments from SCE's in-house meteorologists informed by high resolution weather models, data from strategically deployed SCE weather stations (e.g., wind speeds, humidity levels, and temperature), and publicly available weather stations

- The SCE FPI, an internal tool that utilizes both modeled weather and fuel conditions

- Real-time situational awareness information obtained from weather station data and, in some instances, field observers positioned locally in HFRA identified as at risk for extreme fire weather conditions

- Specific concerns from state and local fire authorities, emergency management personnel, and law enforcement regarding public safety issues

- Expected impact of de-energizing circuits on essential services such as public safety agencies, water pumps, traffic controls, medical facilities, etc.

- Circuit maintenance conditions, length of conductor, and other technical characteristics for the applicable circuit

In addition to the above factors, which are monitored by SCE's IMT at least one qualified LFO is stationed at every circuit in scope, at least two hours before the start of the event when possible. The purpose of this LFO is to monitor a circuit for any possible signs of failure or prevailing environmental conditions such as potential damage from wind gusts, airborne vegetation, or flying debris. SCE also deploys field resources to pre-patrol each circuit that is forecasted to be in scope for PSPS de-energization consideration. The pre-patrol requires qualified personnel to visually inspect the entire length of the overhead circuit that traverses HFRA to verify if the circuit can withstand incoming weather and to provide additional up-to-date intelligence on field conditions to SCE's IMT. If maintenance concerns are discovered on a circuit in scope, repairs are expedited (if possible) before the impending wind event. Where possible, every circuit that is in scope for the upcoming event has a pre-patrol performed, unless it was already patrolled within the last seven days. While the SCE Incident Commander takes recommendations from LFOs, operations members of the IMT and external public safety partners, the decision to carry out a PSPS de-energization must be ultimately authorized by the Incident Commander.

SCE's de-energization decisions are complex and made on a circuit-by-circuit basis, often on a sub-circuit level, only when current conditions in the immediate area warrant action. For each PSPS event, every circuit has a de-energization threshold. De-energization thresholds are determined separately for each circuit to prioritize circuits for de-energization based on the specific risks of the event. This is particularly important for large events where many circuits must be evaluated simultaneously. De-energization thresholds account for circuit health, including any outstanding maintenance and issues identified through patrols, and are also informed by a consequence score for each specific high fire risk area. If actual conditions suggest more risk, or in large-scale events when many circuits are under consideration for shutoffs, the de-energization thresholds may be lowered (discounted), meaning power on a circuit will be turned off at lower wind speeds. This step prioritizes the circuits that represent the highest risk to be evaluated for de-energization before circuits at lower risk.

In 2021, SCE has enhanced the transparency of its PSPS decision-making process by developing clear, understandable, and accessible materials to share with customers and Public Safety Partners about its PSPS decision making process. As part of this effort, SCE explains its activation thresholds, de- energization thresholds, and the quantitative and qualitative analysis that warrant de-energizing a circuit or portion of a circuit. Detailed information will be included in PSPS post-event reports to clearly explain why each PSPS event was necessary to protect public safety.

During the second quarter of 2021, SCE prepared three external facing pieces[104] of collateral to educate and inform customers, Public Safety Partners, and other stakeholders about its PSPS decision-making process:

- Infographic: An illustration to explain why in two similar neighborhoods only one might be subject to PSPS. This was included in the PSPS Newsletter sent to customers residing in HFRAs in April/May 2021
- Fact sheet: An illustrated fact sheet taking readers through the PSPS decision-making process
- Technical paper: An 11-page paper providing of the technical basis for our PSPS decision making process.

8.2.3 Strategy for safe and effective re-energization

Strategy to provide for safe and effective re-energization of any area that was de-energized due to PSPS protocol.

After weather conditions resulting in elevated fire ignition risk have abated, SCE's IMT dispatches qualified personnel to perform restoration patrols on all circuits that experienced PSPS de-energization. While a circuit is de-energized, SCE does not get the same indicators of potential hazards that it might normally, therefore necessitating patrols. For example, if a foreign object were to come into contact with a line while energized, SCE would see a fault on the system and would be alerted to the hazard. During a PSPS outage, SCE has diminished awareness of potential failure modes on a circuit, and thus must patrol the circuit to assess its condition and ensure that it is safe to return to service. Failure to do so could result in an attempted re-energization that is unsafe or ineffective.

As discussed in Section 7.3.6.4, SCE has implemented procedures as required by the PSPS OIR Phase 1 and Phase 2 Decisions that electric service to circuits de-energized due to PSPS will be restored as soon as possible and within 24 hours whenever possible. Once it is safe to do so, SCE restores service to a particular circuit within 24 hours of the cessation of extreme weather and reports to the Commission instances when it is unable to meet the 24-hour goal. In 2019 and 2020, the average time of restoration, measured from the time it is safe to begin the restoration process, was approximately six hours.

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[104] The technical paper and fact sheet are available on SCE's website. "SCE's PSPS Decision Making Factors", available at: https://download.newsroom.edison.com/create_memory_file/?f_id=5dfab5ff2cfac26533ac6f3d&content_verified=True

8.2.4 Company standards relative to customer communications

Company standards relative to customer communications including consideration for the need to notify priority essential services – critical first responders, Public Safety Partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies. This section, or an appendix to this section, shall include a complete listing of which entities the electrical corporation considers to be priority essential services. This section shall also include a description of strategy and protocols for providing timely notifications to customers, including access and functional needs populations in the languages prevalent within the utility's service area.

SCE utilizes several communication channels for its customers, Public Safety Partners and other stakeholders regarding PSPS including: 1) PSPS event notifications to SCE customers; 2) PSPS event notifications to non-SCE account holders; and 3) SCE.com. In addition, SCE engages in a suite of outreach activities, including community meetings (DEP-1.2), marketing campaign (DEP-1.3) and customer research and education (DEP-4), that are not described here but are described in Section 7.3.10.1.

<u>PSPS Event Notifications to SCE Customers and Other Stakeholders:</u>

SCE provides PSPS event notifications pursuant to the PSPS guidelines provided by the Commission, as shown in the table below. SCE understands its stakeholders have different needs and require varying methods of alerts and notifications. For example, first responders, Public Safety Partners, and local governments require as much lead time as practical to begin contacting constituents and preparing to respond to potential de-energizations. To support this need, SCE generally provides priority notification to these agencies between 48 to 72 hours before a potential PSPS de-energization, if weather conditions can be predicted this far in advance. Additional alerts and warning update notifications are made again at 24-hour intervals with these agencies to maintain operational coordination. SCE sends initial alerts and warning messages to remaining customers up to 48 hours in advance of a potential PSPS event via their preferred method of communication (e.g., text, e-mail, voice call, and TTY). Notifications are then made to these customers in 24-hour intervals to maintain situational awareness and provide updated information regarding the ongoing potential PSPS event. Notifications are offered in multiple languages.[105]

Table SCE 8-5
De-Energization Notification Requirements

[105] SCE's efforts to notify public safety agencies and local governments, Cal OES and the CPUC of potential de-energizations were discussed as WMP activities PSPS-1.1, PSPS-1.2 and PSPS-1.3, respectively, in SCE's 2020 WMP. As these activities are CPUC requirements, they will be discussed in this section and remain a part of SCE's WMP but will not be program targets specifically tracked by SCE to monitor wildfire mitigation implementation.

Stakeholder	Initial Notification (Alert)	Update Notification (Alert)	Imminent Shut Down (Warning)[106]	De-Energized (Statement)	Preparing for Re-Energization (Statement)[107]	Re-Energized (Statement)	PSPS Averted (Statement)
First/ Emergency Responders/ Public Safety Partners, local governments, and tribal governments	72 hours before	48 & 24 hours before	1-4 hours before	When De-Energization Occurs	Before Re-energization Occurs	When Re-Energization Occurs	When circuits are no longer being considered for PSPS
Critical Infrastructure Providers	72 hours before	48 & 24 hours before	1-4 hours before	When De-Energization Occurs	Before Re-energization Occurs	When Re-Energization Occurs	When circuits are no longer being considered for PSPS
Customers	48 hours before	24 hours before	1-4 hours before	When De-Energization Occurs	Before Re-energization Occurs	When Re-Energization Occurs	When circuits are no longer being considered for PSPS
*SCE will target the schedule above to notify customers. Erratic or sudden onset of hazardous conditions that jeopardize public safety may impact SCE's ability to provide advanced notice to customers.							

SCE implemented the Electric Outage Notification System (EONS) in 2019 to execute high-volume targeted notifications within very short timeframes, enabling SCE to reach a large number of customers in areas potentially subject to PSPS. In 2019, SCE enhanced EONS' capabilities to expand in-language notifications based on customer preference including Spanish, Mandarin, Cantonese, Tagalog, Vietnamese and Korean. In 2020, SCE enhanced the system further to include additional languages spoken prevalently in the SCE service area.[108]

Customers who are enrolled in SCE's MBL program and whose physician has indicated that medical equipment is used for life support purposes (i.e., customer cannot be without life sustaining medical equipment for two hours or more) are identified upon enrollment as Critical Care customers. SCE makes extra effort to communicate with Critical Care customers prior to disconnection or interruptions of service, including using in-person notifications, if necessary. When SCE identifies that a PSPS notification has not been delivered to a Critical Care customer, SCE attempts to contact them directly. Undelivered

[106] SCE will make every attempt to notify customers of imminent de-energization at the 1- to 4-hour warning stage. Given the unpredictability of shifting weather during PSPS, implementation of this imminent notification timeframe may vary.
[107] SCE will attempt to notify customers before re-energization when possible.
[108] This effort was completed in 2020 and was discussed as WMP Activity PSPS-1.4 De-energization notifications in SCE's 2020 WMP.

alerts and notifications are sent to SCE's Consumer Affairs on-duty resources, who research the account and make further attempts to directly reach the customer to deliver the alert or warning message and to discuss the customer's preparations for remaining resilient during the PSPS event. In those circumstances where Consumer Affairs is unable to contact the Critical Care customers, SCE will send a representative to the customer's home to attempt to deliver an in-person notification. If the representative is unable to make contact with the customer directly at the home, they will leave a door hanger at the property asking the customer to call SCE at the phone number provided. In 2021, SCE will provide the same service to all Medical Baseline customers.

2021 PSPS Notifications Improvements:

In 2021, SCE has initiated the PSPS IMT Process Automation & Customer Notifications project, which is focused on IT improvements in customer notifications (digital & process transformation), such as the automation of reports and customer notifications.

SCE engaged with customers to clarify how much information customers want, how frequently they want it, and the best way to message the notification content for clarity and transparency. This helped us understand the current-state customer notification experience and where we are falling short from the customer perspective, through both direct customer research and work with third-party communication experts. SCE mapped the customer experience from first notification through event all-clear, including the cadence, content, language, and delivery methods, and developed a plan for customer experience improvements. The plan included the re-design of the notification content and process and launching new messages in 2021.

SCE assessed its accuracy and adherence to timing interval guidelines for PSPS notifications that are sent after the onset of extreme weather by performing an end-to-end assessment of the notification process. In 2020, both SCE's practice of de-energizing at the circuit-segment level, which reduced customer impacts, and the use of manual processes, slowed the notification process and resulted in missed or conflicting notifications. During the first and second quarter of 2021, we performed a root-cause analysis to better understand why notifications were missed and conflicting notifications were being sent. One of the key observations from this root-cause analysis was that we need to better coordinate the handoff between our operational team and notification team by integrating operational (grid) and customer (notification and communications) workflows.

To close the gaps between operational and customer workflows, we developed a short-term and long-term integration strategy for a broad technical solution to increase automation. These efforts integrate PSPS, customer and field data and reduce the need for manual handoffs. The integration effort will provide significant improvements to notification accuracy and timeliness, as well as improved overall situational awareness.

In addition, SCE also reviewed the language used in the PSPS notifications for (a) text messages, (b) voice messages, and (c) emails for each of the notifications provided to Public Safety Partners and customers. Based on feedback gathered, we re-wrote the various messages to improve clarity and comprehension. We tested these new messages and cadence via focus group meetings with residential and business customers. Besides English, some of these static customer messages are also being translated to the five written (Spanish, Chinese, Vietnamese, Korean, and Tagalog) and six spoken core languages (Spanish, Cantonese, Mandarin, Vietnamese, Korean, and Tagalog).

One of the key changes in customer notifications being implemented in 2021 is that if power to a customer is not restored overnight, a notification will be provided to the customers in the morning. This notification is intended to provide updated information (if available) on the estimated end of the Period of Concern. Another new notification is being introduced to inform customers when their power is only being temporarily restored. This notification will be sent when we have two Periods of Concern with only a short gap between them.

SCE will also change the cadence of notifications to customers on the monitored circuit list to factor in data from two consecutive weather reports. This adjustment will allow SCE to use more accurate weather data as the basis for scope decisions, which should thereby reduce the number of customers who may come in and out of scope during contiguous weather reports. This should also help SCE reduce the perception of over-notification to customers and respond to customers' desire to have notifications that provide more confidence about whether an event will take place.

In addition, SCE will begin sending the de-energization notifications as soon as a de-energization decision is made instead of waiting for confirmation that circuit or segment has been de-energized. This change should reduce missed and delayed notifications.

<u>PSPS Event Notifications to Non-SCE Account Holders:</u>
SCE has enhanced its PSPS event notification processes to include notification options for those who are not an SCE account holder or customer of record to receive outage notifications. SCE has done this by using area-wide and zip code level notifications, SCE's social media channels, and Nextdoor to communicate with people who may be visiting the area, transient, live in a sub-metered housing unit,[109] or others who do not have access to other forms of notifications.

In late 2019, SCE implemented zip code-level alerting for PSPS events to address the needs of non-SCE customers who are interested in receiving alerts and notifications for a particular area. In July 2020, SCE implemented a second phase of this notification platform by including the option to receive in-language notifications in the currently supported five additional languages. Those interested may sign up for zip code-level alerts at www.sce.com/wildfire/psps-alerts. Separately, SCE launched Google & Nixle Public Alerts in November 2020 as a pilot program, which is currently available in Inyo, Kern, Mono and Los Angeles counties. Google and Nixle Public Alerts are area-wide alerts that will be broadcast to all devices in a given area. Google notifications are sent based on the circuit the customer is on, while the Nixle alert if sent to customers based on their zip code. Once this pilot has been tested successfully, it will be incorporated into all counties served by SCE that are identified as HFRA. SCE worked with CALFIRE to develop the

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[109] Residents of sub-metered housing units (e.g., mobile homes) are typically not SCE account holders. Rather, they obtain service from SCE through the master-metered customer, typically the owner of the development, who has a direct customer relationship with SCE.

notification message sent to customers, and customers can view the areas affected by the PSPS event based on GIS shape files.

In 2019, SCE began participating in the Nextdoor platform, a neighborhood online forum to exchange helpful information, goods, and services. Nextdoor currently has 2.5 to 3.0 million verified users in SCE's service area that can be targeted by region, county, city, or neighborhood. Nextdoor is also used as a channel to reach populations who may not have access to other channels or forms of communications. In 2021, SCE will be enhancing its Nextdoor communications to further refine our targeting capabilities and enable PSPS notifications to be delivered directly to the customers served by a specific circuit segment affected by a PSPS event.

As part of its PSPS Action Plan, SCE will move customers from ZIP code alerts to premise-level alerts if they are also enrolled in premise-level account alerts for a premise in the same ZIP code. The change will reduce duplicate and potentially conflicting notifications to customers previously enrolled in both alert types.

SCE Website (SCE.com):

SCE has also improved its website to make wildfire and PSPS information readily available in multiple languages. In alignment with Commission direction, SCE's website, which contains three wildfire pages and four PSPS pages, now provides information in all prevalent languages beyond English. SCE implemented these changes in November 2020 and is also in the process of enhancing its PSPS website to provide a clear explanation of the pros and cons to customers for signing up for zip code alerts. In addition, PSPS information will now be available to all customers on the website at the same time as it is provided to Public Safety Partners.

SCE will improve the outage look-up features on SCE.com to make it easier for customers to find the status of any type of event that may impact their electrical service. This will address the current inconvenience when customers have to check up to three different website pages (PSPS Events, Maintenance/Repair Outages, and CAISO Rotating Outages) to determine the cause and expected duration of an outage during PSPS events that coincide with other service interruptions.

With the planned enhancements to the website, customers will be able to enter an SCE service address and the website will display the status of any current or planned interruptions to their electrical service including an estimate for the end time for the Period of Concern and an estimated restoration time. In the first phase, SCE will implement a simple search-based service interruption look-up tool to expedite delivery in time for the beginning of the 2021 fire season. Phase 2 of the website enhancements will expand the capability and scope to consolidate the various map-based displays of service interruptions into a single solution to improve the experience for website visitors who need or prefer to see the information in a visual, area-wide format. In Phase 2, SCE will also incorporate additional detail into the map-based display to improve customer understanding of active PSPS event conditions. Further, the website will better reflect realistic expected restoration times for each event.

The Phase 1 development for the website enhancements are expected to be completed in June 2021. The Phase 2 development for the website enhancements are expected to be completed in September 2021.

Priority Notifications:

Per the PSPS Guidelines, certain entities are entitled to receive priority notifications (72 to 48 hours prior to de-energization) whenever feasible. SCE prioritizes the following types of customers when providing notifications related to PSPS events:

Table SCE 8-6
List of Critical Facilities and Infrastructure

Critical Facilities/Infrastructure	
Government Facilities	***Chemical Sector***
Gov't agencies essential to national defense	Chemical Plants
Jails and Prisons	Chemical Distribution Centers
Schools	Chemical Storage Facilities
Communications Sector (Public Safety Partner)	***Transportation Sector***
Cellular Sites, Cellular Switches, Routers	Airports
Central Offices, Head end	CalTrans Operations Centers*
Radio and Television broadcasting stations	Mass Transit Stations
Remote Switches	Transportation Management Centers
Healthcare and Public Health Sector	***Emergency Services Sector***
Blood Banks	Emergency Dispatch Centers*
Dialysis Centers	Emergency Operations Centers
Hospice Facilities	Fire Stations (Federal/State/Local)
Hospitals	Food Banks
Nursing Homes	Police Stations (Federal/State/Local)
Public Health Departments	***Water and Wastewater Systems Sector (Public Safety Partner)***
Skilled Nursing Facilities	Wastewater Treatment Plants, Pumping Stations,
Energy Sector	Lift Stations, Flood Control Gates, Well Sites,
Electric Cooperatives	
Inter-connected Publicly Owned Utilities	
Public and Private Utility Facilities	

* Represents County request as Critical Infrastructure/Facilities

8.2.5 Protocols for mitigating the public safety impacts

Protocols for mitigating the public safety impacts of these protocols, including impacts on first responders, health care facilities, operators of telecommunications infrastructure, and water utilities/agencies.

Public Safety Partner Portal:

Currently, local and tribal government officials, Public Safety Partners, and critical infrastructure managers can access outage and Period of Concern boundaries for HFRA circuits in SCE service area for planning purposes through SCE's Representational State Transfer (REST) Service. SCE will be launching a new Public Safety Partner Portal in June 2021 to improve situational awareness during PSPS events for first responders and operators of critical facilities and communications systems. Features and content of the Portal will include the same real-time PSPS information publicly available on sce.com and through SCE's PSPS REST service and will, subject to appropriate confidentiality measures, expand upon that information to enable better coordination of event response between SCE and Public Safety Partners.

The PSPS Public Safety Partner Portal will be a new website with information that is not available to the public on SCE.com. To gain access to the Portal, partners will need to register and accept a user agreement . The Portal will be a single destination to find PSPS information for planning (pre-event), active PSPS event information and will allow archiving of event data published on the Portal. Users will be able to access information specific to their jurisdictions based on their login credentials. SCE conducted a benchmarking review with PG&E to understand their experiences with a similar portal and leveraged these learnings to develop our requirements for the Portal. The Portal will not replace the existing PSPS REST service immediately.

Subscribers will be able to access the following information on the Public Safety Partner Portal:

- Planning Information (Pre-Event): information for planning purposes when there is no active PSPS event. The information available will include:
  - PSPS planning interactive map (GIS layers, KMZ, Shapefile, PDF, File Geodatabase, GeoJSON)
    - Includes outage areas and impacted circuits
  - Planning Files
    - Outage areas and impacted circuits in various downloadable formats and API to allow integration with third-party systems
  - Planning Reports
    - Summary of potentially impacted customers
    - Critical facilities and identified medical baseline and critical care customers
    - Also available in various downloadable formats and API
  - PSPS Policies & Procedures
  - PSPS Sample Notifications

- Event Information**:** information used to get active PSPS event information and certain archived PSPS event information. The information available will include:
  - PSPS event interactive map
    - Includes outage areas, impacted circuits with estimated restoration times, Community Resource Centers and Community Crew Vehicles
  - Event-specific files
    - Outage areas and impacted circuits in various downloadable formats and API to allow integration with third-party systems
  - Event-specific reports
    - Summary of impacted customers
    - Critical facilities and identified medical baseline and critical care customers

    - Also available in various downloadable formats and API
- Reports including situational awareness and data
- Archive of certain information from inactive past events

The first phase of the Public Safety Partner Portal will be available in June 2021, and the second phase will follow in September 2021. Phase 1 of the Public Safety Partner Portal will include the following functionality: (a) user registration and request for Portal access; (b) PSPS planning data; (c) PSPS event data; (d) situation reports during events; (e) user notification when new PSPS content is published; (f) ability for users to download planning and event data in different formats (Shapefiles, GeoJSON, CSV, Excel); and (g) archiving of certain event data published on the Portal. Phase 2 of the Public Safety Partner Portal will include the following functionality: (a) Portal usage monitoring; (b) automated data pipelines; and (c) user experience improvements.

<u>Backup Power:</u>

Because PSPS may disrupt electric services to critical electrical loads and essential customers, SCE may contract the deployment of temporary mobile generators for critical facilities to assist maintaining electric service for essential life safety and public services emergencies on a case-by-case basis. These case-by-case decisions will be made by the IMT, based on the unique circumstances associated with each event. SCE's supply chain organization performed a competitive solicitation for regional vendors who could support mobile generator deployment and will keep a list of generator vendors assigned to different regions. Under the plan, SCE would begin to assess emergency generator deployment once the PSPS IMT is activated and emergent public safety needs are identified.

2020 was also the first year that SCE was prepared to provide backup generation to select pockets of customers on HFRA circuits. These areas were completely underground portions of frequently impacted circuits that are served by overhead bare conductor. Because of the very low wildfire danger from underground cable, SCE began engineering solutions to provide mobile diesel generation to those circuit segments so that they could remain energized even if their source line is proactively de-energized for PSPS.

Temporary back-up power under certain conditions may be used to safely power subsets of customers who would otherwise be affected by a PSPS event. In late 2020, SCE took delivery of a novel mobile battery energy storage system (MBESS), which will function as a zero-emission alternative to a mobile diesel generator. In preliminary deployments, SCE will operate the MBESS in conjunction with diesel generators to reduce net emissions. SCE will also identify potential opportunities for standalone MBESS operation. With 0.7MW/2.9MWh power energy capacity, the MBESS can support multiple customers during a typical PSPS event, depending on targeted customer load profiles and event duration. The preliminary deployment site, north of Chatsworth in Los Angeles County, has been impacted by past PSPS events and includes 121 total customers (113 residential and eight commercial). This site was well-suited for the preliminary deployment based on load profile, available space for equipment, and prior work preparing for temporary diesel generator implementation. The system is expected to be ready for deployment in time for peak 2021 wildfire season. Potential additional deployment sites have been identified in Ventura and San Bernardino counties. Expansion of MBESS deployment to other sites for the

2021 fire season will be evaluated based upon factors such as effectiveness in mitigating customer minutes of interruption and avoided emissions.

8.3 PROJECTED CHANGES TO PSPS IMPACT

Describe organization-wide plan to reduce scale, scope and frequency of PSPS for each of the following time periods, highlighting changes since the prior WMP report and including key program targets used to track progress over time

For a more detailed description of SCE's commitment to reductions in the scale, scope, and frequency of PSPS events in 2021, please see Section 8.1.2 above. Based on current program projections, but subject to change as the year progresses, SCE plans to take the following actions in the noted timeframes to achieve the expected reduction in the scale, scope and frequency of PSPS events.

1. By June 1 of current year

During the first half of 2021, SCE is developing circuit mitigation plans for frequently impacted PSPS circuits, which may build upon existing circuit plans for circuits that were subject to PSPS de-energization in 2019. Circuit mitigation plans identify ways to avoid de-energization of a specific circuit or isolatable circuit-segment by evaluating all relevant mitigations (e.g., covered conductor, sectionalizing devices, backup power) and accelerating those mitigations that provide the most potential PSPS reduction, where possible.

SCE will also develop and deliver appropriate training and facilitate exercises for dedicated and pooled IMT positions so that all new and existing protocols can be reviewed. Details on IMT training are discussed in Section 7.3.9.1.

2. By September 1 of current year

As circuit mitigation plans are being executed, SCE expects to re-evaluate its environmental and consequence modeling to verify and revise circuit de-energization thresholds, which could potentially support complete removal of an entire circuit or isolatable circuit segment from the PSPS monitoring scope.

As described in Section 8.1.2, SCE plans to perform analysis and validation of its machine-learning model for the creation of PSPS thresholds and triggers in 2021. Assuming final verification and successful side-by-side testing of the new model against SCE's current algorithm, SCE will integrate this new data model into its situational awareness tools.

3. By next Annual WMP Update

In the longer term, SCE plans upgrades to the forecasting and modeling for PSPS events, namely through the development and implementation of the Next Generation Weather Modeling System, which will include robust ensemble forecasting, machine learning modeling, and an improved FPI. Upgrading the forecasting and modeling will help SCE be more precise on executing a PSPS event.

Though not directly related reducing PSPS scope, scale or frequency, SCE has undertaken additional activities for community engagement. SCE will also conduct its yearly stakeholder and community engagement meetings, providing PSPS and wildfire mitigation updates. Some of these meetings will take place with specific communities and elected officials, offering detailed plans for frequently impacted circuits in their areas. These meetings will help inform the IMT's communications redesign to address concerns with counties, conduct end-to-end process mapping and further improve/automate notifications protocols.

Review and evaluation of customer care options will also take place, again influenced by customer feedback. Included in this effort will be the implementation of planned resiliency zones and backup power for select CRCs. Additional details on customer care programs are described in Section 7.3.6.5.2.

In 2021, SCE will use machine-learning models to better forecast weather. Machine-learning can remove forecast bias[110] to improve weather forecasts. Forecast bias may result in errors when identifying circuits that are forecast to breach PSPS thresholds. SCE has identified 61 locations along 54 circuits (typically in mountainous or coastal terrain) that are subject to persistent forecast bias. Machine learning will use pattern recognition to relate forecasts to actual outcomes. Preliminary testing has shown output for six high wind events in 2020 provided up to a 50% improvement in detecting weather stations that would exceed 31 MPH sustained winds over the currently used base weather model forecast. We will be able to assess the machine learning forecasts alongside the existing weather model output to more accurately identify circuits forecast to breach PSPS criteria.

8.4 ENGAGING VULNERABLE COMMUNITIES

8.4.1 Vulnerable Communities

Describe protocols for PSPS that are intended to mitigate the public safety impacts of PSPS on vulnerable, marginalized and/or at-risk communities. Describe how the utility is identifying these communities.

As part of its PSPS Action Plan, SCE discussed several specific areas of focus in 2021 for ensuring that its vulnerable customers are prepared for PSPS events and enroll in programs intended to support them during such events. These include expanded outreach and marketing for its programs, increased research on vulnerable populations, and an enhanced online AFN customer experience.

Outreach and Education

To mitigate the impacts of PSPS events on vulnerable, traditionally marginalized and/or at-risk customers, as well as all other customers, SCE has developed a comprehensive communications strategy focusing on outreach, education and awareness in advance of emergencies. Communications are designed to emphasize the importance of building personal resilience so that customers, including AFN populations, are prepared and remain safe when any power outage or other emergency occurs. Messaging focuses on communicating what to do during emergencies, what to expect, and the resources available following emergencies. SCE's messaging is developed for all types of emergencies, including PSPS de-energizations and other types of power outages.

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[110] A forecast bias occurs when there are consistent differences between actual outcomes and previously generated forecasts.

SCE's plan includes outreach and education through various channels, including direct mail, social media, digital awareness, dedicated web pages and trained resources that provide direct support to customers, which helps to address the diverse needs of its customers. Additionally, SCE partners with CBOs and trusted agency partners to help amplify education and awareness about these important topics for our customers. These strategies are discussed in greater detail in Section 7.3.10 and can also be found in SCE's AFN Plan submitted on Feb. 1, 2021.[111]

As part of its PSPS Action Plan, SCE has increased its marketing, education, and outreach to enroll vulnerable populations into appropriate programs and services, such as SCE's Medical Baseline program. The increased marketing includes advertisements in English and other languages using a variety of channels, including digital banners, digital video, connected TV, social media, digital audio and broadcast radio. In addition to this overall marketing campaign, SCE is working to promote meaningful and relevant programs that offer benefits, incentives, and services to its AFN customers. SCE will promote these programs throughout the year using campaigns dedicated to individual programs. Communications that include highlights about available programs are sent to customers to raise awareness and direct them to channels, such as sce.com and SCE's customer contact center, where they can learn more about the programs. In 2021, SCE is more than tripling the dedicated marketing budget to increase Medical Baseline program enrollments.

SCE launched its expanded marketing and outreach for the Medical Baseline program in March 2021 and delivered an email campaign to approximately 420,000 customers with the highest likelihood of eligibility and need for the Medical Baseline program. In April 2021, SCE promoted the Medical Baseline program to 1,600 community-based organizations through SCE's CBO newsletter. In addition, SCE rolled out digital banner ads in English as well as in Spanish, Chinese, Korean, Vietnamese, and Tagalog in April 2021. SCE also created and deployed new ads promoting Medical Baseline through digital banners and print ads.

In addition, SCE will enhance the online experience by creating a dedicated web page where customers can self-certify as vulnerable, enroll in customer programs, and update their contact information.

PSPS Notifications and Alerts

SCE's overall PSPS notification and alert strategy is described above in Section 8.2.4. In addition, SCE employs a number of different channels to alert and notify specific at-risk customer groups about PSPS events. In 2020, SCE added a dedicated Customer Care team to its PSPS IMT. The Customer Care team's purpose is to effectively manage the needs of our vulnerable populations during PSPS events. This team helps ensure advanced notifications are sent to community partners such as CBOs, 2-1-1 and other trusted agencies statewide as PSPS events unfold. Community partners are engaged before, during and following events in the development and execution of customer care plans that help address the needs of vulnerable customers impacted by the events. The SCE Customer Care team is engaged throughout the

[111] See Southern California Edison's Access and Functional Needs 2021 Plan for Public Safety Power Shutoff Pursuant to Commission Decision in Phase Two of R.18-12-005: Go to www.sce.com/regulatory/CPUC-Open-Proceedings; Click "View and Search all CPUC Documents"; Click "Proceeding #" column header; Click "Filter By", type "R.18-12-005" into the Search box, and "Apply"

PSPS event with the broader IMT and facilitates requests made through Public Safety Partners or other agencies seeking support for vulnerable customers.

To better support vulnerable populations during PSPS events, SCE works closely with other agencies and partners to raise awareness, share information and support resource planning to aid these populations. For example, when possible SCE provides three-day advanced notification to its Public Safety Partners, including county/tribal governments and first responders, upon activation of its EOC. Advanced notification helps these agencies prepare to respond to potential de-energization and community needs and begin contacting constituents. Upon request during PSPS events, SCE shares information about the vulnerable populations who may be affected by the PSPS event with representatives from county offices of emergency management to aid them in executing their own plans to assist vulnerable populations.

Community Resources During De-Energization

Sections 8.2.1 and 7.3.6.5.2.1 describe SCE's use of CRCs and CCVs to serve people affected by PSPS events.

Although CRCs and CCVs are intended to serve all customers, not just AFN populations, SCE considers the AFN population when contracting CRCs and enhancing capabilities. All contracted CRCs must meet Americans with Disabilities Act requirements. Six of SCE's CRCs are located at ILCs, which are facilities specifically serving the needs of AFN populations. This partnership enables SCE to leverage the expertise and pre-established relationships that these ILCs have with the communities in addressing diverse AFN needs. CRCs and CCVs also serve the AFN community by providing extension cords that enable charging of small medical devices. Some CRCs may also have refrigeration for temporary storage of medication. Customers may also update their contact information and enroll in SCE programs, including income-qualified programs, and outage alerts at CRCs and CCVs. In response to the COVID-19 pandemic, some features may not always be available as SCE tailors its CRCs to comply with state and local social distancing requirements.

AFN Advisory Council

SCE co-launched the California statewide AFN Advisory Council with other IOUs in 2020 to raise greater awareness of the needs of our AFN populations and to collaborate on initiatives that will advance communications, resources and support for these populations, all aimed at PSPS impact mitigation. The AFN Council is comprised of more than 40 statewide agencies representing various AFN communities and stakeholders such as the Cal OES Director of AFN, members of the CPUC, and advocacy groups. SCE will continue to sponsor this effort into 2021 and is committed to advancing new concepts and initiatives to support our vulnerable populations.

SCE remains committed to building upon the expertise within the AFN Advisory Council and further opportunities to serve its AFN populations. In the Joint IOU Statewide AFN Advisory Council held in April 2021, the Council discussed how SCE, PG&E, and 211 can work together to create a statewide 211 service, building further on the 211 engagement that SDG&E initiated earlier in 2020. The IOUs are also working with the Department of Social Services to develop a communications plan to promote program communications with In-Home Support Services (IHSS), which serves approximately 600,000 clients. Additionally, the IOUs are collaborating to create a draft inventory of information at the aggregated ZIP code level of those IHSS and Regional Center clients that rely on electricity, as well as capturing IOU Medical Baseline recipients by ZIP code to better understand the geographic representation of AFN customers at the ZIP code level.

Process Improvements

SCE is developing the capability for Medical Baseline applicants to use DocuSign for physician e-signatures required for enrollment. The development efforts for the launch are complete, however, SCE plans to launch the functionality after the current emergency consumer protections due to the COVID-19 pandemic (which include not requiring physical signatures) expire on June 30, 2021. This change will allow customers to receive program benefits more quickly after enrollment.

In 2021, SCE expanded some of its customer care programs targeted toward the AFN population. For example, SCE expanded the eligibility requirements for the CCBB Program to all customers enrolled in SCE's MBL Program who are also enrolled in CARE/FERA and reside in HFRA. The expansion of this program increased eligibility from 2,641 to approximately 13,000.

In 2021, SCE expanded its marketing with a focus on customer programs, including Medical Baseline and the CCBB programs. We expanded our marketing efforts through new ads (digital, print, emails, etc.) and by partnering with external agencies such as IHSS and CBOs, as well as collaborating with the IOU Statewide AFN Council. We are providing information to Public Safety Partners and customers through community meetings, meetings with local and tribal governments, workshops, working groups, and trainings.

AFN Research

In 2021, SCE will launch a broad AFN Research study that will include both SCE customers and CBOs that serve AFN communities. This study will aim to gather qualitative data to better understand AFN customer needs in preparation for PSPS and to understand AFN customer expectations of SCE before, during, and after a PSPS outage. Using this qualitative data, SCE can more effectively build campaigns, programs and customer care plans to aid these populations as emergencies unfold.

Identification of Vulnerable Populations

In February 2020, SCE performed an analysis to identify the percentage of the SCE customer base that meets the definition of AFN[112] in D.19-05-042[E32]. SCE found that approximately 80 percent of SCE's total customer population would identify in at least one AFN category, given the expansive definition. SCE actively collects information on a subset of this population that directly interface with SCE's customer programs and services.[113] For the remainder, SCE enlists the help of a third-party vendor to obtain

[112] AFN populations consist of "individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency, or who are non-English speaking, older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant." See D.19-05-052, pp. A6-A7.

[113] More information about how SCE tracks AFN populations may be found in the Calculation of Key Metrics, Chapter 4.4 under Access and Functional Needs Population.

information about population characteristics in order to help refine its outreach and engagement to AFN populations.

Using data on customer characteristics, such as current customer program participation, energy usage, demographic, psychographic information, and operational data, SCE developed a model to estimate MBL propensity scores to each SCE service account based on predicted probability. SCE will use this data in 2021 to increase our campaigns to identify and assist MBL customers.

As discussed above, SCE initiated its AFN research in 2021 to help us further understand the varying needs and impacts of this diverse and vulnerable population when PSPS events unfold. This research study will help to influence customer care plans and future programs that will address the gaps in resiliency capabilities for AFN customers so that as PSPS events unfold, this population will have emergency plans in place that enable them to remain resilient through these events. Data gathered from this study will enhance and inform the strategies for greater integration with the vulnerable population and customer programs offered by SCE for the needs of our vulnerable populations.

8.4.2 Prevalent Languages

List all languages which are "prevalent" in utility's territory. A language is prevalent if it is spoken by 1,000 or more persons in the utility's territory or if it is spoken by 5% or more of the population within a "public safety answering point" in the utility territory (D.20-03-004).

SCE's advice letter 4215-E filed on May 15, 2020 identifies the following "prevalent" and indigenous languages (in addition to English) prevalent in its service area:

Prevalent Languages:

1. Arabic
2. Armenian
3. Cantonese[114]
4. Farsi
5. French
6. German
7. Japanese
8. Khmer
9. Korean

[114] Cantonese and Mandarin refer to dialects of the spoken word. SCE uses Traditional Chinese for these speakers thus has 18 written "prevalent" languages.

10. Mandarin
11. Punjabi
12. Russian
13. Spanish
14. Tagalog
15. Vietnamese

A subsequent ALJ Ruling (R.18-10-007)[E33] issued in August 2020 ordered SCE to also treat four additional languages as "prevalent" within our service area:[115]

16. Portuguese
17. Hindi
18. Hmong
19. Thai

While not considered "prevalent" languages, D.20-03-004[E33] ordered electrical utilities to also conduct community awareness and public outreach in languages spoken by indigenous communities that have significant roles in California's agricultural economy regardless of prevalence. SCE has identified three Indigenous (Spoken) Languages within our service area:[116]

1. Mixteco
2. Zapoteco
3. Purepecha

8.4.3 Languages for Public Outreach Material

List all languages for which public outreach material is available, in written or oral form.

SCE is working toward conducting wildfire-related community awareness and public outreach in all languages prevalent in our service area along with the three indigenous languages. In 2020, SCE continued to promote wildfire and resiliency awareness in the prevalent languages through several channels, including direct mail, web-based messaging, community meetings, digital media, and radio. SCE also worked to reach and administer pre- and post-wildfire season surveys in the preferred language of the survey participants. While advancing toward these goals, SCE has set up processes that are currently available to provide translation options for prevalent language speakers.

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[115] *See* August 21, 2020 Administrative Law Judge's Ruling Regarding Compliance Filings Submitted In Response to Decision 20-03-004 Related to In-Language Outreach Before, During And After a Wildfire And Surveys Of Effectiveness of Outreach, OP 1, p. 6.
[116] D.20-03-004[E34], OP 1, p. 37.

SCE conducted digital and radio campaigns targeting customers in its HFRA and in languages that are prevalent, to the extent available. To conduct customer outreach and community awareness in the prevalent languages, SCE is developing a web-based Multicultural Communications Resource Library. The majority of SCE's channels will provide links to this web-based library that will serve as a centralized hub for customers to find wildfire-related outreach in all prevalent languages. Most notably, this Multicultural Communications Resource Library will provide non-English speaking customers access to all versions of radio, website, social media, digital ads, print collateral, email, direct mail, call center, notification texts, recorded messages, and emergency alerts created in all languages (beyond English) that are prevalent in its service area. SCE has enlisted a third-party vendor to integrate its translation technology and artificial intelligence capability into SCE's website, sce.com, so that webpages can be established in all prevalent languages.[117] This work was completed in December 2020. The estimated deployment and "go live" of SCE's Multicultural Communications Resource Library is expected during the first quarter of 2021.

Beginning in May 2020, SCE ran a mass media campaign to educate customers about emergency preparedness, urging them to sign up for outage alerts and provide information about the critical wildfire mitigation work that SCE is undertaking. These ads took place in the following media/languages:

Table SCE 8-7
List of SCE Channels and Associated Languages

CHANNEL	LANGUAGES
Radio[118]	English, Spanish, Mandarin, Cantonese, Korean, Vietnamese
Digital Banners	All prevalent languages and English
Social Media[119]	English, Spanish
Digital Videos	English, Korean, Chinese, Spanish, Tagalog, and Vietnamese
Direct Mail (PSPS Newsletter)	English and a list of SCE customer service contact numbers and PSPS website (in-language versions, where available) was provided in Spanish, Chinese, Korean, Vietnamese, Cambodian, Tagalog, Arabic, Armenian, Farsi, French, German, Japanese, Punjabi and Russian

[117] SCE's wildfire and PSPS related webpages that are available in all prevalent languages include: Wildfire Safety primary landing page (sce.com/wildfire), Wildfire Mitigation Efforts page (sce.com/mitigation), PSPS page (sce.com/psps), PSPS Alerts page (sce.com/pspsalerts) Fire Weather page (sce.com/fireweather), Community Meetings page, (sce.com/wildfiresafetymeetings), and Customer Resources and Support page (sce.com/customerresources).

[118] There are no radio stations in Southern California that transmit in the remaining prevalent languages. SCE does not implement radio ads in many of these languages as these ads are dependent on availability of a resource in SCE's Corporate Communications organization with the ability to speak that language and reply in real-time.

[119] SCE does not implement social media in many of these languages as social media is a two-way communication channel that is dependent on availability of a resource in SCE's Corporate Communications organization with the ability to speak that language and reply in real-time. SCE is limited in how it communicates on social media in many of these prevalent languages.

In collaboration with the other IOUs, SCE designed a questionnaire, also known as the In-Language Wildfire Mitigation Communications Effectiveness Surveys, to measure the communications and outreach effectiveness prior to and coincident with the wildfire seasons by prevalent language. The questionnaire was administered in two phases: a pre-wildfire season survey in August / September 2020, and a post-wildfire season survey in November / December 2020.[120] In mid-August 2020 when the pre-surveys were launched, SCE initially included the 15 "prevalent" languages – Arabic, Armenian, Cantonese, Mandarin, Farsi, French, German, Japanese, Khmer, Korean, Punjabi, Russian, Spanish, Tagalog, and Vietnamese – plus English for a total of 16 languages. Given the August 21, 2020 ALJ Ruling, SCE expanded the survey to include five additional languages (Hindi, Hmong, Portuguese, Thai, and Urdu) for a total of 21 languages – and subsequently added five more variations of Hindi (Bengali, Gujarati, Tamil, Telugu, and Pashto) for a total of 26 languages. Survey invitations were delivered to Residential and Business customers via email in all 26 languages (with a link to a self-administered web survey in the language of the respondent's choice) and phone (to an interviewer-administered telephone survey). For phone surveys, the Computer-Assisted Telephone Interview (CATI) phone center has staff capable of administering the questionnaire in all languages, although not all interviewers / languages were available at all times. Upon encountering a language barrier with a potential survey respondent, the interviewer attempted to identify the language and stored the customer record for re-contact at a later date. If the language could not be identified, a surname-based, pre-coded flag was used to assign the record for re-contact at a later time.

All Residential and Business pre-wildfire season surveys were completed between August 18 and October 14, 2020 and administered on a large scale to the general public (Residential and Business customers) systemwide and in HFRA. Post-surveys were fielded between November 11 and December 11, 2020. In SCE's service area, the pre-survey was also administered to geo-targeted areas (*i.e.,* ZIP codes) with high concentrations of Chinese, Korean, and Vietnamese speaking customers as an additional test to determine the types of in-language preferences or dependencies specific to these areas, which could not be easily identified in SCE's database. In these areas, more than 85% of the screenings qualified as a "member of" a targeted community (versus the expected 50%). The post-surveys were also conducted with Residential and Business customers area-wide and in the HFRAs, but not in the GEO targeted areas.

8.4.4 Community Outreach for PSPS

Detail the community outreach efforts for PSPS and wildfire-related outreach. Include efforts to reach all languages prevalent in utility territory.

In 2020, SCE increased the number of prevalent languages pursuant to OP 3 of D.20-03-004[E34] in its service area when conducting community outreach to increase public awareness of emergency planning and preparedness. Since SCE's community outreach efforts for PSPS and wildfire-related activities are described in detail in Section 7.3.10, SCE offers below some additional context around those efforts to reach communities in all languages prevalent in SCE's service area.

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[120] See SCE's December 31, 2020 compliance filing entitled Southern California Edison Company's 2020 Survey Results Pursuant To Public Utilities Code Section 8386(c)(18)(B), As Required By Decision 20-03-004, And Response to August 21, 2020 Administrative Law Judge's Ruling that includes the pre- and post-survey questions and detailed reports on the 2020 Survey results.

SCE's community meetings in 2020 on the company's wildfire mitigation activities, PSPS protocols, customer programs, resources and wildfire preparedness were conducted as online livestream meetings due to COVID-19. The online platform allowed participants to receive translations through closed captioning. While the livestream meetings were conducted in English, SCE leveraged its existing platform for 2020 to provide closed captioning in six different languages (English, Spanish, Chinese, Tagalog, Korean, and Vietnamese) during these events. SCE recorded the community meetings and added closed captioning to the recorded videos, [121] which enabled translation into multiple languages on YouTube. In addition, SCE added American Sign Language (ASL) versions of the videos. SCE's other community outreach activities related to wildfire and PSPS were conducted in English, including local and tribal government meetings, PowerTalks, resiliency workshops, PSPS Working Group and PSPS Advisory Board meetings.

SCE issued a RFP to CBOs to aid with conducting outreach and communications to the customer segments previously mentioned and in the prevalent languages required by D.20-03-004[E34]. SCE selected 50 CBOs through the RFP selection process to partner with SCE to help educate their constituents around wildfire and how to be prepared in the event of a disaster or a PSPS. The 50 selected CBOs support all 19 prevalent languages (in addition to English) mandated by D.20-03-004[E34] and the subsequent ALJ Ruling. SCE will continue to explore options to expand in-language engagement through partnerships and collaboration with CBOs and other organizations.

SCE's wildfire risk reduction and PSPS outreach prior to the start of the fire season provided in-language information in all prevalent languages to direct customers to contact our Customer Contact Center. SCE's Customer Contact Center currently communicates in English, Spanish, Mandarin, Cantonese, Korean, Vietnamese, Tagalog, and Cambodian. SCE's customer service representatives also use a translations service vendor that supports more than 150 languages for customer inbound inquires, to ensure all prevalent languages are available to customers.

When power outages occur, SCE customers who have enrolled will receive digital outage notifications in English and translated notifications in Spanish, Tagalog, Vietnamese, Chinese (Mandarin and Cantonese), and Korean. In addition, the sce.com/outage-center website provides customers with access to information on the status of the outage affecting them. Non-English-speaking customers are directed to contact the Customer Contact Center where they can speak to an SCE representative or in conjunction with SCE's translation vendor to help ensure communications occur in-language. SCE is working toward providing outage notifications in all required prevalent languages and plans to implement these additional languages in 2021.

After an emergency, SCE conducts outreach to impacted customers to raise awareness about its consumer protections via on-bill messaging, direct mail (when appropriate), email, CBO engagement, targeted social media, web-based content, and direct phone calls (in certain cases when emergency events impact a smaller population of customers). The purpose of these communications is to inform customers of

[121] Recorded community meetings are available for viewing on SCE's website at sce.com/wildfiresafetymeetings.

important protections such as billing adjustments, deposit waivers, extended payment plans, suspension of disconnection and nonpayment fines, and access to utility representatives.

After a wildfire, SCE will provide in-language information in all prevalent languages that directs customers to contact our Customer Contact Center where they can speak to an SCE representative and third-party interpreter, if needed, for in-language communications.

SCE has continued to evaluate alternatives and refinements to its community engagement activities and included some of these in the PSPS Action Plan it submitted to the Commission on February 12, 2021. SCE will include changes in approach, scope or cost in Change Order Reports to this WMP.

SCE is improving its processes and protocols to begin providing customers newly developed, clear and concise information explaining why customers are in scope and being notified regarding PSPS, including the factors that lead to de-energizations and improvements on the grid that will ultimately reduce the need for PSPS. SCE will also provide information about and increase enrollment in customer programs and services that support customer resiliency. In addition to the overall marketing campaign, SCE will continue targeted marketing efforts to its AFN customers.

SCE will continue using SCE's customer-facing Energized by Edison website to complement our outreach activities. Through this website we share content that aids customers in understanding PSPS and encourages customer participation in rebates and other customer programs. SCE recently published the following articles on its website:

- Protecting Communities in Sierra Nevada on March 2, 2021
- Drone Usage for Beyond-Visual-Line-of-Sight Inspections on March 5, 2021
- Expediting grid hardening to reduce PSPS on May 4, 2021

SCE's ongoing marketing campaign, which includes radio, digital, social media, search ads and direct customer mailings, seeks to educate customers and the public on PSPS, including the conditions that trigger a PSPS, how to prepare for a PSPS, what SCE has done and continues to do to mitigate the risk of wildfires, and how to prepare for emergencies, including signing up for PSPS alerts. In 2021, SCE created new digital ads and print materials to expand the campaign for increasing customer awareness of and participation in customer programs and services. Print ads promoting the Medical Baseline program, signing up for outage alerts, and preparedness for emergencies and PSPS were published in 40 ethnic (African American, Chinese, Filipino, Korean, Spanish and Vietnamese) newspapers in April 2021 and will appear again in June 2021.

SCE will track impressions, with a 2021 campaign-wide goal of one billion impressions, as well as measuring click-through rates for these ads.

8.5 PSPS-SPECIFIC METRICS

Please see below for SCE's quarterly response submittal for the 2020 WMP Class B Deficiency SCE-20.
Name: Potential notification fatigue from frequency of PSPS communications (**Class B**)

Category: Emergency Planning and Preparedness

Deficiency: *SCE's rapid expansion of PSPS implementation and the associated decision-making to "call" a PSPS, led to constant and persistent PSPS events in the summer of 2019. Given PSPS notification requirements, this led SCE's customers and public safety partners to experience notification fatigue, which could potentially reduce the effectiveness of SCE's notifications. Striking the right balance for timely and accurate notifications is paramount to effective emergency planning and preparedness. SCE's PSPS notifications in 2019 were criticized for being overwhelming, inaccurate or confusing.*

Condition:
In its quarterly report, SCE shall detail:

i. its plans for ensuring PSPS notifications are both timely and accurate,

ii. the number of PSPS events initiated during the prior quarter,

iii. the number of pre-event notifications sent for each event, and

iv. the number of false-positive pre-event notifications (i.e. a customer was notified of an impending PSPS event that did not occur) for each event.

Condition i:

In Q1 2021, SCE initiated one PSPS event. Based on this event and other past experiences, SCE continued to revise its processes and protocols to incorporate lessons learned during previous de-energization and re-energization activities.

As mentioned in Section 8.2.4, SCE's Action Plan includes various technical enhancements that will help increase the timeliness and accuracy of PSPS notifications. SCE has also made the following operational changes:

- SCE will send imminent de-energization notifications when reaching a pre-set threshold for each segment. This should improve ability to send imminent notifications in a timely manner, reduce missed imminent notifications, and reduce over-notification that had happened when notifying at the circuit but de-energizing at the segment level. The threshold is set for each event, based on the complexity of the event.
- SCE will send de-energization notifications when de-energization is authorized by the incident commander instead of after confirmation that power has been shut off. This should speed de-energization notifications and reduce missed notifications.
- SCE will publish monitored circuit maps for all customers at the 72-hour mark immediately following release of maps to Public Safety Partners (currently on REST service and after June 1 also on new Public Safety Partner Portal). This should reduce confusion when Public Safety Partners alert customers before SCE notifies them at the 48-hour mark. Given the lack of forecasting granularity in this time frame, SCE begins sending customer notifications at the 48-hour mark.
- SCE will provide pre-event and update notifications based on weather reporting once a day rather than twice a day. This should improve accuracy and reduce over-notification.

SCE discusses various notification improvements in Section 8.2.4. This discussion includes progress on improved messaging, revised messaging cadence, technology enhancements, and premise-level notifications.

Conditions ii. – iv.:

SCE sends several kinds of PSPS notifications in alignment with regulatory requirements, broadly categorized as customer service notifications and notifications sent to local and tribal governments, Community Choice Aggregators, federal and state legislative offices, Community-Based Organizations, key contacts at Independent Living Centers, 211, and the American Red Cross and other Public Safety Partners. Once weather conditions at individual circuits are forecast to breach thresholds and an SCE IMT is activated to manage the upcoming event, notifications are sent to potentially affected customers and agencies, at the intervals specified in the PSPS Guidelines.

PSPS notifications begin with in-scope notifications to critical infrastructure providers, impacted jurisdictions and Public Safety Partners three days in advance and subsequently every day in advance of a PSPS event. Customer notifications begin two days in advance, followed by one day in advance and on the day of the forecasted PSPS event, when possible. These notifications are designed to inform customers that SCE might need to de-energize their circuits or circuit segment as part of an upcoming PSPS event. Update notifications are also sent noting changes in weather forecasts that could take them out of scope for the event or return them to scope. SCE interprets all these customer notifications to be "pre-event" notifications. SCE will not de-energize circuits or segments that are unlikely to meet pre-set thresholds for de-energization. SCE considers these in-scope notifications to be a prudent step meant to give customers and Public Safety Partners an advance warning of a potential de-energization and the ability to put into action their emergency plans.

Should a de-energization be necessary because of the real-time risk to a circuit, SCE sends "imminent de-energization notifications," which are delivered 1-4 hours before a PSPS de-energization, when possible. On the customer notification side, these notifications are sent only to customers on the targeted circuit or circuit segment. Jurisdiction and Public Safety Partner notifications are sent to all impacted jurisdictions, grouped by county, and include a spreadsheet of circuits in scope by county.

Once de-energization occurs, SCE sends a de-energization confirmation notification to affected customers and to jurisdictions and Public Safety Partners informing them that they have been de-energized because of PSPS. Next, customers, jurisdictions and Public Safety Partners are sent an imminent re-energization notice when the Period of Concern has ended, and SCE begins to patrol the circuit prior to restoration. Customers also receive a confirmation notice once re-energization is completed. Lastly, SCE sends an "all clear" notification once a PSPS event has ended.

WSD defined "false-positive" pre-event notifications as a customer being notified of an impending PSPS event that did not occur. "Impending" can be reasonably interpreted to mean "imminent" or customers who were noticed 1-4 hours before the PSPS de-energization. However, in the spirit of transparency, SCE has provided all the notification information along with the actual de-energization information in its post-event reports.

SCE notes that “false positives” typically refer to decisions made, or actions taken based on erroneous information. SCE notes that these “false positives” do not stem from incorrect data, but rather from actual ground conditions varying from forecast conditions. This variance is inherent in every weather forecast application because of the constantly changing nature of emergent weather.

SCE recognizes the impact of notifications and potential notification fatigue and makes every effort to avoid sending unnecessary communications during PSPS events. However, SCE must balance the risk of notifying customers too frequently with the risk of inadequate or late notification of PSPS events, which can leave customers unprepared for service interruptions. SCE’s decision-making process for PSPS events responds to weather conditions, which may change rapidly or unpredictably. The risk of late notifications leading to under-preparation may outweigh the risks associated with notifications of potential PSPS de-energizations that do not materialize and potential over-preparation.

As mentioned earlier, SCE sends notifications to impacted jurisdictions and Public Safety Partners. SCE’s Liaison Officer also sends notifications to its affected stakeholders including city, county and tribal government officials, Public Safety Partners, community choice aggregators, state and federal legislative offices, key contacts at ILCs, 211, and the American Red Cross. The main difference between customer service and jurisdictions and Public Safety Partner notifications is that jurisdictions and Public Safety Partner “in-scope” notifications are sent starting at the three-day mark, one day prior to general customer notifications, and then in a daily cadence through the lifetime of the PSPS event as well as in real time during the PSPS de-energization. Jurisdiction and Public Safety Partner notifications are provided to share situational information as SCE knows it. To reduce notification fatigue while continuing to provide stakeholders with timely information about possible future PSPS events, stakeholders are encouraged to leverage their own group email address and control frequency and distribution on their side so the appropriate people are receiving the level of information they require while not overwhelming others. The jurisdiction and Public Safety Partner distribution list is based on contact information provided by each organization.

The tables below provide the notification summary for the one PSPS event initiated during the prior quarter (January 2021 to March 2021). This PSPS event impacted several counties in the SCE area - Fresno, Kern, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. The event was composed of three separate periods of concern - January 14 to January 15 with 389,152 customers in scope, January 16 to January 17 with 303,928 customers in scope, and January 18 to January 20 with 332,183 customers in scope. SCE ultimately de-energized a total of 114,341 customers during the entire PSPS event. Power was restored to all customers impacted by PSPS on January 21 at 6:30 pm. Customer notifications are counted by individual recipients who have opted in to receive notifications, whereas jurisdiction and Public Safety Partner notifications are counted by notification campaigns not the number of individual contacts that were sent notifications.

Table SCE 8-8
Customer Notifications
PSPS Events (January 2021 – March 2021)

Category	Event Period: 1/12/21 – 1/21/21
Pre-event (In-Scope) notifications sent	317,610
Imminent De-energization notifications sent	80,810
De-energize confirmations notification sent	49,680
Imminent Re-energization notifications	60,860
Re-energize confirmations notification sent	59,890
All Clear notifications sent	157,340

Table SCE 8-9
Jurisdiction and Public Safety Partner Notifications[122]
PSPS Events (January 2021 – March 2021)

Category	Event Period: 1/12/21 – 1/21/21
Pre-event (In-Scope) notifications sent	7
Imminent De-energization notifications sent	200
De-energize confirmations notification sent	126
Imminent Re-energization notifications	145
Re-energize confirmations notification sent	169
All Clear notifications sent	9

Table 11: Recent use of PSPS and other PSPS metrics

Instructions for PSPS table:

In the attached spreadsheet document, report performance on the following PSPS metrics within the utility's service area over the past five years as needed to correct previously reported data. Where the utility does not collect its own data on a given metric, the utility shall work with the relevant state agencies to collect the relevant information for its service area, and clearly identify the owner and dataset used to provide the response in the "Comments" column.

Table 11 provides a five-year history, where applicable, as well as one year of projections of Recent use of PSPS and other PSPS metrics as defined by the Guidelines. The comment section for each metric in the table provides details of the source and data that was used or explanations for why certain data is not available.

[122] Because SCE employs circuit segmentation when possible to limit customer impacts, it can be the case that SCE sends jurisdiction and Public Safety Partner notifications multiple times to a given circuit, based on a potential de-energization to a new portion of that circuit. When restoring, SCE may re-energize the circuit all at once, leading to fewer all-clear notices than de-energization notices for that circuit.

Table 11 represents the frequency, scope, and duration of PSPS events in total. A combination of data from SCE's OMS and data recorded by documentation specialists during actual PSPS events was used for the historical information. For projections, Q1 2021 used actual PSPS event data from SCE's January event. No further PSPS events are forecasted for Q1 as the fire season is expected to have ended. For Q2-Q4 2021 time periods, SCE used 2020 recorded data adjusted for improvement expected based on SCE's planned wildfire mitigation activities to create a baseline. To factor in weather variability, which has significant impacts on PSPS events, SCE developed a range around the baseline. The range was based on an 18 year backcast analysis that analyzed how current PSPS thresholds would have resulted in PSPS events when applied to historical weather data. The following equation was used to calculate the factor used for the low and high range for PSPS forecast data.

$$Lower\ limit\ factor = \frac{1st\ Quartile\ for\ days\ of\ interuption\ from\ the\ 18\ year\ backcast}{Average\ days\ of\ interuption\ from\ the\ 18\ year\ backcast}$$

$$Higher\ limit\ factor = \frac{3rd\ Quartile\ for\ days\ of\ interuption\ from\ the\ 18\ year\ backcast}{Average\ days\ of\ interuption\ from\ the\ 18\ year\ backcast}$$

Please see Table 11 for updates to SCE's use of PSPS protocols and other related metrics.

9 APPENDIX

9.1 DEFINITIONS OF INITIATIVE ACTIVITIES BY CATEGORY

Category	*Initiative activity*	*Definition*
A. Risk mapping and simulation	*A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment*	*Development and use of tools and processes to develop and update risk map and simulations and to estimate risk reduction potential of initiatives for a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.*
	Climate-driven risk map and modelling based on various relevant weather scenarios	*Development and use of tools and processes to estimate incremental risk of foreseeable climate scenarios, such as drought, across a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.*
	Ignition probability mapping showing the probability of ignition along the electric lines and equipment	*Development and use of tools and processes to assess the risk of ignition across regions of the grid (or more granularly, e.g., circuits, spans, or assets).*
	Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	*Development of a tool to estimate the risk reduction efficacy (for both wildfire and PSPS risk) and risk-spend efficiency of various initiatives.*
	Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment	*Development and use of tools and processes to assess the impact of potential ignition and risk to communities (e.g., in terms of potential fatalities, structures burned, monetary damages, area burned, impact on air quality and greenhouse gas, or GHG, reduction goals, etc.).*
B. Situational awareness and forecasting	*Advanced weather monitoring and weather stations*	*Purchase, installation, maintenance, and operation of weather stations. Collection, recording, and analysis of weather data from weather stations and from external sources.*

Category	*Initiative activity*	*Definition*
	Continuous monitoring sensors	*Installation, maintenance, and monitoring of sensors and sensorized equipment used to monitor the condition of electric lines and equipment.*
	Fault indicators for detecting faults on electric lines and equipment	*Installation and maintenance of fault indicators.*
	Forecast of a fire risk index, FPI, or similar	*Index that uses a combination of weather parameters (such as wind speed, humidity, and temperature), vegetation and/or fuel conditions, and other factors to judge current fire risk and to create a forecast indicative of fire risk. A sufficiently granular index shall inform operational decision-making.*
	Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	*Personnel position within utility service territory to monitor system conditions and weather on site. Field observations shall inform operational decisions.*
	Weather forecasting and estimating impacts on electric lines and equipment	*Development methodology for forecast of weather conditions relevant to utility operations, forecasting weather conditions and conducting analysis to incorporate into utility decisionmaking, learning and updates to reduce false positives and false negatives of forecast PSPS conditions.*
C. Grid design and system hardening	*Capacitor maintenance and replacement program*	*Remediation, adjustments, or installations of new equipment to improve or replace existing capacitor equipment.*
	Circuit breaker maintenance and installation to de-energize lines upon detecting a fault	*Remediation, adjustments, or installations of new equipment to improve or replace existing fast switching circuit breaker equipment to improve the ability to protect electrical circuits from damage caused by overload of electricity or short circuit.*
	Covered conductor installation	*Installation of covered or insulated conductors to replace standard bare or unprotected conductors (defined in accordance with GO 95 as supply conductors, including but not limited to lead wires, not enclosed in a grounded metal pole or not covered by: a "suitable protective covering" (in accordance with Rule 22.8), grounded metal conduit, or grounded metal sheath or shield). In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of*

Category	*Initiative activity*	*Definition*
		fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.
	Covered conductor maintenance	*Remediation and adjustments to installed covered or insulated conductors. In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.*
	Crossarm maintenance, repair, and replacement	*Remediation, adjustments, or installations of new equipment to improve or replace existing crossarms, defined as horizontal support attached to poles or structures generally at right angles to the conductor supported in accordance with GO 95.*
	Distribution pole replacement and reinforcement, including with composite poles	*Remediation, adjustments, or installations of new equipment to improve or replace existing distribution poles (i.e., those supporting lines under 65kV), including with equipment such as composite poles manufactured with materials reduce ignition probability by increasing pole lifespan and resilience against failure from object contact and other events.*
	Expulsion fuse replacement	*Installations of new and CAL FIRE-approved power fuses to replace existing expulsion fuse equipment.*
	Grid topology improvements to	*Plan to support and actions taken to mitigate or reduce PSPS events in terms of geographic scope and number of*

Category	*Initiative activity*	*Definition*
	mitigate or reduce PSPS events	*customers affected, such as installation and operation of electrical equipment to sectionalize or island portions of the grid, microgrids, or local generation.*
	Installation of system automation equipment	*Installation of electric equipment that increases the ability of the utility to automate system operation and monitoring, including equipment that can be adjusted remotely such as automatic reclosers (switching devices designed to detect and interrupt momentary faults that can reclose automatically and detect if a fault remains, remaining open if so).*
	Maintenance, repair, and replacement of connectors, including hotline clamps	*Remediation, adjustments, or installations of new equipment to improve or replace existing connector equipment, such as hotline clamps.*
	Mitigation of impact on customers and other residents affected during PSPS event	*Actions taken to improve access to electricity for customers and other residents during PSPS events, such as installation and operation of local generation equipment (at the community, household, or other level).*
D. Asset management and inspections	*Other corrective action*	*Other maintenance, repair, or replacement of utility equipment and structures so that they function properly and safely, including remediation activities (such as insulator washing) of other electric equipment deficiencies that may increase ignition probability due to potential equipment failure or other drivers.*
	Pole loading infrastructure hardening and replacement program based on pole loading assessment program	*Actions taken to remediate, adjust, or install replacement equipment for poles that the utility has identified as failing to meet safety factor requirements in accordance with GO 95 or additional utility standards in the utility's pole loading assessment program.*
	Transformers maintenance and replacement	*Remediation, adjustments, or installations of new equipment to improve or replace existing transformer equipment.*
	Transmission tower maintenance and replacement	*Remediation, adjustments, or installations of new equipment to improve or replace existing transmission towers (e.g., structures such as lattice steel towers or tubular steel poles that support lines at or above 65kV).*
	Undergrounding of electric lines and/or equipment	*Actions taken to convert overhead electric lines and/or equipment to underground electric lines and/or equipment (i.e., located underground and in accordance with GO 128).*

Category	*Initiative activity*	*Definition*
	Updates to grid topology to minimize risk of ignition in HFTDs	*Changes in the plan, installation, construction, removal, and/or undergrounding to minimize the risk of ignition due to the design, location, or configuration of utility electric equipment in HFTDs.*
	Detailed inspections of distribution electric lines and equipment	*In accordance with GO 165, careful visual inspections of overhead electric distribution lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.*
	Detailed inspections of transmission electric lines and equipment	*Careful visual inspections of overhead electric transmission lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.*
	Improvement of inspections	*Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.*
	Infrared inspections of distribution electric lines and equipment	*Inspections of overhead electric distribution lines, equipment, and right-of-way using infrared (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.*
	Infrared inspections of transmission electric lines and equipment	*Inspections of overhead electric transmission lines, equipment, and right-of-way using infrared (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.*
	Intrusive pole inspections	*In accordance with GO 165, intrusive inspections involve movement of soil, taking samples for analysis, and/or using more sophisticated diagnostic tools beyond visual inspections or instrument reading.*
	LiDAR inspections of distribution electric lines and equipment	*Inspections of overhead electric distribution lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).*
	LiDAR inspections of transmission electric lines and equipment	*Inspections of overhead electric transmission lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).*

Category	*Initiative activity*	*Definition*
	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	*Inspections of overhead electric distribution lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.*
	Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations	*Inspections of overhead electric transmission lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.*
	Patrol inspections of distribution electric lines and equipment	*In accordance with GO 165, simple visual inspections of overhead electric distribution lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.*
	Patrol inspections of transmission electric lines and equipment	*Simple visual inspections of overhead electric transmission lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.*
	Pole loading assessment program to determine safety factor	*Calculations to determine whether a pole meets pole loading safety factor requirements of GO 95, including planning and information collection needed to support said calculations. Calculations shall consider many factors including the size, location, and type of pole; types of attachments; length of conductors attached; and number and design of supporting guys, per D.15-11-021.*
	Quality assurance / quality control of inspections	*Establishment and function of audit process to manage and confirm work completed by employees or subcontractors, including packaging QA/QC information for input to decisionmaking and related integrated workforce management processes.*
	Substation inspections	*In accordance with GO 175, inspection of substations performed by qualified persons and according to the frequency established by the utility, including record-keeping.*
	Additional efforts to manage community	*Plan and execution of strategy to mitigate negative impacts from utility vegetation management to local*

Category	*Initiative activity*	*Definition*
E. Vegetation management and inspections	*and environmental impacts*	*communities and the environment, such as coordination with communities to plan and execute vegetation management work or promotion of fire-resistant planting practices*
	Detailed inspections of vegetation around distribution electric lines and equipment	*Careful visual inspections of vegetation around the right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded.*
	Detailed inspections of vegetation around transmission electric lines and equipment	*Careful visual inspections of vegetation around the right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded.*
	Emergency response vegetation management due to red flag warning or other urgent conditions	*Plan and execution of vegetation management activities, such as trimming or removal, executed based upon and in advance of forecast weather conditions that indicate high fire threat in terms of ignition probability and wildfire consequence.*
	Fuel management and reduction of "slash" from vegetation management activities	*Plan and execution of fuel management activities that reduce the availability of fuel in proximity to potential sources of ignition, including both reduction or adjustment of live fuel (in terms of species or otherwise) and of dead fuel, including "slash" from vegetation management activities that produce vegetation material such as branch trimmings and felled trees.*
	Improvement of inspections	*Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.*
	LiDAR inspections of vegetation around distribution electric lines and equipment	*Inspections of right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).*
	LiDAR inspections of vegetation around transmission electric lines and equipment	*Inspections of right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).*
	Other discretionary inspections of vegetation around distribution electric lines and equipment	*Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.*

Category	*Initiative activity*	*Definition*
	Other discretionary inspections of vegetation around transmission electric lines and equipment	*Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.*
	Patrol inspections of vegetation around distribution electric lines and equipment	*Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business.*
	Patrol inspections of vegetation around transmission electric lines and equipment	*Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business.*
	Quality assurance / quality control of vegetation inspections	*Establishment and function of audit process to manage and confirm work completed by employees or subcontractors, including packaging QA/QC information for input to decision making and related integrated workforce management processes.*
	Recruiting and training of vegetation management personnel	*Programs to ensure that the utility is able to identify and hire qualified vegetation management personnel and to ensure that both full-time employees and contractors tasked with vegetation management responsibilities are adequately trained to perform vegetation management work, according to the utility's wildfire mitigation plan, in addition to rules and regulations for safety.*
	Remediation of at-risk species	*Actions taken to reduce the ignition probability and wildfire consequence attributable to at-risk vegetation species, such as trimming, removal, and replacement.*
	Removal and remediation of trees with strike potential to electric lines and equipment	*Actions taken to remove or otherwise remediate trees that could potentially strike electrical equipment, if adverse events such as failure at the ground-level of the tree or branch breakout within the canopy of the tree, occur.*
	Substation inspection	*Inspection of vegetation surrounding substations, performed by qualified persons and according to the frequency established by the utility, including record-keeping.*
	Substation vegetation management	*Based on location and risk to substation equipment only, actions taken to reduce the ignition probability and wildfire consequence attributable to contact from vegetation to substation equipment.*

Category	*Initiative activity*	*Definition*
	Vegetation inventory system	*Inputs, operation, and support for centralized inventory of vegetation clearances updated based upon inspection results, including (1) inventory of species, (2) forecasting of growth, (3) forecasting of when growth threatens minimum right-of-way clearances ("grow-in" risk) or creates fall-in/fly-in risk.*
	Vegetation management to achieve clearances around electric lines and equipment	*Actions taken to ensure that vegetation does not encroach upon the minimum clearances set forth in Table 1 of GO 95, measured between line conductors and vegetation, such as trimming adjacent or overhanging tree limbs.*
F. Grid operations and protocols	*Automatic recloser operations*	*Designing and executing protocols to deactivate automatic reclosers based on local conditions for ignition probability and wildfire consequence.*
	Crew-accompanying ignition prevention and suppression resources and services	*Those firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, and water) that are deployed with construction crews and other electric workers to provide site-specific fire prevention and ignition mitigation during on-site work*
	Personnel work procedures and training in conditions of elevated fire risk	*Work activity guidelines that designate what type of work can be performed during operating conditions of different levels of wildfire risk. Training for personnel on these guidelines and the procedures they prescribe, from normal operating procedures to increased mitigation measures to constraints on work performed.*
	Protocols for PSPS reenergization	*Designing and executing procedures that accelerate the restoration of electric service in areas that were de-energized, while maintaining safety and reliability standards.*
	PSPS events and mitigation of PSPS impacts	*Designing, executing, and improving upon protocols to conduct PSPS events, including development of advanced methodologies to determine when to use PSPS, and to mitigate the impact of PSPS events on affected customers and local residents.*
	Stationed and on-call ignition prevention and suppression resources and services	*Firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, firefighting foam, chemical extinguishing agent, and water) stationed at utility facilities and/or standing by to respond to calls for fire suppression assistance.*
G. Data governance	*Centralized repository for data*	*Designing, maintaining, hosting, and upgrading a platform that supports storage, processing, and utilization of all*

Category	Initiative activity	Definition
		utility proprietary data and data compiled by the utility from other sources.
	Collaborative research on utility ignition and/or wildfire	*Developing and executing research work on utility ignition and/or wildfire topics in collaboration with other non-utility partners, such as academic institutions and research groups, to include data-sharing and funding as applicable.*
	Documentation and disclosure of wildfire-related data and algorithms	*Design and execution of processes to document and disclose wildfire-related data and algorithms to accord with rules and regulations, including use of scenarios for forecasting and stress testing.*
	ing and analysis of near miss data	*Tools and procedures to monitor, record, and conduct analysis of data on near miss events.*
H. Resource allocation methodology	*Allocation methodology development and application*	*Development of prioritization methodology for human and financial resources, including application of said methodology to utility decision-making.*
	Risk reduction scenario development and analysis	*Development of modelling capabilities for different risk reduction scenarios based on wildfire mitigation initiative implementation; analysis and application to utility decision making.*
	Risk spend efficiency analysis	*Tools, procedures, and expertise to support analysis of wildfire mitigation initiative risk-spend efficiency, in terms of MAVF and/ or MARS methodologies.*
I. Emergency planning and preparedness	*Adequate and trained workforce for service restoration*	*Actions taken to identify, hire, retain, and train qualified workforce to conduct service restoration in response to emergencies, including short-term contracting strategy and implementation.*
	Community outreach, public awareness, and communications efforts	*Actions to identify and contact key community stakeholders; increase public awareness of emergency planning and preparedness information; and design, translate, distribute, and evaluate effectiveness of communications taken before, during, and after a wildfire, including Access and Functional Needs populations and Limited English Proficiency populations in particular.*
	Customer support in emergencies	*Resources dedicated to customer support during emergencies, such as website pages and other digital resources, dedicated phone lines, etc.*
	Disaster and emergency preparedness plan	*Development of plan to deploy resources according to prioritization methodology for disaster and emergency preparedness of utility and within utility service territory (such as considerations for critical facilities and*

Category	*Initiative activity*	*Definition*
		infrastructure), including strategy for collaboration with Public Safety Partners and communities.
	Preparedness and planning for service restoration	*Development of plans to prepare the utility to restore service after emergencies, such as developing employee and staff trainings, and to conduct inspections and remediation necessary to re-energize lines and restore service to customers.*
	Protocols in place to learn from wildfire events	*Tools and procedures to monitor effectiveness of strategy and actions taken to prepare for emergencies and of strategy and actions taken during and after emergencies, including based on an accounting of the outcomes of wildfire events.*
J. Stakeholder cooperation and community engagement	*Community engagement*	*Strategy and actions taken to identify and contact key community stakeholders; increase public awareness and support of utility wildfire mitigation activity; and design, translate, distribute, and evaluate effectiveness of related communications. Includes specific strategies and actions taken to address concerns and serve needs of Access and Functional Needs populations and Limited English Proficiency populations in particular.*
	Cooperation and best practice sharing with agencies outside CA	*Strategy and actions taken to engage with agencies outside of California to exchange best practices both for utility wildfire mitigation and for stakeholder cooperation to mitigate and respond to wildfires.*
	Cooperation with suppression agencies	*Coordination with CAL FIRE, federal fire authorities, county fire authorities, and local fire authorities to support planning and operations, including support of aerial and ground firefighting in real-time, including information-sharing, dispatch of resources, and dedicated staff.*
	Forest service and fuel reduction cooperation and joint roadmap	*Strategy and actions taken to engage with local, state, and federal entities responsible for or participating in forest management and fuel reduction activities; and design utility cooperation strategy and joint stakeholder roadmap (plan for coordinating stakeholder efforts for forest management and fuel reduction activities).*

9.2 CITATIONS FOR RELEVANT STATUTES, COMMISSION DIRECTIVES, PROCEEDINGS AND ORDERS

Throughout the WMP, cite relevant state and federal statutes, Commission directives, orders, and proceedings. Place the title or tracking number of the statute in parentheses next to comment, or in the appropriate column if noted in a table. Provide in this section a brief description or summary of the relevant portion of the statute. Track citations as end-notes and order (1, 2, 3…) across sections (e.g., if section 1 has 4 citations, section 2 begins numbering at 5).

Table SCE 9-1
Citations For Relevant Statutes, Commission Directives, Proceedings and Orders

WMP Section / Category	State and Federal Statutes, Commission Directives, Orders and Proceedings	Description
4.1 – Lessons Learned and Risk Trends	1. A.19-08-013	1. SCE's General Rate Case – covered conductors
4.2 - Understanding Major Trends Impacting Ignition Probability And Wildfire Consequence	2. D.17-12-024 3. CPUC GO 95, Rule 35, App. E; 165; 166 & Rule 11 4. D.20-12-030	2.: Decision in Rulemaking 15-05-006 adopting regulations to enhance fire safety in the HFTD. Modified in D.20-12-030 to allow SCE to modify boundaries of HFTD within and near its service territory. 3. GO 95: • Rule 18: Reporting and resolution of safety hazards discovered by utilities • Rule 31.1: known local condition monitoring by utility; Rule 35: Radial clearance of bare line conductors from tree branches or foliage; Rule 38: Minimum clearances of wires from other wires • Rule 80.1: Patrol and detailed inspections, intrusive inspections • Appendix E: recommended minimum clearances that should be established, at time of trimming, between the vegetation and the energized conductors GO 165: Standards and cycles for inspections of electric distribution and transmission facilities; GO 166: standards for emergency response plan; Rule 11: electric utility tariff rule governing discontinuance and restoration of service.

WMP Section / Category	State and Federal Statutes, Commission Directives, Orders and Proceedings	Description
		4. Decision modifying HFTD maps.
4.4.1 – Research proposals	5. CPUC GO 95, Rule 35, Appendix E 6. SB 1339	5. Recommended minimum clearances that should be established, at time of trimming, between the vegetation and the energized conductors and associated live parts where practicable 6. Definition of microgrid & facilitation of the commercialization of microgrids for distribution customers of large electrical corporations, Pub. Util. Code §§8370 – 8372.
4.5.2 – Calculations of key metrics	7. Government Code § 8593.3 8. Rulemaking 18-12-005 9. 38 CFR 17.701 10. CPUC GO 165	7. Sub. (b), definition of AFN population 8. D.19-05-042: vulnerable populations defined and identified 9. Definition of “highly rural” 10. Definition of “rural” & “urban”
5.4 – Planning for Workforce and Other Limited Resources	11. 14 CFR 91, 107 & 135 12. CPUC GO 95	11. Federal regulations pertaining to general operating and flight rules, small unmanned aircraft, air carrier and operator certifications 12. Requirements for overhead line design, construction, and maintenance.
6.5 – Mapping Recent, Modified, and Baseline Conditions	13. Resolution WSD-002	13. Class B deficiency Guidance-10 – submission of geodatabase mapping recent, modelled, and baseline conditions
7.3.3 – Grid Design & System Hardening	14. A.19-08-013 15. AB 1054 16. CPUC GO 165 17. Rulemaking 19-09-009	14. SCE’s General Rate Case 15. Referring to PUC section 8389 requirement to submit a tier 1 advice letter on a quarterly basis that, among other things, details the implementation of both its approved wildfire mitigation plan 16. Requirements for distribution facilities inspections 17. Microgrid and resiliency strategies for areas that are prone to outages

WMP Section / Category	State and Federal Statutes, Commission Directives, Orders and Proceedings	Description
7.3.4 – Asset Management & Inspections	18. CPUC GO 95 19. CPUC GO 165 20. NERC, WECC and CAISO rules and regulations 21. CPCU GO 95, Rule 18	18. Rule 44.2 - Overhead electrical construction guidance 19. Overhead Detailed Inspection and ground inspection 20. NERC/WECC rule FAC-501-WECC-2 provides the minimum requirements for transmission maintenance and inspections. CAISO Transmission Control Agreement, appendix C provides maintenance standards. 21. Requirements for reporting and resolution of safety hazards discovered by utilities.
7.3.5 – Vegetation Management and Inspections	22. CPUC General Order 95, Rule 35 Appendix E 23. Cal. Pub. Res. Code § 4291 24. Cal. Pub. Res. Code § 4292 25. Cal. Pub. Res. Code § 4293 26. CPUC GO 174 27. D.17-12-024	22. Recommended minimum clearances that should be established, at time of trimming, between the vegetation and the energized conductors and associated live parts where practicable. 23. PRC 4291: maintenance of distance clearance from high voltage facilities. 24. PRC 4292: requirement for firebreak clearance from pole or tower. 25. PRC 4923: clearance maintenance of distances between vegetation and conductors. 26. GO 174: inspection program for equipment inside substations. 27. Decision in Rulemaking 15-05-006 providing guidance re line clearances across transmission and distribution facilities in HFTD.
7.3.6 – Grid Operations & Protocols	28. SB 167	28. Cal. Pub. Util. Code § 8386: Authorizes deployment of backup electrical resources or financial to customers.
7.3.9 – Emergency Planning and Preparedness	29. D.20-05-051 30. D.20-03-004	29. Decision in Rulemaking 18-12-005 Risk to be mitigated / problem to be addressed Phase 2 Guidelines for PSPS; and directing IOUs to include specific actions in WMP to reduce scale, scope, impact of PSPS events. 30. Decision on community awareness and public outreach before, during and after a wildfire, and explaining next steps for other phase 2 issues
7.3.10 – Stakeholder Cooperation	31. D.20-05-051	31. D.20-05-051, OP 1-5: IOUs to lead PSPS Working Groups that convene at least quarterly to help better inform the electric IOUs regarding how to plan and execute de-

WMP Section / Category	State and Federal Statutes, Commission Directives, Orders and Proceedings	Description
and Community Engagement		energization protocols and (2) coordinate service area-wide Advisory Boards to provide valuable input into a utility's planning for de-energization events
8.4.2 – Vulnerable Communities	32. D.19-05-042 33. D.20-03-004	32. Decision in Rulemaking 18-12-005 defining AFN (Access and Functional Need) Population 33. Decision in Rulemaking 18-10-007 requiring IOUs to conduct community awareness and public outreach before, during, and after a wildfire in any language that is "prevalent" in its service territory or portions thereof.
8.4.4 – Community Outreach for PSPS	34. D.20-03-004	34. Decision in Rulemaking 18-10-007 increasing the number of prevalent languages.

9.3 WMP ACTIVITY MAP

The table below provides a mapping that documents the movement of activities included in the 2020-2022 WMP and their disposition in the 2021 WMP Update.

Table SCE 9-2
Map of 2020 WMP Activities in 2021 WMP Update

	2020 WMP Activities		2021 WMP Designation
WMP ID	**2020 WMP Activity**	**Category**	**Notes**
RA-1	Expansion of Risk Analysis	Risk Assessment and Mapping	Not an activity in 2021 WMP; implementation complete in 2020
SA-1	Weather Stations	Situational Awareness	Remains an activity in 2021 WMP Update
SA-2	Fire Potential Index (FPI) Phase II	Situational Awareness	Remains an activity in 2021 WMP Update; Renamed "Fire Potential Index (FPI)"
SA-3	HPCC Weather Modeling System	Situational Awareness	Remains an activity in 2021 WMP Update; Renamed "Weather and Fuels Modeling System"
SA-4	Asset Reliability & Risk Analytics Capability	Situational Awareness	Remains an activity in 2021 WMP Update; Renamed "Fire Spread Modeling"
SA-5	Fuel Sampling Program	Situational Awareness	Remains an activity in 2021 WMP Update
SA-6	Surface and Canopy Fuels Mapping	Situational Awareness	Not a standalone activity in 2021 WMP; discussed as a part of SA-4
SA-7	Remote Sensing / Satellite Fuel Moisture	Situational Awareness	Remains an activity in 2021 WMP Update
SA-8	Fire Science Enhancements	Situational Awareness	Remains an activity in 2021 WMP Update
AT-7	Early Fault Detection (EFD) Evaluation	Situational Awareness	Not an activity in 2021 WMP; discussed in Section 7.1.D
SH-1	Covered Conductor	Grid Design and System Hardening	Remains an activity in 2021 WMP Update
SH-2	Undergrounding Overhead Conductor	Grid Design and System Hardening	Remains an activity in 2021 WMP Update
SH-3	WCCP Fire Resistant Poles	Grid Design and System Hardening	Not a standalone activity in 2021 WMP; discussed as a part of SH-1 Covered Conductor
SH-4	Branch Line Protection Strategy	Grid Design and System Hardening	Remains an activity in 2021 WMP Update
SH-5	Installation of System Automation Equipment – RAR/RCS	Grid Design and System Hardening	Remains an activity in 2021 WMP Update
SH-6	Circuit Breaker Relay Hardware for FC	Grid Design and System Hardening	Remains an activity in 2021 WMP Update

WMP ID	2020 WMP Activities 2020 WMP Activity	Category	2021 WMP Designation Notes
SH-7	PSPS-Driven Grid Hardening Work	Grid Design and System Hardening	Remains an activity in 2021 WMP Update; Renamed Circuit Evaluation for PSPS-Driven Grid Hardening Work
SH-8	Transmission Open Phase Detection	Grid Design and System Hardening	Remains an activity in 2021 WMP Update
SH-9	Transmission Overhead Standards (TOH) Review	Grid Design and System Hardening	Not an activity in 2021 WMP; evaluation complete in 2020
AT-1	Alternative Technology Pilots – Meter Alarming for Down Energized Conductor (MADEC)	Grid Design and System Hardening	Not an activity in 2021 WMP; discussed in Section 7.1.D
SH-10	Tree Attachment Remediation	Grid Design and System Hardening	Remains an activity in 2021 WMP Update
SH-11	Legacy Facilities	Grid Design and System Hardening	Remains an activity in 2021 WMP Update
SH-12.1	Remediations – Distribution	Grid Design and System Hardening	Not a standalone activity in 2021 WMP; discussed as a part of IN-1.1
SH-12.2	Remediations – Transmission	Grid Design and System Hardening	Not a standalone activity in 2021 WMP; discussed as a part ofIN-1.2
SH-12.3	Remediations – Generation	Grid Design and System Hardening	Not a standalone activity in 2021 WMP; discussed as a part ofIN-5
IN-1.1	Distribution High Fire Risk Informed Inspections in HFRA	Asset Management and Inspections	Remains an activity in 2021 WMP Update
IN-1.2	Transmission High Fire Risk Informed Inspections in HFRA	Asset Management and Inspections	Remains an activity in 2021 WMP Update
IN-2	Quality Oversight / Quality Control	Asset Management and Inspections	Not an activity in 2021 WMP; operationalized
IN-3	Infrared Inspection of energized overhead distribution facilities and equipment	Asset Management and Inspections	Remains an activity in 2021 WMP Update
IN-4	Infrared Inspection, Corona Scanning, and HD imagery of energized overhead Transmission facilities and equipment	Asset Management and Inspections	Remains an activity in 2021 WMP Update
IN-5	Generation High Fire Risk Informed Inspections in HFRA	Asset Management and Inspections	Remains an activity in 2021 WMP Update
IN-6.1	Aerial Inspections – Distribution	Asset Management and Inspections	Not a standalone activity in 2021 WMP; discussed as a part of IN-1.1

	2020 WMP Activities		2021 WMP Designation
WMP ID	**2020 WMP Activity**	**Category**	**Notes**
IN-6.2	Aerial Inspections – Transmission	Asset Management and Inspections	Not a standalone activity in 2021 WMP; discussed as a part of IN-1.2
IN-7	Failure Modes and Effects Analysis (FMEA)	Asset Management and Inspections	Not an activity in 2021 WMP; evaluation complete in 2020
VM-1	Hazard Tree Management Program	Vegetation Management	Remains an activity in 2021 WMP Update
VM-2	Expanded Pole Brushing	Vegetation Management	Remains an activity in 2021 WMP Update
VM-3	Expanded Clearances for Legacy Facilities	Vegetation Management	Remains an activity in 2021 WMP Update
VM-4	Drought Relief Initiative	Vegetation Management	Remains an activity in 2021 WMP Update; renamed "Dead and Dying Tree Removal"
VM-5	Quality Control	Vegetation Management	Not an activity in 2021 WMP; operationalized
PSPS-1.1	De-Energization Notifications	Grid Operations and Protocols	Not an activity in 2021 WMP, discussed in Chapter 8
PSPS-1.2	De-Energization Notifications	Grid Operations and Protocols	Not an activity in 2021 WMP, discussed in Chapter 8
PSPS-1.3	De-Energization Notifications	Grid Operations and Protocols	Not an activity in 2021 WMP, discussed in Chapter 8
PSPS-1.4	De-Energization Notifications	Grid Operations and Protocols	Not an activity in 2021 WMP; work complete in 2020
PSPS-2	Community Resource Centers	Grid Operations and Protocols	Remains an activity in 2021 WMP Update; renamed "Customer Care Programs"
PSPS-3	Customer Resiliency Equipment Incentives	Grid Operations and Protocols	Not a standalone activity in 2021 WMP; discussed as a part of PSPS-2
PSPS-4	Critical Care Battery Backup	Grid Operations and Protocols	Not a standalone activity in 2021 WMP; discussed as a part of PSPS-2
PSPS-5	MICOP Partnership	Grid Operations and Protocols	Not a standalone activity in 2021 WMP; discussed in Stakeholder Cooperation and Community Engagement Section 7.3.10
PSPS-6	Independent Living Centers Partnership	Grid Operations and Protocols	Not a standalone activity in 2021 WMP; discussed in Stakeholder Cooperation and Community Engagement Section 7.3.10
PSPS-7	Community Outreach	Grid Operations and Protocols	Not a standalone activity in 2021 WMP, CCVs discussed as a part of PSPS-2
PSPS-8	Microgrid Assessment	Grid Operations and Protocols	Remains an activity in 2021 WMP Update; Activity renamed SH-12 and included in Section 7.3.3
OP-1	Annual SOB 322 Review	Grid Operations and Protocols	Not an activity in 2021 WMP; operationalized
OP-2	Wildfire Infrastructure Protection Team Additional Staffing	Emergency Preparedness and Planning	Not an activity in 2021 WMP; work complete in 2020

	2020 WMP Activities		2021 WMP Designation
WMP ID	**2020 WMP Activity**	**Category**	**Notes**
OP-3	Unmanned Aerial Systems (UAS) Operations Training	Emergency Preparedness and Planning	Not a standalone activity in 2021 WMP; discussed in Stakeholder Cooperation and Community Engagement Section 7.3.10
DEP-1.1	Customer Education and Engagement – Dear Neighbor Letter	Emergency Preparedness and Planning	Not a standalone activity in 2021 WMP; discussed as a part of DEP-1.3
DEP-1.2	Customer Education and Engagement - Community Meetings	Emergency Preparedness and Planning	Remains an activity in 2021 WMP Update
DEP-1.3	Customer Education and Engagement - Marketing Campaign	Emergency Preparedness and Planning	Remains an activity in 2021 WMP Update
DEP-2	SCE Emergency Responder Training	Emergency Preparedness and Planning	Remains an activity in 2021 WMP Update
DEP-3	IOU Customer Engagement	Emergency Preparedness and Planning	Not an activity in 2021 WMP Update; Discontinued in Off Ramp report
DEP-4	Customer Research and Education	Emergency Preparedness and Planning	Remains an activity in 2021 WMP Update
AT-2.1	Distribution Fault Anticipation (DFA)	Situational Awareness	Remains an activity in 2021 WMP Update; renamed SA-9
AT-2.2	Advanced Unmanned Aerial Systems Study	Asset Management and Inspections	Not an activity in 2021 WMP; Complete in 2020
AT-3.1	Alternative Technology Evaluations: Rapid Earth Fault Current Limiter - Ground Fault Neutralizer (GFN)	Grid Design and System Hardening	Not an activity in 2021 WMP; discussed in Section 7.1.D
AT-3.2	Alternative Technology Evaluations: Rapid Earth Fault Current Limiter – Resonant Grounding with Arc Suppression Coil	Grid Design and System Hardening	Not an activity in 2021 WMP; discussed in Section 7.1.D
AT-3.3	Alternative Technology Evaluations – Rapid Earth Fault Current Limiter and Resonant Grounded Transformer	Grid Design and System Hardening	Not an activity in 2021 WMP; discussed in Section 7.1.D
AT-3.4	Alternative Technology Evaluations – Distribution Open Phase Detection	Grid Design and System Hardening	Not an activity in 2021 WMP; discussed in Section 7.1.D
AT-4	Alternative Technology Implementation – Vibration Dampers	Grid Design and System Hardening	Not an activity in 2021 WMP; work complete in 2020

	2020 WMP Activities		2021 WMP Designation
WMP ID	**2020 WMP Activity**	**Category**	**Notes**
AT-5	Asset Defect Detection Using Machine Learning Object Detection	Asset Management and Inspections	Not an activity in 2021 WMP; work complete in 2020
AT-6	Assessment of Partial Discharge for Transmission Facilities	Asset Management and Inspections	Not an activity in 2021 WMP; work complete in 2020
AT-8	High Impedance Relay Evaluations	Grid Design and System Hardening	Not an activity in 2021 WMP; discussed in Section 7.1.D
SH-13	C-Hooks	Grid Design and System Hardening	Not an activity in 2020 WMP; New Activity in 2021 WMP (SH-13)
SH-14	Long Span Initiative (LSI)	Grid Design and System Hardening	Not an activity in 2020 WMP; New Activity in 2021 WMP (SH-14)
SH-15	Vertical Switches	Grid Design and System Hardening	Not an activity in 2020 WMP; New Activity in 2021 WMP Update (SH-14)
DG-1	Wildfire Safety Data Mart and Data Management (WiSDM / Ezy)	Data Governance	Not an activity in 2020 WMP; New Activity in 2021 WMP Update (DG-1)
IN-8	Inspection Work Management Tools	Asset Management and Inspections	Not an activity in 2020 WMP; New Activity in 2021 WMP Update (IN-8)
VM-6	VM Work Management Tool (Arbora)	Vegetation Management	Not an activity in 2020 WMP; New Activity in 2021 WMP Update (VM-6)
DEP-5	Aerial Suppression	Stakeholder Cooperation and Community Engagement	Not an activity in 2020 WMP; New Activity in 2021 WMP Update (DEP-5)

9.4 SCE EXTERNAL ENGAGEMENTS WITH AGENCIES OUTSIDE OF CALIFORNIA (1/1/2020 – 1/15/2021)

Table SCE 9-3
SCE External Engagements Outside of California

Meeting Date	Engagement / Forum	Purpose
1/7/2020	Edison Electric Institute (EEI) Western CEO Roundtable Meeting - Wildfires	Provided updates on emerging technologies that could be deployed by the 2020 fire season
1/17/2020	Electricity Subsector Coordinating Council (ESCC) (The CEO-led ESCC serves as the principal liaison between the federal government and the electric power industry on efforts to prepare for, and respond to, national-level disasters or threats to critical infrastructure)	The ESCC works across the sector, and with the Electricity Information Sharing and Analysis Center (E-ISAC), to develop actions and strategies that help protect the North American energy grid and prevent a spectrum of threats from disrupting electricity service. At this meeting, the US Forest Service, Bureau of Land Management and the National Park Service were key contributors. SCE's Chief Executive Officer (CEO) provided the council with leadership and guidance on wildfire related matters by sharing SCE's own successes and challenges.
1/22/2020	Federal Emergency Management Agency (FEMA) Greater Los Angeles Federal Executive Board Meeting	Provided FEMA representatives with a tour of SCE's EOC and provided an overview of wildfire mitigation efforts
2/6/2020	Edison Electric Institute (EEI) Subcommittee on Evolving Resiliency Needs	Discussed customer perspectives on energy resiliency, specifically how can customers and electric companies work together to develop solutions that address evolving resiliency needs?
2/6/2020	North American Electric Reliability Corporation (NERC) Wildfire Risk Mitigation Discussion	Provided NERC an update on SCE's wildfire mitigation efforts.
2/18/2020	Edison Electric Institute (EEI) Wildfire Technology Summit	Moderated the "Advanced Grid Sensing and Detection Technologies" panel
2/25/2020	Western Electric Institute (WEI) Managing Risk and Building Residency Webinar	Provided an overview of its risk approach to wildfire mitigation efforts
3/3/2020	California Large Energy Consumers Association (CLECA) PSPS and Wildfire Mitigation Update	Although this meeting was about coordinating key energy topics with large energy consumers in California, the participants represented large national/international companies. SCE provided updates on its PSPS and wildfire mitigation efforts with the intent of helping large energy consumers prepare and become more resilient.

Meeting Date	Engagement / Forum	Purpose
3/10/2020	Western Electricity Coordinating Council (WECC)	Provided an update on SCE's PSPS activities
3/16/2020	National & Key Accounts Update Meetings	Assembled customers with national accounts (e.g., Rite Aid, Vons, etc.) and provided them with updates on SCE's efforts in a cleaner, smarter, more reliable grid including highlighting PSPS activities.
4/6/2020	California Manufacturers and Technology Association (CMTA) Spring Meeting	Brought together manufacturers (e.g., Boeing, Schultz Steel and Lockheed Martin) and provided them with updates on SCE's efforts in a cleaner, smarter, more reliable grid including highlighting PSPS activities.
4/16/2020	Western Electric Institute (WEI Operations Conference: PSPS Update	Provided an update on SCE's PSPS activities
5/7/2020	Electric Power Research Institute (EPRI) Wildfire Risk Reduction Methods Discussion	Shared strategies SCE is using to reduce wildfire risk in areas such as fault reduction, enhanced situational awareness and grid hardening
5/29/2020	American Society of Mechanical Engineers (ASME) Special Report: Engineering Ways to Improve Electrical Grid Resilience	Provided ASME with details on what SCE is doing to improve electrical grid resilience for wildfire preparedness.
07/20/20	Cox Communications: PSPS and Wildfire Mitigation Discussion	Provided Cox Communication leadership with an update on SCE's PSPS and wildfire mitigation activities with the intent of helping this customer and telecommunications provider become more resilient to wildfire risks.
08/06/20	WECC's Wildfire Webinar Series - Wildfires in the West	The first of three webinars focused on the 2020 wildfire season providing a high-level overview of the activities and preparations in the west. SCE covered following topics: PSPS, wildfire mitigation tools, customer care programs and communications, and stakeholder engagement.
08/13/20	WECC's Wildfire Webinar Series - Best Practices and Lessons Learned	The second of three webinars provided a technical exploration into wildfire preparedness and the BPS, including system hardening, technology deployment, advanced weather modeling, weather stations, predictive fire spread modeling, and high-definition camera installations. SCE provided details about its advanced tech weather modeling.
08/20/20	WECC's Wildfire Webinar Series - Compliance Open Webinar	The third webinar was on the mitigation, right-of-way, and vegetation management aspects of wildfire preparedness. The webinar explored actions that entities may take to stay compliant and

Meeting Date	Engagement / Forum	Purpose
		assist in the preparation and prevention of wildfires. SCE covered vegetation management.
08/27/20	Cox Communications Follow-up Meeting	Provided additional details about PSPS mitigation activities as a follow up from the July meeting
09/11/20	T-Mobile/Sprint: PSPS and Wildfire Mitigation Discussion	Provided an update on SCE's PSPS and wildfire mitigation activities with the intent of helping this customer and telecommunications provider become more resilient to wildfire risks.
09/14/20	AT&T: PSPS and Wildfire Mitigation Discussion	Provided an update on SCE's PSPS and wildfire mitigation activities with the intent of helping this customer and telecommunications provider become more resilient to wildfire risks.
09/15/20	Frontier Communications: PSPS and Wildfire Mitigation Discussion	Provided an update on SCE's PSPS and wildfire mitigation activities with the intent of helping this customer and telecommunications provider become more resilient to wildfire risks.
09/17/20	Verizon Wireless: PSPS and Wildfire Mitigation Discussion	Provided an update on SCE's PSPS and wildfire mitigation activities with the intent of helping this customer and telecommunications provider become more resilient to wildfire risks.
10/06/20	Charter Communications: PSPS and Wildfire Mitigation Discussion	Provided an update on SCE's PSPS and wildfire mitigation activities with the intent of helping this customer and telecommunications provider become more resilient to wildfire risks.
10/09/20	Portland General Electric Meeting	Provided an overview of SCE's WMP
10/22/20	California Catastrophe Response Council Conference	Provided overview of SCE's wildfire mitigation efforts, focusing on SCE's wildfire risk assessment, situational awareness capabilities and new technologies being implemented to reduce wildfire risk
11/9/20	International Wildfire Risk Management Consortium Webinar	Provided an overview of SCE's PSPS triggers
11/16/20	International Wildfire Risk Management Consortium Webinar	Provided an overview of SCE's risk-based inspections program
11/18/20	International Wildfire Risk Management Consortium Webinar	Provided an overview of SCE's data management systems for vegetation management
11/19/20	Electric Power Research Institute (EPRI) Jodie Lane National Conference	Co-hosted the virtual event with EPRI. SCE's keynote speaker provided overview of SCE's wildfire mitigation efforts. Provided in-depth sessions on public safety topics, including electrical arcing mitigation technologies, wires down and manhole restraints.
11/20/20	International Wildfire Risk Management Consortium Webinar	Provided an overview of SCE's Journey to Multi-Attribute Value Function (MAVF) Risk Modeling

Meeting Date	Engagement / Forum	Purpose
11/20/20	Filsinger Energy Partners Site Visit	Provided overview of SCE's wildfire mitigation efforts and a tour of one of our burn scar areas and covered conductor construction.
1/12/21	Meeting with Filsinger Energy Partners and IOUs	Provided details about SCE's plans on undergrounding

9.5 List of Acronyms

Table SCE 9-4
List of Acronyms Used in 2021 WMP Update

Acronym / Abbreviation	Definition
AAR	After Action Report
AC-DC	Alternating Current/Direct Current
ACS	American Community Survey
ADS	Atmospheric Data Solutions
AFN	Access and Functional Need(s)
AI	Artificial Intelligence
AHJ	Authority Having Jurisdiction
ALJ	Administrative Law Judge
AMSE	Asset Management, Strategy & Execution
AOC	Areas of Concern
APM	Accident Prevention Manual
ASD	Audit Services Department
ASL	American Sign Language
ASME	American Society of Mechanical Engineers
BVLOS	Beyond Visual Line of Sight
C&Q	Compliance & Quality
CAISO	California Independent System Operator
CARE	California Alternate Rates for Energy
CAT	Customer Attitude Tracking
CB	Circuit Breaker
CBO	Community Based Organization
CCA	Community Choice Aggregators
CCBB	Critical Care Battery Backup
CCV	Community Crew Vehicles
CEC	California Energy Commission
CEMA	Catastrophic Event Memorandum Account
CEO	Chief Executive Officer
CFO	Contact Foreign Objects
cGIS	Comprehensive Geographical Information System
CLF	Current-Limiting Fuses
CMI	Customer Minutes of Interruption
CMTA	California Manufacturers and Technology Association
CPUC	California Public Utilities Commission or Commission

Acronym / Abbreviation	Definition
CPCN	Certificate of Public Convenience and Necessity
CRC	Community Resource Centers
CREI	Customer Resiliency Equipment Incentive
CUEA	California Utilities Emergency Association
DER	Distributed Energy Resource
DFA	Distribution Fault Anticipation
DMS	Distribution Management System
D-OPD	Distribution Open Phase Detection
DRI	Drought Relief Initiative
DVMP	Distribution Vegetation Management Plan
EEI	Edison Electric Institute
EFD	Early Fault Detection
EFF	Equipment and Facility Failure
EIA	U.S. Energy Information Administration
E-ISAC	Electricity Information Sharing and Analysis Center
EOC	Emergency Operations Center
EOI	Enhanced Overhead Inspections
EONS	Emergency Outage Notification System
EPIC	Electric Program Investment Charge Program
EPRI	Electric Power Research Institute
ERM	Enterprise Risk Management
ES	Electric Services
ESCC	Electricity Subsector Coordinating Council
ESI	Electrical System Inspector
EVLOS	Extended Visual Line of Sight
FAA	Federal Aviation Administration
FBAN	Fire Behavior Analyst
FC	Fast Curve
FCZ	Fire Climate Zone
FEMA	Federal Emergency Management Agency
FERA	Family Electric Rate Assistance
FIPA	Fire Incident Preliminary Analysis
FLOC	Function / Location
FMEA	Failure Modes and Effects Analysis
FPI	Fire Potential Index
FR	Fire Resistant
FRP	Fire Resistant Pole

Acronym / Abbreviation	Definition
FTE	Full Time Employee
FWT	Fire Weather Threat
FWZ	Fire Weather Zone
GACC	Geographic Area Coordination Centers
GFN	Ground Fault Neutralizer
GIS	Geographical Information System
GO	General Order
GPS	Global Positioning System
GR	Grid Resiliency
GRC	General Rate Case
GSRP	Grid Safety and Resiliency Program
GTI	Gas Technology Institute
HD	High Definition
HFRA	High Fire Risk Areas
HFRI	High Fire Risk Informed Inspection
HFTD	High Fire Threat District
Hi-Z	High Impedance Relay
HPCC	High Performance Computing Cluster
HTMP	Hazard Tree Management Program
HWW	High Wind Warning
IBEW	International Brotherhood of Electrical Workers
ICS	Incident Command System/Structure
ILC	Independent Living Centers
IMT	Incident Management Team
IOU	Investor-Owned Utility
IPI	Intrusive Pole Inspection Program
ISA	International Society of Arboriculture
IST	Incident Support Team
IVM	Integrated Vegetation Management
IWRMC	International Wildfire Risk Management Consortium
LED	Light Emitting Diode
LFO	Live Field Observation
LiDAR	Light Detection and Ranging Technology
LNO	Liaison officer
LOS	Letter of Support
LSI	Long Span Initiative
LTE	Long-Term Evolution

Acronym / Abbreviation	Definition
LTP	Long Term Plan
MADEC	Meter Alarming for Downed Energy Conductor
MARS	Multi Attribute Risk Score
MAVF	Multi-Attribute Value Function
MBL	Medical baseline
MICOP	Mixteco Indigena Community Organizing Project
ML	Machine Learning
MOU	Memorandum of Understanding
MSUP	Master Special Use Permit
NEPA	National Environmental Policy Act
NERC	North American Reliability Corporation
NFDRS	National Fire Danger Rating System
NGWMS	Next Generation Weather Modeling System
NIMS	National Incident Management System
NONC	Non-Compliance
NPV	Net Present Value
NRCI	Non-Residential Critical Infrastructure
NSF	National Science Foundation
NWS	National Weather Service
O&M	Operation and Maintenance
OCFA	Orange County Fire Association
OCM	Organizational Change Management
ODI	Overhead Detail Inspection
ODRM	Outage Database and Reliability Metrics
OH	Overhead
OIR	Order Instituting Rulemaking
OMS	Outage Management System
OPD	Open Phase Detection
OSHA	Occupational Safety and Health Administration
PG&E	Pacific Gas and Electric Company
PLP	Pole Loading Program
PMA	Predictive Maintenance Assessment
POD	Probability of De-energization
POI	Probability of ignition
PRA	Probability Risk Assessment
PTC	Permit to Construct
PSPS	Public Safety Power Shut Off

Acronym / Abbreviation	Definition
QA	Quality Assurance
QC	Quality Control
QDR	Quarterly Data Report
QEW	Qualified Electrical Worker
QR	Quarterly Report
RAMP	Risk Assessment Mitigation Phase
RAR	Remote-Controlled Automatic Reclosers
RAVE	Risk Associated with Value Exposure
RCD	Regulation Clearance Distance
RCP	Remedial Compliance Plan
RCS	Remote Controlled Switches
REFCL	Rapid Earth Fault Current Limiter
REST	Representational State Transfer
RF	Radio Frequency
RFP	Request for Proposal
RFW	Red Flag Warnings
RGS	Resonant Grounded Substations
ROW	Rights-of-Way
RSE	Risk Spend Efficiency
RSR	Remote Sectionalizing Recloser
SAP	Systems, Applications & Products
SAR	System Average Rates
SAWTi	Santa Ana Winds Threat Index
SCE	Southern California Edison Company
SDG&E	San Diego Gas & Electric Company
SEMS	Standardized Emergency Management System
SGIP	Self-Generation Incentive Program
SI	Serious Injury
SIR	Self-Insured Retention
SJSU	San Jose State University
S-MAP	Safety Model Assessment Proceedings
SME	Subject Matter Expert
SOB	Standard/System Operating Bulletin
SSP	Senior Specialist
STEM	Science, Technology, Engineering & Math
T&D	SCE's Transmission and Distribution Business Unit
TCCI	Tree-Caused Circuit Interruption

Acronym / Abbreviation	Definition
TIGER	Topologically Integrated Geographic Encoding and Referencing
TIMP	Transmission Inspection and Maintenance Program
TOH	Transmission Overhead
TT	Thunderstorm Threat
TVMP	Transmission Vegetation Management Plan
UAS	Advanced Unmanned Aerial Systems
UCLA	University of California, Los Angeles
UCSD	University of California, San Diego
USFS	United States Forest Service
USZ	Utility Strike Zone
UVM	Utility Vegetation Management
VM	Vegetation Management
WCCP	Wildfire Covered Conductor Program
WECC	Western Electricity Coordination Council
WEI	Western Electric Institute
WF	Wildfire
WIRC	Wildfire Interdisciplinary Research Center
WisDM	Wildfire Safety Data Mart and Data Management
WMP	Wildfire Mitigation Plan
WRM	Wildfire Risk Model
WRRM	Wildfire Risk Reduction Model
WSD	Wildfire Safety Division
WSOC	Wildfire Situational Operational Center
WUI	Wildland Urban Interface
WWZ	Wind Weather Zone

9.6 ACTION STATEMENTS

Responses to WSD Action Statement on Remedial Compliance Plan (RCP)
Guidance-3, Lack of Risk Modeling to Inform Decision Making

Action SCE-1*: In its 2021 WMP update, SCE shall: 1) provide a table and narrative similar to that provided in the RCP filing that includes all 136 initiatives from the 2020 WMP, as well as any additional initiatives added in the 2021 filing, and 2) provide additional narrative about the choice of model(s) being used for each initiative.*

Response:

1) See the Table at the end of the Guidance-3 action responses for the requested information for all 136 initiatives from the 2020 WMP, inclusive of WSD-defined initiatives and SCE's specific 2021 WMP activities. For each of the initiatives in Section 7.3.1-7.3.10 of this WMP Update, SCE describes how it used risk models to inform the initiative's decisions, where applicable.

2) For each of the initiatives in 7.3.2 Section of this WMP update, SCE describes how it used risk models to inform the initiative's decisions, where applicable. Please also refer to Chapter 4 of this WMP update for additional narrative on how SCE employs risk-informed decision-making.

Action SCE-2*: In its 2021 WMP update, SCE shall: 1) describe how it determined 5,000 as the setpoint for distinction of ignition outcomes, 2) provide the range of historical data used for wildfire consequence modeling, and any non-SCE data used, 3) provide the algorithm(s) used to calculate the unitless risk score and baseline wildfire risk score for both distribution and transmission, and 4) describe the useful life of each mitigation, and provide how such was calculated.*

Response:

1) In the 2020 WMP, SCE's RAMP model separated the wildfire outcomes into four groups: 1) Red Flag Day, > 5,000 acres, 2) Red Flag Day, < 5,000 acres, 3) Non Red Flag Day, > 5,000 acres and 4) Non Red Flag Day, < 5,000 acres. One of the reporting components prescribed in D.14-02-015 is that each CPUC reportable wildfire must be grouped by size (e.g., less than 0.25 Acres, 0.26 – 9.99 Acres, etc.). As such, SCE chose the largest size group, namely "Greater than 5,000 Acres," as a setpoint to differentiate between different outcomes.

2) As described above, SCE's RAMP model captured 4 distinct outcomes – each outcome is associated with the four consequence dimensions (Fatalities, Serious Injuries, Reliability, and Financial).

For each outcome, SCE collected statewide wildfires associated with a cause of "Electrical Power" and computed the average "consequence" per event to be used in the model. Data came from CAL FIRE Redbooks and CAL FIRE press releases, except as stated below.

Outcomes	Wildfire Population dataset
Outcome 1 – Red Flag Day, > 5,000 Acres	Wildfires in this outcome included Witch Fire, Norrbom, Adobe, Patrick, Pythian, Nuns, Atlas, Redwood, Pocket, DEER, Cascade, Cherokee, La Porte, and Camp
Outcome 2 – Red Flag Day, < 5,000 Acres	Based on CAL FIRE 2010-2017 dataset, received through a data request to CAL FIRE. Filtered on <5,000 acres, electrical cause codes 141,142, 143. Attempted to match with Red Flag day data, however CAL FIRE dataset did not have incidents by county. As such, performed a match by date (best information available). Dataset included over 1,300 rows of data.
Outcome 3 – Non Red Flag Day, > 5,000 Acres	Wildfires in this outcome included Butte, Mountain
Outcome 4 – Non Red Flag Day, < 5,000 Acres	For purposes of risk modeling, used same dataset as Outcome 2 as this particular outcome showed no safety impact

The below four consequences below were calculated for each outcome describe above based on the population set.

Fatalities	Serious Injuries	Reliability	Financial
Based on fatalities from Electric Power Fires as reported by CAL FIRE through its Redbook or press releases	To estimate serious injuries, a ratio was developed between serious injuries and fatalities. Based on National Fire Protection Association Database from 2010-2014, a ratio of 8.3: 1 was used.	SCE utilized its internal outage database (ODRM) to calculate an average CMI per wildfire outage event	Estimated unit costs per structure destroyed and acres burned were developed using national insurance databases, national firefighting cost data, and restoration cost studies. Damage Claims: SCE applied a cost per structure of $819K based on insurance industry property claims data for fires in California.[123] Suppression Costs: A unit cost of $248 was applied per acre suppression based on nationally reported suppression costs[124] Land Restoration costs: A unit cost of $1,227 was

[123] https://www.iii.org/fact-statistic/facts-statistics-wildfires

[124] https://www.nifc.gov/fireInfo/fireInfo_documents/SuppCosts.pdf

			applied per acre restoration based on public agency workpapers.[125]

3) SCE has previously provided the Excel model, which has full transparency of the calculations, in 1) WSD data request ("SCE-43895-X-379") and 2) Class B deficiencies in the Guidance-1 Appendix D. In the first submission, SCE also provided a whitepaper in Guidance-1 Appendix C ("2020 WMP Risk Model Whitepaper") which describes the workbook in the Excel file that has the calculations for the Baseline Distribution ("BASELINE_DISTR") and Transmission ("BASELINE_TRANS").

For purposes of this explanation, SCE will describe the calculation of the baseline distribution risk as the transmission baseline calculation is similar.

1) Calculate the 5-year average historical CPUC reportable ignitions frequency in HFRA for SCE (row 23)
2) The four outcomes described above have an associated percentage of occurrence based on the historical data (Row 26-29). For example, if Outcome-1 was shown to have occurred 5% of the time, then based on the total in (1), the total number of wildfires which have an Outcome-1 consequence is 5% multiplied by the total calculated in (1) above. (row 32-35)
3) SCE then calculates the consequences (in natural units[126]) by multiplying the number of occurrences of a particular outcome and the consequences per event (which is in column A) to arrive at the total consequences for each outcome. Example: Row 39-57.
4) To convert to a unitless risk score (MARS) so that different consequences can be added together, SCE used the Multi-Attribute Value Framework (MAVF) as discussed in its 2018 RAMP filing, but is reiterated here:

Attribute (units)	Weight	Range	Scaling
Fatality (#)	25%	100	Non-Linear (square root)
Serious Injuries (#)	25%	500	Non-Linear (square root)
Reliability (CMI)	25%	2,000,000,000	Linear
Financial ($)	25%	5,000,000,000	Linear

5) For each outcome, SCE applied the following formula below, based on the table parameters above, to convert each consequence dimension to the unitless risk score.
The generic equation is as follows:

[125] https://www.blm.gov/or/districts/roseburg/plans/collab_forestry/files/TrueCostOfWilfire.pdf

[126] Natural units for consequences are (#) for Fatalities and Serious Injuries, Customer Minutes of Interruption (CMI) for Reliability and Dollars for Financial.

$$MARS\ (Consequence) = \left(\frac{forecasted\ consequence}{Consequence\ Range}\right)^x * Total\ MARS\ Score * Consequence\ Weight$$

Where *Total MARS Score* = 100,

$$x = \begin{cases} \frac{1}{2}\ for\ Non-Linear\ Scaling \\ 1\ for\ Linear\ Scaling \end{cases}$$

Below is an example of the calculations for the Outcome-1 consequence dimensions.

$$MARS\ (Fatality) = \sqrt{\frac{\#\ of\ fatalities\ associated\ with\ Outcome1}{100}} * 100 * 25\%$$

$$MARS\ (Serious\ Injuries) = \sqrt{\frac{\#\ of\ Serious\ Injuries\ associated\ with\ Outcome1}{500}} * 100 * 25\%$$

$$MARS\ (Reliability) = \frac{CMI's\ associated\ with\ Outcome1}{2{,}000{,}000{,}000} * 100 * 25\%$$

$$MARS\ (Financial) = \frac{\$'s\ associated\ with\ Outcome1}{5{,}000{,}000{,}000} * 100 * 25\%$$

6) This calculation is repeated for the other 3 Outcomes
7) Add up the MARS numbers for each consequence and for each outcome to arrive at a total baseline score for Distribution.

4) The table below describes the useful life of each mitigation and provides how such was calculated.

Mitigation	Useful Life (years)	Determination of Useful Life
Wildfire Covered Conductor Program	45	Based on the Covered Conductor Compendium[127]
Undergrounding Overhead Conductor	43	Based on 2021 GRC Depreciation table (SCE-07, Volume 2 Workpapers

[127] The SCE Covered Conductor Compendium has been made public by the CPUC. It can also be accessed on pages A14-A256 in SCE's GRC rebuttal testimony at the following link.

https://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A1908013/2745/340234737.pdf

Mitigation	Useful Life (years)	Determination of Useful Life
Fire Resistant Composite Poles and Composite Cross-Arms	45	Based on SME judgment on useful life of equipment replacement
Branch Line Strategy Replace	15	Based on SME judgment on useful life of equipment replacement
Circuit Breaker Fast Curve Settings	65	Based on SME judgment on useful life of settings
Remote Controlled Automatic Reclosers Installation	25	Based on SME judgment on useful life of equipment installation
Hazard Tree Removals	60	Based on SME (vegetation team) on time for a tree to grow back
Expanded Pole Brushing	1	Based on a 1 year cycle to pole brush
DRI Quarterly Inspections and Tree Removals	60	Based on SME (vegetation team) on time for a tree to grow back
Distribution Detailed Overhead Inspections Transmission Detailed Overhead Inspections Distribution Aerial Inspections Transmission Aerial Inspections Distribution Infrared & Corona Inspections Transmission Infrared & Corona Inspections	45	These mitigations incorporate the remediation of findings from inspections. Since only remediations reduce risk and not inspections. SME judgement on useful life based on replacing equipment.
PSPS	3	PSPS mitigation incorporates many activities, such as Additional Staffing, Weather Stations, Weather forecasting, Fuel Sampling, Surface & Canopy Fuels Mapping, Remote Sensing/Satellite Fuel Moisture, Fire Science Enhancements, De-Energization Notifications, Community Resource Centers, Customer resiliency equipment incentives, MICOP Partnership, Community Outreach, PSPS driven grid hardening work. SME judgment of useful life based on the portfolio of individual programs listed above.

***Action SCE-3**: In its 2021 WMP update, SCE shall: 1) provide each asset-specific Point of Ignition (POI) model, 2) describe the frequency and method(s) in which POI models are tested for accuracy, and 3) describe the frequency in which SCE plans on updating POI models, including details on what will be updated.*

Response:
1) The Probability of Ignition (POI) models include significant amounts of input/output data as well as programs written in R/Python. Providing each asset-specific Probability of Ignition (POI) model will likely not help to understand the models themselves given their complex nature. SCE can provide the code for these models but believes it would be more beneficial to hold working session(s) to discuss the models, to provide a better understanding of the data engineering, model building, testing and validation processes.[128]

2) The WRRM's accuracy was tested throughout the model creation process: First, the input data was split randomly into two parts: the training dataset (~70%) and the test dataset (~30%). The training dataset was used to "train" the model, and the test dataset was used to validate the model performances to make sure no "overfitting" occurs. Further, SCE compares the performance of a new model with that of existing models to help ensure the new models outperform the existing models (e.g., Weibull and age-based models). Lastly, models are further validated by comparing model predictions to actual results, after the model is created.

3) SCE typically updates the models on annual or bi-annual basis. During updates to the WRRM, and its relevant components, the latest asset data are refreshed, including the latest asset failure data, to reinforce training of the models and test for accuracy. Additionally, model updates also include updates to all applicable data, including latest weather data, asset usage data, etc., when applicable. When new features become available (e.g., new data sources and/or new engineering inputs), those will also be included in each model update/refresh cycle.

Action SCE-4*: In its 2021 WMP update, SCE shall: 1) describe how all the models outlined in SCE's RCP response interact with one another, and 2) describe the process SCE uses to determine when to use each model.*

Response:
1) SCE has been building its wildfire risk model capabilities over the last two years. SCE started in 2018 by creating models to calculate the probability of ignitions (POI) to understand the likelihood of wildfires starting around SCE lines and assets. In early 2019, REAX Engineering provided SCE with its simulated wildfire consequence scores, which allowed SCE to quantify the expected wildfire risk calculated as POI*Consequence (Reax). In 2020, SCE replaced the Reax consequence values with Technosylva because it utilized more recent data and has a superior fire propagation simulation engine producing better wildfire consequence scores. Also, in 2020, SCE developed a method to quantify PSPS risk, and integrated the method into Wildfire Risk Reduction Model (WRRM). Finally, SCE developed a method to translate the WRRM expected risk into a unitless values using its MARS 2.0 framework consistent with RAMP. Because

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[128] At the time of drafting, SCE plans to meet with the WSD shortly after filing its 2021 WMP Update to provide a demonstration and facilitate discussion of its POI model.

it is not possible to send the WRRM model over, WSD agreed to a detailed demonstration of the model which is scheduled for February 11, 2021.

2) In SCE's RCP response we described the WRM (POI*Reax) and MARS/RAMP as separate models with the WRM used for prioritizing work scope within programs such as covered conductor and MARS used for enterprise level decision making and calculating risk spend efficiency (RSE). With both models now integrated into a single model WRRM, they interact directly. Chapter 4 of this WMP update describes in detail how this integration was accomplished and how each of the WRRM components can be used in whole or as sub-models for risk informed decision-making.

The process used to determine how to use the WRRM starts with the identification of a potential risk. Once a potential risk has been identified, SCE determines which component of the model may be influenced by the risk, e.g., wildfire, PSPS, or both. Next, SCE determines which POI/Probability of De-energization elements within the components (i.e., EFF, CFO, Windspeed, FPI) drive the likelihood of an event and if needed which individual sub-models of the elements, e.g., conductor, switch, vegetation, animal, etc. This evaluation determines whether the complete WRRM would be used or a sub-set of components and elements would be needed to evaluate the identified potential risk. Finally, if the risk has an identified mitigation and needs to be compared to other mitigations through an RSE, the WRRM calculated expected risk is translated into unitless values through the MARS translation and an RSE is computed.

The Table below includes the requested information for Guidance-3, Action SCE-1 for all 136 initiatives from the 2020 WMP, inclusive of WSD-defined initiatives and SCE's specific 2021 WMP activities.

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
A summarized risk map showing the overall ignition probability and estimated wildfire consequence along electric lines and equipment	Section 7.3.1	These tasks are enabling activities, component of SCE's risk modeling.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Climate-driven risk map and modelling based on various relevant weather scenarios	Section 7.3.1	These tasks are enabling activities, component of SCE's risk modeling.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Ignition probability mapping showing the probability of ignition along the electric lines and equipment	Section 7.3.1	These tasks are enabling activities, component of SCE's risk modeling.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	Section 7.3.1	These tasks are enabling activities, component of SCE's risk modeling.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment	Section 7.3.1	These tasks are enabling activities, component of SCE's risk modeling.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Continuous monitoring sensors: Early Fault Detection (EFD) Evaluation (AT-7)	Section 7.1.d	New Technology & Innovation, not a WMP activity in 2021.	Ignition risk: contact from object & equipment failure	N/A	N/A	N/A	N/A	N/A
Forecast of a fire risk index, fire potential index, or similar: Surface & Canopy Fuels Mapping (SA-6)	Part of 2020 WMP, combined into Section 7.3.2.6.2	No longer listing SA-6 as a separate activity, it is considered an input into the SA-4 Fire Spread Modeling activity. Output from this activity will feed and update our fuel layer in our Technosylva suite of tools.	N/A	N/A	Yes	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Advanced weather monitoring and weather stations: Weather Stations (SA-1)	Section 7.3.2.1	Weather stations provide additional inputs to risk modeling, having real-time weather information informs PSPS operations and decision-making. SCE did not estimate the RSE for this activity as it does not directly reduce wildfire or PSPS risks. Rather weather stations enable performing other wildfire mitigation activities more effectively, and the RSE calculations for those activities in the future will reflect the benefits of having weather stations.	Enabling Activity	N/A	No - deploy based on gaps in current coverage	N/A	N/A	N/A
Continuous monitoring sensors: Distribution Fault Anticipation (DFA) (SA-9)	Section 7.3.2.2	Distribution Fault Anticipation (DFA) technology incorporates electrical system measurements to alert on the potential for pending equipment failures by continually monitoring circuits to detect risks.	Ignition risk: arcing or equipment failure	Yes	Yes	N/A	N/A	N/A
Fault indicators for detecting faults on electric lines and equipment	Section 7.3.2.3	Fault indicators are installed and used as part of SCE's standard grid operations and are not specifically deployed for wildfire mitigation purposes.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Forecast of a fire risk index, fire potential index, or similar: Fire Potential Index phase II (SA-2)	Section 7.3.2.4.1	SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, FPI improvement enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect the benefits of FPI improvement.	Enabling Activity	N/A	Yes	FPI	FPI 2.0	FPI 2.0

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Forecast of a fire risk index, fire potential index, or similar: Fuel Sampling Program (SA-5)	Section 7.3.2.4.2	SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.	Enabling Activity	N/A	Yes	FPI	FPI 2.0	FPI 2.0
Forecast of a fire risk index, fire potential index, or similar: Remote Sensing / Satellite Fuel Moisture (SA-7)	Section 7.3.2.4.3	SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.	Enabling Activity	N/A	Yes	N/A	N/A	SCE is considering the use of a Fuels Regrowth Model in conjunction with Fuels Potential Index (FPI 2.0) in the future
Forecast of a fire risk index, fire potential index, or similar: Fire Science Enhancements (SA-8)	Section 7.3.2.4.4	SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.	Enabling Activity	N/A	Yes	FPI	FPI 2.0	FPI 2.0
Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	Section 7.3.2.5	As line patrols are a necessary component of implementing PSPS events, a separate RSE for just this activity was not calculated.	Enabling Activity	N/A	N/A	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Weather forecasting and estimating impacts on electric lines and equipment: Weather and Fuels Modeling System (SA-3)	Section 7.3.2.6.1	SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Weather forecasting and estimating impacts on electric lines and equipment: Fire Spread Modeling (SA-4)	Section 7.3.2.6.2	SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.	Enabling Activity	N/A	Yes	Reax (Consequence)	WRRM	WRRM
Covered conductor installation: Alternative Technology Implementation - Vibration Dampers (AT-4)	Section 7.1.d	No longer a WMP activity, installing vibration dampers to mitigate potential failures due to Aeolian vibration is operationalized, as needed.	Ignition risk: equipment failure	N/A	N/A	N/A	N/A	N/A
Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: Alternative Technology Evaluations - Meter Alarm Down Energized Conductor (MADEC) (AT-1)	2020 Activity Only	New Technology & Innovation. Not a WMP activity in 2021.	Ignition risk: equipment failure	N/A	N/A	N/A	N/A	N/A
Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: Alternative Technology Evaluations - Rapid Earth Current Fault Limiter - Ground Fault Neutralizer (GFN) (AT-3.1)	Section 7.1.d	New Technology & Innovation. Not a WMP activity in 2021.	Ignition risk: contact from object & equipment failure	N/A	N/A	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: Alternative Technology Evaluations - Rapid Earth Current Fault Limiter - Arc Suppression Coil (AT-3.2)	Section 7.1.d	New Technology & Innovation. Not a WMP activity in 2021.	Ignition risk: contact from object & equipment failure	N/A	N/A	N/A	N/A	N/A
Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: Alternative Technology Evaluations - Rapid Earth Current Fault Limiter - Isolation Transformer (AT-3.3)	Section 7.1.d	Installing a Rapid Earth Fault Current Limiter (REFCL) and Resonant Grounded Transformer at the boundary of an HFRA, can significantly reduce ignition risk from phase-to-ground faults.	Ignition risk: contact from object & equipment failure	N/A	N/A	N/A	N/A	N/A
Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: Alternative Technology Evaluations - Distribution Open Phase Detection (AT-3.4)	Section 7.1.d	Deploying Open Phase detection alarming settings to detect when an Open Phase event occurs.	Ignition risk: equipment failure	N/A	N/A	N/A	N/A	N/A
Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: Alternative Technology Evaluations - High Impedance Relay Evaluations (AT-8)	Section 7.1.d	Installing controllers with Hi-Z /arcing elements to Hi-Z conditions.	Ignition risk: contact from object & equipment failure	N/A	N/A	N/A	N/A	N/A
Capacitor maintenance and replacement program	Section 7.3.3.1	Since capacitor maintenance and replacements activities are not driven by wildfire nor PSPS risk reduction, but rather performed as part of traditional programs, program selection and design was not driven by risk analysis or RSE calculations.	Traditional Reliability Program	N/A	No	N/A	N/A	N/A
Maintenance, repair, and replacement of connectors, including hotline clamps	Section 7.3.3.10	These are replaced if needed based on inspection findings and not as a dedicated connector replacement project. Priority can be determined as part of findings, such as temperature of connectors found during infra-red scanning with repair timelines based on HFRA location.	Traditional Reliability Program	Yes - part of IN-1.1, IN-1.2	Yes	N/A	N/A	N/A
Mitigation of impact on customers and other residents affected during PSPS event	Section 7.3.3.11	Prioritized by location of AFN/NCRI customer.	PSPS Risk	Yes - part of PSPS-2	Yes	WRRM	WRRM	WRRM

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Other corrective action - Long Span Initiative (SH-14)	Section 7.3.3.12.1	Prioritized by location long spans in HFRA.	Ignition risk: wire to wire contact	Yes	Yes	WRM(POI)/Reax (consequence)	WRRM	WRRM
Pole loading infrastructure hardening and replacement program based on pole loading assessment program	Section 7.3.3.13	These are replaced if needed during inspection.	Traditional Reliability Program	N/A	No	N/A	N/A	N/A
Transformers maintenance and replacement	Section 7.3.3.14	These are risk-prioritized indirectly by the HFRI program and replaced as needed through various non-prioritized programs.	Traditional Reliability Program	N/A	Yes	N/A	N/A	N/A
Transmission tower maintenance and replacement: C-Hooks (SH-13)	Section 7.3.3.15.1		Ignition risk: equipment failure	Yes	Yes	WRM(POI)/Reax (consequence)	WRRM	WRRM
Undergrounding of electric lines and/or equipment: Undergrounding Overhead Conductor (SH-2)	Section 7.3.3.16	Comparing mitigation effectiveness of covered conductor vs. undergrounding by sub-drivers.	Ignition risk: contact from object & equipment/facility failure	Yes	Yes	WRM(POI)/ Technosylva (consequence)	WRRM	WRRM
Updates to grid topology to minimize risk of ignition in HFTDs: Transmission Open Phase Detection (SH-8)	Section 7.3.3.17.1	SCE did not calculate an RSE for this initiative as it is a pilot deployed on a very limited number of lines.	Pilot Program	N/A	N/A	N/A	N/A	N/A
Legacy Facilities (SH-11)	Section 7.3.3.17.2	SCE did not calculate an RSE for this initiative as SCE does not have historical ignition data from these types of facilities to develop a risk model.	Ignition risk: contact from object & equipment failure	N/A	No	N/A	N/A	N/A
Transmission Overhead (TOH) Review (SH-9)	Section 7.3.3.17.4	Concluded the review, not a WMP activity in 2021.	Ignition risk: equipment failure	N/A	No	N/A	N/A	N/A
Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: Circuit Breaker Relay Hardware for Fast Curve (SH-6)	Section 7.3.3.2		Ignition risk: equipment failure	Yes	Yes	RAMP model; WRM (POI)/ Reax (Consequence)	WRRM	WRRM
Covered conductor installation: Covered Conductor (SH-1)	Section 7.3.3.3.1		Ignition risk: contact from object & equipment failure	Yes	Yes	RAMP model; WRM (POI)/ Reax (Consequence)	WRRM	WRRM
Covered conductor installation: Tree Attachment Remediation (SH-10)	Section 7.3.3.3.2	Embedded in Covered Conductor scoring in 2018 RAMP/2021 GRC.	Ignition risk: contact from object & equipment failure	Yes	Yes	RAMP model; WRM (POI)/ Reax (Consequence)	WRRM	WRRM

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Covered conductor maintenance	Section 7.3.3.4	SCE does not have a separate program for covered conductor maintenance. Sit will be maintained as part of other inspection and remediation programs.	Maintenance Program	Yes - part of IN-1.1	N/A	N/A	N/A	N/A
Crossarm maintenance, repair, and replacement	Section 7.3.3.5	SCE does not have a separate program for crossarm repair and replacements. They are primarily replaced as part of IN-1.1 in HFRA and is included in the RSE calculations for IN-1.1.	Maintenance Program	N/A	Yes	RAMP model; WRM (POI)/ Reax (Consequence)	WRRM	WRRM
Distribution pole replacement and reinforcement, including with composite poles: WCCP Fire Resistant Poles (SH-3)	Section 7.3.3.6	Fire resistant poles replaced as part of WCCP are scoped based on the scope and prioritization of WCCP.	Ignition risk: equipment failure; Wildfire consequence risk	Yes - part of SH-1	Yes	RAMP model; Reax (Consequence)	WRRM	WRRM
Expulsion fuse replacement: Branch Line Protection Strategy (SH-4)	Section 7.3.3.7		Ignition risk: equipment failure, contact from object	Yes	Yes	RAMP model; WRM (POI)/ Reax (Consequence)	WRRM	WRRM
Grid topology improvements to mitigate or reduce PSPS events: Circuit Evaluation for PSPS Driven Grid Hardening Work (SH-7)	Section 7.3.3.8.1	SCE did not calculate an RSE for this initiative as the evaluation by itself does not reduce ignition or PSPS risks. The risk reduction for the work undertaken as a result of this initiative are included in the risk analyses of the corresponding activities, as appropriate.	Ignition risk: contact from object & equipment failure; Impact of PSPS on customers	N/A	Yes	WRM(POI)/Reax (consequence)	WRRM	WRRM
Grid topology improvements to mitigate or reduce PSPS events: Microgrid Assessment (PSPS-8)	Section 7.3.3.8.2	SCE did not calculate an RSE for this initiative as it is a pilot.	Adverse impact of PSPS (maintain energy resiliency, reduce CMI)	N/A	Yes	N/A	N/A	N/A
Installation of system automation equipment: installation of system automation equipment - Remote Controlled Automatic Reclosers Settings Update (SH-5)	Section 7.3.3.9	Scope dependent on SH-7 evaluation (PSPS Driven Grid Hardening Work).	Wildfire consequence; Impact of PSPS on customers	N/A	N/A	RAMP model	N/A	N/A
Other corrective action: Distribution Remediations (SH-12.1)	Part of 2020 WMP, combined into Section 7.3.4.9.1	Inspections that identify these remediations are risk prioritized by the WRRM	Ignition risk: contact from object & equipment failure	Yes - part of IN-1.1	Yes – Risk prioritized in accordance with GO 95 Rule 18	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Other corrective action: Transmission Remediations (SH-12.2)	Part of 2020 WMP, combined into Section 7.3.4.9.14	Inspections that identify these remediations are risk prioritized by the WRRM	Ignition risk: contact from object & equipment failure	Yes - part of IN-1.2	Yes– Risk prioritized in accordance with GO 95 Rule 18	N/A	N/A	N/A
Other corrective action: Generation Remediations (SH-12.3)	Part of 2020 WMP, combined into Section 7.3.4.9.2		Ignition risk: contact from object & equipment failure	Yes - part of IN-1.1	No	N/A	N/A	N/A
Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations: Advanced Unmanned Aerial Systems Study (AT-2.2)	Section 7.1.d	Complete in 2020	Ignition risk: contact from object & equipment failure	N/A	N/A	N/A	N/A	N/A
Substation inspections: Failure Modes and Effects Analysis (FMEA) (IN-7)	Section 7.3.4.15	Complete in 2020	Assessment of potential sources of ignition	N/A	N/A	N/A	N/A	N/A
Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations: Asset Defect Detection Using Machine Learning Object Detection (AT-5)	Section 7.1.d	Using machine learning to identify assets and defects from inspection imagery in the field and potentially identifies defects prior to inspections.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations: Aerial Inspections - Transmission (IN-6.2)	Part of 2020 WMP, combined into Section 7.3.4.10		Ignition risk: contact from object & equipment failure	Yes - part of IN-1.2	Yes	Reax (Consequence)	WRRM	WRRM
Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations: Aerial Inspections - Distribution (IN-6.1)	Part of 2020 WMP, combined into Section 7.3.4.9.1		Ignition risk: contact from object & equipment failure	Yes - part of IN-1.1	Yes	WRM(POI)/Reax (consequence)	WRRM	WRRM
Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations: Assessment of Partial Discharge for Transmission Facilities (AT-6)	Section 7.1.d	Scope completed in 2020, not a WMP activity in 2021.	Pilot Program	N/A	N/A	N/A	Scope completed in 2020	Scope completed in 2020

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Detailed inspections of distribution electric lines and equipment: Distribution HFRA Detailed Inspections + Remediations (previously ODI)	Section 7.3.4.1	This program is driven by compliance requirements, not wildfire risk reduction. Though SCE does not calculate RSEs for compliance programs which have to be undertaken regardless of RSEs, SCE supports risk informed evaluation of compliance requirements in collaboration with the Commission. The inspections are not prioritized for risk, however, the remediations are prioritized by risk and completed within compliance timelines.	Ignition risk: contact from object & equipment failure	N/A	Yes (Remediations)	WRM(POI)/Reax (consequence)	WRRM	WRRM
Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations: Transmission Risk-Informed Inspections in HFRA (IN-1.2)	Section 7.3.4.10.1		Ignition risk: contact from object & equipment failure	Yes	Yes	RAMP model; Reax (Consequence)	WRRM	WRRM
Patrol inspections of distribution electric lines and equipment	Section 7.3.4.11	SCE does not calculate RSEs for compliance programs which have to be undertaken regardless of RSEs, SCE supports risk informed evaluation of compliance requirements in collaboration with the Commission.	Ignition risk: contact from object & equipment failure	N/A	N/A	N/A	N/A	N/A
Patrol inspections of transmission electric lines and equipment	Section 7.3.4.12	SCE does not calculate RSEs for compliance programs which have to be undertaken regardless of RSEs, SCE supports risk informed evaluation of compliance requirements in collaboration with the Commission.	Ignition risk: contact from object & equipment failure	N/A	N/A	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Pole loading assessment program to determine safety factor	Section 7.3.4.13	Pole loading programs are undertaken to meet GO 95 compliance. Any wildfire mitigation benefits are collateral. Though SCE does not calculate RSEs for compliance programs which have to be undertaken regardless of RSEs, SCE supports risk informed evaluation of compliance requirements in collaboration with the Commission.	Traditional Safety/Reliability Program	N/A	Yes - HFRA	N/A	N/A	N/A
Quality assurance / quality control of inspections: Quality Oversight / Quality Control (IN-2)	Section 7.3.4.14	Operationalized, not a 2021 WMP activity.	Enabling Activity	N/A	Yes (QC Sampling Process)	Reax (Consequence)	WRRM	WRRM
Detailed inspections of Transmission electric lines and equipment	Section 7.3.4.2	GO 95 provides guidance on overhead electric line construction standards and GO 165 provides guidance on the minimum timing for inspections and maintenance that SCE is required to comply with. Though SCE does not calculate RSEs for compliance programs which have to be undertaken regardless of RSEs, SCE supports risk informed evaluation of compliance requirements in collaboration with the Commission.	Traditional Safety/Reliability Program	N/A	Yes	Prioritize SCE's HFRA over non-HFRA prior to wildfire season	Prioritize SCE's HFRA over non-HFRA prior to wildfire season	Prioritize SCE's HFRA over non-HFRA prior to wildfire season
Improvement of Inspections: Inspection and Maintenance Tools (IN-8)	Section 7.3.4.3.1	These are technology projects which cannot reduce wildfire or PSPS risks, but can improve the efficacy and efficiency of high fire risk informed inspections and remediations, which already has its own RSE.	Enabling Activity	N/A	N/A	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Infrared inspections of distribution electric lines and equipment: Infrared Inspection of Energized Overhead Distribution Facilities and Equipment (IN-3)	Section 7.3.4.4		Ignition risk: equipment failure	Yes	Yes	RAMP model; WRM (POI)/ Reax(Consequence)	WRRM	WRRM
Infrared inspections of transmission electric lines and equipment: Infrared Inspection, Corona Scanning, and High Definition Imagery of Energized Overhead Transmission Facilities and Equipment (IN-4)	Section 7.3.4.5		Ignition risk: equipment failure	Yes	Yes	RAMP model; Reax(Consequence)	WRRM	WRRM
Intrusive pole inspections (IPI)	Section 7.3.4.6	GO 95 provides guidance on overhead electric line construction standards and GO 165 provides guidance on the minimum timing for inspections and maintenance that SCE is required to comply with. Though SCE does not calculate RSEs for compliance programs which have to be undertaken regardless of RSEs, SCE supports risk informed evaluation of compliance requirements in collaboration with the Commission.	Traditional Safety/Reliability Program	N/A	No	N/A	N/A	N/A
LiDAR inspections of distribution electric lines and equipment	Section 7.3.4.7	SCE did not develop an RSE for this activity because it does not have a separate LiDAR program for inspecting distribution lines and equipment. SCE uses LiDAR as part of its inspection programs and as such it informs the RSE associated with the activity described in Section 7.3.4.9.1.	Ignition risk: contact from object & equipment failure	N/A	No	N/A	N/A	WRRM

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
LiDAR inspections of transmission electric lines and equipment	Section 7.3.4.8	SCE did not develop an RSE for this activity because it does not have a separate LiDAR program for inspecting transmission lines and equipment. SCE uses LiDAR as part of its inspection programs and as such it informs the RSE associated with the activity described in Section 7.3.4.10.1.	Ignition risk: contact from object & equipment failure	N/A	No	N/A	N/A	WRRM
Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations: Distribution High Fire Risk-Informed Inspections (IN-1.1)	Section 7.3.4.9.1		Ignition risk: contact from object & equipment failure	Yes	Yes	WRM(POI)/Reax (consequence)	WRRM	WRRM
Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations: Generation Risk-Informed Inspections in HFRA (IN-5)	Section 7.3.4.9.2	See IN-1.1. for comparable RSE value	Ignition risk: contact from object & equipment failure	N/A	Yes	N/A	N/A	WRRM
Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations: UAS Operations Training (OP-3)	Part of 2020 WMP, combined into Section 7.3.9.1 (DEP-2)	This activity does not directly mitigate wildfire risk, but it facilitates the wildfire risk mitigation activities and supports safe and reliable operation of SCE's systems.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Additional efforts to manage community and environmental impacts	Section 7.3.5.1	SCE did not perform risk analysis or calculate an RSE for this activity as it does not directly mitigate wildfire or PSPS risks but supports other vegetation management activities.	Enabling Activity	N/A	N/A	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Other discretionary inspection of vegetation around transmission electric lines and equipment, beyond inspections mandated by rules and regulations	Section 7.3.5.10	See details on VM-1	Ignition risk: contact from object	N/A	No	N/A	N/A	WRRM; Tree Risk Index
Patrol inspections of vegetation around distribution electric lines and equipment	Section 7.3.5.11	This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Vegetation management to achieve clearances around electric lines and equipment (section 7.3.5.20), that directly mitigates wildfire and PSPS risk.	Ignition risk: contact from object	N/A (see Vegetation management to achieve clearances around electric lines and equipment)	Yes	RAMP model; Reax (Consequence)	Reax (Consequence) transitioning to WRRM	WRRM; Tree Risk Index
Patrol inspections of vegetation around transmission electric lines and equipment	Section 7.3.5.12	This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Vegetation management to achieve clearances around electric lines and equipment (section 7.3.5.20), that directly mitigates wildfire and PSPS risk.	Ignition risk: contact from object	N/A (see Vegetation management to achieve clearances around electric lines and equipment)	Yes	Reax (Consequence)	Reax (Consequence) transitioning to WRRM	WRRM; Tree Risk Index

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Quality assurance / quality control of inspections: Quality Control (VM-5)	Section 7.3.5.13	This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Vegetation management to achieve clearances around electric lines and equipment (section 7.3.5.20), that directly mitigates wildfire and PSPS risk.	Ignition risk: contact from object	N/A	Yes	Reax (Consequence)	Reax (Consequence) transitioning to WRRM	WRRM; Tree Risk Index
Recruiting and training of vegetation management personnel	Section 7.3.5.14	SCE did not perform risk analysis or calculate an RSE for this activity as it does not directly mitigate wildfire or PSPS risks but supports other vegetation management activities.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Remediation of at-risk species	Section 7.3.5.15	This is not currently an activity separate from Vegetation management to achieve clearances around electric lines and equipment (section 7.3.5.20) and thus SCE did not develop an RSE for it.	Ignition risk: contact from object	N/A	No	N/A	N/A	WRRM; Tree Risk Index
Removal and remediation of trees with strike potential to electric lines and equipment: Hazard Tree (VM-1)	Section 7.3.5.16.1		Ignition risk: contact from object	Yes	Yes	RAMP model; Reax (Consequence); Tree Risk Calculator	Reax (Consequence) transitioning to WRRM/ Tree Risk Calculator	WRRM; Tree Risk Calculator
Removal and remediation of trees with strike potential to electric lines and equipment: Dead and Dying Tree Removal (VM-4)	Section 7.3.5.16.2		Ignition risk: contact from object	Yes	Yes	RAMP model; Reax (Consequence)	Reax (Consequence) transitioning to WRRM	WRRM

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Substation inspections	Section 7.3.5.17	This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Substation vegetation management, which does not have an RSE due to the lack of historical data on vegetation-caused ignitions involving substation facilities.	Ignition risk: contact from object	N/A	No	N/A	N/A	WRRM; Tree Risk Index
Substation vegetation management	Section 7.3.5.18	Due to the lack of historical data on vegetation-caused ignitions involving substation facilities, SCE did not develop an RSE for this activity. However, SCE determined that it was prudent to manage the vegetation around its substations and will continue to do so for the foreseeable future.	Ignition risk: contact from object	N/A	No	N/A	N/A	WRRM; Tree Risk Index
Vegetation inventory system: VM Work Management Tool (Arbora) (VM-6)	Section 7.3.5.19	SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other vegetation management activities, and the RSE calculations for those activities in the future will reflect these benefits.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Detailed inspections of vegetation around distribution electric lines and equipment	Section 7.3.5.2	This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Vegetation management to achieve clearances around electric lines and equipment (section 7.3.5.20), that directly mitigates wildfire and PSPS risk.	Ignition risk: contact from object	N/A (see Vegetation management to achieve clearances around electric lines and equipment)	No	N/A	N/A	WRRM; Tree Risk Index

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Vegetation management to achieve clearances around electric lines and equipment	Section 7.3.5.20		Ignition risk: contact from object	Yes	No	N/A	N/A	WRRM; Tree Risk Index
Detailed inspections of vegetation around transmission electric lines and equipment	Section 7.3.5.3	This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Vegetation management to achieve clearances around electric lines and equipment (section 7.3.5.20), that directly mitigates wildfire and PSPS risk.	Ignition risk: contact from object	N/A (see Vegetation management to achieve clearances around electric lines and equipment)	No	N/A	N/A	WRRM; Tree Risk Index
Emergency response vegetation management due to red flag warning or other urgent conditions	Section 7.3.5.4	SCE did not develop an RSE for vegetation management protocols during RFW periods because they support the safe and prudent performance of vegetation management work and are not specific wildfire initiatives.	Ignition risk	N/A	No	N/A	N/A	N/A
Fuel management and reduction of "slash" from vegetation management activities: Expanded Pole Brushing (VM-2)	Section 7.3.5.5.1		Ignition risk: equipment failure	Yes	No	N/A	N/A	WRRM
Fuel management and reduction of "slash" from vegetation management activities: Expanded Clearances for Legacy Facilities (VM-3)	Section 7.3.5.5.2	SCE did not calculate an RSE for this initiative as relevant historical ignition information for these types of facilities was not readily available.	Ignition risk: contact from object	N/A	No	N/A	N/A	N/A
Improvement of inspections	Section 7.3.5.6	SCE did not develop an RSE for this enabling activity as it does not directly reduce wildfire or PSPS risk or consequence. Rather, this activity enables more effective execution of other wildfire mitigation activities, and the RSE calculations for those activities in the future will reflect these benefits.	Enabling Activity	N/A	No	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
LiDAR inspections of vegetation around distribution electric lines and equipment	Section 7.3.5.7	This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Vegetation management to achieve clearances around electric lines and equipment (section 7.3.5.20), that directly mitigates wildfire and PSPS risk.	Enabling Activity	N/A	No	N/A	N/A	WRRM
LiDAR inspections of vegetation around transmission electric lines and equipment	Section 7.3.5.8	This activity does not have its own RSE because by itself, it does not directly mitigate wildfire or PSPS risk. Rather, it informs the mitigation, Vegetation management to achieve clearances around electric lines and equipment (section 7.3.5.20), that directly mitigates wildfire and PSPS risk.	Enabling Activity	N/A	No	N/A	N/A	WRRM
Other discretionary inspection of vegetation around distribution electric lines and equipment, beyond inspections mandated by rules and regulations	Section 7.3.5.9	See details on SCEs Hazard Tree Management Program (Section 7.3.5.16.1).	Ignition risk: contact from object	Yes - part of VM-1	Yes	RAMP model; Reax (Consequence); Tree Risk Calculator	Reax (Consequence) transitioning to WRRM/ Tree Risk Calculator	WRRM; Tree Risk Calculator
Annual SOB 322 review (OP-1)	2020 Activity Only	Initiative doesn't target specific ignition probability or other risk drivers but instead supports SCE's overall wildfire mitigation effort.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
PSPS events and mitigation of PSPS impacts: Community Outreach Partnerships (PSPS-5)	Part of 2020 WMP, combined into Section 7.3.10.1	Though this activity is critical to help prepare customers for wildfire and PSPS events, it does not necessarily lead to reduction in impact and it is not feasible to reasonably measure the impact of this activity on reducing PSPS impacts.	Insufficient awareness of PSPS & Impact of PSPS on customers	N/A	N/A	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
PSPS events and mitigation of PSPS impacts: Independent Living Centers Partnership (PSPS-6)	Part of 2020 WMP, combined into Section 7.3.10.1	This partnership helps vulnerable customers better prepare but does not impact wildfire or ignition risks. Safety impacts may be reduced if customers plan based on information shared, but these indirect benefits cannot be quantified. Such partnerships are foundational and RSEs do not drive decision making on whether to undertake such partnerships.	Adverse impact of PSPS (access to resources & facilities)	N/A	N/A	N/A	N/A	N/A
PSPS events and mitigation of PSPS impacts: Community Outreach (PSPS-7)	Part of 2020 WMP, combined into Section 7.3.10.1	This activity helps customers better prepare for emergencies but does not impact wildfire or ignition risks. Safety impacts may be reduced if customers plan based on information shared, but these indirect benefits cannot be quantified. Such outreach is foundational and RSEs do not drive decision making on whether to undertake this activity.	Adverse impact of PSPS (access to resources & facilities)	N/A	N/A	N/A	N/A	N/A
PSPS events and mitigation of PSPS impacts: Battery Backup Programs (PSPS-3)	Part of 2020 WMP, combined into Section 7.3.6.5.2.3		Adverse impact of PSPS (maintaining energy resiliency)	Yes - part of PSPS-2	Yes - RSE for this activity is evaluated, however scope is not prioritized based on risk modeling	N/A	WRRM	WRRM
PSPS events and mitigation of PSPS impacts: Self Generation Incentive Program (SGIP) Resiliency	Part of 2020 WMP, combined into Section 7.3.6.5.2.3	The SGIP is a state-mandated program that SCE is required to implement and is not driven by a risk analysis.	Adverse impact of PSPS (maintaining energy resiliency)	N/A	N/A	N/A	N/A	N/A
PSPS events and mitigation of PSPS impacts: Income Qualified Critical Care (IQCC) Customer Battery Backup Incentive Program (PSPS-4)	Part of 2020 WMP, combined into Section 7.3.6.5.2.3		Adverse impact of PSPS (maintaining energy resiliency)	Yes - part of PSPS-2	Yes - RSE for this activity is evaluated, however scope is not prioritized based on risk modeling	N/A	WRRM	WRRM

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Automatic recloser operations	Section 7.3.6.1	The application of fast curve settings ensures that any potential relays during a time of high wildfire risk release as little electrical energy as possible.	Ignition risk	N/A	N/A	N/A	N/A	N/A
Crew-accompanying ignition prevention and suppression resources and services	Section 7.3.6.2	SCE does not perform this activity.	Ignition risk	N/A	N/A	N/A	N/A	N/A
Personnel work procedures and training in conditions of elevated fire risk	Section 7.3.6.3	These are procedures followed by SCE as a prudent utility operator and is not informed by an RSE.	Ignition risk	N/A	N/A	N/A	N/A	N/A
Protocols for PSPS re-energization	Section 7.3.6.4	This activity is an essential step of the PSPS process and an RSE associated with it would be the RSE for PSPS. However, consistent with the WSD's directive, SCE does not rely on rely on RSE calculations as a tool to justify the use of PSPS.	Ignition risk: equipment failure; contact from object	N/A	Yes	FPI	FPI 2.0	FPI 2.0
PSPS events and mitigation of PSPS impacts	Section 7.3.6.5		Adverse impact of PSPS	Yes	Yes	N/A	WRRM	WRRM
PSPS events and mitigation of PSPS impacts: Community Resource Centers (PSPS-2)	Section 7.3.6.5.2.1		Adverse impact of PSPS (access to resources & facilities)	Yes	<u>Yes -RSE for this activity is evaluated, however scope is not prioritized based on risk modeling</u>	RAMP Model	WRRM	WRRM
Stationed and on-call ignition prevention and suppression resources and services	Section 7.3.6.6	SCE does not utilize stationed and on-call ground-based ignition prevention and suppression resources and services.	N/A	N/A	N/A	N/A	N/A	N/A
Centralized repository for data	Section 7.3.7.1	Implementation a centralized repository of wildfire datasets to support comprehensive analysis.	Enabling Activity	N/A	N/A	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Collaborative research on utility ignition and/or wildfire	Section 7.3.7.2	SCE did not develop an RSE for this activity because it does not directly mitigate the risk of wildfire or PSPS but rather supports and enables the future improvement of wildfire mitigation.	Research Activity	N/A	N/A	N/A	N/A	N/A
Documentation and disclosure of wildfire-related data and algorithms	Section 7.3.7.3	SCE did not develop an RSE for these activities because they do not directly reduce the risk of wildfire or PSPS but rather support and enable SCE's risk modeling and implementation of its wildfire mitigations.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Tracking and analysis of near miss data	Section 7.3.7.4	SCE did not develop an RSE for this activity as it does not directly reduce wildfire or PSPS risk. Rather it supports and potentially improves SCE's wildfire mitigations and risk modeling. The RSEs of these activities reflect the benefits of having adequate monitoring analysis of near miss data.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Organizational Support - PMO, OCM, and wildfire-related IT support	Part of 2020 WMP, combined into Section 7.3.8.1	These activities do not reduce wildfire or PSPS risks but help inform how other risk mitigation activities are conducted. The RSEs of these activities reflect the benefits of having adequate organizational support.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Allocation methodology development and application	Section 7.3.8.1	These activities do not reduce wildfire or PSPS risks but help inform how other risk mitigation activities are selected and deployed. The RSEs of these activities reflect the benefits of having adequate allocation methodology.	Enabling Activity	N/A	N/A	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Risk reduction scenario development and analysis	Section 7.3.8.2	This activity does not reduce wildfire or ignition risk but can inform which activities to perform and prioritize. This also does not have any incremental costs. The RSEs of the activities that use the analysis reflect the impact of this activity.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Risk spend efficiency analysis	Section 7.3.8.3	This activity does not reduce wildfire or ignition risk but can inform which activities to perform and prioritize. This also does not have any incremental costs. The RSEs of the activities that use the analysis reflect the impact of this activity.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Adequate and trained workforce for service restoration: SCE Emergency Response Training (DEP-2)	Section 7.3.9.1	This activity does not directly mitigate wildfire risk, but it facilitates the wildfire risk mitigation activities and supports safe and reliable operation of SCE's systems.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Community outreach, public awareness, and communications efforts: Customer Education and Engagement (DEP-1.1, 1.2, 1.3), IOU Customer Engagement (DEP-3)	Section 7.3.9.2	Though this activity is critical to help prepare customers for wildfire and PSPS events, it does not necessarily lead to reduction in impact and it is not feasible to reasonably measure the impact of this activity on reducing PSPS impacts.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Customer support in emergencies	Section 7.3.9.3	These activities are not intended to directly reduce the probability or consequences of wildfire and de-energization, but rather support customer needs during an emergency, and therefore risk models were not used to select the scope of work, calculate RSE or target deployment.	Enabling Activity	N/A	N/A	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Disaster and emergency preparedness plan	Section 7.3.9.4	These activities are not intended to directly reduce the probability or consequence of ignitions or de-energizations, but rather support the essential task of SCE's response to emergencies, and therefore risk models were not used to select the scope of work, calculate RSE or target deployment.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Preparedness and planning for service restoration	Section 7.3.9.5	Protocols for safe restoration of power is essential and thus not informed by an RSE. The training allows SCE personnel to support vital activities (e.g., service restoration after an emergency) and/or specific wildfire mitigation initiatives (i.e., PSPS). The impact of this activity is included in the RSE calculations of the individual activities it supports.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Protocols in place to learn from wildfire events	Section 7.3.9.6	These activities are not intended to directly reduce the probability or consequence of ignitions or de-energizations, but rather support the essential task of SCE's response to emergencies, and therefore risk models were not used to select the scope of work, calculate RSE or target deployment.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Community engagement: Customer Education and Engagement - Community Meetings (DEP-1.2)	Section 7.3.10.1.1	Information to help customers prepare to respond to a PSPS, wildfires, and emergencies, emphasizing HFRA and PSPS-impacted communities.	Insufficient awareness of Wildfire Mitigations, PSPS, Emergency Preparedness & Impact of Wildfire Mitigations and PSPS on customers	N/A	N/A	N/A	N/A	N/A
Cooperation and best practice sharing with agencies outside CA	Section 7.3.10.2	Benchmarking can help identify new and refine existing mitigation activities and approaches.	Enabling Activity	N/A	N/A	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
Cooperation with suppression agencies: Aerial Suppression (DEP-5)	Section 7.3.10.3	Prioritizing SCE's HFRA over non-HFRA.	Wildfire consequence	Yes	Yes	N/A	N/A	N/A
Forest service and fuel reduction cooperation and joint roadmap	Section 7.3.10.4	An RSE was not used to inform this activity, as risk reduction stemming from these partnerships will occur once the applicable fuel reduction activities are undertaken.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
Community engagement: PSPS Working Groups and Advisory Board	Section 7.3.10.1.2	Stakeholder engagement and feedback loop to improve PSPS protocols and inform public messaging.	Insufficient customer and stakeholder engagement and feedback on PSPS events	N/A	N/A	N/A	N/A	N/A
Community engagement: Customer Education and Engagement, Marketing Campaign (DEP-1.3)	Section 7.3.10.1.3	Information to help customers prepare to respond to a PSPS, wildfires, and emergencies.	Insufficient awareness of Wildfire Mitigations, PSPS, Emergency Preparedness & Impact of Wildfire Mitigations and PSPS on customers	N/A	N/A	N/A	N/A	N/A
Community engagement: Customer Research and Education (DEP-4)	Section 7.3.10.1.4	Feedback loop to improve PSPS protocols and inform public messaging.	Insufficient customer and stakeholder feedback on PSPS events	N/A	N/A	N/A	N/A	N/A
Installation of system automation equipment: installation of system automation equipment - Vertical Switches (SH-15)	Section 7.3.3.17.3		Incandescent particle generation in HFRA	Yes	Yes	WRM(POI)/Reax (consequence)	WRRM	WRRM
PSPS Incident Management Team	Section 7.3.6.5.1	This activity is an essential step of the PSPS process and an RSE associated with it would be the RSE for PSPS. However, consistent with the WSD's directive, SCE does not rely on rely on RSE calculations as a tool to justify the use of PSPS.	Enabling Activity	N/A	N/A	N/A	N/A	N/A
PSPS events and mitigation of PSPS impacts: Customer Resiliency Programs (Resiliency Zones and Customer Resiliency Equipment Incentive)	Section 7.3.6.5.2.2	Initiative to provide power to large venues such as community centers/gyms with backup power during PSPS events.	Adverse impact of PSPS (maintaining energy resiliency)	N/A	N/A	N/A	N/A	N/A
PSPS events and mitigation of PSPS impacts: Customer Resiliency Programs	Section 7.3.6.5.2.3	Customer incentive program to assist customers relying on well water during PSPS events.	Adverse impact of PSPS (maintaining energy resiliency)	N/A	N/A	N/A	N/A	N/A

Initiative	2021 WMP Update Section	SCE Comments	Risk(s) to be Mitigated	Risk Spend Efficiency (RSE), If Applicable	Risk-Informed Prioritization	Risk Models Used (2020)	Current Risk Models Used (2021)	Future Risk-Informed Decision Making Enhancements (2022)
De-energization notifications (PSPS-1.1, PSPS-1.2, PSPS-1.3, PSPS-1.4)	Section 8.2		Insufficient awareness of PSPS & Impact of PSPS on customers	Yes	Yes	FPI	FPI 2.0	FPI 2.0 and/or Technosylva FireCast
Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: maintenance	Section 7.3.3.2	Traditional Maintenance Activity	Ignition risk: heating, arcing, sparking	N/A	N/A	N/A	N/A	N/A
Distribution pole replacement and reinforcement, including with composite poles: Deteriorated Pole Program	Section 7.3.3.6	Traditional Maintenance Activity	Ignition risk: equipment failure; Wildfire consequence	N/A	N/A	N/A	N/A	N/A
PSPS events and mitigation of PSPS impacts: Wildfire Infrastructure Protection Team Additional Staffing (OP-2)	2020 Activity Only	While this initiative does not directly reduce probability or consequence of ignitions, dedicated and specialized staff to help ensure operational consistency and enhance efficiency in implementing PSPS standards/protocols, thus reducing PSPS impacts on customers.	Enabling Activity	N/A	N/A	N/A	N/A	N/A

Responses to WSD Action Statement on Remedial Compliance Plan
SCE-12, Insufficient justification of increased vegetation clearances

Action SCE-16*: In its 2021 WMP update, SCE shall submit a detailed plan on how the data will be statistically analyzed.*

Response:
SCE will be using Tree Caused Circuit Interruption (TCCI) data and specific tree inventory data to determine: (1) if a TCCI was caused by a tree that was in SCE's known tree data base, or in proximity to a tree in SCE's inventory; and (2) if the tree was determined to be in the tree database, whether the tree had a post trim clearance that met the enhanced clearance requirements of Appendix E (12 feet or greater).

The table below identifies TCCI events which occurred in HFRA and non-HFRA between 2016 and 2020.[129] The evaluation of the effectiveness of enhanced clearances is focused on TCCI events commencing December 1, 2019 when enhanced clearances was implemented in HFRA; however, TCCIs since 2016 are provided for trending purposes.

Year (1/1 – 12/31)	Total TCCIs	TCCIs in HFRA	TCCIs in Non-HFRA
2016	545	191	354
2017	534	213	321
2018	411	139	272
2019	545	215	330
2020	307[130]	94	190

SCE's analysis approach is described below and may be adjusted as the data collected during the current and future analysis confirms the methodology behind SCE's approach.

SCE is analyzing each of the TCCIs in its database to determine if the incident was caused by a tree that had enhanced trims or by a tree that did not have enhanced trims. SCE will report on the data and compare the trend in TCCIs caused by trees with enhanced clearances with the trend in TCCIs caused by trees with non-enhanced clearances to determine the overall effectiveness of its enhanced clearances. However, given that the sample size of faults or ignition events are relatively small and there are many

[129] The table's results are based on field validation of distribution outage information.

[130] 23 TCCIs are still being analyzed by SCE's Senior Specialists, including determination of HFRA and non-HFRA.

uncontrollable variables that can drive faults and ignitions, it will require a multi-year effort before SCE can draw any meaningful conclusions about the effectiveness of its enhanced clearances.

Furthermore, SCE's TCCI data resides in a separate database from its tree inventory database. Although all trees in the database and all trees in the TCCI database are identified by geospatial coordinates, there is no direct way to link TCCI to a particular tree in SCE's inventory as the TCCI's geospatial coordinates are not indicative of the tree that caused it. For example, the vegetation-caused outage could have resulted from any number of the surrounding trees in the vicinity of the TCCI. Making this connection requires a significant manual effort. Therefore, SCE has taken extra steps to determine if the TCCIs were caused by trees with or without enhanced clearances at the time of the event. To achieve this, SCE's analytics team has created GIS overlays of all TCCIs between December 1, 2019 and December 18, 2020. The analytics team also developed a TCCI metric dashboard that identifies the TCCIs based on SCE service territory, HFRA versus non-HFRA, species type and event type (i.e., blow in, fall in, etc.). SCE also created a GIS overlay of all trees from its tree inventory data base. The two GIS overlays were used to identify: (1) the three closest inventory trees to TCCI; and (2) any inventory tree within 100 feet radial distance from the TCCI. Trees meeting criteria (1) & (2) are then evaluated to determine if the species matches the species identified on the TCCI report. Contingent on successful matches, the identified trees (or the location where trees existed, as some trees were removed after a TCCI event) are further evaluated to determine if it was feasible that the tree could have caused the TCCI (e.g., based on the tree's height versus its proximity to SCE facilities). The analysis will also attempt to factor in exogenous factors such as weather events for normalization purposes.

***Action SCE-17**: In its 2021 WMP update, SCE shall 1) describe how it plans to address the fact that only 60% of the trees scheduled for full expanded clearances have been completed, 2) explain if SCE will be able to reach the goal of 100% by the end of the year, and 3) provide a comprehensive and extensive explanation as to the reason SCE is behind schedule.*

Response:

1. Action 17 Item (1): Enhanced clearances in accordance with GO 95 Rule 35, Appendix E were operationalized by SCE in June 2019. One of the challenges faced by SCE in achieving the expanded trim distances in Appendix E is due to the fact that the clearances are recommended and not required. Thus, if customers refuse to grant SCE authorization to trim to the expanded distances, SCE has no legal recourse given that it is not a regulated requirement. Unless the requirement becomes a regulation, SCE will continue to face challenges in achieving 100% of enhanced clearances. SCE nevertheless strives to achieve the enhanced clearances in its HFRA, where feasible. This occurs via discussions to educate customers about the risks posed by the tree(s) on their property and includes a formal escalation process amongst SCE contractors and employees when the customer refuses the necessary pruning.

   To clarify SCE's statement in its RCP for SCE-12, the 60% achievement rate cited by the WSD is actually the value based on the sampling results of QC inspections and not necessarily the actual percentage of enhanced trims achieved. QC inspections are not performed real-time and typically lag work completion by approximately 60 to 90 days. For example, a QC inspector may be looking for a tree trimmed to 12 feet, but due to the time lag, the tree may have grown into some of that clearance; however, the QC inspector would still note the clearance as not achieved. During this inspection lag time, completed work that may have achieved an enhanced clearance at the time of the trim could be identified by QC as not achieving enhanced clearance as a result of species growth during the 60-to-90 day lag.

   Additionally, between March 2020 and December 2020, SCE's post-trim data shows that for approximately 490,000 trees trimmed in HFRA, SCE achieved Appendix E enhanced clearance for approximately 65% of these trees. Where the 35% enhanced clearances were not achieved, approximately 8% were related to customer refusals, approximately 9.5% were due to exception trees such as Major Woody Stem,[131] and the remaining 17.5% were related to other valid reasons such as tree condition, site condition, environmental and agency constraints.

   Although SCE makes every reasonable effort to achieve enhanced clearances throughout its HFRA, as a result of some of the reasons identified above, it's unlikely 100% achievement will ever be achieved

[131] Woody Stems, as defined in CPUC GO95 Rule 35, Exceptions, are "[m]ature trees whose trunks and major limbs are located more than six inches, but less than the clearance required by the applicable regulation from primary distribution conductors are exempt from the minimum clearance requirement under this rule. The trunks and limbs to which this exemption applies shall only be those of sufficient strength and rigidity to prevent the trunk or limb from encroaching upon the six–inch minimum clearance under reasonably foreseeable local wind and weather conditions."

given the current regulatory requirements. To increase the achievement level from a decrease in customer refusals, the Commission could assist SCE and other IOUs by making the recommendation a requirement.

2. Action 17 Items (2) & (3): There appears to be some confusion regarding clearances for Vegetation Management work, specifically enhanced clearances recommended in GO 95 Rule 35 Appendix E, and SCE's SB-247 / WMP VM-3 Goal for achieving expanded buffers at SCE facilities in accordance with PRC 4291.[132] Regarding expanded clearances at Legacy facilities which is WMP Goal VM-3, SCE has 158 Identified Facilities (IFs) and two goals for VM-3 in 2020 which are: (1) Perform assessments of all IFs; and (2) establish buffers at 30% of IFs. SCE achieved both VM-3 goals in 2020. SCE inspected all 158 IFs and established buffers at 61 (39%) of its IFs.

[132] In the RCP Action SCE-17, Item 2, the WSD asks SCE to "explain if SCE will be able to reach the goal of 100% [expanded clearances] by the end of the year" and "the reason [SCE] is behind schedule" and references SCE Advice Letter 4327-E Attachment A, "VM-3: Expand clearances for legacy facilities" in the footnote. *See* Wildfire Safety Division Evaluation of Southern California Edison's Remedial Compliance Plan, issued December 30, 2020, p. 10.

WMP Class B Deficiency Action Statements
SCE-10, Lack of detail on effectiveness of inspection program QA/QC

Action SCE-18: *In its 2021 WMP Update, SCE shall: 1) describe whether each of its listed inspection program risk categorization factors (i.e., program maturity, process complexity, organizational complexity, and downstream impacts) are treated equally or weighted differently in determining program risk, 2) if weighted differently, provide the relative weighting of each factor, and 3) explain how it measures each inspection program risk categorization factor listed, including all threshold values and delineations applied.*

Response:

1. Each of the factors are weighted equally.
2. N/A
3. For 2021, SCE is currently working to update risk ranking scores based on the evolution of program risk ranking criteria. The updated risk ranking criteria includes five risk-ranking categories: Quality Oversight, Process/Program Complexity, Org Complexity, Downstream Impacts and High-Risk Assets. The measures and scoring for each risk category are based on a ranking of 1 to 5, with 1 being the lowest risk and 5 being the highest risk. As before, all risk categories are equally weighted. Additionally, the ranking for each risk category is based on several factors, such as the following:

   <u>Quality Oversight</u>

   - Are there sufficient and documented controls in place for key processes, outputs or deliverables?
     Are controls monitored for conformance to external and internal requirements?
   - Are controls reviewed for effectiveness and performance improvement opportunities?
   - Does the program team execute a procedure for the internal QC of key outputs, products or deliverables?
   - If internal QC is less than 100% of output, is the sampling random, statistically valid or otherwise deemed sufficient, in order to accurately reflect program and process performance?
   - Are internal QC results reviewed with program team to ensure understanding, impact, and the need to improve performance?
   - Is there recurring (monthly, annually, etc.) quality oversight (QC or QA) by the Compliance & Quality organization, or another quality organization outside of the program team's organization?
   - If recurring, external QA or QC is present, what are the current performance scoring results, critical findings, and/or volume of critical findings in the past 12 - 18 months?
   - If recurring, external QA or QC is present, do recent findings merit additional QA or QC oversight?

<u>Process Complexity</u>

- Do key process inputs or dependencies require interfacing or engaging multiple systems?
- Do key processes or workflows require multiple system interfaces and/or multiple data exchanges, updates and/or validations before work can move forward in the workflow? If yes, are these exchanges or interactions between systems fully automated?

- Do system exchanges/interactions require user engagement/interface to move forward in the workflow?
- Does key process data have to be manually extracted or pulled from one system and/or manually input or pushed into another system before moving forward in the workflow?
- Does key process data have to be reviewed, validated, updated, refreshed or otherwise manually 'managed' prior to moving forward in the workflow?

Organizational Complexity

- Is the program team centralized in a single location and comprised of SCE resources only?
- Do key workflows require hand-offs spanning multiple SCE organizations?
- Is the workflow decentralized across multiple internal and external organizations and/or multiple physical locations, e.g. districts, regions or grids?
- Do key inputs or dependencies require engagement by multiple internal and external organizations?
- Are there different rules, program or contract requirements, expectations, access and/or roles for key external stakeholders (vendors/contractors) vs SCE stakeholders?

Downstream Impacts

- Would the downstream impacts of poor quality negatively impact critical asset lifecycle programs?
- Will poor quality negatively impact critical program outputs/results such as regulatory compliance (external requirements), SCE standards compliance (internal), grid reliability or safety of employees or the public?
- Will inaccurate or missing data negatively impact key downstream processes, programs or outputs?
- Is the program at risk for not satisfying program or organization requirements, goals, or commitments?

High Risk Assets

Ranking to consider things such as the following program scope percentage bands:

- Range between 81 - 100% of program scope includes one or more high-risk assets, material, or equipment. Risk category value = 5
- Range between 61 - 80% of program scope includes one or more high-risk assets, material, or equipment. Risk category value = 4
- Range between 41 - 60% of program scope includes one or more high-risk assets, material, or equipment. Risk category value = 3
- Range between 21 - 40% of program scope includes one or more high-risk assets, material, or equipment. Risk category value = 2
- Range between 0 - 20% of program scope includes one or more high-risk assets, material, or equipment. Risk category value = 1

With five risk categories the overall program risk ranking is as follows:

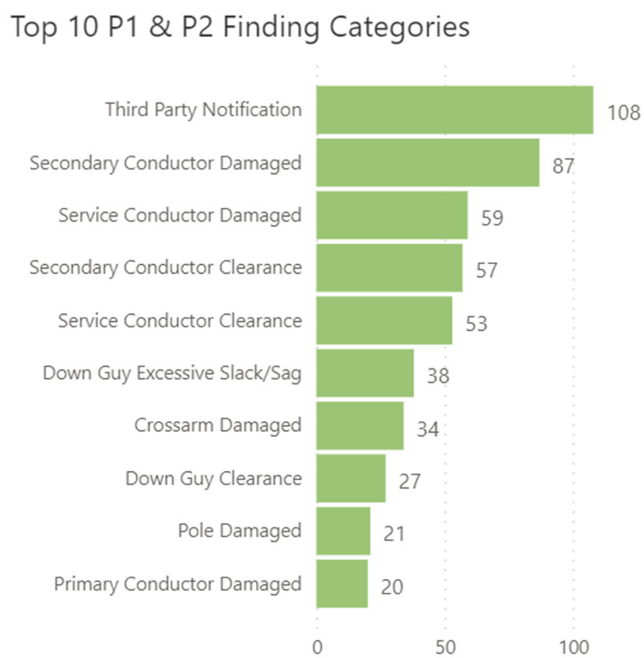
- Very High program risk ranking: Total combined risk score of 23 to 25.
- High program risk ranking: Total combined risk score of 18 to 22.
- Medium program risk ranking: Total combined risk score of 13 to 17.

- Low program risk ranking: Total combined risk score of 5 to 12.

Action SCE-19: *In its 2021 WMP Update, SCE shall detail 1) all possible corrective actions related to findings from QA/QC review and performance metrics evaluation, and 2) how it verifies the effectiveness of these corrective actions.*

Response:
In 2020, SCE performed more than 17,000 quality inspections in HFRA, exceeding its 2020 WMP target of 15,000 inspections. Possible corrective actions related to findings and metrics from SCE's quality programs are dependent upon the specific issues identified. The specific corrective action taken will vary depending upon the nature or extent of the condition but can include such things as training, program enhancements, standard changes (e.g. clarifying a standard that may be confusing), or other appropriate actions to improve performance. SCE's inspection Quality program helps drive continuous improvement and is deemed effective when it identifies non-conformances with SCE standards, provides visibility to the business lines, and in turn helps to drive increases in performance over time. Throughout the year, monthly quality scores for actionable items are provided at the program level to provide visibility to performance, and results from the quality inspections are communicated to frontline personnel. Quality scores are typically reported by program and can be further sorted by region or district. Additionally, for the distribution Overhead Detail Inspection (ODI) program, SCE provided quality scores at the inspector level to help drive performance improvement. The top finding categories for this program included such things as third-party notifications, secondary/service conductor damaged, secondary/service conductor clearance, down guy slack or clearance, crossarm damage, pole damage and primary conductor damage. The following chart shows the top ten finding categories, and number of non-conformances identified in each category, from SCE's distribution ODI program which represents approximately 80% of distribution ODI program findings.[133]

[133] The chart shows overall distribution ODI program findings from both HFRA and non-HFRA areas.



All actionable findings from the quality reviews are reviewed with the program leaders and tracked until completion. For 2020, the overall quality scores for distribution, transmission and generation inspections were 96.7%, 99.5% and 92.1%, respectively.

Responses to WSD Action Statement on Remedial Compliance Plan
SCE-13, Lack of ambition in improving vegetation inspection and management capability

Action SCE-19*: In its 2021 WMP update, SCE shall 1) demonstrate how it is implementing risk models for prioritizing the highest risk areas when scheduling vegetation management work, and 2) explain the determination of such areas as highest risk, including all supporting analysis.*

Response:

1. SCE's vegetation management activities which support its WMP can be addressed in five specific areas: (1) Compliance inspections and trimming; (2) Hazard Tree Management Plan; (3) Pole Brushing; (4) Drought Relief Initiative; and (5) Quality Control. Activities 1, 3 and 4 are performed annually, and thus, as stated in SCE Guidance 3, are not subject to the use of risk models for prioritization, although timeliness of inspections is often determined around potential seasonal weather constraints and vegetation growth conditions.

Activities 2 and 5 are performed using the Reax risk model which was developed based on the consequence of an ignition event occurring. In 2020, SCE transitioned most of its activities from the REAX risk consequence model to its Wildfire Risk Reduction Model (WRRM) which combines probability of ignition with the consequence of an ignition to convey total wildfire risk. In 2021 and 2022, for vegetation management programs, SCE will be determining how best to transition from the Reax model to the WRRM. WRRM is anticipated to provide additional risk modeling capabilities to vegetation management programs performed annually that have not applied risk modeling in the past, to inform activities such as potential schedule reprioritization. However, as SCE's vegetation management work for 2021 has already been fully planned, SCE determined that due to the potential risks of data translation errors and impacts to work management (rescheduling work and crew resources, contracts, etc.), SCE would not transition from Reax to WRRM in advance of 2021.

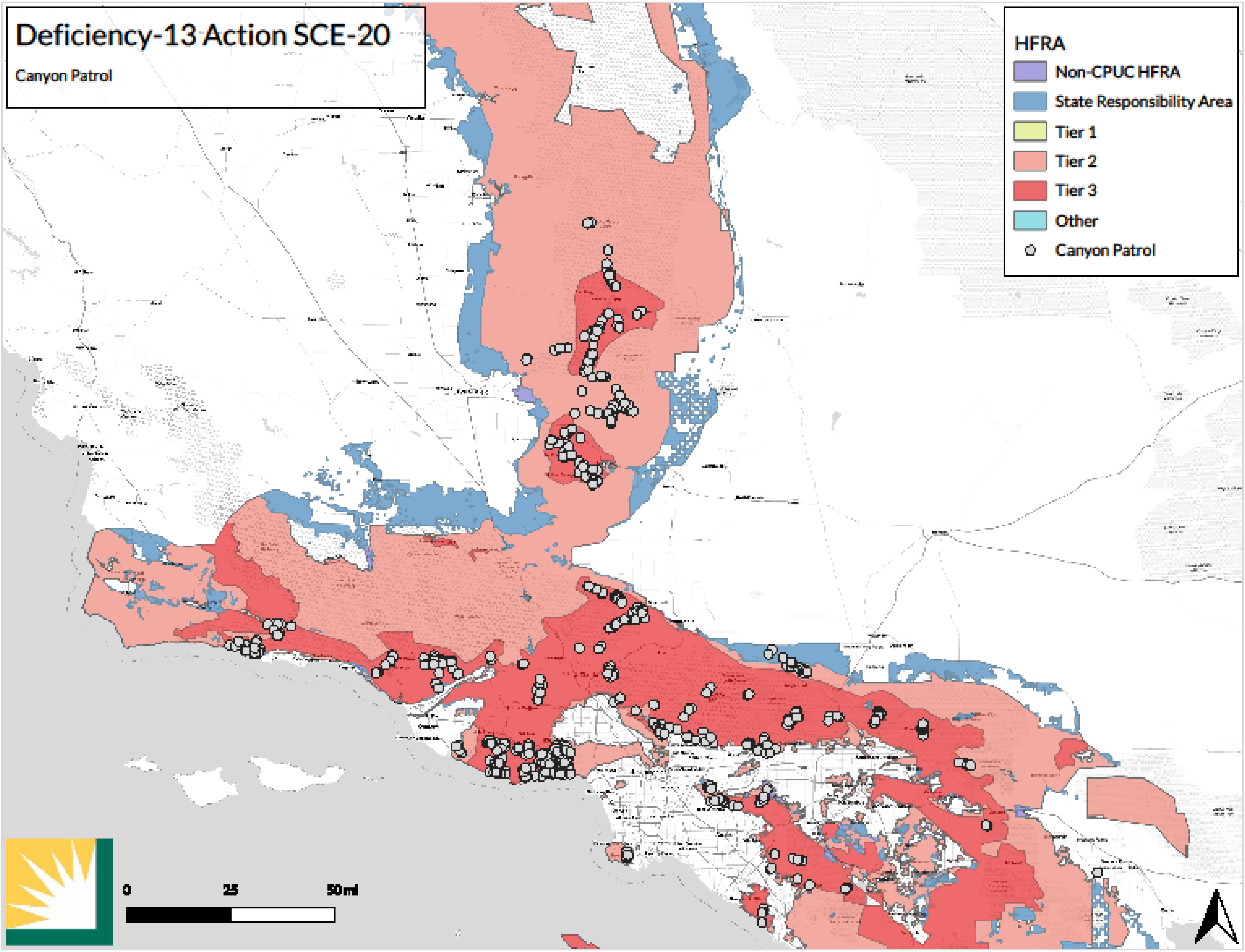
2. The current Reax model separates SCE's HFRA into risk percentiles and actual risk consequence by circuit miles. For HTMP, SCE schedules the Reax areas of highest risk for work first, when practical, followed by the next highest risk category etc. Similarly, SCE's QC program relies heavily on Reax risk-modeling to identify areas for inspection. SCE performs QC on 100% of the 2,100 circuit miles ranked as having the highest consequence risk by Reax. On the remaining HFRA circuit miles, QC is sampled using a 99% Confidence Level / 1.7% Confidence Interval sample rate.

Action SCE-20*: In its 2021 WMP update, SCE shall 1) provide a GIS map showing the locations of supplemental patrols in 2020 broken down by type (e.g. Canyon Patrols (CP), Summer Readiness (SRVP)), and 2) provide the number of instances for vegetation work prescribed found by type of patrol, both in total number as well as in number of instances per circuit mile.*

Response:
Item (1): Please see the attached files/documents:

- Action SCE-20 Canyon Patrol.pdf – an overview of all Canyon Patrols performed in 2020
- Action SCE-20 Canyon Patrol.xlsx – a list of all remediations required from the 2020 inspections. 1478 remediations were required and completed
- Action SCE-20 SRVP.pdf – an overview of all Summer Readiness Verification Patrols performed in 2020
- Action SCE-20 SRVP.xlsx – a list of all remediations required from the 2020 inspections. 38 remediations were required and completed
- Action SCE-20.pdf – an interactive file identifying all Canyon Patrols, Summer Readiness Verification Patrols and required remediations

Item (2): SCE does not document prescription by circuit mile as SCE utilizes a tree-based inventory system. As part of its 2020 Canyon Patrols inspection process, SCE inspected 117 circuits with a cumulative HFRA circuit mileage of 2,118. However, SCE does not specifically track the actual mileage. Instead, SCE records point-based data and not line-based data. Canyon Patrol inspection scope is focused only on the HFRA portions of assigned circuits. Non-HFRA areas are not in scope. Based on the total mileage of 2,118 and the 1,478 remediations that were required, SCE estimates the prescription to mileage rate was approximately 0.7 trees per circuit mile. Regarding SRVP, the 38 inspections are ad hoc in scope, and do not correlate to specific circuits. Therefore, for the SRVP, SCE does not have the ability to provide a prescription to mileage rate.


Deficiency-13 Action SCE-20
Canyon Patrol
HFRA
Non-CPUC HFRA
State Responsibility Area
Tier 1
Tier 2
Tier 3
Other
Canyon Patrol
0
25
50 mi

_record_id	_geometry	_latitude	_longitude	assessment_date	circuit	work_location	type_of_service
8eb3b79f-7e7e-44b3-bef6-28fbdcb6a411	SRID=4326;POINT(-118.876273334 34.0903671631)	34.09037	-118.876	2020-06-24	MAGUIRE_10934	Decker Canyon	Remove Tree(s)
b56e4d19-dbfc-4281-913e-c22c14409c08	SRID=4326;POINT(-118.918496668 34.0835522681)	34.08355	-118.918	2020-07-06	MAGUIRE_10934	Decker Canyon	Remove Tree(s)
6a7722f3-6a92-4674-bc36-17bc83c430b5	SRID=4326;POINT(-118.652418684 35.5303133838)	35.53031	-118.652	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
beffd2ce-a1bb-4bd0-ba67-a6b87d4b8934	SRID=4326;POINT(-118.211788908 34.2012949537)	34.20129	-118.212	2020-07-21	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Overhang
55198dc9-061d-4832-aa03-3abe15d31fb7	SRID=4326;POINT(-118.20856858 34.1995510204)	34.19955	-118.209	2020-07-21	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Overhang
501aa231-8545-4e1c-8416-1c286acc4fb0	SRID=4326;POINT(-117.993646525 34.3504719035)	34.35047	-117.994	2020-06-26	RED BOX_14758	Big Tujunga	Remove Tree(s)
a1fe8102-49d3-47cc-b3e4-d0425fac0eba	SRID=4326;POINT(-118.668738753 35.5240087258)	35.52401	-118.669	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
9b01e81e-dd2f-40cd-9fe9-fdc416ec1a0d	SRID=4326;POINT(-118.547989391 35.5751851481)	35.57519	-118.548	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
735fe16e-e6b7-4ffe-8e0c-76eb968f6061	SRID=4326;POINT(-118.547684876 35.575312553)	35.57531	-118.548	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Remove Tree(s)
0af54555-a4ba-4cd4-99e8-65999845b2e8	SRID=4326;POINT(-118.451133147 35.8049850548)	35.80499	-118.451	2020-06-23	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
5e02e9df-3389-4ac5-8d57-f58363806636	SRID=4326;POINT(-118.547350606 35.5753711006)	35.57537	-118.547	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
80453cf0-e1a9-4495-8403-b2c04b17997d	SRID=4326;POINT(-118.438019659 35.7926435257)	35.79264	-118.438	2020-06-24	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
80b10865-6ce4-48ac-90a8-c0e3ed7513ae	SRID=4326;POINT(-118.439476099 35.7925077807)	35.79251	-118.439	2020-06-25	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
b8730561-1e7f-4f6f-a02a-b566d7860947	SRID=4326;POINT(-117.639844045 34.2554412448)	34.25544	-117.64	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
cfb527d7-dfaa-4ea5-bbda-26ca88766448	SRID=4326;POINT(-117.637859881 34.2581735828)	34.25817	-117.638	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
7725208b-bd20-493c-83a6-972d41de292b	SRID=4326;POINT(-117.660138644 34.2359722926)	34.23597	-117.66	2020-08-25	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Routine Tree Trim
e7dc3f91-4657-4154-bac9-0d5c69301c28	SRID=4326;POINT(-117.658405937 34.2388898598)	34.23889	-117.658	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
4d3a3a71-c26e-4ce6-a9e6-00c564e1d042	SRID=4326;POINT(-118.620478322 35.1727147901)	35.17271	-118.62	2020-07-01	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Not Routine Top/Heavy Trim
3fa60122-3fda-417b-8f79-45c0c7e0b735	SRID=4326;POINT(-118.440868249 35.7812911179)	35.78129	-118.441	2020-06-29	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
8c6cc7f8-1afe-4c7f-b610-dfd22301e5d0	SRID=4326;POINT(-118.444431061 35.791218644)	35.79122	-118.444	2020-06-29	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
814d3d0c-cf35-481f-83a1-d66e5a7cfdd2	SRID=4326;POINT(-118.444185387 35.7912643673)	35.79126	-118.444	2020-06-29	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
f031e747-ae50-4800-9157-e41f788c1b46	SRID=4326;POINT(-118.443713151 35.7909206255)	35.79092	-118.444	2020-06-29	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
b83d3d67-f1da-4bf3-b7ce-af3214ffc2f8	SRID=4326;POINT(-118.45198106 35.8012570364)	35.80126	-118.452	2020-06-23	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
de846414-53f1-4acd-90b6-a994c53b5c91	SRID=4326;POINT(-118.451925321 35.8016083064)	35.80161	-118.452	2020-06-23	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
f1168e25-758a-4063-b3ea-603594683809	SRID=4326;POINT(-118.451568671 35.8028693218)	35.80287	-118.452	2020-06-23	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
4b461060-5db6-4b92-9250-3355424539d5	SRID=4326;POINT(-118.451678893 35.8057930554)	35.80579	-118.452	2020-06-23	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
5c9bbd53-d73a-4fe0-9c21-0e833632eb4a	SRID=4326;POINT(-118.453462729 35.8094328968)	35.80943	-118.453	2020-06-23	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
c763cf99-e359-4c3a-81e4-4fb54895fc0d	SRID=4326;POINT(-118.660358191 35.5288505314)	35.52885	-118.66	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim

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a94a5ef4-3f53-43d1-b6c8-3784804a56be	SRID=4326;POINT(-118.648836496 35.5313020847)	35.5313	-118.649	2020-07-08	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
74aeffd4-b17e-4e10-b949-bf8703c4a253	SRID=4326;POINT(-118.511001226 35.5967193889)	35.59672	-118.511	2020-07-08	ERSKINE_6040	Bodfish Cyn Rd	Not Routine Top/Heavy Trim
ef4132c3-d4b4-4697-9536-f9293e656115	SRID=4326;POINT(-118.519525034 35.5112437997)	35.51124	-118.52	2020-07-15	FLYING D_6585	Caliente Bodfish Rd	Not Routine Top/Heavy Trim
ad529cd1-0df4-490c-ba9d-7683cbe37da5	SRID=4326;POINT(-118.654055921 35.5300809956)	35.53008	-118.654	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
6cfce199-c9f0-4f4e-ae68-2be8bfd17f89	SRID=4326;POINT(-118.649257366 35.5314352177)	35.53144	-118.649	2020-07-09	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
ebf11068-5e56-4060-b5ac-7e4e8feb785f	SRID=4326;POINT(-118.648793058 35.5313647155)	35.53136	-118.649	2020-07-08	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
bcb0d505-fbdf-43ea-a1d0-f08f670e6f94	SRID=4326;POINT(-118.650324981 35.5308004979)	35.5308	-118.65	2020-07-08	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
acbf3bc3-f082-4546-b38c-9eb90ed33b45	SRID=4326;POINT(-118.452640716 35.8767156909)	35.87672	-118.453	2020-06-25	INTAKE_8930	Kern River Hwy/ Serra Rd	Remove Tree(s)
34ea0e58-3c2c-4dd0-9077-a134f224bb9c	SRID=4326;POINT(-118.452532338 35.8767920919)	35.87679	-118.453	2020-06-25	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
4255123b-caf4-43aa-b089-46d87dca15c7	SRID=4326;POINT(-119.897277318 34.4454364348)	34.44544	-119.897	2020-07-08	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
26242cd1-3340-4ef8-b33f-755935ba3ec2	SRID=4326;POINT(-119.810710363 34.5434069609)	34.54341	-119.811	2020-04-11	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
a3b07879-7550-43f4-b039-3ac6736bc85a	SRID=4326;POINT(-118.884604275 34.0785507753)	34.07855	-118.885	2020-06-25	MAGUIRE_10934	Decker Canyon	Routine Tree Trim
408d06e4-bc12-45ef-9f1d-cc2a36f3942d	SRID=4326;POINT(-118.895324059 34.0724664448)	34.07247	-118.895	2020-06-25	MAGUIRE_10934	Decker Canyon	Tree Trim - Clear S/W
3e7bfa65-019e-4529-a45c-92214fcba248	SRID=4326;POINT(-118.884612657 34.0671318473)	34.06713	-118.885	2020-06-29	MAGUIRE_10934	Decker Canyon	Tree Trim - Clear S/W
8a06a539-8e52-42fd-a21a-02db2ee57356	SRID=4326;POINT(-118.896332569 34.0713891653)	34.07139	-118.896	2020-06-29	MAGUIRE_10934	Decker Canyon	Tree Trim - Clear S/W
f124a073-08ac-4288-afac-507e9e517d0e	SRID=4326;POINT(-118.657463752 34.0413559117)	34.04136	-118.657	2020-10-04	SERRA_16150	Tuna Canyon	Routine Tree Trim
ac1cbae2-6eb6-4ec3-9ded-04f8c8642602	SRID=4326;POINT(-118.657185473 34.0417907006)	34.04179	-118.657	2020-10-04	SERRA_16150	Tuna Canyon	Remove Tree(s)
787d611a-0880-4dd1-970d-d85053306219	SRID=4326;POINT(-118.911634572 34.0435773402)	34.04358	-118.912	2020-06-30	GALAHAD_6924	Decker Canyon	Tree Trim - Clear S/W
c026b8f3-d4dd-4ab9-9f43-2e24d78b7773	SRID=4326;POINT(-118.62926133 34.1115416773)	34.11154	-118.629	2020-10-04	PARADISE_13658	Old Topanga Canyon	Remove Overhang
6ee6519c-738a-4b29-a4ed-b0755850485f	SRID=4326;POINT(-118.629199304 34.1114303632)	34.11143	-118.629	2020-10-04	PARADISE_13658	Old Topanga Canyon	Remove Overhang
55756928-78b7-46f2-874c-f339cb3f0dac	SRID=4326;POINT(-117.639657296 34.2545397755)	34.25454	-117.64	2020-12-17	FERRARA_6357	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
97280a23-624b-4436-ae15-84386be16172	SRID=4326;POINT(-117.4110717 33.6523509)	33.65235	-117.411	2020-10-09	SWIFTWATER_17421	Ortega Hwy including Main Divide Rd	Remove Tree(s)
a91e65f5-4f7e-4177-97aa-a03425150e6b	SRID=4326;POINT(-117.659623995 34.2349514251)	34.23495	-117.66	2020-09-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
f1b61d6e-a5f4-4fb1-ad28-c781b46f67c1	SRID=4326;POINT(-117.657700516 34.2391989064)	34.2392	-117.658	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Tree(s)
d8be1d8a-40af-4076-b6f7-bd16fbfea528	SRID=4326;POINT(-117.648565918 34.2403089705)	34.24031	-117.649	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
d1bda575-a0de-4487-9f3c-615f8994c01c	SRID=4326;POINT(-117.647792436 34.2396487544)	34.23965	-117.648	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
b92ad2b7-0560-4eca-a64c-5c8b7e383503	SRID=4326;POINT(-117.647765279 34.2390805542)	34.23908	-117.648	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
57965c9f-b2c4-4aa6-b7e6-a0c7ea9562fa	SRID=4326;POINT(-117.625215277 34.267331533)	34.26733	-117.625	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang

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6a198e26-9a86-452f-826a-ade99ee4058e	SRID=4326;POINT(-117.625162974 34.2673811301)	34.26738	-117.625	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
34a35e65-90e0-4950-a4d8-56c79fefa6bd	SRID=4326;POINT(-117.624758631 34.2677859409)	34.26779	-117.625	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
aebf131a-e37d-43d7-9e6d-0cbfcb1a6524	SRID=4326;POINT(-117.624802887 34.2678299962)	34.26783	-117.625	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
dfc7594b-b00d-496e-8fd6-3569aa5dffff	SRID=4326;POINT(-117.624808706 34.2679560189)	34.26796	-117.625	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
3d5b51bd-acb6-4919-927d-a098dd64d239	SRID=4326;POINT(-117.632770348 34.2689517669)	34.26895	-117.633	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
589d5cae-9f3d-4c44-b9bf-983c7642a568	SRID=4326;POINT(-117.632712722 34.2683702947)	34.26837	-117.633	2020-08-27	BALDY_1010	Mount Baldy (includes Ice House Cyn)	Routine Tree Trim
137c0840-7c0a-4ea7-a8f7-2542a8bd2ec3	SRID=4326;POINT(-117.632784497 34.2682244879)	34.26822	-117.633	2020-08-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Routine Tree Trim
428dcc82-ad3e-44b6-b478-e16b492b8e50	SRID=4326;POINT(-117.63293501 34.268071607)	34.26807	-117.633	2020-08-25	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
feee36a9-88f4-4be4-ba46-5edafc7483ef	SRID=4326;POINT(-117.660211064 34.2406861949)	34.24069	-117.66	2020-12-14	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
36d466a6-c546-4928-9074-efc829b11cdc	SRID=4326;POINT(-117.650062926 34.2403211659)	34.24032	-117.65	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
a711d68c-8061-4077-91c8-df33d2efc67c	SRID=4326;POINT(-117.63268657 34.2685501164)	34.26855	-117.633	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
d3f431b2-3356-47cf-8379-4694b2b4d8b9	SRID=4326;POINT(-118.797427453 34.1222085488)	34.12221	-118.797	2020-06-11	TRIUNFO_18164	Triunfo Canyon	Remove Tree(s)
18b4c245-0bde-4b57-82bd-25424dc672ae	SRID=4326;POINT(-118.797268532 34.1225130272)	34.12251	-118.797	2020-06-11	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
3b40da2a-bc8d-4529-85a3-20ae16204e01	SRID=4326;POINT(-118.796548024 34.1225713137)	34.12257	-118.797	2020-06-11	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
8def31fe-d72c-4976-929a-ad573b59ba2b	SRID=4326;POINT(-118.803325295 34.1198018267)	34.1198	-118.803	2020-06-11	TRIUNFO_18164	Triunfo Canyon	Remove Overhang
88e5f5ac-dee0-405d-a7cb-5a2212d303db	SRID=4326;POINT(-118.774324581 34.0479636293)	34.04796	-118.774	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
669ccf29-b827-4e06-b583-6e66789d73af	SRID=4326;POINT(-118.774497248 34.0479455723)	34.04795	-118.774	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
888eed26-76f0-4018-b931-874a0b2db565	SRID=4326;POINT(-118.772959337 34.0482314276)	34.04823	-118.773	2020-06-24	MAGUIRE_10934	Latigo Canyon	Tree Trim - Clear S/W
660707db-566c-42e5-928f-c6200147e947	SRID=4326;POINT(-118.8542182 34.1316624097)	34.13166	-118.854	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
d7ff7748-bc1d-443a-b3ee-5a5264c73af0	SRID=4326;POINT(-117.837485299 34.3248010013)	34.3248	-117.837	2020-06-23	JARVIS_9150	Azusa Canyon	Not Routine Top/Heavy Trim
4d02520d-786a-43d3-8a6c-13d68d93f03f	SRID=4326;POINT(-118.604553156 34.1239293784)	34.12393	-118.605	2020-10-04	SYLVIA_17440	Red Rock Canyon	Routine Tree Trim
ed64f4a0-dcb4-4512-a904-35da1ff35a3c	SRID=4326;POINT(-118.620189428 34.0421040806)	34.0421	-118.62	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
ae988200-25af-4659-804b-389a9c7091d5	SRID=4326;POINT(-118.620699719 34.0421874262)	34.04219	-118.621	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
b0d65713-212f-444d-a175-6a83db454c3e	SRID=4326;POINT(-117.637855187 34.2580012209)	34.258	-117.638	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
a04c37d9-6fa8-4c7e-a1ad-736bab84542d	SRID=4326;POINT(-117.638014778 34.2580560886)	34.25806	-117.638	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
e09e88f9-0018-41ed-8eed-7592c7d87a4d	SRID=4326;POINT(-117.638336979 34.2576977855)	34.2577	-117.638	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
e5f0021e-e569-4a6d-a161-2ceb1870e778	SRID=4326;POINT(-117.634283155 34.263020909)	34.26302	-117.634	2020-08-05	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
9e4b080d-515f-44d4-b141-96696fef346a	SRID=4326;POINT(-117.63419196 34.2632179218)	34.26322	-117.634	2020-08-05	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang

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aee07577-aa3a-4fb8-a46c-3608fcb3160f	SRID=4326;POINT(-117.63417419 34.26349917)	34.2635	-117.634	2020-08-05	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
39c798e7-a3ac-4215-abbf-dc0ff00e6b1c	SRID=4326;POINT(-117.634021975 34.2636368843)	34.26364	-117.634	2020-08-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
936f9d71-eead-4023-aae9-ae51e951bd72	SRID=4326;POINT(-117.633572705 34.2636479679)	34.26365	-117.634	2020-08-05	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
96aa3ea4-9e63-472b-a5f5-228b8de22312	SRID=4326;POINT(-117.633334994 34.2660289759)	34.26603	-117.633	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
02f813e3-b2e5-4587-befe-737ca0ccf844	SRID=4326;POINT(-117.633543871 34.2668394398)	34.26684	-117.634	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
68f27d0c-da3e-49d0-a6d3-fe4c513ffc24	SRID=4326;POINT(-117.633300126 34.2676069488)	34.26761	-117.633	2020-08-25	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
5b19a0b5-840e-4ca2-ab3e-94eb3d4e4f00	SRID=4326;POINT(-117.633176409 34.2675667725)	34.26757	-117.633	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
7d071b2e-32dc-46dc-9cb2-78498d8844de	SRID=4326;POINT(-117.632936016 34.2678754368)	34.26788	-117.633	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
d914fba0-7520-478e-b853-1bd16d49ac1e	SRID=4326;POINT(-117.63199959 34.2658998551)	34.2659	-117.632	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
8b5a0662-ebfa-479f-8b96-3e45ee8b9233	SRID=4326;POINT(-117.631953321 34.2658846155)	34.26588	-117.632	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
947f66f9-f3fa-49f0-b3b6-d2f28553a502	SRID=4326;POINT(-117.628804316 34.2655905878)	34.26559	-117.629	2020-08-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Routine Tree Trim
de3110bb-bb62-43c5-b22c-d193210b5789	SRID=4326;POINT(-117.62755651 34.2662276442)	34.26623	-117.628	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
26e2c4cf-506b-4a32-b555-2bc78227e047	SRID=4326;POINT(-117.62474589 34.2681045791)	34.2681	-117.625	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
8805a3a1-c8a9-4ebc-bf5c-9ee276b24bd6	SRID=4326;POINT(-117.623724859 34.2479994085)	34.248	-117.624	2020-08-10	BALDY_1010	Mount Baldy (includes Ice House Cyn)	Remove Overhang
65347030-04d1-480c-8694-3f085347f04b	SRID=4326;POINT(-117.454864495 34.2511582789)	34.25116	-117.455	2020-06-09	VERDEMONT_18674	Lytle Creek	Not Routine Top/Heavy Trim
9efae5c9-71e8-4a65-a160-429d3c463cf6	SRID=4326;POINT(-118.22602 34.28696055)	34.28696	-118.226	2020-06-05	VERDUGO_18660	Big Tujunga	Remove Overhang
d84be134-91de-4464-ab5d-f62150d3f786	SRID=4326;POINT(-118.89752917 34.0726672355)	34.07267	-118.898	2020-06-29	MAGUIRE_10934	Decker Canyon	Tree Trim - Clear S/W
2f2719b7-9580-42bf-871e-f2d474725e7f	SRID=4326;POINT(-118.850085251 34.0457567617)	34.04576	-118.85	2020-07-01	GALAHAD_6924	Encinal Canyon	Tree Trim - Clear S/W
34c9055e-8863-4f6b-b7dd-6f49cf788a78	SRID=4326;POINT(-118.882533275 34.0394547605)	34.03945	-118.883	2020-07-01	GALAHAD_6924	Encinal Canyon	Tree Trim - Clear S/W
bfe8dfb0-255b-4568-9ce7-ddc2b914a813	SRID=4326;POINT(-118.888288289 34.0403896444)	34.04039	-118.888	2020-07-06	MAGUIRE_10934	Decker Canyon	Not Routine Top/Heavy Trim
fa57e61f-4a85-4da8-957f-c350aea5e207	SRID=4326;POINT(-118.755950779 34.143268261)	34.14327	-118.756	2020-06-15	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
5cb9d1fb-206c-450c-8e5a-2432259d913f	SRID=4326;POINT(-117.295218436 34.2428661304)	34.24287	-117.295	2020-06-03	TWIN PEAKS_18375	Crestline	Not Routine Top/Heavy Trim
e2a10fb2-f626-4bbd-9a23-88ffc878be55	SRID=4326;POINT(-117.295234337 34.2430667266)	34.24307	-117.295	2020-06-03	TWIN PEAKS_18375	Crestline	Not Routine Top/Heavy Trim
25682879-f6d8-4e12-95f3-24db1c79c76c	SRID=4326;POINT(-117.295217087 34.2431277332)	34.24313	-117.295	2020-06-03	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
c3396bef-b2f2-48b9-84f9-382fbf988ba0	SRID=4326;POINT(-116.9092857 34.0833565)	34.08336	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
cb648b6e-a960-4ac8-b7c6-476b22bd82a5	SRID=4326;POINT(-116.909147536 34.0833456824)	34.08335	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
7d402a18-33aa-478a-bd60-e36ebdf1f525	SRID=4326;POINT(-116.944684787 34.0918740258)	34.09187	-116.945	2020-06-05	POULTRY_14372	Forest Falls	Not Routine Top/Heavy Trim
5cf11bd1-0cea-4370-8ec9-5b6a7f31af48	SRID=4326;POINT(-117.764223106 34.1759565427)	34.17596	-117.764	2020-10-09	AVENIDA_884	San Dimas Canyon	Not Routine Top/Heavy Trim

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503a4324-1e1e-417b-9ca0-4a98ea058881	SRID=4326;POINT(-117.76789438 34.1688963862)	34.1689	-117.768	2020-10-09	AVENIDA_884	San Dimas Canyon	Not Routine Top/Heavy Trim
2cda43ca-c311-4009-974d-fcef76a43544	SRID=4326;POINT(-117.983341143 34.0029456746)	34.00295	-117.983	2020-07-30	TURNBULL_18317	Turnbull Canyon	Remove Overhang
b10f5677-4670-4af2-8fed-b1e5da57914c	SRID=4326;POINT(-117.835096456 34.3267386497)	34.32674	-117.835	2020-06-23	JARVIS_9150	Azusa Canyon	Remove Overhang
523b2478-0367-4f90-89b7-47395a100781	SRID=4326;POINT(-117.834962681 34.326947696)	34.32695	-117.835	2020-06-23	JARVIS_9150	Azusa Canyon	Remove Overhang
7d15342b-26bd-45a2-8dbc-bab20b960e4a	SRID=4326;POINT(-117.832382396 34.3270495886)	34.32705	-117.832	2020-06-22	JARVIS_9150	Azusa Canyon	Remove Tree(s)
8d5b37a9-0c60-49c7-aa76-531e0a670573	SRID=4326;POINT(-117.992904224 34.3505806876)	34.35058	-117.993	2020-06-26	RED BOX_14758	Big Tujunga	Remove Tree(s)
ac9f9f1a-d2fb-4375-9c67-0dd5a485f93c	SRID=4326;POINT(-118.009929545 34.3325302849)	34.33253	-118.01	2020-06-29	RED BOX_14758	Big Tujunga	Remove Overhang
d5face38-02a4-434a-8fce-8daf2f4caa55	SRID=4326;POINT(-118.078744635 34.2784527373)	34.27845	-118.079	2020-06-30	RED BOX_14758	Big Tujunga	Remove Tree(s)
25a0f041-d3dd-4970-a6fb-3eb1ed1bfaff	SRID=4326;POINT(-118.082102761 34.2716649325)	34.27166	-118.082	2020-06-30	RED BOX_14758	Big Tujunga	Remove Tree(s)
3f83cf12-255d-4bc6-badf-5ce8591d009a	SRID=4326;POINT(-118.104144819 34.246780588)	34.24678	-118.104	2020-06-24	BROADCAST_2261	Big Tujunga	Not Routine Top/Heavy Trim
7fc95949-ae54-42e3-8edf-b939ed5a8f08	SRID=4326;POINT(-117.828681283 34.3283860864)	34.32839	-117.829	2020-06-23	JARVIS_9150	Azusa Canyon	Remove Overhang
b8271a7a-3aad-4547-8ca5-f449fe084d6e	SRID=4326;POINT(-118.495820258 35.594970421)	35.59497	-118.496	2020-07-09	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
67c440af-497a-4d83-b028-7039b79c5895	SRID=4326;POINT(-119.161655 34.42777788)	34.42778	-119.162	2020-05-26	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
5cbdf577-f6d6-4860-9fc1-88eb4a981a9e	SRID=4326;POINT(-118.754227795 34.1094028117)	34.1094	-118.754	2020-06-16	TRIUNFO_18164	Triunfo Canyon	Remove Overhang
22063151-29d3-460d-bda5-98bf542da913	SRID=4326;POINT(-118.753164969 34.1104945976)	34.11049	-118.753	2020-06-16	TRIUNFO_18164	Triunfo Canyon	Remove Tree(s)
ebf368e4-857d-4963-baeb-318ab27117ce	SRID=4326;POINT(-118.199544623 34.2214461487)	34.22145	-118.2	2020-07-07	CRESCENTA_10313	Big Tujunga	Remove Overhang
8340c2c8-33d1-49d0-bd1a-cac0bc049632	SRID=4326;POINT(-117.622450339 34.2487181677)	34.24872	-117.622	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
fe05c1e1-7d51-44c2-bf93-a7fbfb87473e	SRID=4326;POINT(-117.632908523 34.2484404015)	34.24844	-117.633	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
b16c4319-0d2f-4067-a104-5f3be785acb6	SRID=4326;POINT(-117.631249745 34.2489353009)	34.24894	-117.631	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
04d8631f-9b4e-44d7-b45f-6e8ecd606f8a	SRID=4326;POINT(-117.630737946 34.2488416331)	34.24884	-117.631	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Remove Overhang
b35bd636-61c8-451b-baf9-b029e305e4c1	SRID=4326;POINT(-117.630507862 34.2489187885)	34.24892	-117.631	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
a579af1a-246b-482d-a3c5-a165539abe2b	SRID=4326;POINT(-117.630338632 34.249115237)	34.24912	-117.63	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
ecfc104c-9d51-4f6b-8245-09e129fa3e28	SRID=4326;POINT(-117.630022221 34.2490149049)	34.24901	-117.63	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
2acc30a4-f69a-467b-be6f-98823b915320	SRID=4326;POINT(-117.629616112 34.2487483045)	34.24875	-117.63	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
fd29954e-c72d-4de4-8b85-0f3e63452b26	SRID=4326;POINT(-117.629031055 34.2484792012)	34.24848	-117.629	2020-08-10	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
23c74d8e-3aa9-4314-982d-f1646caa82b0	SRID=4326;POINT(-117.629128398 34.2485664779)	34.24857	-117.629	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
fb4ad3b2-4ca7-4a6f-b03b-d2787fec6d46	SRID=4326;POINT(-117.628822178 34.2484614642)	34.24846	-117.629	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
465a0e01-7138-456f-9208-2d96509aedca	SRID=4326;POINT(-117.628479861 34.2483979989)	34.2484	-117.628	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim

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123f5b29-061a-4fc9-9035-8dfbc4c0b6e4	SRID=4326;POINT(-117.628616318 34.2484991554)	34.2485	-117.629	2020-08-10	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
e3271f38-047d-4083-b26f-d6f700dabbb1	SRID=4326;POINT(-117.628004439 34.2483711162)	34.24837	-117.628	2020-08-10	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
31645b12-198d-4017-a185-3fe66a90e442	SRID=4326;POINT(-117.627837894 34.2484450967)	34.24845	-117.628	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Tree(s)
35182df2-7b9c-40c3-88a0-438678f3cada	SRID=4326;POINT(-117.627618201 34.2485077467)	34.24851	-117.628	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
cae142e2-f9d3-4f19-b484-c8adedfc7637	SRID=4326;POINT(-117.627504542 34.2485193866)	34.24852	-117.628	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
4ec83ca9-6233-40b8-8b04-d641533aa7da	SRID=4326;POINT(-117.627249062 34.2484236276)	34.24842	-117.627	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Remove Overhang
f5f17f6e-a32b-4c4f-b898-29aab08fe439	SRID=4326;POINT(-117.626716644 34.2484035417)	34.2484	-117.627	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
e89ff12f-0eee-4018-a0ec-94867e3fb0ef	SRID=4326;POINT(-117.62548048 34.2483517163)	34.24835	-117.625	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
0a60614d-6195-4a6f-a931-4a94cc14a10f	SRID=4326;POINT(-117.625750042 34.2482211827)	34.24822	-117.626	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
7264cfed-5f82-4e3d-99f1-58f49b807f94	SRID=4326;POINT(-117.625305466 34.2479861663)	34.24799	-117.625	2020-08-10	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Tree(s)
8988db2b-cee2-4995-8b49-e7320a0f2cb8	SRID=4326;POINT(-117.625261278 34.2479683772)	34.24797	-117.625	2020-08-10	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
e2c6485b-0107-4919-9eb7-9003f4ec0e64	SRID=4326;POINT(-117.625213936 34.2480598861)	34.24806	-117.625	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
17c36b59-b357-4cff-87e7-85c3c70db881	SRID=4326;POINT(-117.628614977 34.2484193388)	34.24842	-117.629	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Tree(s)
0e0fbb41-a77f-4720-9c6e-4cd7a1472a9c	SRID=4326;POINT(-117.628577426 34.248400216)	34.2484	-117.629	2020-08-10	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
86d0d519-2ea1-4b2c-98d4-4716be3544fd	SRID=4326;POINT(-117.657588199 34.2388654686)	34.23887	-117.658	2020-08-25	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
65a38db0-e515-4443-82c4-31d7dfd6bb3d	SRID=4326;POINT(-117.661452256 34.2355512521)	34.23555	-117.661	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
e831b239-0448-43d4-bc76-86021cb3d594	SRID=4326;POINT(-117.66106803 34.2189862526)	34.21899	-117.661	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
f689672a-dfd0-49f1-850e-15dd92e173e9	SRID=4326;POINT(-117.660729736 34.2190447498)	34.21904	-117.661	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
2d2b4191-f73a-4afd-b54b-530036867a77	SRID=4326;POINT(-117.660665028 34.2190234025)	34.21902	-117.661	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
f7e7bb6c-2ae5-4af4-8169-5905d22c3c1f	SRID=4326;POINT(-117.632274516 34.2499433234)	34.24994	-117.632	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Remove Overhang
53e72de2-add7-4fa0-beaa-119b5acb1328	SRID=4326;POINT(-117.631812003 34.2491389811)	34.24914	-117.632	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
bcfb3204-c8bf-495b-a2bb-2bcb7becbb23	SRID=4326;POINT(-117.632672405 34.2496600841)	34.24966	-117.633	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
d366abc6-6aa1-4767-a400-36ef762147b0	SRID=4326;POINT(-117.633020422 34.2498469167)	34.24985	-117.633	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
2fefbb7a-8138-473f-b132-c6efad03874d	SRID=4326;POINT(-117.633129135 34.2498629539)	34.24986	-117.633	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
17113bd2-4d51-4f6d-893f-15cdb7488708	SRID=4326;POINT(-117.633203901 34.2499580116)	34.24996	-117.633	2020-08-21	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
62e5467b-3b81-4ef9-994c-7dc0bfc0f04f	SRID=4326;POINT(-117.633550745 34.2499694182)	34.24997	-117.634	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
9c4b4a53-6bc7-45a9-98a9-c4d0be7047c9	SRID=4326;POINT(-117.633804549 34.2500429694)	34.25004	-117.634	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
5d45e377-f64f-423f-9faf-db6dd28d9448	SRID=4326;POINT(-117.635159567 34.2502032766)	34.2502	-117.635	2020-08-10	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang

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6f1e643b-0acc-42a8-85a4-d5a975de8540	SRID=4326;POINT(-118.3060334 34.2670442)	34.26704	-118.306	2020-06-05	VERDUGO_18660	Big Tujunga	Remove Tree(s)
25ff0eb4-b2ae-4b35-a5b0-ee997f836fae	SRID=4326;POINT(-118.2297419 34.28806666)	34.28807	-118.23	2020-06-05	VERDUGO_18660	Big Tujunga	Not Routine Top/Heavy Trim
a6892124-d68c-4be6-9c01-136a5794606e	SRID=4326;POINT(-118.104295693 34.2471300689)	34.24713	-118.104	2020-06-24	BROADCAST_2261	Big Tujunga	Not Routine Top/Heavy Trim
904d2d44-770e-4a7f-9c90-e26af4955661	SRID=4326;POINT(-118.07274621 34.2775517917)	34.27755	-118.073	2020-06-25	RED BOX_14758	Big Tujunga	Remove Tree(s)
52e5084e-2266-4615-863b-e34f8d25f386	SRID=4326;POINT(-118.082098067 34.2718247986)	34.27182	-118.082	2020-06-30	RED BOX_14758	Big Tujunga	Not Routine Top/Heavy Trim
d47adb4c-6d0b-4508-98e5-8f1f342b94f6	SRID=4326;POINT(-118.599523176 34.0976085048)	34.09761	-118.6	2020-10-05	VICASA_18724	Topanga Canyon	Remove Tree(s)
24652da7-b074-4622-a485-4c9dcf8fe66a	SRID=4326;POINT(-118.687317744 34.0821982759)	34.0822	-118.687	2020-10-03	PLATEAU_14190	Piuma Canyon	Routine Tree Trim
c2038d96-b251-4ba2-a3ad-656cbc6a706d	SRID=4326;POINT(-118.594034873 34.0863090582)	34.08631	-118.594	2020-10-04	PARADISE_13658	Old Topanga Canyon	Not Routine Top/Heavy Trim
c9e2ab5b-88df-481b-a2dc-e608f7de6421	SRID=4326;POINT(-118.609118611 34.0692156797)	34.06922	-118.609	2020-10-03	VICASA_18724	Tuna Canyon	Routine Tree Trim
f20c15b4-1223-4757-aa0b-c11a1beb55f0	SRID=4326;POINT(-118.642986864 34.0513757714)	34.05138	-118.643	2020-10-04	TUNA_18290	Big Rock Canyon	Routine Tree Trim
d0007e81-62da-461e-8112-84ae0efa0581	SRID=4326;POINT(-118.64390552 34.0504693434)	34.05047	-118.644	2020-10-04	TUNA_18290	Big Rock Canyon	Routine Tree Trim
9a2c8344-eacb-4580-b2f2-da038c54d948	SRID=4326;POINT(-118.644873798 34.0442988196)	34.0443	-118.645	2020-10-04	TUNA_18290	Big Rock Canyon	Routine Tree Trim
1e4d8424-3b91-4cef-801c-d37c99b17ded	SRID=4326;POINT(-118.643200099 34.0513271585)	34.05133	-118.643	2020-10-04	TUNA_18290	Big Rock Canyon	Routine Tree Trim
2d9ab3ad-07dd-4fd4-ba77-80b277d5f889	SRID=4326;POINT(-118.644261584 34.0523213575)	34.05232	-118.644	2020-10-04	TUNA_18290	Big Rock Canyon	Routine Tree Trim
54f9e1ce-26d8-4171-9f8c-97cab27dd92f	SRID=4326;POINT(-118.643919602 34.0502710002)	34.05027	-118.644	2020-10-04	TUNA_18290	Big Rock Canyon	Routine Tree Trim
21019c46-6e23-4c97-9ea4-a468ee069ccc	SRID=4326;POINT(-118.639983907 34.0548013769)	34.0548	-118.64	2020-10-04	TUNA_18290	Big Rock Canyon	Tree Trim - Clear S/W
58fe0352-da01-46b6-aba9-d323d674de48	SRID=4326;POINT(-118.685055636 34.0833906566)	34.08339	-118.685	2020-10-03	PLATEAU_14190	Piuma Canyon	Routine Tree Trim
8d44672c-cf9d-4a1f-87cd-a420c5d976a7	SRID=4326;POINT(-118.65417067 34.042527753)	34.04253	-118.654	2020-10-04	TUNA_18290	Serra Creek Canyon	Tree Trim - Clear S/W
c31d1a45-61c5-4ae7-b4c1-f7d585a5958c	SRID=4326;POINT(-118.620965593 34.0422821622)	34.04228	-118.621	2020-10-04	TUNA_18290	Big Rock Canyon	Routine Tree Trim
5f8ba807-bbe6-4024-852a-ee921c0a6404	SRID=4326;POINT(-118.601933978 34.0826014768)	34.0826	-118.602	2020-10-03	VICASA_18724	Tuna Canyon	Remove Overhang
601baef4-15c4-4932-a852-9834c831d009	SRID=4326;POINT(-118.661283217 34.1069943371)	34.10699	-118.661	2020-10-04	PARADISE_13658	Old Topanga Canyon	Routine Tree Trim
0ac75f61-8205-4f39-bda9-857c6cc4a191	SRID=4326;POINT(-118.582124859 34.0552447184)	34.05524	-118.582	2020-10-03	VICASA_18724	Tuna Canyon	Not Routine Top/Heavy Trim
cc6b641f-bdff-453e-b140-caa800f47787	SRID=4326;POINT(-118.599787205 34.0972250986)	34.09723	-118.6	2020-10-05	SYLVIA_17440	Topanga Canyon	Remove Tree(s)
c827933f-798f-4c5e-9dce-624c4271f055	SRID=4326;POINT(-118.584642448 34.1030192046)	34.10302	-118.585	2020-10-05	SYLVIA_17440	Topanga Canyon	Tree Trim - Clear S/W
84353585-c35e-45d8-b41d-f1882622fae1	SRID=4326;POINT(-118.599600624 34.0974524338)	34.09745	-118.6	2020-10-05	VICASA_18724	Topanga Canyon	Remove Tree(s)
a4901e09-99bf-48c4-bdec-f84cbe412fa5	SRID=4326;POINT(-118.710028343 34.085307483)	34.08531	-118.71	2020-10-04	PLATEAU_14190	Piuma Canyon	Not Routine Top/Heavy Trim
2ea2300b-a4c5-4ef5-8570-7640d10de38f	SRID=4326;POINT(-118.697492704 34.095956006)	34.09596	-118.697	2020-10-03	PLATEAU_14190	Piuma Canyon	Not Routine Top/Heavy Trim
db005878-3d79-47c6-8d14-7a0101210d5e	SRID=4326;POINT(-118.643585332 34.0790883993)	34.07909	-118.644	2020-10-04	HORNTOAD_8698	Las flores canyon	Tree Trim - Clear S/W

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01d0b2e4-b36d-4d89-ac99-1b580be1ab33	SRID=4326;POINT(-118.643445522 34.079173097)	34.07917	-118.643	2020-10-04	HORNTOAD_8698	Las Flores canyon	Tree Trim - Clear S/W
b4056ffb-5052-4238-8841-c29fc9446e27	SRID=4326;POINT(-118.643990345 34.0763299856)	34.07633	-118.644	2020-10-04	HORNTOAD_8698	Las flores canyon	Tree Trim - Clear S/W
9b9bb51b-98d8-45fa-a963-5158b339e381	SRID=4326;POINT(-118.669129685 34.0697075378)	34.06971	-118.669	2020-10-04	PLATEAU_14190	Big Rock Canyon	Routine Tree Trim
8ddbc25d-288e-45ac-a570-44f5ecbea2ab	SRID=4326;POINT(-118.653129298 34.066680459)	34.06668	-118.653	2020-10-04	PLATEAU_14190	Big Rock Canyon	Remove Overhang
c98bcaec-1d4b-4c8f-9fad-74b75ec5cb6d	SRID=4326;POINT(-118.650827967 34.0577496617)	34.05775	-118.651	2020-10-04	TUNA_18290	Big Rock Canyon	Routine Tree Trim
ab64ba51-1bc4-4633-9eb7-e6b33079099d	SRID=4326;POINT(-118.643828996 34.0652892514)	34.06529	-118.644	2020-10-04	TUNA_18290	Big Rock Canyon	Routine Tree Trim
412677f8-ff67-43df-97df-d4810d823999	SRID=4326;POINT(-118.645982221 34.0514060504)	34.05141	-118.646	2020-10-04	TUNA_18290	Big Rock Canyon	Routine Tree Trim
e476a22e-4727-46d7-9792-06ff26610890	SRID=4326;POINT(-118.647278063 34.0511665966)	34.05117	-118.647	2020-10-04	TUNA_18290	Big Rock Canyon	Routine Tree Trim
b7c10513-5293-43ae-beb0-a41ec2c7e655	SRID=4326;POINT(-118.639527973 34.0533448604)	34.05334	-118.64	2020-10-04	TUNA_18290	Big Rock Canyon	Routine Tree Trim
81d54731-ae53-43d3-9e61-17756e475244	SRID=4326;POINT(-118.644724265 34.0752274837)	34.07523	-118.645	2020-10-04	HORNTOAD_8698	Big Rock Canyon	Tree Trim - Clear S/W
732d9bc9-197b-4a81-ab4b-828aff1aed7a	SRID=4326;POINT(-118.589662872 34.1055640993)	34.10556	-118.59	2020-10-05	SYLVIA_17440	Topanga Canyon	Tree Trim - Clear S/W
2ac1c523-bcf9-4bc6-af57-31995db92d46	SRID=4326;POINT(-118.589780554 34.1055554934)	34.10556	-118.59	2020-10-05	SYLVIA_17440	Topanga Canyon	Tree Trim - Clear S/W
b28b9a9e-09e7-40f5-8757-d335a74312de	SRID=4326;POINT(-118.603949659 34.0695031296)	34.0695	-118.604	2020-10-03	VICASA_18724	Tuna Canyon	Remove Overhang
418f777f-12d1-426d-aec2-f6197b234745	SRID=4326;POINT(-118.654361777 34.1011608029)	34.10116	-118.654	2020-10-04	PARADISE_13658	Old Topanga Canyon	Not Routine Top/Heavy Trim
96ce71f6-c4c1-46fe-8888-47eeee65ba3e	SRID=4326;POINT(-118.661421016 34.1003068239)	34.10031	-118.661	2020-10-04	HORNTOAD_8698	Topanga Canyon	Routine Tree Trim
5e0ae2c9-4383-4217-9947-e71d574030ed	SRID=4326;POINT(-118.660560697 34.1007346474)	34.10073	-118.661	2020-10-04	PARADISE_13658	Old Topanga Canyon	Not Routine Top/Heavy Trim
47803b4b-95e3-4bbc-8a14-0aa938ece2ed	SRID=4326;POINT(-118.600000441 34.0966365041)	34.09664	-118.6	2020-10-05	SYLVIA_17440	Red Rock Canyon	Tree Trim - Clear S/W
a7ccc501-27f1-4b32-83e9-97ca7777e669	SRID=4326;POINT(-118.5986875 34.0992884788)	34.09929	-118.599	2020-10-05	SYLVIA_17440	Red Rock Canyon	Routine Tree Trim
5d6f420a-24c2-4e98-9373-50ddc70552c1	SRID=4326;POINT(-118.600382321 34.0754935296)	34.07549	-118.6	2020-10-03	VICASA_18724	Tuna Canyon	Remove Tree(s)
40ea440a-9eb6-4cb4-8a62-52d938b772aa	SRID=4326;POINT(-118.690203466 34.0841648342)	34.08416	-118.69	2020-10-03	PLATEAU_14190	Piuma Canyon	Routine Tree Trim
9a30c46c-f3c9-4dea-8e78-09fc00a543f5	SRID=4326;POINT(-118.604806792 34.1039188207)	34.10392	-118.605	2020-10-05	SYLVIA_17440	Topanga Canyon	Remove Tree(s)
8980a7a1-04cb-4169-a417-8013341e3b36	SRID=4326;POINT(-118.652711548 34.0914039409)	34.0914	-118.653	2020-10-04	PARADISE_13658	Old Topanga Canyon	Remove Tree(s)
b5d075ae-2999-44ab-a082-fbbec42cf6bd	SRID=4326;POINT(-118.578809984 34.0420062884)	34.04201	-118.579	2020-10-03	VICASA_18724	Tuna Canyon	Remove Overhang
79847ff2-70ac-48e3-9ea6-de93a67b9462	SRID=4326;POINT(-118.598564453 34.0811924867)	34.08119	-118.599	2020-10-03	VICASA_18724	Tuna Canyon	Remove Overhang
43e2809a-ef7f-4091-b203-1e307c946775	SRID=4326;POINT(-118.586999439 34.0671726745)	34.06717	-118.587	2020-10-02	VICASA_18724	Tuna Canyon	Tree Trim - Clear S/W
0ecdcbd6-cc8e-45e6-89fa-3e9dda907efa	SRID=4326;POINT(-118.584158309 34.059073213)	34.05907	-118.584	2020-10-02	VICASA_18724	Tuna Canyon	Not Routine Top/Heavy Trim
fd012d56-aa3f-4b94-b011-d8b00ce8419c	SRID=4326;POINT(-118.6609523 34.0883638191)	34.08836	-118.661	2020-10-04	PARADISE_13658	Old Topanga Canyon	Not Routine Top/Heavy Trim
471a0838-ebdb-4762-9c6d-ef601df78e16	SRID=4326;POINT(-118.6840887 34.0732246147)	34.07322	-118.684	2020-10-02	PLATEAU_14190	Piuma Canyon	Routine Tree Trim

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4925f220-9de0-4aaf-bf61-878570ca58f0	SRID=4326;POINT(-118.602128439 34.0763047143)	34.0763	-118.602	2020-10-04	VICASA_18724	Tuna Canyon	Not Routine Top/Heavy Trim
a76d90a5-c98e-4dc7-9614-270e3703f4ce	SRID=4326;POINT(-118.60086076 34.0800553363)	34.08006	-118.601	2020-10-04	VICASA_18724	Tuna Canyon	Routine Tree Trim
929c33e7-ea10-4e01-85b8-a68ce4740a47	SRID=4326;POINT(-118.598858155 34.0790273058)	34.07903	-118.599	2020-10-04	VICASA_18724	Tuna Canyon	Remove Overhang
dbf9f794-bd21-4912-838d-97bb471c4965	SRID=4326;POINT(-118.600686416 34.0778120922)	34.07781	-118.601	2020-10-04	VICASA_18724	Tuna Canyon	Routine Tree Trim
537bd6b2-b4f8-4a2c-bedf-ec25d47a9e12	SRID=4326;POINT(-118.600027934 34.0781950419)	34.0782	-118.6	2020-10-04	VICASA_18724	Tuna Canyon	Remove Tree(s)
a04bde19-f73a-4b9f-9f1b-8410c74e7917	SRID=4326;POINT(-118.599960543 34.0802136219)	34.08021	-118.6	2020-10-03	VICASA_18724	Tuna Canyon	Routine Tree Trim
d24d6b58-197f-4862-a426-5684bf2a7dd3	SRID=4326;POINT(-118.699405789 34.0824559693)	34.08246	-118.699	2020-10-03	PLATEAU_14190	Piuma Canyon	Routine Tree Trim
17c7377e-5a69-407a-9119-af525ab6399a	SRID=4326;POINT(-118.697775342 34.0942534873)	34.09425	-118.698	2020-10-03	PLATEAU_14190	Piuma Canyon	Not Routine Top/Heavy Trim
01d12b02-7bf8-41f0-8a8e-337720bfdee9	SRID=4326;POINT(-118.703959845 34.1046335434)	34.10463	-118.704	2020-10-02	PLATEAU_14190	Piuma Canyon	Not Routine Top/Heavy Trim
9a89e3ce-2607-4b3c-bbb4-4f76872867c6	SRID=4326;POINT(-118.607894517 34.0740097161)	34.07401	-118.608	2020-10-04	VICASA_18724	Tuna Canyon	Not Routine Top/Heavy Trim
9ec584c7-b4a2-4915-9ee2-fe16a7e28e16	SRID=4326;POINT(-118.608636484 34.0736253589)	34.07363	-118.609	2020-10-04	VICASA_18724	Tuna Canyon	Not Routine Top/Heavy Trim
c4e6f8e9-74a8-47cd-bb98-71599ef63ac1	SRID=4326;POINT(-118.616558388 34.0674040287)	34.0674	-118.617	2020-10-04	VICASA_18724	Tuna Canyon	Routine Tree Trim
f8dd2ae2-6cff-4737-b297-72e27bdb100a	SRID=4326;POINT(-118.683461063 34.0731568518)	34.07316	-118.683	2020-10-04	PLATEAU_14190	Piuma Canyon	Not Routine Top/Heavy Trim
b21db409-3ba1-4d92-b8d0-3a46c037c4fd	SRID=4326;POINT(-118.607144505 34.0922041447)	34.0922	-118.607	2020-10-04	PARADISE_13658	Old Topanga Canyon	Not Routine Top/Heavy Trim
10bc3d6c-61c2-42bc-ab43-f2f5a7e12b03	SRID=4326;POINT(-118.662198856 34.1106453312)	34.11065	-118.662	2020-10-04	PARADISE_13658	Old Topanga Canyon	Not Routine Top/Heavy Trim
51f5d6d9-b7a6-400c-a90c-cd23f81eb9bd	SRID=4326;POINT(-118.583715744 34.0579749308)	34.05797	-118.584	2020-10-03	VICASA_18724	Tuna Canyon	Not Routine Top/Heavy Trim
f8c4ceb5-a257-465a-a310-45b0c571cd2d	SRID=4326;POINT(-118.603121862 34.0783613843)	34.07836	-118.603	2020-10-04	VICASA_18724	Tuna Canyon	Routine Tree Trim
a34ec5d5-e698-4520-b068-784152404b4c	SRID=4326;POINT(-118.61560151 34.0889946763)	34.08899	-118.616	2020-10-04	PARADISE_13658	Old Topanga Canyon	Routine Tree Trim
c2f62b9e-6959-4944-b2eb-4f5896d42dee	SRID=4326;POINT(-118.606265411 34.0887722664)	34.08877	-118.606	2020-10-04	PARADISE_13658	Old Topanga Canyon	Remove Overhang
e9ac1dd9-b81d-4c97-89c2-dce22aa1c1c1	SRID=4326;POINT(-118.61446023 34.0878040406)	34.0878	-118.614	2020-10-04	PARADISE_13658	Old Topanga Canyon	Routine Tree Trim
ba639509-7b28-4612-8927-4a9d546941d0	SRID=4326;POINT(-118.590414561 34.0921841536)	34.09218	-118.59	2020-10-04	VICASA_18724	Topanga Canyon	Not Routine Top/Heavy Trim
8a9643c8-9d17-4bc5-ba8e-6d5aeb6434e9	SRID=4326;POINT(-118.599855602 34.0912870472)	34.09129	-118.6	2020-10-04	PARADISE_13658	Old Topanga Canyon	Routine Tree Trim
1d3a0cdb-8de5-4fb3-bf3c-45fbe0bc6fd2	SRID=4326;POINT(-118.600338735 34.0912801057)	34.09128	-118.6	2020-10-04	PARADISE_13658	Old Topanga Canyon	Routine Tree Trim
62903513-fbd4-4efe-89f6-c996935cd48a	SRID=4326;POINT(-118.62628676 34.1071681182)	34.10717	-118.626	2020-10-04	PARADISE_13658	Old Topanga Canyon	Remove Tree(s)
3af2ed24-3baf-46fd-b91d-fde6829fc855	SRID=4326;POINT(-118.590338789 34.0897082722)	34.08971	-118.59	2020-10-04	PARADISE_13658	Old Topanga Canyon	Routine Tree Trim
db42a481-62e9-4e41-8c4e-9ac5932ede24	SRID=4326;POINT(-118.589996807 34.0898673728)	34.08987	-118.59	2020-10-04	VICASA_18724	Topanga Canyon	Remove Tree(s)
dc7be73a-4a9f-45cc-8e6d-908ae7b023b5	SRID=4326;POINT(-118.652492277 34.0447185917)	34.04472	-118.652	2020-10-04	SERRA_16150	Tuna Canyon	Remove Tree(s)
58d04f3a-1627-4619-abb7-981c518552d0	SRID=4326;POINT(-118.622277193 34.1099921502)	34.10999	-118.622	2020-10-04	PARADISE_13658	Old Topanga Canyon	Remove Overhang

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d3c00941-3b81-4609-9bc6-44d894f7cb57	SRID=4326;POINT(-118.587973416 34.1138148394)	34.11381	-118.588	2020-10-04	VICASA_18724	Topanga Canyon	Remove Overhang
b2c95e9e-b1e9-4d8a-a321-8c7137dbdbca	SRID=4326;POINT(-118.613370247 34.0889402539)	34.08894	-118.613	2020-10-04	PARADISE_13658	Old Topanga Canyon	Routine Tree Trim
6487e562-d408-4079-9c7c-c4e5bf466882	SRID=4326;POINT(-118.604948446 34.142366424)	34.14237	-118.605	2020-10-04	VICASA_18724	Topanga Canyon	Remove Tree(s)
6dc0f1f1-a8ee-4200-90d3-bb27eb997d30	SRID=4326;POINT(-118.695887066 34.0817598066)	34.08176	-118.696	2020-10-03	PLATEAU_14190	Piuma Canyon	Remove Overhang
e95b1805-94d4-4064-8144-f905ce219b67	SRID=4326;POINT(-118.652754463 34.0451469738)	34.04515	-118.653	2020-10-04	SERRA_16150	Tuna Canyon	Not Routine Top/Heavy Trim
27f9875e-2a94-47ee-b281-3659c1a7642c	SRID=4326;POINT(-118.720350824 34.3026677119)	34.30267	-118.72	2020-09-29	TAPO_17548	Tapo Canyon & Pepper Tree	Not Routine Top/Heavy Trim
82286dbc-feea-454b-8fd8-c34fcd499527	SRID=4326;POINT(-118.619418629 34.1411773718)	34.14118	-118.619	2020-10-04	VICASA_18724	Topanga Canyon	Not Routine Top/Heavy Trim
ba8faba8-158c-42c5-8ba0-05226c8174fa	SRID=4326;POINT(-118.650059514 34.0388504839)	34.03885	-118.65	2020-10-04	SERRA_16150	Tuna Canyon	Routine Tree Trim
b50d1083-c227-4b96-860e-e575aeb4d8b1	SRID=4326;POINT(-118.652287088 34.0440298977)	34.04403	-118.652	2020-10-04	SERRA_16150	Tuna Canyon	Not Routine Top/Heavy Trim
7056db17-91ea-4267-b87c-a6065c25ba5d	SRID=4326;POINT(-118.654041924 34.0466974099)	34.0467	-118.654	2020-10-04	SERRA_16150	Tuna Canyon	Not Routine Top/Heavy Trim
26f1b9ed-0751-49d1-9e23-e3742a7b582e	SRID=4326;POINT(-118.592625372 34.0896577376)	34.08966	-118.593	2020-10-04	PARADISE_13658	Old Topanga Canyon	Routine Tree Trim
7e0255c0-ba29-44be-9d0b-a98ab5888eef	SRID=4326;POINT(-118.589789942 34.0899720513)	34.08997	-118.59	2020-10-04	VICASA_18724	Topanga Canyon	Not Routine Top/Heavy Trim
ec083dc4-2fc4-4f10-af92-43f8b4ad8145	SRID=4326;POINT(-117.823181413 34.154620317)	34.15462	-117.823	2020-10-10	LEMONADE_10333	Big Dalton	Remove Tree(s)
5ef7d0a1-2638-4317-b863-42593d006968	SRID=4326;POINT(-118.183229752 34.1922468507)	34.19225	-118.183	2020-07-13	HASKELL_8140	Flint Canyon/Chevy Chase Dr.	Not Routine Top/Heavy Trim
ea7895e3-3303-4e07-b071-f49a6ec62e25	SRID=4326;POINT(-118.142751865 34.2043293505)	34.20433	-118.143	2020-06-09	GORGE_7448	Mt. Lowe/Channey Trail	Not Routine Top/Heavy Trim
17e7f663-f2f3-4065-a8c6-62ee94f4776b	SRID=4326;POINT(-118.080919906 34.1735094659)	34.17351	-118.081	2020-06-12	VIDEO_18730	Eaton Canyon	Remove Overhang
ff1c0cb9-0f1b-495c-ba46-610e6608156d	SRID=4326;POINT(-118.60370189 34.0786160346)	34.07862	-118.604	2020-06-23	VICASA_18724	Tuna Canyon	Routine Tree Trim
ee7b6788-9a3b-4c6a-a250-9f368d9f7905	SRID=4326;POINT(-118.630370423 34.1244622734)	34.12446	-118.63	2020-07-08	PARADISE_13658	Old Topanga Canyon	Remove Overhang
ec36ed6a-ed5f-4e07-be96-f94ea39f9d4f	SRID=4326;POINT(-118.596565537 34.0904351899)	34.09044	-118.597	2020-07-07	PARADISE_13658	Old Topanga Canyon	Not Routine Top/Heavy Trim
e877b8c8-c0fa-46c1-adc7-6ecbf96d2435	SRID=4326;POINT(-118.594716825 34.0841645565)	34.08416	-118.595	2020-07-07	CHENEY_3401	Topanga Canyon	Not Routine Top/Heavy Trim
e765e747-a41f-4ee6-b3ec-1ce897d2177e	SRID=4326;POINT(-118.590644561 34.105419464)	34.10542	-118.591	2020-06-23	SYLVIA_17440	Red Rock Canyon	Remove Overhang
db462808-ead9-448a-b563-db0ba38c29de	SRID=4326;POINT(-118.622382134 34.1101817481)	34.11018	-118.622	2020-07-08	PARADISE_13658	Old Topanga Canyon	Remove Overhang
a34f7c91-28b3-4e56-9dbe-fbe254c3f9b5	SRID=4326;POINT(-118.664663471 34.0756887589)	34.07569	-118.665	2020-06-23	PLATEAU_14190	Big Rock Canyon	Tree Trim - Clear S/W
9ed9754f-1a9f-4ad4-9dee-696b20f9bace	SRID=4326;POINT(-118.596604764 34.1072008756)	34.1072	-118.597	2020-06-24	SYLVIA_17440	Red Rock Canyon	Routine Tree Trim
73b189e3-8503-4c30-bb82-6789c8fe72cf	SRID=4326;POINT(-118.624437377 34.1103954963)	34.1104	-118.624	2020-07-08	PARADISE_13658	Old Topanga Canyon	Remove Overhang
6d0b3dc7-b5d7-4284-83c8-6242576d0bb2	SRID=4326;POINT(-118.594092876 34.0862032644)	34.0862	-118.594	2020-07-07	PARADISE_13658	Old Topanga Canyon	Tree Trim - Clear S/W
5d902bbf-e285-420d-a71c-726cd2e8a40a	SRID=4326;POINT(-118.686987497 34.0815340454)	34.08153	-118.687	2020-06-30	PLATEAU_14190	Piuma Canyon	Routine Tree Trim
59307c0b-5281-461a-b801-c5e8bc880c84	SRID=4326;POINT(-118.580058217 34.0404485431)	34.04045	-118.58	2020-06-24	VICASA_18724	Tuna Canyon	Remove Overhang

_record_id	_geometry	_latitude	_longitude	assessment_date	circuit	work_location	type_of_service
4b8ca5eb-1f81-4a43-a413-b8fa0b44ce5b	SRID=4326;POINT(-118.605155647 34.0791744855)	34.07917	-118.605	2020-06-23	VICASA_18724	Tuna Canyon	Not Routine Top/Heavy Trim
2f4c7cf5-5797-490b-89fc-4cae48c9d38f	SRID=4326;POINT(-118.598777018 34.1370431696)	34.13704	-118.599	2020-06-11	VICASA_18724	Topanga Canyon	Remove Tree(s)
208ba72f-92a1-4e4b-83e6-2014fbe74ad9	SRID=4326;POINT(-118.661292605 34.0883449378)	34.08834	-118.661	2020-07-01	PARADISE_13658	Old Topanga Canyon	Not Routine Top/Heavy Trim
0d036dd0-e1f7-46de-89b5-947a8b7934e9	SRID=4326;POINT(-118.603158742 34.082574819)	34.08257	-118.603	2020-06-23	VICASA_18724	Tuna Canyon	Remove Overhang
0965e813-c67e-4f33-b92d-51a34959f1e4	SRID=4326;POINT(-118.676503748 34.0392066603)	34.03921	-118.677	2020-06-24	SERRA_16150	Tuna Canyon	Not Routine Top/Heavy Trim
05b5fc38-c932-4608-b657-b70af37e24cb	SRID=4326;POINT(-118.663299903 34.072770269)	34.07277	-118.663	2020-06-23	PLATEAU_14190	Big Rock Canyon	Routine Tree Trim
38554647-765f-4263-8ce9-020334cfb7c9	SRID=4326;POINT(-117.663199715 34.2433369734)	34.24334	-117.663	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
1f6d7b50-8c1c-4833-84b5-06b5051ed093	SRID=4326;POINT(-117.663168535 34.2433220069)	34.24332	-117.663	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
015a601f-37db-447f-993c-cca5ec975d6b	SRID=4326;POINT(-117.663110867 34.2431338165)	34.24313	-117.663	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
2dcacfa8-c784-48b6-a61c-c2eb5f606be4	SRID=4326;POINT(-117.660797462 34.2410041043)	34.241	-117.661	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
4f5dbf90-2fdf-4634-90ad-8e530b1f6919	SRID=4326;POINT(-118.447621381 35.7925787336)	35.79258	-118.448	2020-06-24	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
188f985c-ca16-4708-a87b-8a827b49af44	SRID=4326;POINT(-117.639775984 34.2544824115)	34.25448	-117.64	2020-08-05	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
d8117cba-ff20-4c4b-9d07-b459603c6b80	SRID=4326;POINT(-117.304431178 34.2301088819)	34.23011	-117.304	2020-06-02	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
958b227a-6a5f-49e7-8649-058b666f4ae8	SRID=4326;POINT(-117.661059648 34.2413791083)	34.24138	-117.661	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
5d8eabef-c3e4-43ae-993a-f719bc5dad17	SRID=4326;POINT(-117.661007009 34.24129097)	34.24129	-117.661	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
a73e52ac-0c78-48b2-8abe-4b527caf02c7	SRID=4326;POINT(-117.66095873 34.2412291623)	34.24123	-117.661	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
eaada8c2-f4cf-42b5-a15a-b996790b4e5f	SRID=4326;POINT(-117.660874575 34.241116079)	34.24112	-117.661	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
e35e4e7e-03d9-45b6-9f60-8fcdbdb4b78c	SRID=4326;POINT(-117.660731077 34.2408555435)	34.24086	-117.661	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
4407e060-3b18-4341-9af3-340ca954259c	SRID=4326;POINT(-117.660650611 34.2407951213)	34.2408	-117.661	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
def820b1-b601-44cd-aeef-1e1e74b5ec14	SRID=4326;POINT(-117.660602331 34.2406157946)	34.24062	-117.661	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
b440e3a4-30f5-4b7c-8929-be046e858f7b	SRID=4326;POINT(-117.661067024 34.2415542758)	34.24155	-117.661	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
fe3c932e-bb57-4c21-a5c4-b5facc823fe0	SRID=4326;POINT(-117.661515288 34.2419783351)	34.24198	-117.662	2020-08-25	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
fe4e7a6f-16b8-4f42-a948-8aa6f864dc92	SRID=4326;POINT(-117.661743276 34.2420908629)	34.24209	-117.662	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
31c785f0-2fbe-4654-95bb-69c572e0f329	SRID=4326;POINT(-117.662111409 34.242529609)	34.24253	-117.662	2020-08-25	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
d106a868-e2ba-4616-8ad3-04da39bcc098	SRID=4326;POINT(-117.662346773 34.2426413046)	34.24264	-117.662	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
115dbb02-125f-40fe-9b3e-8ef921958b78	SRID=4326;POINT(-117.662413828 34.2427153063)	34.24272	-117.662	2020-08-25	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
8525ca19-ffa1-4b12-b742-d0c17b273c98	SRID=4326;POINT(-117.662777406 34.2429212995)	34.24292	-117.663	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
a1c15c15-9b67-41a1-b78d-8688d86ff5e8	SRID=4326;POINT(-118.500525272 35.0676055486)	35.06761	-118.501	2020-08-03	METTLER_11760	Paradise valley rd	Routine Tree Trim

_record_id	_geometry	_latitude	_longitude	assessment_date	circuit	work_location	type_of_service
4136a9d2-ecea-4c2f-a668-79b254fc2c01	SRID=4326;POINT(-118.501834609 35.0719954027)	35.072	-118.502	2020-07-28	METTLER_11760	Water Cyn	Remove Tree(s)
ccd6b55d-2b57-42bb-a57b-8b072d419af8	SRID=4326;POINT(-118.503227094 35.0620143582)	35.06201	-118.503	2020-07-28	METTLER_11760	Water Cyn	Routine Tree Trim
64ec9be6-3006-4284-b2bc-34867cfd0782	SRID=4326;POINT(-117.633479498 34.2671248321)	34.26712	-117.633	2020-08-25	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
88d789c9-71a4-4555-b0f8-0d72ca2f850c	SRID=4326;POINT(-118.738345094 34.0610878046)	34.06109	-118.738	2020-06-25	MERLIN_11695	Tuna Canyon	Not Routine Top/Heavy Trim
c16d5b54-4416-43b1-adf6-fed5c559a7b2	SRID=4326;POINT(-117.629452497 34.2654684351)	34.26547	-117.629	2020-09-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
7e7588e4-6558-4f16-80d8-bbcff7804a78	SRID=4326;POINT(-117.635503896 34.2608831099)	34.26088	-117.636	2020-08-25	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
70ff30ec-2d89-44e7-891a-876ea7a1595f	SRID=4326;POINT(-117.102018861 34.2102688798)	34.21027	-117.102	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
19ccd327-06bf-447f-b5f9-e406ada58173	SRID=4326;POINT(-118.200961165 34.1900038092)	34.19	-118.201	2020-07-30	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Not Routine Top/Heavy Trim
fff19021-c92f-4c17-ab63-6675619c6c84	SRID=4326;POINT(-117.762737162 33.9615401282)	33.96154	-117.763	2020-07-20	DEL CARBON_4795	Carbon Canyon	Remove Overhang
46a0cd20-4057-4ca9-89d2-c11e056b88c0	SRID=4326;POINT(-117.776841559 33.9610134387)	33.96101	-117.777	2020-07-22	DEL CARBON_4795	Carbon Canyon	Remove Overhang
db59aef8-f85f-4ec1-ba9b-d3e16fdb8326	SRID=4326;POINT(-118.548581824 35.5751556857)	35.57516	-118.549	2020-07-02	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
ff9dbeae-9142-48fd-8fa3-90c5d479f25b	SRID=4326;POINT(-117.622709759 34.2485628977)	34.24856	-117.623	2020-08-10	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
eb79e1bb-6faa-4b52-bcb3-3bf94dd3355f	SRID=4326;POINT(-117.626916453 34.2483394761)	34.24834	-117.627	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
e0089001-e1c9-40c5-b0c4-26073284da3e	SRID=4326;POINT(-117.622048259 34.2489586535)	34.24896	-117.622	2020-08-10	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
bca64afd-8249-4ca7-8f34-18c172a1cefe	SRID=4326;POINT(-117.6238041 34.2479886605)	34.24799	-117.624	2020-08-10	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Tree(s)
b73c79dc-9b3c-4988-aa3b-11a0afd6ac8f	SRID=4326;POINT(-117.626448423 34.2483736105)	34.24837	-117.626	2020-08-10	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
6811711c-8d14-499a-96f8-4f0c48ab9aca	SRID=4326;POINT(-117.625069097 34.2477544749)	34.24775	-117.625	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
5220c2a2-f5a4-413e-add5-7d19db1f07a7	SRID=4326;POINT(-117.623232454 34.2482494512)	34.24825	-117.623	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
3ad639b4-dec5-4836-9ac1-0124893f6541	SRID=4326;POINT(-117.626816965 34.2483891473)	34.24839	-117.627	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
26f46224-afce-4e3f-bab2-dc81883f9ea0	SRID=4326;POINT(-117.624770701 34.2476081431)	34.24761	-117.625	2020-08-24	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
144a4029-cd2f-4639-9d30-88c5a1ced399	SRID=4326;POINT(-117.760949805 33.5767421103)	33.57674	-117.761	2020-07-30		Laguna Canyon	Not Routine Top/Heavy Trim
87b8103c-3408-42f4-bf61-94707105b13d	SRID=4326;POINT(-118.183616661 34.1920954306)	34.1921	-118.184	2020-07-13	HASKELL_8140	Flint Canyon/Chevy Chase Dr.	Remove Overhang
c072e478-f38d-4797-825c-a14db3950977	SRID=4326;POINT(-117.763872072 33.5659127731)	33.56591	-117.764	2020-07-30		Laguna Canyon	Remove Tree(s)
878f13a7-d30b-49c4-8173-66577fce28ae	SRID=4326;POINT(-117.768608853 33.5294804105)	33.52948	-117.769	2020-07-29		Laguna Canyon	Not Routine Top/Heavy Trim
00559fd8-de5d-4692-872e-d5f829811a1f	SRID=4326;POINT(-117.768587396 33.529532954)	33.52953	-117.769	2020-08-06	ACRES_46	Laguna Canyon	Remove Tree(s)
93594b35-758d-4a8e-9bf9-ed38b1d984ec	SRID=4326;POINT(-119.894895516 34.4536472478)	34.45365	-119.895	2020-07-08	BIDDER_1610	Dos Pueblos Canyon	Remove Overhang
aacd80a7-7508-4edc-8c22-561131e96c19	SRID=4326;POINT(-119.9005647 34.4413417858)	34.44134	-119.901	2020-07-09	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
e985de07-b093-4364-833c-5e56c7548bba	SRID=4326;POINT(-119.904711731 34.4408180853)	34.44082	-119.905	2020-07-09	BIDDER_1610	Dos Pueblos Canyon	Remove Overhang

_record_id	_geometry	_latitude	_longitude	assessment_date	circuit	work_location	type_of_service
fc6351ea-9920-46a5-b112-1f1aff11965f	SRID=4326;POINT(-117.635528371 34.2603455343)	34.26035	-117.636	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
fb01aff6-a31e-4cc2-860e-faaa409504a8	SRID=4326;POINT(-117.6571282 34.2386229424)	34.23862	-117.657	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
e6e763f5-220b-46e8-9091-c7005689754b	SRID=4326;POINT(-117.632832751 34.2632273429)	34.26323	-117.633	2020-08-05	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
e141d88e-4449-46e6-9c58-c56c7da6bfce	SRID=4326;POINT(-117.632693276 34.2659538864)	34.26595	-117.633	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
da7d483b-eb20-42a3-9c7a-2a89e3a378a9	SRID=4326;POINT(-117.663026378 34.2435453958)	34.24355	-117.663	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Tree(s)
c0e2c89e-b7d3-4215-8ed4-c960c4af9f71	SRID=4326;POINT(-117.656874731 34.2386717248)	34.23867	-117.657	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
a2b3aab6-5119-4def-a2a6-43231bbde4fe	SRID=4326;POINT(-117.663153447 34.2433621947)	34.24336	-117.663	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
911f17d1-fec3-4d2f-93e1-c93fe9dc1653	SRID=4326;POINT(-117.660080306 34.2405207264)	34.24052	-117.66	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
911cba84-4a95-4af1-918b-cc1753904b50	SRID=4326;POINT(-117.66272597 34.242949506)	34.24295	-117.663	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
847e0523-d13c-4304-b2bc-710ca7b0d378	SRID=4326;POINT(-117.633868083 34.2646313576)	34.26463	-117.634	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
8193e439-ba03-4599-b7c8-842eb9ec8992	SRID=4326;POINT(-117.658295967 34.2366145209)	34.23661	-117.658	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
717ed557-57df-4f7f-aeea-5a8ae2a33c53	SRID=4326;POINT(-117.64553301 34.2434669603)	34.24347	-117.646	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
379a6e17-72fb-4c74-ad32-4837741bcea7	SRID=4326;POINT(-117.660584119 34.2409991953)	34.241	-117.661	2020-08-05	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Tree(s)
20da1b02-62f2-45ef-931a-8381c3b1419d	SRID=4326;POINT(-117.632736526 34.2658865551)	34.26589	-117.633	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
0bfeef06-129f-4993-b309-b00c0cd52dbf	SRID=4326;POINT(-117.663079351 34.2436035987)	34.2436	-117.663	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
0a0ddfa6-ccbf-417c-98fa-1c8163849a8c	SRID=4326;POINT(-117.65983019 34.2406133001)	34.24061	-117.66	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
091a5235-e4bf-44f5-b7cd-09aecfd1ca6d	SRID=4326;POINT(-117.65743766 34.2380957571)	34.2381	-117.657	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
d4edc788-de6e-410d-a48a-c0723e1871a5	SRID=4326;POINT(-118.201960623 34.1905482126)	34.19055	-118.202	2020-07-27	LANE_10050	Flint Canyon/Chevy Chase Dr.	Remove Overhang
b46ff69a-72eb-4332-a346-b7f838796664	SRID=4326;POINT(-117.4195307 33.6462911)	33.64629	-117.42	2020-06-03	STILLWATER_17026	Ortega Hwy including Main Divide Rd	Remove Tree(s)
a3969051-4026-4ea0-b270-6f31e044e679	SRID=4326;POINT(-118.200941049 34.1963154004)	34.19632	-118.201	2020-07-30	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Not Routine Top/Heavy Trim
57a83f41-a0a4-43f6-9be3-5bbbc542d840	SRID=4326;POINT(-118.199445046 34.2216368826)	34.22164	-118.199	2020-07-07	CRESCENTA_10313	Big Tujunga	Remove Overhang
72c2ab1f-dbb9-4a0a-9111-9fe11618070b	SRID=4326;POINT(-118.220657632 34.2140826031)	34.21408	-118.221	2020-07-29	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Overhang
4c3ee218-5180-48c0-b10c-0c06fb79b4b8	SRID=4326;POINT(-117.980371937 34.1575165632)	34.15752	-117.98	2020-06-18	PRIMROSE_14410	Chantry Flats	Remove Tree(s)
9a8c05df-5803-472c-bb8d-6ac96f6fdf6a	SRID=4326;POINT(-117.981258072 34.1571400762)	34.15714	-117.981	2020-06-09	SHAMROCK_16250	Monrovia Canyon	Not Routine Top/Heavy Trim
9b82ebb3-bec5-4baf-8b40-57842cbec478	SRID=4326;POINT(-119.161736481 34.4478283203)	34.44783	-119.162	2020-06-18	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
f7acb760-0f89-43cc-93f3-54a9ff111e98	SRID=4326;POINT(-118.776310757 34.0465337834)	34.04653	-118.776	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
f674aa93-0158-4036-b08a-f14bd369de28	SRID=4326;POINT(-118.86806611 34.0564313674)	34.05643	-118.868	2020-06-30	MAGUIRE_10934	Encinal Canyon	Routine Tree Trim
ef999113-5680-4c36-b7df-aafd8be49993	SRID=4326;POINT(-118.776924312 34.0531610979)	34.05316	-118.777	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim

_record_id	_geometry	_latitude	_longitude	assessment_date	circuit	work_location	type_of_service
e4b11e40-d41d-4e4e-9861-a612bdd9dbc9	SRID=4326;POINT(-118.775102757 34.0479447389)	34.04794	-118.775	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
d4a1a9e6-b9a9-4fd8-be49-7118b711bb4f	SRID=4326;POINT(-118.778298274 34.0532683219)	34.05327	-118.778	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
d2346f95-1ae9-4170-8900-4aa2bfdf4aba	SRID=4326;POINT(-118.774366155 34.0493865062)	34.04939	-118.774	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
c9ae4be4-5b5a-4a55-be01-6a01ac97166f	SRID=4326;POINT(-118.777792677 34.0532113765)	34.05321	-118.778	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
c66b0630-4d33-47f8-ae72-7234fb64020c	SRID=4326;POINT(-118.741015233 34.0608472671)	34.06085	-118.741	2020-06-25	MERLIN_11695	Tuna Canyon	Routine Tree Trim
bd32b57f-a1cf-4ecd-88af-8952776f66a2	SRID=4326;POINT(-118.740582392 34.0454433951)	34.04544	-118.741	2020-06-24	MERLIN_11695	Corral Canyon	Routine Tree Trim
b55da673-55c3-43e1-b641-f9c41b7a30ad	SRID=4326;POINT(-118.741587549 34.0442063083)	34.04421	-118.742	2020-06-24	MERLIN_11695	Corral Canyon	Routine Tree Trim
a1799e5f-7096-4e3f-a12b-321e3fccae07	SRID=4326;POINT(-118.874035701 34.0630054134)	34.06301	-118.874	2020-06-30	MAGUIRE_10934	Encinal Canyon	Tree Trim - Clear S/W
91068fad-2434-47ca-988f-fa3c45b3ae48	SRID=4326;POINT(-118.777229413 34.0517749523)	34.05177	-118.777	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
8fb14421-eea5-4463-af65-32bd8e8913f8	SRID=4326;POINT(-118.776003644 34.0468221436)	34.04682	-118.776	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
8581b016-38bb-415f-8ed9-d67c2d277fa2	SRID=4326;POINT(-118.775256313 34.0472005108)	34.0472	-118.775	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
7097cdeb-b260-4b9d-826d-71733135acb6	SRID=4326;POINT(-118.744828328 34.0599431625)	34.05994	-118.745	2020-06-25	MERLIN_11695	Corral Canyon	Routine Tree Trim
60517dba-ef3c-4a0e-849f-10dd31c1a405	SRID=4326;POINT(-118.740193471 34.0437245814)	34.04372	-118.74	2020-06-24	MERLIN_11695	Corral Canyon	Routine Tree Trim
4fd50cd7-6951-4d2f-ada1-21b552dc20b0	SRID=4326;POINT(-118.776590042 34.0528908152)	34.05289	-118.777	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
45d768e7-0121-4d9b-b298-ae1d0d307b09	SRID=4326;POINT(-118.870400973 34.0630123572)	34.06301	-118.87	2020-07-01	MAGUIRE_10934	Encinal Canyon	Tree Trim - Clear S/W
42c17b4c-35d0-4843-938d-d5b71a98a429	SRID=4326;POINT(-118.77635099 34.0464140498)	34.04641	-118.776	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
3f660b20-bebf-4bc1-a889-772ddcb7cdaf	SRID=4326;POINT(-118.869498074 34.0558266562)	34.05583	-118.869	2020-06-30	MAGUIRE_10934	Encinal Canyon	Tree Trim - Clear S/W
324a901d-3b9b-4858-9f20-0fab76c6e7e3	SRID=4326;POINT(-118.74172803 34.06028814)	34.06029	-118.742	2020-06-25	MERLIN_11695	Tuna Canyon	Routine Tree Trim
246b701d-0aca-4fc3-b367-e74657638cc8	SRID=4326;POINT(-118.776080087 34.0487806336)	34.04878	-118.776	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
d4adb80c-73f9-4785-a8b7-3696671501ca	SRID=4326;POINT(-119.16035179 34.4274830801)	34.42748	-119.16	2020-05-26	THACHER_17731	Sulphur Mountain	Not Routine Top/Heavy Trim
db946a6a-b2dd-47d9-b45e-b4736358631d	SRID=4326;POINT(-119.95678179 34.4599935)	34.45999	-119.957	2020-07-03	BIDDER_1610	Dos Pueblos Canyon	Remove Overhang
ea6bdedd-c688-4ff8-a201-85f21c113653	SRID=4326;POINT(-118.768168911 34.1102611404)	34.11026	-118.768	2020-06-17	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
8ba53e88-197d-4679-b4fe-e192ce197b12	SRID=4326;POINT(-118.757365979 34.135053974)	34.13505	-118.757	2020-06-16	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
ab6615fe-b78e-4ac4-9d71-c07c34168dd7	SRID=4326;POINT(-118.637310974 34.0432631321)	34.04326	-118.637	2020-06-23	TUNA_18290	Big Rock Canyon	Remove Overhang
3531013b-00d4-461a-8c29-6a8c575fa2e3	SRID=4326;POINT(-118.779357746 34.1200821657)	34.12008	-118.779	2020-06-16	TRIUNFO_18164	Triunfo Canyon	Remove Tree(s)
8cf27d61-dd0f-401f-bc4e-2c7c5fc7cd26	SRID=4326;POINT(-118.779863007 34.1198492901)	34.11985	-118.78	2020-06-16	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
b30ed16a-4798-49d1-9d0a-a0834dc201dc	SRID=4326;POINT(-117.768341973 33.5633193523)	33.56332	-117.768	2020-07-29		Laguna Canyon	Remove Tree(s)
5ce0260a-f407-4d17-a92d-fce2ff124aa4	SRID=4326;POINT(-117.451553049 34.2495478831)	34.24955	-117.452	2020-06-09	BLUE CUT_1832	Lytle Creek	Not Routine Top/Heavy Trim

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0a85c045-6c9c-45e1-80de-cf6739d7f69b	SRID=4326;POINT(-117.451318013 34.2493880115)	34.24939	-117.451	2020-06-09	BLUE CUT_1832	Lytle Creek	Not Routine Top/Heavy Trim
e4a43b0e-6e6c-4335-97be-9d175d291698	SRID=4326;POINT(-117.451183997 34.249305274)	34.24931	-117.451	2020-06-09	BLUE CUT_1832	Lytle Creek	Not Routine Top/Heavy Trim
6107ebb0-43b1-41af-99ab-a845cda9c85d	SRID=4326;POINT(-118.40006154 34.2957901809)	34.29579	-118.4	2020-06-29	LOPEZ_10705	Lopez Canyon	Tree Trim - Clear S/W
85542e43-6168-46d5-9cff-f5921bfd2d5f	SRID=4326;POINT(-118.42418164 34.4165995775)	34.4166	-118.424	2020-06-23	PYTHON_14547	Sand Canyon	Tree Trim - Clear S/W
a57d2071-44c7-49b8-b37c-2ad31bab79e9	SRID=4326;POINT(-117.094560359 34.1865713599)	34.18657	-117.095	2020-06-02	SEYMOUR_16222	Running Springs	Not Routine Top/Heavy Trim
91d64b3c-74e0-4215-9ecb-80ddd36318e8	SRID=4326;POINT(-118.440516964 35.7814117335)	35.78141	-118.441	2020-06-29	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
0e4b051d-0344-400a-8aec-4dc393d4a1c0	SRID=4326;POINT(-118.455677815 35.8308236394)	35.83082	-118.456	2020-06-23	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
db4c9a07-d9ab-43fa-9b68-d560c34d7c74	SRID=4326;POINT(-117.626077272 34.2666294126)	34.26663	-117.626	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
d8debd68-897a-4cc8-aa08-df8b5796ee98	SRID=4326;POINT(-117.630812712 34.2655928461)	34.26559	-117.631	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
ba7343d6-45c6-4acf-b852-cec03f5ea93b	SRID=4326;POINT(-117.629280165 34.265172785)	34.26517	-117.629	2020-08-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
b2967a43-5e99-43ee-8bff-74c77f33d7e9	SRID=4326;POINT(-117.629307322 34.265549898)	34.26555	-117.629	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
ae11b393-cd14-43cb-a961-63b0d9dc4a92	SRID=4326;POINT(-117.634719349 34.2616958402)	34.2617	-117.635	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
9f99b15d-c102-4e12-b26d-899ba127199f	SRID=4326;POINT(-117.657529525 34.2386808715)	34.23868	-117.658	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
938824e7-ab4d-4b36-b6ca-088f5fca32be	SRID=4326;POINT(-117.62824785 34.2660165072)	34.26602	-117.628	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
8a2daafb-3fad-4440-96a2-713bd44b0094	SRID=4326;POINT(-117.6275317 34.266166409)	34.26617	-117.628	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
81363d71-ceb4-48cc-8a15-4f7bf076bd4e	SRID=4326;POINT(-117.627338246 34.2663057814)	34.26631	-117.627	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
79072698-555a-4c29-ba43-3a05d1e523fb	SRID=4326;POINT(-117.626059167 34.2666501937)	34.26665	-117.626	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
781a791b-26bb-4f92-82d3-a5e260357b9a	SRID=4326;POINT(-117.628376562 34.2658816913)	34.26588	-117.628	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
5ecb7173-ae14-494d-801f-00cd751bb6c1	SRID=4326;POINT(-117.628297471 34.2659924009)	34.26599	-117.628	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
5793c703-1224-4f5c-8eb6-de6e384d3be1	SRID=4326;POINT(-117.634498738 34.261981527)	34.26198	-117.634	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
43a08756-b305-419e-96c2-df6a0806fe7a	SRID=4326;POINT(-117.628753446 34.265543248)	34.26554	-117.629	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
42528b53-e03b-49c3-b058-b2f061102325	SRID=4326;POINT(-117.633719221 34.2644576235)	34.26446	-117.634	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
3d6413cf-de1b-41f2-9427-cc669b59a065	SRID=4326;POINT(-117.640856244 34.2517532791)	34.25175	-117.641	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
3b9026a9-423b-4e4b-9dde-86c2e6fdfe41	SRID=4326;POINT(-117.629569173 34.2656163983)	34.26562	-117.63	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
33f832bb-4f79-4fe8-9ef4-149ffb816fab	SRID=4326;POINT(-117.633765824 34.2640225939)	34.26402	-117.634	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
25f3112a-8782-4195-a641-f0868e68020d	SRID=4326;POINT(-117.624479681 34.2683431414)	34.26834	-117.624	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
22249966-e2ba-4cee-802f-ffd0a080220a	SRID=4326;POINT(-117.659034245 34.2393485789)	34.23935	-117.659	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
1eafca5e-e7fe-4d6b-b07e-ee97f2affbdf	SRID=4326;POINT(-117.633837573 34.2636097294)	34.26361	-117.634	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang

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1ae63344-df87-4458-8b81-3b5dc28f0211	SRID=4326;POINT(-117.657325342 34.2384042524)	34.2384	-117.657	2020-07-31	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
19eeb8ab-ba86-4ce6-8c6d-6ea1098b4036	SRID=4326;POINT(-117.659427188 34.2387690125)	34.23877	-117.659	2020-08-03	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
068a21ef-8a92-4549-b6e8-3c4d5c5a8d35	SRID=4326;POINT(-117.62557067 34.2669427907)	34.26694	-117.626	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
036ed3d1-421d-45c9-a2e9-8261053ac257	SRID=4326;POINT(-117.625628673 34.2669045537)	34.2669	-117.626	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
63ee5436-da11-4277-9b15-585def847289	SRID=4326;POINT(-118.621744104 34.0406113478)	34.04061	-118.622	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
f92c7c9a-7011-4180-9926-a6019bcb85d9	SRID=4326;POINT(-118.767037896 34.0266304885)	34.02663	-118.767	2020-06-25	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
ca4e9a79-6285-4791-812d-323f6b08bc74	SRID=4326;POINT(-118.799079694 34.1309844135)	34.13098	-118.799	2020-06-15	MULHOLLAND_12350	Triunfo Canyon	Remove Tree(s)
ce76c259-ede3-4635-968f-d6a586998a03	SRID=4326;POINT(-117.989351302 33.9966274293)	33.99663	-117.989	2020-07-28	TURNBULL_18317	Turnbull Canyon	Not Routine Top/Heavy Trim
cde27757-9db4-463b-94ac-917e5d1f4947	SRID=4326;POINT(-117.989455573 33.9960603737)	33.99606	-117.989	2020-07-28	TURNBULL_18317	Turnbull Canyon	Not Routine Top/Heavy Trim
a1f9007f-ec9d-4a67-bcc6-e799554cdc60	SRID=4326;POINT(-117.780257147 33.9462529858)	33.94625	-117.78	2020-07-20	DEL CARBON_4795	Carbon Canyon	Remove Overhang
1a617974-4a05-47d8-922d-beaf4d887b3f	SRID=4326;POINT(-118.689573817 34.1122489762)	34.11225	-118.69	2020-06-29	PLATEAU_14190	Piuma Canyon	Remove Overhang
fc553647-d810-42f6-a841-19bbaba95f28	SRID=4326;POINT(-118.592253216 34.1111127981)	34.11111	-118.592	2020-06-23	SYLVIA_17440	Red Rock Canyon	Remove Overhang
5e2c2089-e72c-446d-8ced-813a1fdae29c	SRID=4326;POINT(-118.681501374 34.0457920431)	34.04579	-118.682	2020-06-24	SERRA_16150	Tuna Canyon	Remove Tree(s)
a814335d-5138-4d6d-a591-1f3e5184a54e	SRID=4326;POINT(-118.754597269 34.1427662858)	34.14277	-118.755	2020-06-15	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
1fe0855a-5fb1-48b2-8502-66fcdadcd58a	SRID=4326;POINT(-118.696840592 34.0390066238)	34.03901	-118.697	2020-06-24	SERRA_16150	Tuna Canyon	Remove Overhang
2a5dfae3-c402-49d2-a476-a23f75cea602	SRID=4326;POINT(-118.690135069 34.0430289339)	34.04303	-118.69	2020-06-24	SERRA_16150	Tuna Canyon	Remove Overhang
49c7d61a-4148-4347-b968-f723740b6673	SRID=4326;POINT(-118.763568923 34.0320681214)	34.03207	-118.764	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
c5951909-d679-4f32-9caa-aae9614c2085	SRID=4326;POINT(-118.422374418 35.3113148734)	35.31131	-118.422	2020-07-22	ZENDA_19820	Sand Canyon	Not Routine Top/Heavy Trim
8a45f1e6-a0aa-41a7-bdee-0bfa030c9d1e	SRID=4326;POINT(-119.137919471 34.4336452159)	34.43365	-119.138	2020-06-18	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
4989debb-3a0b-4e1b-93fc-ba2391adce44	SRID=4326;POINT(-118.208602108 34.1992828691)	34.19928	-118.209	2020-07-21	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Overhang
77013711-7009-4a62-8800-9f011bb8bcf6	SRID=4326;POINT(-118.208681569 34.1997678702)	34.19977	-118.209	2020-07-21	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Overhang
e7c6f7a0-0cdb-497f-bd96-6d6cbd159161	SRID=4326;POINT(-118.20865877 34.2000282556)	34.20003	-118.209	2020-07-21	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Overhang
921bfe08-4d1a-4d94-afc9-a039ec12b2cc	SRID=4326;POINT(-118.209153973 34.2000235414)	34.20002	-118.209	2020-07-21	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Overhang
8a0baa54-1167-4334-9c31-5afecbde70eb	SRID=4326;POINT(-118.209492937 34.200295018)	34.2003	-118.209	2020-07-21	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Overhang
8f09ebf1-0f8c-42a2-bfe7-6c4ebe3426ac	SRID=4326;POINT(-118.209956288 34.2006613297)	34.20066	-118.21	2020-08-18	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Tree(s)
4560cf47-b68b-4e95-b68c-7af91e330cf4	SRID=4326;POINT(-118.500939841 35.5978983036)	35.5979	-118.501	2020-07-08	ERSKINE_6040	Bodfish Cyn Rd	Not Routine Top/Heavy Trim
7708bb85-9746-48a9-a090-04756ffbc519	SRID=4326;POINT(-118.497953285 35.5977253011)	35.59773	-118.498	2020-07-08	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
63f15b66-a6ed-40ec-8b25-081b71d28dce	SRID=4326;POINT(-118.49555539 35.5974359997)	35.59744	-118.496	2020-07-09	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim

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09b1f042-cba1-4eb6-acd5-34fcd0bdab99	SRID=4326;POINT(-117.659606226 34.2351066488)	34.23511	-117.66	2020-08-05	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Routine Tree Trim
cbf2acbe-4285-42c2-822c-2074fa2932ba	SRID=4326;POINT(-117.65949022 34.2352083756)	34.23521	-117.659	2020-08-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
d7c3a7a9-9018-4e7f-a289-3b2adb6b62e0	SRID=4326;POINT(-117.659600861 34.2352457955)	34.23525	-117.66	2020-08-05	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
07fbb121-9a41-44d8-a737-9c3a33f60d33	SRID=4326;POINT(-117.63380965 34.2639142126)	34.26391	-117.634	2020-09-04	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
40633636-63a4-4082-93e7-050606bf713f	SRID=4326;POINT(-118.681639843 34.0442985418)	34.0443	-118.682	2020-06-24	SERRA_16150	Tuna Canyon	Remove Overhang
181d8ac1-e381-4d81-b547-82fd9af7e9fb	SRID=4326;POINT(-118.696172386 34.0398481631)	34.03985	-118.696	2020-06-24	SERRA_16150	Tuna Canyon	Routine Tree Trim
8de7f63c-da56-409e-9f04-0e039110bd74	SRID=4326;POINT(-118.684332781 34.0402029462)	34.0402	-118.684	2020-06-24	SERRA_16150	Tuna Canyon	Not Routine Top/Heavy Trim
f4f8e495-300c-40b0-970e-ebdbf6711717	SRID=4326;POINT(-118.741002828 34.048864806)	34.04886	-118.741	2020-06-24	MERLIN_11695	Corral Canyon	Routine Tree Trim
f21214a4-4011-4a89-98e5-445f415303b2	SRID=4326;POINT(-118.704794683 34.1047754039)	34.10478	-118.705	2020-06-29	PLATEAU_14190	Piuma Canyon	Not Routine Top/Heavy Trim
d4fa1cb2-1d8b-4973-ac01-22031764bba4	SRID=4326;POINT(-118.741405495 34.0622818712)	34.06228	-118.741	2020-06-25	MERLIN_11695	Tuna Canyon	Routine Tree Trim
b2baadff-f4e1-4ba3-9d63-cf7860f414ea	SRID=4326;POINT(-118.740610555 34.06160443)	34.0616	-118.741	2020-06-25	MERLIN_11695	Corral Canyon	Routine Tree Trim
7e409f9b-d530-4dd5-96ad-247a6eca44d9	SRID=4326;POINT(-118.756247833 34.056593586)	34.05659	-118.756	2020-06-25	MERLIN_11695	Corral Canyon	Routine Tree Trim
3c7a8df9-72db-4374-a4f9-f4e7e20c8d16	SRID=4326;POINT(-118.740462027 34.0599145532)	34.05991	-118.74	2020-06-25	MERLIN_11695	Tuna Canyon	Routine Tree Trim
2d6de142-229b-4f0e-acf2-2b9088168aaf	SRID=4326;POINT(-118.850573078 34.0464843343)	34.04648	-118.851	2020-07-06	MAGUIRE_10934	Decker Canyon	Routine Tree Trim
2a78b7b1-5ebd-4a25-b81a-f25ae933688f	SRID=4326;POINT(-118.740369491 34.0603028612)	34.0603	-118.74	2020-06-25	MERLIN_11695	Tuna Canyon	Not Routine Top/Heavy Trim
1fb6ce80-b14a-4fbc-945a-dca2c2b17fdb	SRID=4326;POINT(-118.741296865 34.0441449119)	34.04414	-118.741	2020-06-24	MERLIN_11695	Corral Canyon	Routine Tree Trim
57d48391-e350-45d8-810a-b293e210a19c	SRID=4326;POINT(-117.988779321 33.9500514949)	33.95005	-117.989	2020-07-14	SOCRATES_16609	La Habra Heights	Remove Tree(s)
d8e26dc8-ccdd-405d-8d72-831817c8fee1	SRID=4326;POINT(-119.956153482 34.4684273306)	34.46843	-119.956	2020-07-03	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
d5e04480-0b06-4e28-9319-eb49c8bf45a9	SRID=4326;POINT(-118.582949303 34.114055504)	34.11406	-118.583	2020-06-23	SYLVIA_17440	Red Rock Canyon	Tree Trim - Clear S/W
ac846f31-4cd4-4adf-ad9f-28b08dd619ba	SRID=4326;POINT(-118.741473556 34.0490973213)	34.0491	-118.741	2020-06-24	MERLIN_11695	Tuna Canyon	Not Routine Top/Heavy Trim
42c12351-31be-4216-904a-f99d0b3c96a7	SRID=4326;POINT(-118.625051267 34.0408188818)	34.04082	-118.625	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
f6c27eb8-ff37-441d-8eb5-6201e987df75	SRID=4326;POINT(-118.701794632 34.3523273035)	34.35233	-118.702	2020-06-10	TAPO_17548	Tapo Canyon & Pepper Tree	Tree Trim - Clear S/W
3a4124e6-7ca0-4063-80fe-450cc99c01e3	SRID=4326;POINT(-118.766214252 34.0305999412)	34.0306	-118.766	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
61f2c306-1350-4160-baec-46dea4c537dc	SRID=4326;POINT(-118.766225316 34.0305554842)	34.03056	-118.766	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
7bae9ce0-7124-461c-b55e-d828663dd31f	SRID=4326;POINT(-118.766190112 34.030553817)	34.03055	-118.766	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
f6f4c880-1fa4-4578-9509-3cf1eaf1467c	SRID=4326;POINT(-118.67983941 34.0437390277)	34.04374	-118.68	2020-06-24	SERRA_16150	Tuna Canyon	Not Routine Top/Heavy Trim
5abea7cd-1001-4a91-a21f-faf97a67fd70	SRID=4326;POINT(-118.679818623 34.044455783)	34.04446	-118.68	2020-06-24	SERRA_16150	Tuna Canyon	Remove Overhang
bcb3050f-0d78-4379-8484-244378773768	SRID=4326;POINT(-118.680668548 34.041671238)	34.04167	-118.681	2020-06-24	SERRA_16150	Tuna Canyon	Not Routine Top/Heavy Trim

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5a83c125-ca00-4002-bbb9-fbf261c7b418	SRID=4326;POINT(-118.453897499 34.6765494471)	34.67655	-118.454	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Not Routine Top/Heavy Trim
af46063c-f9af-468e-98fe-f5b12f54f336	SRID=4326;POINT(-119.955705889 34.466513415)	34.46651	-119.956	2020-07-03	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
71d82a13-6b4b-4ef3-b8e4-1a7cc42d7bd3	SRID=4326;POINT(-117.989840135 33.9960423057)	33.99604	-117.99	2020-07-28	TURNBULL_18317	Turnbull Canyon	Not Routine Top/Heavy Trim
f4eb0722-ce81-4fbb-9468-b49fde00b22a	SRID=4326;POINT(-119.138377123 34.4270970155)	34.4271	-119.138	2020-06-18	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
4b8c4653-8697-4fe8-843c-2b03eb7501cd	SRID=4326;POINT(-118.001483269 33.9998698588)	33.99987	-118.001	2020-08-06	TURNBULL_18317	Turnbull Canyon	Routine Tree Trim
9daa692c-6760-4c75-a9c3-fe514990b0f4	SRID=4326;POINT(-117.997650057 33.9975461071)	33.99755	-117.998	2020-07-29	TURNBULL_18317	Turnbull Canyon	Not Routine Top/Heavy Trim
4bb1e7e2-fc75-4477-90d2-dd2f64823382	SRID=4326;POINT(-117.987454645 34.0036894571)	34.00369	-117.987	2020-07-28	TURNBULL_18317	Turnbull Canyon	Not Routine Top/Heavy Trim
70f131f9-24e0-4305-83ed-cd62fa244dd8	SRID=4326;POINT(-117.988408171 34.0046808791)	34.00468	-117.988	2020-07-28	TURNBULL_18317	Turnbull Canyon	Not Routine Top/Heavy Trim
eb4f7c11-38dc-484d-8a34-a6f27170696d	SRID=4326;POINT(-117.601550482 33.7463059075)	33.74631	-117.602	2020-06-18	ATENTO_817	Silverado Canyon	Not Routine Top/Heavy Trim
8063eb73-13d8-48d5-bc8f-cdb67f724ff3	SRID=4326;POINT(-118.776294664 34.0521474638)	34.05215	-118.776	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
8add935d-8cf4-4a78-9790-502cb1a91d26	SRID=4326;POINT(-118.782199882 34.1189208343)	34.11892	-118.782	2020-06-16	TRIUNFO_18164	Triunfo Canyon	Remove Tree(s)
5d6fefbc-eaab-4834-91fc-a5d83e19c4d0	SRID=4326;POINT(-117.620406076 34.2493228136)	34.24932	-117.62	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
c3edcf9f-8981-4a8d-9bec-bcf892b70295	SRID=4326;POINT(-117.631171457 34.2494616597)	34.24946	-117.631	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
07e20c05-303c-4733-8248-c05a2afdc17f	SRID=4326;POINT(-118.644376248 34.0425710925)	34.04257	-118.644	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
be4f5c86-fdf6-4276-8e95-21d335cc2e9f	SRID=4326;POINT(-118.864507489 34.0931206771)	34.09312	-118.865	2020-06-25	MAGUIRE_10934	Decker Canyon	Tree Trim - Clear S/W
087ce908-ac74-4c4b-b8af-af3502c33bc3	SRID=4326;POINT(-117.98397582 34.0006837128)	34.00068	-117.984	2020-07-30	TURNBULL_18317	Turnbull Canyon	Not Routine Top/Heavy Trim
906380df-bbb2-447d-97cd-41a5343093f7	SRID=4326;POINT(-117.749566175 33.9943961546)	33.9944	-117.75	2020-07-23	INDEPENDENCE_8912	Carbon Canyon	Remove Overhang
109c596b-ff0f-41dd-8ed2-46e3505a7803	SRID=4326;POINT(-117.77824603 33.9496048333)	33.9496	-117.778	2020-07-23	DEL CARBON_4795	Carbon Canyon	Not Routine Top/Heavy Trim
6d62041b-d7c3-4193-a19c-a77d0e2dc370	SRID=4326;POINT(-117.750158273 33.9944317354)	33.99443	-117.75	2020-07-23	INDEPENDENCE_8912	Carbon Canyon	Remove Overhang
376953c3-ed71-4d72-a52d-de4bf724fb39	SRID=4326;POINT(-117.764334422 33.9669879494)	33.96699	-117.764	2020-07-20	DEL CARBON_4795	Carbon Canyon	Not Routine Top/Heavy Trim
d204063e-b366-402c-ac28-e3f9404136d6	SRID=4326;POINT(-119.921767227 34.4360775347)	34.43608	-119.922	2020-07-08	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
d10ee53c-90cd-4e06-a52f-b3ee73adbdc4	SRID=4326;POINT(-119.132993929 34.4221927884)	34.42219	-119.133	2020-06-16	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
938df89c-5623-4f2b-b82e-3ba56fd0de2b	SRID=4326;POINT(-118.305496657 35.6669288501)	35.66693	-118.305	2020-07-01	FAYE_6305	Fay Ranch Rd	Tree Trim - Clear S/W
4777b932-334c-4f43-a545-77437eb99ef0	SRID=4326;POINT(-118.450704832 35.6546093384)	35.65461	-118.451	2020-07-02	TUNGSTEN_18300	Bodfish Cyn Rd	Not Routine Top/Heavy Trim
3f8f2772-5f9c-474b-aa85-98e93e166263	SRID=4326;POINT(-117.766884863 33.9572330806)	33.95723	-117.767	2020-07-21	DEL CARBON_4795	Carbon Canyon	Remove Overhang
b2484dc1-f36e-479d-b2ba-c5283aa7cc6a	SRID=4326;POINT(-117.766863741 33.9571151676)	33.95712	-117.767	2020-07-21	DEL CARBON_4795	Carbon Canyon	Remove Overhang
646080a0-f8b2-4dd7-bac3-38ef3652ef50	SRID=4326;POINT(-117.766422853 33.9562324839)	33.95623	-117.766	2020-07-21	DEL CARBON_4795	Carbon Canyon	Not Routine Top/Heavy Trim
71c460a8-9343-48d3-8907-163385c2365b	SRID=4326;POINT(-117.988895997 34.000156154)	34.00016	-117.989	2020-07-30	TURNBULL_18317	Turnbull Canyon	Remove Overhang

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ad425789-d1af-411d-b3fc-ee119af3cb0d	SRID=4326;POINT(-117.988913767 34.0006420197)	34.00064	-117.989	2020-07-30	TURNBULL_18317	Turnbull Canyon	Not Routine Top/Heavy Trim
fabcf964-34ad-4fba-b5bf-e97a790e6b42	SRID=4326;POINT(-118.765110858 34.0268404617)	34.02684	-118.765	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
ddba0418-8447-45c2-999b-95d87ff658f4	SRID=4326;POINT(-118.681323007 34.0449694539)	34.04497	-118.681	2020-06-24	SERRA_16150	Tuna Canyon	Remove Overhang
3c5493b7-59f3-482a-8f0c-ccf1ce226e4e	SRID=4326;POINT(-118.683618307 34.0432042354)	34.0432	-118.684	2020-06-24	SERRA_16150	Tuna Canyon	Not Routine Top/Heavy Trim
b874a30c-b278-45c6-90cf-579dae4e699f	SRID=4326;POINT(-118.683061078 34.0429733707)	34.04297	-118.683	2020-06-24	SERRA_16150	Tuna Canyon	Remove Overhang
8a64c6db-074f-433b-9bc9-befdfdc87cb9	SRID=4326;POINT(-118.680250458 34.0410386394)	34.04104	-118.68	2020-06-24	SERRA_16150	Tuna Canyon	Remove Overhang
dac68ec2-e301-4356-87fc-7dc99c67d7aa	SRID=4326;POINT(-118.41324728 35.3162906226)	35.31629	-118.413	2020-08-15	ZENDA_19820	Caliente Creek Rd	Routine Tree Trim
3266a81d-0a5e-4cfd-bc68-ce28b2d377c4	SRID=4326;POINT(-118.406301197 35.3412001301)	35.3412	-118.406	2020-07-21	ZENDA_19820	Sand Canyon	Routine Tree Trim
efb13ff3-5d42-43b9-9d61-7eb93fee7999	SRID=4326;POINT(-118.373055719 35.3274459299)	35.32745	-118.373	2020-07-21	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
8c45033a-3746-4f07-b81b-64e5d17604d5	SRID=4326;POINT(-117.668127939 34.2219141113)	34.22191	-117.668	2020-07-27	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
3d9b832e-64dd-49cd-a36e-533a3d7e5e82	SRID=4326;POINT(-119.1553884 34.42065617)	34.42066	-119.155	2020-06-04	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
1b7ef067-1cff-406c-89b3-b049878ed5f8	SRID=4326;POINT(-119.960107729 34.448761997)	34.44876	-119.96	2020-07-03	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
bc8d81c4-037f-4089-a522-0ebc29f40993	SRID=4326;POINT(-118.581667542 34.1148807534)	34.11488	-118.582	2020-06-23	SYLVIA_17440	Red Rock Canyon	Tree Trim - Clear S/W
07a5c44e-1368-4e00-ab2f-f75674edb39e	SRID=4326;POINT(-119.116675034 34.4291136028)	34.42911	-119.117	2020-07-16	CASTRO_4632	Koenigstein Rd. Area	Not Routine Top/Heavy Trim
627b00d3-3bf4-47ef-8966-548402db2fb2	SRID=4326;POINT(-118.631565683 34.1171424453)	34.11714	-118.632	2020-07-08	PARADISE_13658	Old Topanga Canyon	Tree Trim - Clear S/W
1a1ed7a7-0193-4d5b-ab6a-d95dce2d1d30	SRID=4326;POINT(-118.622827381 34.1122623005)	34.11226	-118.623	2020-07-08	PARADISE_13658	Old Topanga Canyon	Remove Overhang
e7aee07b-fac4-4b87-8d40-9d1c4b060d3f	SRID=4326;POINT(-118.211869709 34.2012558549)	34.20126	-118.212	2020-07-21	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Overhang
7a0deb8a-ae60-4b50-b3a5-596061d8b793	SRID=4326;POINT(-118.683963642 34.043063383)	34.04306	-118.684	2020-06-24	SERRA_16150	Tuna Canyon	Not Routine Top/Heavy Trim
91c8adf6-f76c-4560-9279-6d09caa12a7e	SRID=4326;POINT(-118.211529739 34.2013254563)	34.20133	-118.212	2020-07-21	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Overhang
81ccc7d2-a43c-49a2-b58c-560d39f8239b	SRID=4326;POINT(-118.211630993 34.2014743641)	34.20147	-118.212	2020-08-17	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Overhang
47227b34-16e1-4a59-b461-c75a9f2cf3de	SRID=4326;POINT(-118.230632767 34.2241294133)	34.22413	-118.231	2020-08-11	ROSEMONT_15441	Big Tujunga	Remove Tree(s)
e68651a2-7cca-4b00-8731-fbd4355bcbd8	SRID=4326;POINT(-117.740940861 34.1234897376)	34.12349	-117.741	2020-07-20	PALMER_13578	Live Oak Canyon	Not Routine Top/Heavy Trim
bcf0661b-6179-4f8e-8b45-e7ae3ddb8d70	SRID=4326;POINT(-118.082877584 34.1790043329)	34.179	-118.083	2020-06-11	VIDEO_18730	Eaton Canyon	Remove Overhang
d4d05360-39f5-4ef4-b3f6-6c98efd0e602	SRID=4326;POINT(-117.999746874 33.9974260263)	33.99743	-118	2020-07-29	TURNBULL_18317	Turnbull Canyon	Remove Overhang
8c5d0cde-a2b8-431a-a64c-29c330f0a460	SRID=4326;POINT(-117.995455004 34.0014097263)	34.00141	-117.995	2020-08-06	TURNBULL_18317	Turnbull Canyon	Remove Overhang
e37eef53-4147-4462-9ecc-30f0ec2d7c9e	SRID=4326;POINT(-117.990227379 34.0028964779)	34.0029	-117.99	2020-07-28	TURNBULL_18317	Turnbull Canyon	Not Routine Top/Heavy Trim
4eeeb3ac-c8e7-4e93-979a-072ebf81eb0e	SRID=4326;POINT(-117.991272099 34.0048387496)	34.00484	-117.991	2020-07-28	TURNBULL_18317	Turnbull Canyon	Not Routine Top/Heavy Trim
da79566c-9481-47ad-a466-c1f9363eea49	SRID=4326;POINT(-118.424107209 35.3202473838)	35.32025	-118.424	2020-07-21	ZENDA_19820	Sand Canyon	Remove Tree(s)

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0c434535-3cf4-44d4-bcd9-eabcefd0375b	SRID=4326;POINT(-118.399045402 35.3296908131)	35.32969	-118.399	2020-07-22	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
46120ea1-95f8-4784-8795-c7bbf0ae468a	SRID=4326;POINT(-118.395600356 35.3265925264)	35.32659	-118.396	2020-07-22	ZENDA_19820	Sand Canyon	Not Routine Top/Heavy Trim
518d1c79-722d-43d4-8357-1d7e8912736d	SRID=4326;POINT(-118.396543991 35.3278687131)	35.32787	-118.397	2020-07-22	ZENDA_19820	Sand Canyon	Not Routine Top/Heavy Trim
cda301d0-3c47-4e40-9dac-6ac037af53ff	SRID=4326;POINT(-118.776389547 34.0519894035)	34.05199	-118.776	2020-06-24	MAGUIRE_10934	Latigo Canyon	Not Routine Top/Heavy Trim
133fc977-cf4b-472d-a074-9b8709ec1f53	SRID=4326;POINT(-118.515379764 34.7002229791)	34.70022	-118.515	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
fd260289-2f04-4791-9490-efe89f87d7ef	SRID=4326;POINT(-118.49725239 34.6946773767)	34.69468	-118.497	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
0386a395-d065-4d59-a520-642a31109285	SRID=4326;POINT(-118.644361831 34.1309280755)	34.13093	-118.644	2020-07-01	PARADISE_13658	Old Topanga Canyon	Remove Tree(s)
9dfc2411-3c43-4783-b082-8573d4439462	SRID=4326;POINT(-118.445941899 35.6564888964)	35.65649	-118.446	2020-07-01	TUNGSTEN_18300	Bodfish Cyn Rd	Not Routine Top/Heavy Trim
109216dc-e5b3-48f9-8119-ab6bbf9885b9	SRID=4326;POINT(-118.488081331 35.606716862)	35.60672	-118.488	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Routine Tree Trim
8e0780fc-56e2-4c8a-a7a7-2ac8d8f05220	SRID=4326;POINT(-118.676354215 34.0400504202)	34.04005	-118.676	2020-06-24	SERRA_16150	Tuna Canyon	Routine Tree Trim
e27e5f75-b031-4b04-ad6a-0751c186a124	SRID=4326;POINT(-118.39385692 34.6696530428)	34.66965	-118.394	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
52423e44-65bd-4d83-ad69-7698ec8fa96a	SRID=4326;POINT(-120.025096312 34.4644081678)	34.46441	-120.025	2020-08-10	MIST_12011	Refugio Rd. & El Capitan Canyon	Not Routine Top/Heavy Trim
47336470-e8ab-42ef-9e27-baf3226b68c4	SRID=4326;POINT(-118.868802711 34.0398503857)	34.03985	-118.869	2020-07-06	GALAHAD_6924	Encinal Canyon	Not Routine Top/Heavy Trim
0c67d79b-83a6-4ffd-b601-f13bc15cc16c	SRID=4326;POINT(-118.91556602 34.0442829844)	34.04428	-118.916	2020-06-30	GALAHAD_6924	Decker Canyon	Routine Tree Trim
9e361643-1410-4912-81a6-27ea85f8d07d	SRID=4326;POINT(-118.861424625 34.036758959)	34.03676	-118.861	2020-07-01	GALAHAD_6924	Encinal Canyon	Tree Trim - Clear S/W
1d2dc765-7bd5-4430-80f7-a2fb8f6c7394	SRID=4326;POINT(-118.404555163 35.6349259056)	35.63493	-118.405	2020-06-30	TUNGSTEN_18300	Bodfish Cyn Rd	Routine Tree Trim
c098b5d4-0bfe-4870-a46c-d66811f19de1	SRID=4326;POINT(-118.760550097 34.029152853)	34.02915	-118.761	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
82a89ebb-1486-4662-8def-859f092fc53d	SRID=4326;POINT(-118.770180903 34.0297858182)	34.02979	-118.77	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
419f3601-1be5-47d7-888c-2396a7703271	SRID=4326;POINT(-118.860760778 34.0383448331)	34.03834	-118.861	2020-07-01	GALAHAD_6924	Encinal Canyon	Tree Trim - Clear S/W
12785ac4-5d4f-4e60-acea-8268eda88948	SRID=4326;POINT(-118.37761296 35.3256484727)	35.32565	-118.378	2020-07-21	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
58d844e2-e8df-4222-ab99-1e2fabfd65ea	SRID=4326;POINT(-118.76984898 34.0261855227)	34.02619	-118.77	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
0c63a8fc-4f06-42b1-b14e-2a3f39a2eb48	SRID=4326;POINT(-117.624535672 34.2477486548)	34.24775	-117.625	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
4fd1ab7a-4bd7-4cf3-8fb4-62bc15873177	SRID=4326;POINT(-117.62436904 34.2478093492)	34.24781	-117.624	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
2f850f4e-9b3c-4e66-98f6-da10530b897f	SRID=4326;POINT(-117.62070464 34.2490679445)	34.24907	-117.621	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Remove Overhang
2f094061-80c7-4696-93b1-382325658f5f	SRID=4326;POINT(-117.660501345 34.2408838572)	34.24088	-117.661	2020-08-05	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Routine Tree Trim
1db4b994-00f2-4ec1-8eaa-0dcc6f6e4e2c	SRID=4326;POINT(-118.860680312 34.038026716)	34.03803	-118.861	2020-07-01	GALAHAD_6924	Encinal Canyon	Tree Trim - Clear S/W
14a11adc-2b8c-4b4d-9425-37ea4822d8d7	SRID=4326;POINT(-117.715609744 34.136722648)	34.13672	-117.716	2020-07-20	PADOVA_13476	Webb Canyon	Not Routine Top/Heavy Trim
0ec71c04-ea1b-4d5f-8830-8cb059845c10	SRID=4326;POINT(-117.775669451 34.1405188821)	34.14052	-117.776	2020-07-10	AVENIDA_884	San Dimas Canyon	Remove Overhang

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a850c12c-66f4-40aa-8112-1a1afc8d49eb	SRID=4326;POINT(-118.885271139 34.0781517206)	34.07815	-118.885	2020-06-25	MAGUIRE_10934	Decker Canyon	Routine Tree Trim
0adfd889-8b4b-4f5f-99c7-a1d8f5572ee0	SRID=4326;POINT(-118.536290517 35.462381118)	35.46238	-118.536	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Not Routine Top/Heavy Trim
286c30c3-883b-43a5-9055-d1f423059368	SRID=4326;POINT(-118.919305019 34.1558033536)	34.1558	-118.919	2020-06-18	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
a7461572-ab4b-480f-92b4-0a2125d57f2a	SRID=4326;POINT(-118.790092617 34.1205734508)	34.12057	-118.79	2020-06-16	TRIUNFO_18164	Triunfo Canyon	Tree Trim - Clear S/W
58e7c28b-3eb6-4dcd-93eb-58c5f6746f28	SRID=4326;POINT(-119.133243039 34.4227843641)	34.42278	-119.133	2020-06-16	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
e03ef769-73e8-4a4b-a4e8-a0e26979f148	SRID=4326;POINT(-117.83536803 34.1560999425)	34.1561	-117.835	2020-07-17	LEMONADE_10333	Big Dalton	Not Routine Top/Heavy Trim
d30eed55-8374-4148-ac2a-bf3343b09f49	SRID=4326;POINT(-117.83539854 34.1560888447)	34.15609	-117.835	2020-07-16	LEMONADE_10333	Big Dalton	Remove Tree(s)
a8f785c3-3567-4903-b5d0-dfd66891d005	SRID=4326;POINT(-118.083029464 34.1736251364)	34.17363	-118.083	2020-06-12	VIDEO_18730	Eaton Canyon	Not Routine Top/Heavy Trim
57177083-42aa-492a-b505-85daaedd3ebf	SRID=4326;POINT(-118.054625541 34.166845801)	34.16685	-118.055	2020-06-23	LIMA_10470	Chantry Flats	Remove Overhang
65d03739-329c-41c7-bd23-9c1d88ca26c1	SRID=4326;POINT(-118.23062975 34.2241249778)	34.22412	-118.231	2020-08-11	ROSEMONT_15441	Big Tujunga	Remove Tree(s)
b6a53271-f593-4c2b-9975-63022b9680a7	SRID=4326;POINT(-118.33502393 33.7481055471)	33.74811	-118.335	2020-06-11	FELDSPAR_6308	Rolling Hills	Not Routine Top/Heavy Trim
57aab0f3-740e-4e83-951b-c76d2bbea0dd	SRID=4326;POINT(-118.341993793 33.768813667)	33.76881	-118.342	2020-06-25	SCIURBA_16003	Rolling Hills	Not Routine Top/Heavy Trim
5da82c7b-316e-4bb0-a046-d7c9c9aebf8e	SRID=4326;POINT(-118.337051849 33.7721413964)	33.77214	-118.337	2020-06-30	FELDSPAR_6308	Rolling Hills	Not Routine Top/Heavy Trim
9198f23b-bace-47a7-9034-f7c47e48d4fb	SRID=4326;POINT(-118.3334654 33.7572711)	33.75727	-118.333	2020-06-05	TANDEM_17524	Rolling Hills	Remove Overhang
8868db70-c06f-4e71-b941-f7645874adcd	SRID=4326;POINT(-118.3398996 33.74870344)	33.7487	-118.34	2020-06-05	SURREY_17372	Rolling Hills	Not Routine Top/Heavy Trim
cf877cad-f47d-4876-a196-a29c421239ad	SRID=4326;POINT(-118.3384671 33.7557528)	33.75575	-118.338	2020-06-04	FELDSPAR_6308	Rolling Hills	Not Routine Top/Heavy Trim
1f18c79e-cad0-4e25-8a2d-db19831932a7	SRID=4326;POINT(-118.3311665 33.75969716)	33.7597	-118.331	2020-06-05	FELDSPAR_6308	Rolling Hills	Not Routine Top/Heavy Trim
ac40573e-5bb6-4bc8-8d16-46af86aff778	SRID=4326;POINT(-119.093700573 34.426681911)	34.42668	-119.094	2020-07-15	CASTRO_4632	Koenigstein Rd. Area	Not Routine Top/Heavy Trim
f65298b4-b889-4653-a971-704925e6fab1	SRID=4326;POINT(-117.837243229 34.1540618093)	34.15406	-117.837	2020-07-16	LEMONADE_10333	Big Dalton	Not Routine Top/Heavy Trim
36ccc541-a06e-4825-ba64-b6446b90b11a	SRID=4326;POINT(-117.751143314 34.1218393986)	34.12184	-117.751	2020-07-16	PALMER_13578	Marshall Canyon	Remove Overhang
1aaa7088-200d-4834-b571-ce25757f5f95	SRID=4326;POINT(-117.928317636 33.9460459187)	33.94605	-117.928	2020-07-22		La Habra Heights	Not Routine Top/Heavy Trim
048a8cd4-f5bc-450c-938a-9899c01ea468	SRID=4326;POINT(-118.435404762 35.7688361042)	35.76884	-118.435	2020-06-25	BONANZA_1898	Kern River Hwy/ Serra Rd	Remove Overhang
855111fa-59d6-4737-aaa9-7973f69a2b90	SRID=4326;POINT(-118.420995427 35.7527550962)	35.75276	-118.421	2020-06-29	BONANZA_1898	Kern River Hwy/ Serra Rd	Remove Tree(s)
9f8847ce-ce00-44b1-9bd4-61a7c7f415d7	SRID=4326;POINT(-118.527179975 35.9728131211)	35.97281	-118.527	2020-06-23	JOHNSONDALE_9290	Kern River Hwy/ Serra Rd	Remove Tree(s)
27346836-9995-4189-b302-2df633e72622	SRID=4326;POINT(-118.456099676 35.3023079736)	35.30231	-118.456	2020-07-23	ZENDA_19820	Caliente Creek Rd	Routine Tree Trim
48509797-8c4b-458b-82ff-44ac43ea3a22	SRID=4326;POINT(-118.495672435 35.5937828852)	35.59378	-118.496	2020-07-09	ERSKINE_6040	Kern River Canyon Rd.	Remove Tree(s)
bb30be48-5a6d-4ad7-bc96-f13c6cb5b75a	SRID=4326;POINT(-118.515805146 35.5171390856)	35.51714	-118.516	2020-07-14	FLYING D_6585	Bodfish Cyn Rd	Not Routine Top/Heavy Trim
6a3cddd7-3273-4ab4-ac8b-7cc3b24fa3c5	SRID=4326;POINT(-118.489597784 35.5995078385)	35.59951	-118.49	2020-07-08	ERSKINE_6040	Kern River Canyon Rd.	Routine Tree Trim

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d46c6b5e-a534-43b8-a811-4a5f7be3a253	SRID=4326;POINT(-118.400154328 35.6136142044)	35.61361	-118.4	2020-07-01	TUNGSTEN_18300	Bodfish Cyn Rd	Routine Tree Trim
6dcf5a70-c1c2-4fb2-9e74-84d52e08a51b	SRID=4326;POINT(-118.322411422 35.6538288156)	35.65383	-118.322	2020-07-01	FAYE_6305	Kern River Canyon Rd.	Remove Tree(s)
e9f9af1a-91e4-46cf-b519-31ab20b2bc48	SRID=4326;POINT(-118.321930552 35.6536391331)	35.65364	-118.322	2020-07-02	FAYE_6305	Kern River Canyon Rd.	Remove Tree(s)
2d7af079-335d-4dc8-84ca-2e2f7c875de8	SRID=4326;POINT(-118.544390285 35.4513187241)	35.45132	-118.544	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Remove Tree(s)
ac19d05f-e5cf-4c00-909c-f359008e9241	SRID=4326;POINT(-118.544478295 35.4510652135)	35.45107	-118.544	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Remove Tree(s)
465b9853-dc1c-44cb-895c-e9781df9be44	SRID=4326;POINT(-118.542746678 35.4490151162)	35.44902	-118.543	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Not Routine Top/Heavy Trim
d6b7cd4e-ae67-4601-a6ab-271734abc2ae	SRID=4326;POINT(-118.548797825 35.4527044203)	35.4527	-118.549	2020-07-14	FLYING D_6585	Caliente Bodfish Rd	Not Routine Top/Heavy Trim
f810b4dc-52ff-4fa8-be8f-dfd690b12a82	SRID=4326;POINT(-118.790670298 35.4955324671)	35.49553	-118.791	2020-07-09	MEBANE_11552	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
269897fc-db2d-4750-9ae8-840ee4b6993c	SRID=4326;POINT(-118.791785762 35.4915605765)	35.49156	-118.792	2020-07-09	ERSKINE_6040	Kern River Canyon Rd.	Routine Tree Trim
915adb7d-17f0-4ba8-940e-b9536bdf5ea8	SRID=4326;POINT(-118.793593319 35.4889294133)	35.48893	-118.794	2020-07-15	MEBANE_11552	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
67d6b79e-2117-419a-8fd5-ae34549762e7	SRID=4326;POINT(-118.793308837 35.4879598786)	35.48796	-118.793	2020-07-15	MEBANE_11552	Kern River Hwy/ Serra Rd	Routine Tree Trim
1f457cc6-763f-42f6-90b8-b3831e5b401b	SRID=4326;POINT(-118.672826775 35.5249065953)	35.52491	-118.673	2020-07-09	ERSKINE_6040	Kern River Canyon Rd.	Routine Tree Trim
b8182372-feaa-439d-ac93-62bde2f1d315	SRID=4326;POINT(-119.151448868 34.4154840988)	34.41548	-119.151	2020-05-28	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
6d40099d-4742-45c2-b64a-fb43960b098a	SRID=4326;POINT(-119.153817929 34.416754742)	34.41675	-119.154	2020-05-28	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
9efb7daa-76f4-43d5-ae4d-778f91bf4083	SRID=4326;POINT(-119.165228046 34.431538587)	34.43154	-119.165	2020-06-09	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
2a8bc6b8-5aef-4780-a4bc-7bc9a80dc929	SRID=4326;POINT(-119.160959646 34.428902046)	34.4289	-119.161	2020-05-27	THACHER_17731	Other	Not Routine Top/Heavy Trim
e42d11af-81d0-4dba-b2c8-789f1fff95c7	SRID=4326;POINT(-117.67047856 34.4278232359)	34.42782	-117.67	2020-06-05	DEALER_4726	Llano	Remove Tree(s)
d2534265-deeb-4f18-b0c6-8051ff1e26f9	SRID=4326;POINT(-117.928290479 33.9460448062)	33.94604	-117.928	2020-07-22		La Habra Heights	Not Routine Top/Heavy Trim
c9d524f6-9f20-4ef5-a5ca-be4fcf105f2e	SRID=4326;POINT(-117.928354517 33.9460434155)	33.94604	-117.928	2020-07-22		La Habra Heights	Not Routine Top/Heavy Trim
9cd1e73a-82c8-4e81-83d6-e1ad870573d6	SRID=4326;POINT(-119.084258191 34.4101460247)	34.41015	-119.084	2020-07-15	CASTRO_4632	Koenigstein Rd. Area	Not Routine Top/Heavy Trim
8e42f50e-3c73-4e5b-822b-beee5b2edecb	SRID=4326;POINT(-118.493955284 35.6029963458)	35.603	-118.494	2020-07-08	ERSKINE_6040	Kern River Canyon Rd.	Routine Tree Trim
4d2b3bda-a558-4854-9738-9a67e48c38f3	SRID=4326;POINT(-117.660833336 34.2345090361)	34.23451	-117.661	2020-08-05	CAMP BALDY_2790	Mount Baldy (includes Ice House Cyn)	Remove Overhang
1f3faed6-3577-4fdc-ab39-70a15c599a82	SRID=4326;POINT(-119.138239995 34.426328476)	34.42633	-119.138	2020-06-18	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
16952cac-8cf0-4453-90fa-ff1ff2b737d8	SRID=4326;POINT(-118.37761296 35.3256484727)	35.32565	-118.378	2020-07-21	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
73686d40-cd48-465f-b064-393c891c9c3e	SRID=4326;POINT(-117.832698561 34.1570612828)	34.15706	-117.833	2020-07-14	LEMONADE_10333	Big Dalton	Not Routine Top/Heavy Trim
dd6744b3-dd1a-4c52-a81a-b8125c9a98b1	SRID=4326;POINT(-119.138061292 34.4339386133)	34.43394	-119.138	2020-06-18	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
e06db872-4502-4442-8a71-4cd6d58d9550	SRID=4326;POINT(-117.835184298 34.1555913849)	34.15559	-117.835	2020-07-16	LEMONADE_10333	Big Dalton	Remove Overhang
70c2543c-d1bf-4aca-b9db-2e7155783be4	SRID=4326;POINT(-117.787974135 34.128360354)	34.12836	-117.788	2020-07-10	BRYDON_2340	Marshall Canyon	Remove Overhang

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8de5a78f-86e6-4e15-90e4-708087eb508e	SRID=4326;POINT(-119.153847434 34.4358236875)	34.43582	-119.154	2020-06-23	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
9aafe774-baaa-40c8-af2f-bcd8a2ec5887	SRID=4326;POINT(-118.611093722 34.0377511062)	34.03775	-118.611	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
34d53086-41b3-4327-807f-4526e877e34a	SRID=4326;POINT(-118.391650133 35.331942779)	35.33194	-118.392	2020-07-21	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
96806c65-e8ca-424b-96f1-0fe2d27690ec	SRID=4326;POINT(-118.4186925 35.3357372666)	35.33574	-118.419	2020-07-21	ZENDA_19820	Sand Canyon	Routine Tree Trim
1edb5ac1-98f2-4dc3-8370-92e39f86c827	SRID=4326;POINT(-118.409525961 35.3906950684)	35.3907	-118.41	2020-07-16	RANKIN_14700	Caliente Bodfish Rd	Not Routine Top/Heavy Trim
abe516bf-3774-4400-8e73-f3996990d454	SRID=4326;POINT(-118.425248154 35.3064839635)	35.30648	-118.425	2020-07-22	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
c1d238c8-5063-480d-8fbf-7c641656fb42	SRID=4326;POINT(-118.426009314 35.3215594031)	35.32156	-118.426	2020-07-21	ZENDA_19820	Sand Canyon	Remove Tree(s)
0fdc3885-44f3-45cc-bd8d-a37eb241e200	SRID=4326;POINT(-118.436199781 35.3044071375)	35.30441	-118.436	2020-07-22	ZENDA_19820	Caliente Creek Rd	Remove Tree(s)
cd0f9a69-b4c4-45e4-aadd-21a090e84a2b	SRID=4326;POINT(-117.837206014 34.1542091358)	34.15421	-117.837	2020-07-17	LEMONADE_10333	Big Dalton	Remove Tree(s)
2374f75e-f3e5-4b2d-a9bb-eb5c9e1058c8	SRID=4326;POINT(-117.831517383 34.1575451395)	34.15755	-117.832	2020-07-17	LEMONADE_10333	Big Dalton	Not Routine Top/Heavy Trim
d6e0b291-da63-450c-ae7e-1e3502a008f2	SRID=4326;POINT(-119.986593202 34.47912112)	34.47912	-119.987	2020-08-10	MIST_12011	Refugio Rd. & El Capitan Canyon	Remove Overhang
b277f31c-cc6a-48ea-94f7-54f3ade9bc5d	SRID=4326;POINT(-118.006221391 34.1643252218)	34.16433	-118.006	2020-06-17	CHANTRY_3335	Chantry Flats	Remove Tree(s)
b3c0d994-d040-4c9b-9ca3-0d81fe93aae6	SRID=4326;POINT(-118.202781044 34.2005013285)	34.2005	-118.203	2020-07-28	BARLEY FLATS_1100	Flint Canyon/Chevy Chase Dr.	Remove Overhang
0815d646-963c-4042-9fa0-2403f797276b	SRID=4326;POINT(-119.193899855 34.4149281518)	34.41493	-119.194	2020-06-16	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
cc81c230-8f0e-4bbf-a340-6ea7d2fb7ddf	SRID=4326;POINT(-119.193285294 34.4150578731)	34.41506	-119.193	2020-06-16	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
6f343710-40d2-46e8-afa0-70ffca3b0199	SRID=4326;POINT(-117.78561037 34.1340893305)	34.13409	-117.786	2020-07-13	AVENIDA_884	Marshall Canyon	Remove Overhang
0dc2f414-4e17-4108-9486-c0017215c8d4	SRID=4326;POINT(-117.785626223 34.1340384606)	34.13404	-117.786	2020-07-13	AVENIDA_884	Marshall Canyon	Remove Overhang
ad322b39-4572-4f55-82af-9e0776cf4758	SRID=4326;POINT(-117.790347487 34.130167092)	34.13017	-117.79	2020-07-13	AVENIDA_884	Marshall Canyon	Remove Overhang
1dd89fe5-73dd-4993-b369-d0dfc4c81246	SRID=4326;POINT(-119.921984151 34.4660224903)	34.46602	-119.922	2020-06-25	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
cfc0eeeb-2176-4510-a15e-8674d693d361	SRID=4326;POINT(-118.436593562 35.3047191957)	35.30472	-118.437	2020-07-22	ZENDA_19820	Caliente Creek Rd	Routine Tree Trim
535ee90c-8d6a-4a05-9720-14b821384460	SRID=4326;POINT(-118.646813706 34.0434437116)	34.04344	-118.647	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
368fd011-315a-4e31-9c28-e6f37c959d73	SRID=4326;POINT(-118.646319173 34.0432823014)	34.04328	-118.646	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
6f59c466-422b-49f2-b844-f685a99dc7fa	SRID=4326;POINT(-118.644328639 34.0439284961)	34.04393	-118.644	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
d9df5a8d-40fa-45d4-9f28-fe1c92f92a5b	SRID=4326;POINT(-118.644114397 34.043848486)	34.04385	-118.644	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
38002149-3143-462b-bec6-eedfbef4655e	SRID=4326;POINT(-118.618135862 34.04229772)	34.0423	-118.618	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
b6934263-8796-4219-8c7b-36f10d9b2033	SRID=4326;POINT(-118.618166707 34.0423891221)	34.04239	-118.618	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
25a10d84-de17-4bfd-9c11-68448ffef317	SRID=4326;POINT(-118.617982306 34.0418343183)	34.04183	-118.618	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
e2262fc5-b965-4dc1-9910-fb4bc945e925	SRID=4326;POINT(-118.93141821 34.1461121757)	34.14611	-118.931	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Remove Overhang

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cea8505b-0631-459d-81d5-737cf01e8e10	SRID=4326;POINT(-118.871719278 34.0392177735)	34.03922	-118.872	2020-07-01	GALAHAD_6924	Encinal Canyon	Tree Trim - Clear S/W
0ba7c124-ad71-4ed6-987d-282e111717c1	SRID=4326;POINT(-118.700164855 34.0314771291)	34.03148	-118.7	2020-06-24	SERRA_16150	Tuna Canyon	Routine Tree Trim
516867c0-ea65-4c05-9415-c7b51333dbb4	SRID=4326;POINT(-118.725763522 34.0324009868)	34.0324	-118.726	2020-06-24	MERLIN_11695	Corral Canyon	Not Routine Top/Heavy Trim
9c1636c2-ed83-4c61-ba78-da74b87ee8a7	SRID=4326;POINT(-118.931067847 34.1452639227)	34.14526	-118.931	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Remove Overhang
f5b01a66-94d7-44f0-bd3f-604f7f140bbf	SRID=4326;POINT(-118.555112081 35.3823154187)	35.38232	-118.555	2020-07-15	FLYING D_6585	Bodfish Cyn Rd	Routine Tree Trim
cc69aa1f-9313-45e8-8a87-4982d33b0924	SRID=4326;POINT(-118.554701703 35.382877593)	35.38288	-118.555	2020-07-15	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
ef0caac8-8044-40e4-8691-f11294b0e193	SRID=4326;POINT(-117.75220111 34.1498350092)	34.14984	-117.752	2020-07-17	AVENIDA_884	Marshall Canyon	Tree Trim - Clear S/W
a7563cb8-c233-4f2f-ac26-f3c05e0e3d16	SRID=4326;POINT(-117.752432786 34.1497509372)	34.14975	-117.752	2020-07-17	AVENIDA_884	Marshall Canyon	Not Routine Top/Heavy Trim
24bcfe32-1a45-4532-b841-c4cfb07d197e	SRID=4326;POINT(-117.790255621 34.1301604313)	34.13016	-117.79	2020-07-13	AVENIDA_884	Marshall Canyon	Not Routine Top/Heavy Trim
98e3d6a3-0b62-40b4-abdd-fcabe10fd52b	SRID=4326;POINT(-117.832590267 34.1571225974)	34.15712	-117.833	2020-07-16	LEMONADE_10333	Big Dalton	Not Routine Top/Heavy Trim
5415c7e2-cc90-4ded-8432-3b957179eebf	SRID=4326;POINT(-117.753262594 34.1491335741)	34.14913	-117.753	2020-07-15	AVENIDA_884	Marshall Canyon	Not Routine Top/Heavy Trim
5cb98bad-f219-42e4-b475-076315e0e6c1	SRID=4326;POINT(-117.740188166 34.1233187655)	34.12332	-117.74	2020-08-13	PALMER_13578	Webb Canyon	Not Routine Top/Heavy Trim
fe64cdd3-d63b-4d0e-8712-f2b62ff346bc	SRID=4326;POINT(-118.45443151 35.4343024548)	35.4343	-118.454	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Remove Tree(s)
7bc6da66-69b7-4639-9005-dbe707a1693c	SRID=4326;POINT(-118.462653235 35.4348152597)	35.43482	-118.463	2020-07-14	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
a9c4e4a6-98f3-48bf-9dc9-4f019d570820	SRID=4326;POINT(-118.470011456 35.4341211962)	35.43412	-118.47	2020-07-14	FLYING D_6585	Caliente Bodfish Rd	Not Routine Top/Heavy Trim
b02bf171-8a6e-4ee5-be2f-b8c0bee130e4	SRID=4326;POINT(-118.470054288 35.4342485592)	35.43425	-118.47	2020-07-14	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
7df73479-2d38-4d07-8f21-f91c4de15994	SRID=4326;POINT(-118.470001398 35.4344261298)	35.43443	-118.47	2020-07-14	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
98eefbc6-dd84-4f8f-a671-e55c41f3c991	SRID=4326;POINT(-118.473881716 35.4373364104)	35.43734	-118.474	2020-07-14	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
3572aebb-2e3c-4f86-99d3-df725d008d01	SRID=4326;POINT(-118.548359787 35.5753793568)	35.57538	-118.548	2020-07-02	ERSKINE_6040	Kern River Canyon Rd.	Routine Tree Trim
d57fb21a-3347-48b1-8b16-4a9dd9153741	SRID=4326;POINT(-118.618879337 35.5338747707)	35.53387	-118.619	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
a3ddb5d5-183a-4217-8e46-257fc5d91f2f	SRID=4326;POINT(-118.619410163 35.5337861739)	35.53379	-118.619	2020-07-08	ERSKINE_6040	Kern River Canyon Rd.	Routine Tree Trim
ce7e222f-0bf4-4c50-a8ce-e4bc6140f83f	SRID=4326;POINT(-118.619491803 35.5335109122)	35.53351	-118.619	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Remove Tree(s)
bb79f92d-5535-4be7-8acf-23ddaecc7ca7	SRID=4326;POINT(-118.649408994 35.5313838786)	35.53138	-118.649	2020-07-09	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
f7d63fe7-31c1-4870-84ea-9e8f2b494b96	SRID=4326;POINT(-118.650099579 35.5322712288)	35.53227	-118.65	2020-07-09	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
2ee02979-f212-4994-a47e-561a12a56881	SRID=4326;POINT(-118.650628142 35.5318734655)	35.53187	-118.651	2020-07-09	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
da37271c-3d3d-4094-a9b1-f0266a5ff95a	SRID=4326;POINT(-118.625256792 35.1487731497)	35.14877	-118.625	2020-07-28	METTLER_11760	Deer Trail Dr, Paramaount Dr	Not Routine Top/Heavy Trim
0ac0ca52-088c-447f-a35b-2c6050cfbc1c	SRID=4326;POINT(-118.022675067 34.1955891158)	34.19559	-118.023	2020-06-16	ARBORETUM_671	Chantry Flats	Not Routine Top/Heavy Trim
a9205a2f-0dc9-4436-a19a-7cd313f5d1dc	SRID=4326;POINT(-118.022855446 34.1956443015)	34.19564	-118.023	2020-06-16	ARBORETUM_671	Chantry Flats	Not Routine Top/Heavy Trim

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faa16611-aa92-43ba-bc79-eb99cd0c1a64	SRID=4326;POINT(-118.128786273 34.2022624343)	34.20226	-118.129	2020-06-12	DOLORES_5185	Eaton Canyon	Remove Overhang
a6288efc-f04c-4fb2-aee0-7c731cb579f4	SRID=4326;POINT(-117.986119241 33.9943550143)	33.99436	-117.986	2020-07-30	TURNBULL_18317	Turnbull Canyon	Not Routine Top/Heavy Trim
6e0a82d3-c80a-426d-a94e-ab5cd4e13e5d	SRID=4326;POINT(-118.524744697 35.4801015929)	35.4801	-118.525	2020-07-20	FLYING D_6585	Caliente Bodfish Rd	Remove Tree(s)
cfd7717d-3acb-43b8-bbcd-b88b5b471336	SRID=4326;POINT(-118.532613544 35.4707552679)	35.47076	-118.533	2020-07-14	FLYING D_6585	Bodfish Cyn Rd	Remove Tree(s)
6e51aa53-5f53-4703-b19c-4bdf1b5b97d8	SRID=4326;POINT(-118.532027397 35.4697671254)	35.46977	-118.532	2020-07-14	FLYING D_6585	Bodfish Cyn Rd	Not Routine Top/Heavy Trim
b7314cac-ebea-4fcf-b4fa-ba8e0a3d9efa	SRID=4326;POINT(-118.512504103 35.4314109828)	35.43141	-118.513	2020-07-13	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
6ed77a3b-0f74-4646-a05e-bce991d3f725	SRID=4326;POINT(-118.54182601 35.448420262)	35.44842	-118.542	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Not Routine Top/Heavy Trim
233b10d0-6c78-4b48-91c7-3b4999b78fd8	SRID=4326;POINT(-118.542047292 35.4484557594)	35.44846	-118.542	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Not Routine Top/Heavy Trim
1b899cab-ec90-4068-9718-f50ff9e526a5	SRID=4326;POINT(-118.542792024 35.4495640146)	35.44956	-118.543	2020-07-14	FLYING D_6585	Caliente Bodfish Rd	Not Routine Top/Heavy Trim
665c5298-c9d0-4f22-8e14-9aa38fd904eb	SRID=4326;POINT(-118.542753048 35.4497788847)	35.44978	-118.543	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Not Routine Top/Heavy Trim
af7234f3-7507-432e-a39f-552f20e3ee66	SRID=4326;POINT(-118.527995618 35.9726114525)	35.97261	-118.528	2020-06-23	JOHNSONDALE_9290	Kern River Hwy/ Serra Rd	Remove Tree(s)
3f1a20de-2843-4fbc-98d3-4306d0d52831	SRID=4326;POINT(-118.527824627 35.9725053376)	35.97251	-118.528	2020-06-23	JOHNSONDALE_9290	Kern River Canyon Rd.	Remove Tree(s)
c4f23670-c938-4b19-8907-1ee6bf9b2cb9	SRID=4326;POINT(-118.426376945 35.2703160933)	35.27032	-118.426	2020-07-23	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
dce7bc83-0076-44b3-a28d-590b276016f1	SRID=4326;POINT(-118.426836273 35.2742404165)	35.27424	-118.427	2020-07-23	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
3a6ade27-cecd-4d8e-92b2-ddf1fb7ef8e3	SRID=4326;POINT(-118.422621768 35.2914957377)	35.2915	-118.423	2020-07-22	ZENDA_19820	Caliente Creek Rd	Routine Tree Trim
34432a28-64c0-4eb0-b804-9e54fe2317d6	SRID=4326;POINT(-118.434374286 35.306946896)	35.30695	-118.434	2020-07-22	ZENDA_19820	Caliente Creek Rd	Routine Tree Trim
45b4e960-59d5-4e01-b0a1-1702d7928685	SRID=4326;POINT(-118.359358851 35.3187617753)	35.31876	-118.359	2020-07-22	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
58048250-dc83-45ab-a2e6-44d9d2d80e40	SRID=4326;POINT(-118.364472231 35.3236931004)	35.32369	-118.364	2020-07-22	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
5e02abbb-2169-4e6a-a9b4-dbf760c3ecdf	SRID=4326;POINT(-118.352172962 35.325248614)	35.32525	-118.352	2020-07-22	ZENDA_19820	Caliente Creek Rd	Remove Tree(s)
7b2fa466-a2e2-4150-a873-005cf179df81	SRID=4326;POINT(-118.345519155 35.3214167431)	35.32142	-118.346	2020-07-21	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
f30ad7ff-51a2-433d-a5aa-5e29785d1e6c	SRID=4326;POINT(-118.33452302 35.3135589604)	35.31356	-118.335	2020-07-21	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
2910a381-0eb5-44a1-82ea-b619ba252f3b	SRID=4326;POINT(-118.354656184 35.3362463834)	35.33625	-118.355	2020-07-21	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
21b003c6-3a26-4573-bb73-b1c7b0eb589b	SRID=4326;POINT(-118.371325 35.34202)	35.34202	-118.371	2020-07-21	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
4b144c18-c89b-494b-90c6-226dbc1c1c39	SRID=4326;POINT(-118.391592382 35.3695992753)	35.3696	-118.392	2020-07-21	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
861c46c3-0d31-417d-a230-5400acf73bac	SRID=4326;POINT(-118.655349165 35.1970984975)	35.1971	-118.655	2020-07-29	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Not Routine Top/Heavy Trim
72c67381-f1ae-4e60-a7c4-ebbbedc0fe6f	SRID=4326;POINT(-118.654686324 35.1974582311)	35.19746	-118.655	2020-07-29	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Not Routine Top/Heavy Trim
1db80681-1d8f-4be0-9871-3b2ba2044502	SRID=4326;POINT(-117.628034279 34.2486435456)	34.24864	-117.628	2020-07-01	ICE HOUSE_8880	Mount Baldy (includes Ice House Cyn)	Not Routine Top/Heavy Trim
c05d0b2a-a1c4-4e9f-aee6-c4573f5dfaef	SRID=4326;POINT(-118.442059485 35.3062242922)	35.30622	-118.442	2020-07-22	ZENDA_19820	Caliente Bodfish Rd	Routine Tree Trim

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9eb059db-3f48-4d43-8cbc-30a2105d0106	SRID=4326;POINT(-118.484972315 35.3050736664)	35.30507	-118.485	2020-07-22	ZENDA_19820	Caliente Creek Rd	Routine Tree Trim
2ecf759f-c704-431d-b1b5-254288a4b6c7	SRID=4326;POINT(-118.517436264 35.3145429958)	35.31454	-118.517	2020-07-22	ZENDA_19820	Caliente Creek Rd	Routine Tree Trim
66c60f1d-7f38-46b1-b37e-0a6ff81cad03	SRID=4326;POINT(-118.583753463 35.3045346681)	35.30453	-118.584	2020-07-27	VIENTO_18734	Caliente Creek Rd	Routine Tree Trim
c64d0fe6-a27c-4e65-bb43-83b289a7b50d	SRID=4326;POINT(-118.521562088 35.5027489504)	35.50275	-118.522	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Not Routine Top/Heavy Trim
830aff47-7f8b-486d-9090-71c78eba9107	SRID=4326;POINT(-118.491765428 35.5958164484)	35.59582	-118.492	2020-07-09	ERSKINE_6040	Kern River Canyon Rd.	Not Routine Top/Heavy Trim
91c031a0-3645-4d50-a210-4550c7c05ee2	SRID=4326;POINT(-118.622471988 35.193882566)	35.19388	-118.622	2020-07-29	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Remove Tree(s)
75f9a65d-9e82-4371-92a4-bd94c137c268	SRID=4326;POINT(-118.656095015 35.1992236227)	35.19922	-118.656	2020-07-29	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Not Routine Top/Heavy Trim
2835ad67-0a69-42b4-97eb-e81f380d7bb2	SRID=4326;POINT(-118.67755048 35.2084678287)	35.20847	-118.678	2020-07-29	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Not Routine Top/Heavy Trim
ed4d66fd-9bb7-419a-a662-334516d62ac6	SRID=4326;POINT(-117.740842625 34.1247048505)	34.1247	-117.741	2020-07-16	PALMER_13578	Webb Canyon	Remove Overhang
fbc4d632-4425-429a-b24a-e92e8a675473	SRID=4326;POINT(-118.183766529 34.1920194432)	34.19202	-118.184	2020-07-13	HASKELL_8140	Flint Canyon/Chevy Chase Dr.	Remove Overhang
d368a361-7273-432a-95f0-13c85ce8473d	SRID=4326;POINT(-118.622586653 35.1985081071)	35.19851	-118.623	2020-07-29	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Not Routine Top/Heavy Trim
d6113bab-c74e-4b2c-9d76-6287622f4f46	SRID=4326;POINT(-117.931875922 33.9545761064)	33.95458	-117.932	2020-07-22		La Habra Heights	Not Routine Top/Heavy Trim
583a7d3f-092f-466a-beac-41a2c15e3678	SRID=4326;POINT(-117.931789085 33.9543914444)	33.95439	-117.932	2020-07-22		La Habra Heights	Not Routine Top/Heavy Trim
56217342-1f66-41be-bbd6-88db82efa073	SRID=4326;POINT(-117.932246067 33.9537395622)	33.95374	-117.932	2020-07-22		La Habra Heights	Remove Tree(s)
34144da9-2967-45ec-8852-b8d7d1b75ae1	SRID=4326;POINT(-117.935604863 33.9534038855)	33.9534	-117.936	2020-07-22		La Habra Heights	Not Routine Top/Heavy Trim
1c7ddca5-5be7-4dde-8b4b-687888345baa	SRID=4326;POINT(-116.944849072 34.0916385781)	34.09164	-116.945	2020-06-05	POULTRY_14372	Forest Falls	Not Routine Top/Heavy Trim
87a2f0ca-a0cd-49da-bff8-74854543c00e	SRID=4326;POINT(-116.895593656 34.0816775244)	34.08168	-116.896	2020-06-03	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
12639c6b-894a-4780-a0fc-570ee704714c	SRID=4326;POINT(-116.909262777 34.0834629443)	34.08346	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
21f2fd80-860a-4bd3-b272-3969fdf25c2c	SRID=4326;POINT(-116.909222483 34.0835339896)	34.08353	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
fb320395-5ec0-4675-beb7-d3c4bbf26f41	SRID=4326;POINT(-116.909112882 34.0837004239)	34.0837	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
e7d1292d-b615-47c0-a92f-a1b1ddc5f427	SRID=4326;POINT(-116.909139576 34.0839068768)	34.08391	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
d69c3fef-2ce3-4cfa-8c7b-2f33c57eb7a1	SRID=4326;POINT(-117.651102617 34.4405979864)	34.4406	-117.651	2020-06-05	DEALER_4726	Pinon Hills	Not Routine Top/Heavy Trim
49bd3e77-414a-4ed3-bb82-6eb6f1a10cc8	SRID=4326;POINT(-117.620681338 34.42336082)	34.42336	-117.621	2020-06-09	DEALER_4726	Lone Pine and Canyon Areas	Remove Tree(s)
74b7dfe5-c9cc-4f43-84c0-18ba1854769c	SRID=4326;POINT(-117.64574524 34.4351639025)	34.43516	-117.646	2020-06-09	DEALER_4726	Pinon hills	Tree Trim - Clear S/W
279ee556-fe90-449c-bc5e-5f953314bebd	SRID=4326;POINT(-117.648684941 34.4262529768)	34.42625	-117.649	2020-06-09	DEALER_4726	Pinon hills	Tree Trim - Clear S/W
df74ea4c-a7a5-49f3-a206-eb2b2cecdd9f	SRID=4326;POINT(-117.75175754 34.1500991557)	34.1501	-117.752	2020-07-16	AVENIDA_884	Marshall Canyon	Not Routine Top/Heavy Trim
0d34a407-4839-4d7f-aad7-5329d809e292	SRID=4326;POINT(-117.753017172 34.1493278012)	34.14933	-117.753	2020-08-13	PALMER_13578	Marshall Canyon	Not Routine Top/Heavy Trim
b0f695de-5d31-4534-a7e2-7411ee86e6fd	SRID=4326;POINT(-119.999611638 34.4611794293)	34.46118	-120	2020-08-10	MIST_12011	Refugio Rd. & El Capitan Canyon	Not Routine Top/Heavy Trim

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77a83b68-8302-4d44-80d2-0ba5c5ab09e3	SRID=4326;POINT(-118.518196084 35.3145941254)	35.31459	-118.518	2020-07-22	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
8e03c6a7-c30f-45df-855c-de433fe7240b	SRID=4326;POINT(-118.51814596 35.3145357455)	35.31454	-118.518	2020-07-22	ZENDA_19820	Caliente Creek Rd	Routine Tree Trim
772b4f7f-3a97-4332-9501-3f03a7b0d79b	SRID=4326;POINT(-118.62839397 35.1692722659)	35.16927	-118.628	2020-07-28	METTLER_11760	Deer Trail Dr, Paramaount Dr	Routine Tree Trim
45a4e8c6-8de5-41ed-b339-3e4216417f93	SRID=4326;POINT(-118.614720404 35.1574333784)	35.15743	-118.615	2020-07-28	METTLER_11760	Deer Trail Dr, Paramaount Dr	Routine Tree Trim
56684d81-db2f-458e-9839-fc77760b7c43	SRID=4326;POINT(-118.632557429 35.1516913374)	35.15169	-118.633	2020-07-28	METTLER_11760	Deer Trail Dr, Paramaount Dr	Routine Tree Trim
ceb836a5-b9c2-4326-8f7a-f6295e4ae27b	SRID=4326;POINT(-118.561229445 35.133160539)	35.13316	-118.561	2020-07-29	CUDDEBACK_4495	Water Cyn	Routine Tree Trim
0042ef5b-2ba6-49b1-ba64-564985af38eb	SRID=4326;POINT(-118.563006744 35.0958580956)	35.09586	-118.563	2020-08-03	METTLER_11760	Water Cyn	Remove Tree(s)
92cecf85-508a-4a5e-8c55-3abfcb06e3d0	SRID=4326;POINT(-118.627273059 35.2359253122)	35.23593	-118.627	2020-07-29	VIENTO_18734	Clear Creek Rd	Not Routine Top/Heavy Trim
8f883bd0-5fbe-4178-bcb2-0c15a26d051b	SRID=4326;POINT(-117.740994841 34.1234325619)	34.12343	-117.741	2020-07-16	PALMER_13578	Marshall Canyon	Remove Overhang
1927652a-cac4-4bf3-8486-1108d9484a73	SRID=4326;POINT(-117.750478126 34.1508688384)	34.15087	-117.75	2020-07-16	AVENIDA_884	Marshall Canyon	Remove Overhang
bb66a5fd-41ee-4ac7-8c79-fc768c49bd82	SRID=4326;POINT(-118.601761187 35.2442149608)	35.24421	-118.602	2020-07-15	VIENTO_18734	Clear Creek Rd	Not Routine Top/Heavy Trim
574aa938-a803-474b-8114-384ebc87059e	SRID=4326;POINT(-118.601866999 35.2441078309)	35.24411	-118.602	2020-07-15	VIENTO_18734	Clear Creek Rd	Not Routine Top/Heavy Trim
d9eecea6-6a41-48a3-9309-83d268b57c3f	SRID=4326;POINT(-118.601192072 35.2438928378)	35.24389	-118.601	2020-07-15	VIENTO_18734	Clear Creek Rd	Not Routine Top/Heavy Trim
d7d11152-7cfc-4945-bbc2-3edfdb084dca	SRID=4326;POINT(-118.600993905 35.2439162359)	35.24392	-118.601	2020-07-15	VIENTO_18734	Clear Creek Rd	Remove Tree(s)
655d86a6-ff29-4a12-a5b2-33bf4140e471	SRID=4326;POINT(-118.600799732 35.2438089962)	35.24381	-118.601	2020-07-15	VIENTO_18734	Clear Creek Rd	Not Routine Top/Heavy Trim
46c031c2-6552-477a-86d6-64a683b34d0f	SRID=4326;POINT(-118.600343328 35.2436749397)	35.24367	-118.6	2020-07-15	VIENTO_18734	Clear Creek Rd	Not Routine Top/Heavy Trim
1a888eed-d316-40c7-ac89-8ac8d764fd2d	SRID=4326;POINT(-118.602332622 35.2430016523)	35.243	-118.602	2020-07-15	VIENTO_18734	Clear Creek Rd	Routine Tree Trim
4bb7e674-2a0b-4996-b2d4-de15e564858e	SRID=4326;POINT(-118.619153258 35.2367253648)	35.23673	-118.619	2020-07-29	VIENTO_18734	Clear Creek Rd	Routine Tree Trim
93fa7bd1-5f0a-42b5-8ebd-8dd13b971329	SRID=4326;POINT(-118.615961345 35.2337200754)	35.23372	-118.616	2020-07-28	VIENTO_18734	Clear Creek Rd	Routine Tree Trim
b29b8b10-0bb1-474e-8de2-d819cb9876a1	SRID=4326;POINT(-118.620449351 35.2305037715)	35.2305	-118.62	2020-07-29	VIENTO_18734	Clear Creek Rd	Not Routine Top/Heavy Trim
95ef728d-db54-439e-b5a2-e175adb19e5b	SRID=4326;POINT(-118.595740255 35.2491862793)	35.24919	-118.596	2020-07-27	VIENTO_18734	Caliente Creek Rd	Not Routine Top/Heavy Trim
bc7cf6a9-029b-4b2c-9c6a-27d039c691e4	SRID=4326;POINT(-118.557921946 35.219057235)	35.21906	-118.558	2020-07-30	VIENTO_18734	Clear Creek Rd	Remove Tree(s)
844bec60-eb16-4b57-af39-756bc11e4851	SRID=4326;POINT(-119.087977074 34.4256207719)	34.42562	-119.088	2020-07-16	CASTRO_4632	Koenigstein Rd. Area	Not Routine Top/Heavy Trim
5547ce85-b0ec-44ed-a45e-89528deea50d	SRID=4326;POINT(-119.195570871 34.4146369004)	34.41464	-119.196	2020-06-16	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
673800dd-22da-4d59-baa2-8d2bfd7c64d1	SRID=4326;POINT(-118.196008801 34.1807167942)	34.18072	-118.196	2020-07-15	FLINTRIDGE_6540	Flint Canyon/Chevy Chase Dr.	Remove Overhang
b66d13e0-a22e-4a6b-99eb-3ad1a960d0ac	SRID=4326;POINT(-118.194301575 34.18142185)	34.18142	-118.194	2020-07-15	FLINTRIDGE_6540	Flint Canyon/Chevy Chase Dr.	Remove Overhang
d06e4e16-2fd0-41cf-bbd4-9aa96916336b	SRID=4326;POINT(-117.972053066 33.9543043973)	33.9543	-117.972	2020-07-14	OMEGA_13164	La Habra Heights	Not Routine Top/Heavy Trim
51d1899a-d79e-4050-b978-0b6c6b504c4d	SRID=4326;POINT(-118.756513372 34.055186941)	34.05519	-118.757	2020-06-25	MERLIN_11695	Corral Canyon	Routine Tree Trim

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452ab32e-e06a-430b-bc06-f67859112946	SRID=4326;POINT(-118.627310526 35.2358719614)	35.23587	-118.627	2020-07-29	VIENTO_18734	Clear Creek Rd	Not Routine Top/Heavy Trim
1c7fb4f6-b3d1-406b-b977-b012402c928b	SRID=4326;POINT(-118.427951736 35.2807754511)	35.28078	-118.428	2020-07-23	ZENDA_19820	Caliente Creek Rd	Routine Tree Trim
3cbf94f7-6f3c-46ad-8822-6c673ca2632c	SRID=4326;POINT(-118.427201137 35.2837646893)	35.28376	-118.427	2020-07-23	ZENDA_19820	Caliente Creek Rd	Routine Tree Trim
efa70f95-98bf-4ee4-b94b-7082a56ada05	SRID=4326;POINT(-118.427767754 35.2823978942)	35.2824	-118.428	2020-07-23	ZENDA_19820	Caliente Creek Rd	Not Routine Top/Heavy Trim
c9c75eb9-4946-4d1c-ba44-08c2ab89c93e	SRID=4326;POINT(-118.607525714 35.1888280216)	35.18883	-118.608	2020-07-29	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Not Routine Top/Heavy Trim
1afebb9d-476b-4150-b627-838701b7b3df	SRID=4326;POINT(-116.908431768 34.0858902275)	34.08589	-116.908	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
363d023d-5b48-47cd-994b-251011838634	SRID=4326;POINT(-118.536148299 35.4677903208)	35.46779	-118.536	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Not Routine Top/Heavy Trim
205ad616-4f4c-4097-9d43-087881504122	SRID=4326;POINT(-116.915525319 34.0868246835)	34.08682	-116.916	2020-06-03	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
dbd17fd5-372a-427d-92ad-1cc761944e81	SRID=4326;POINT(-118.532182966 35.089045493)	35.08905	-118.532	2020-07-30	CUDDEBACK_4495	Water Cyn	Routine Tree Trim
a3a68e3c-2a8a-4b37-ada0-1a457b9c2ca6	SRID=4326;POINT(-118.543695342 35.1227689069)	35.12277	-118.544	2020-07-29	CUDDEBACK_4495	Water Cyn	Routine Tree Trim
873c2476-9692-4352-a227-3fa29d0aea4b	SRID=4326;POINT(-118.535791542 35.0843553152)	35.08436	-118.536	2020-08-03	METTLER_11760	Water Cyn	Routine Tree Trim
008b6977-d918-447d-8cc1-0e59dd77cfb1	SRID=4326;POINT(-118.533499763 35.0832931185)	35.08329	-118.533	2020-08-03	METTLER_11760	Water Cyn	Routine Tree Trim
24bc39da-ea76-43f9-a4c4-2b8363b3ff9b	SRID=4326;POINT(-118.486500252 35.1038088743)	35.10381	-118.487	2020-07-29	GUST_7793	Water Cyn	Not Routine Top/Heavy Trim
4bae815e-6d36-4806-8d37-28f0e2685aa7	SRID=4326;POINT(-119.063299745 34.3827516083)	34.38275	-119.063	2020-07-13	CASTRO_4632	Koenigstein Rd. Area	Not Routine Top/Heavy Trim
86d54af2-fd09-4e36-9901-5a84ea6006b7	SRID=4326;POINT(-119.136537127 34.4365702946)	34.43657	-119.137	2020-06-16	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
0cbc23d8-6061-48fd-be8a-eec55f5b4365	SRID=4326;POINT(-116.832985869 33.8714541542)	33.87145	-116.833	2020-06-04	FINGAL_6432	Idyllwild	Not Routine Top/Heavy Trim
d035c0b5-dae1-424e-8f39-0d71673b7a01	SRID=4326;POINT(-116.825254904 33.8680202561)	33.86802	-116.825	2020-06-04	FINGAL_6432	Idyllwild	Not Routine Top/Heavy Trim
33997168-69db-45fa-9ea9-6be6e9e7b542	SRID=4326;POINT(-116.825016858 33.8679166558)	33.86792	-116.825	2020-06-04	FINGAL_6432	Idyllwild	Remove Overhang
f5f4c0d1-81ad-4597-947c-73886fe73a5c	SRID=4326;POINT(-116.832756708 33.8712221431)	33.87122	-116.833	2020-06-04	FINGAL_6432	Idyllwild	Not Routine Top/Heavy Trim
5e946d0a-d660-4439-a790-62d131e4c29c	SRID=4326;POINT(-116.832677499 33.8711751625)	33.87118	-116.833	2020-06-04	FINGAL_6432	Idyllwild	Not Routine Top/Heavy Trim
6ce4155d-daac-42a1-8d44-a78a0d177a89	SRID=4326;POINT(-116.832991485 33.8715705369)	33.87157	-116.833	2020-06-04	FINGAL_6432	Idyllwild	Not Routine Top/Heavy Trim
ef207b81-b119-4f12-aae0-c8a75d390d6f	SRID=4326;POINT(-118.540592529 35.9690939105)	35.96909	-118.541	2020-06-23	JOHNSONDALE_9290	Kern River Hwy/ Serra Rd	Remove Tree(s)
383497a7-fa30-4704-8126-b72a9d2d05a2	SRID=4326;POINT(-118.54166843 35.9720294969)	35.97203	-118.542	2020-06-24	JOHNSONDALE_9290	Kern River Hwy/ Serra Rd	Routine Tree Trim
b693b5f9-6ec4-46aa-b62f-54c88f896750	SRID=4326;POINT(-118.541781418 35.9716895689)	35.97169	-118.542	2020-06-24	JOHNSONDALE_9290	Kern River Hwy/ Serra Rd	Routine Tree Trim
42d8a7f0-0ea4-43ae-858c-8636b71a6ee4	SRID=4326;POINT(-118.544540405 35.1166648068)	35.11666	-118.545	2020-07-29	CUDDEBACK_4495	Water Cyn	Routine Tree Trim
1423d7e5-c64c-4867-9f64-cc380296f249	SRID=4326;POINT(-118.596166894 35.1566082951)	35.15661	-118.596	2020-07-28	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Routine Tree Trim
046bd6db-1f20-49c7-bdff-a95ac3e9e83c	SRID=4326;POINT(-118.594877757 35.1590171861)	35.15902	-118.595	2020-07-28	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Routine Tree Trim
75d6e789-a363-4ef9-8603-9d853a88872d	SRID=4326;POINT(-118.650963418 35.198561806)	35.19856	-118.651	2020-07-29	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Not Routine Top/Heavy Trim

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f8a26b17-728d-4e81-a478-f4b8ed77efa3	SRID=4326;POINT(-118.482260099 35.071201385)	35.0712	-118.482	2020-08-03	METTLER_11760	Water Cyn	Routine Tree Trim
61e01b04-b912-4a3e-bcf3-94cd96a8b5fb	SRID=4326;POINT(-118.478746321 35.0691627805)	35.06916	-118.479	2020-08-04	METTLER_11760	Water Cyn	Not Routine Top/Heavy Trim
0bb236e2-4130-4032-999e-f5fac88dc3ad	SRID=4326;POINT(-118.48412591 35.0687972457)	35.0688	-118.484	2020-08-03	METTLER_11760	Water Cyn	Routine Tree Trim
cabca121-6965-463f-aba3-76debcaa3c14	SRID=4326;POINT(-118.484161198 35.0687307353)	35.06873	-118.484	2020-08-03	METTLER_11760	Water Cyn	Routine Tree Trim
b824c635-7b61-413a-a51d-206f91a581ca	SRID=4326;POINT(-119.986682385 34.4785006468)	34.4785	-119.987	2020-08-10	MIST_12011	Refugio Rd. & El Capitan Canyon	Not Routine Top/Heavy Trim
d2f2b078-37aa-4a7a-ab5c-d7ad0f11e037	SRID=4326;POINT(-117.740922421 34.1234192394)	34.12342	-117.741	2020-07-16	PALMER_13578	Marshall Canyon	Remove Overhang
1796cc5b-f77b-4744-884e-f8e0190f4159	SRID=4326;POINT(-118.679610081 35.2056779696)	35.20568	-118.68	2020-07-29	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Not Routine Top/Heavy Trim
a133a672-6a17-4f05-9f5b-0b0cd361a0fc	SRID=4326;POINT(-117.891680673 33.93743866)	33.93744	-117.892	2020-06-01	TONNER_17970	Brea Canyon	Not Routine Top/Heavy Trim
9063e87f-2a7f-463d-9ef9-05abfed70ed6	SRID=4326;POINT(-117.97194276 33.9541469892)	33.95415	-117.972	2020-07-14	OMEGA_13164	La Habra Heights	Not Routine Top/Heavy Trim
817ffa24-15d1-4621-9bf1-1acb74d52179	SRID=4326;POINT(-118.919498473 34.4353685305)	34.43537	-118.919	2020-07-28	ANGUS_560	Goodenough Rd.	Not Routine Top/Heavy Trim
c0ee2e08-f4d4-4712-ba5d-90232674d85b	SRID=4326;POINT(-117.93909844 33.952483062)	33.95248	-117.939	2020-07-22		La Habra Heights	Not Routine Top/Heavy Trim
cff959b0-1e40-4fe7-9e59-5ecc557bdf3f	SRID=4326;POINT(-118.679143041 35.2103475874)	35.21035	-118.679	2020-07-29	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Routine Tree Trim
2988c0a6-6b57-4b11-a62d-52f71c6722e4	SRID=4326;POINT(-118.678104691 35.2092817022)	35.20928	-118.678	2020-07-29	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Routine Tree Trim
b2352198-fe81-4a39-a4b1-cdd76cad2482	SRID=4326;POINT(-118.688672595 35.1943948281)	35.19439	-118.689	2020-07-29	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Routine Tree Trim
425050c9-864d-4f1e-8fc6-696202791de0	SRID=4326;POINT(-119.835346453 34.5446679248)	34.54467	-119.835	2020-04-11	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
2027e38e-6bd1-4451-83cf-884b2fafea77	SRID=4326;POINT(-119.837629348 34.5310586682)	34.53106	-119.838	2020-04-05	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
de845fdf-8664-46a4-9391-f93b9def8ee5	SRID=4326;POINT(-118.487182539 35.0718876534)	35.07189	-118.487	2020-08-04	METTLER_11760	Water Cyn	Not Routine Top/Heavy Trim
935fdf87-fb3d-422c-9ec2-81c53ff9d4fa	SRID=4326;POINT(-118.089967668 34.1778485266)	34.17785	-118.09	2020-06-11	KINNELOA_9780	Eaton Canyon	Remove Overhang
3261e456-8f4e-4cf4-8292-049503b587e9	SRID=4326;POINT(-118.489639694 35.1002836135)	35.10028	-118.49	2020-07-30	GUST_7793	Water Cyn	Not Routine Top/Heavy Trim
434aaf4b-73ae-4e0f-a2f1-8094d4a8c345	SRID=4326;POINT(-118.483681502 35.0673364895)	35.06734	-118.484	2020-08-03	METTLER_11760	Water Cyn	Remove Tree(s)
4853e754-ad2e-4be6-a498-9ea306af8070	SRID=4326;POINT(-118.484794451 35.0715583703)	35.07156	-118.485	2020-08-04	METTLER_11760	Water Cyn	Routine Tree Trim
5e3051e0-736f-477d-8ee4-50fcb218b6d4	SRID=4326;POINT(-118.479663789 35.0693011013)	35.0693	-118.48	2020-08-04	METTLER_11760	Water Cyn	Not Routine Top/Heavy Trim
a60ebee1-81f0-413e-a607-c1fb026854fb	SRID=4326;POINT(-118.491200237 35.0744716265)	35.07447	-118.491	2020-08-04	METTLER_11760	Water Cyn	Not Routine Top/Heavy Trim
27c92b49-79cf-442b-86bc-fb4f2c63afd9	SRID=4326;POINT(-118.490518956 35.073871566)	35.07387	-118.491	2020-08-04	METTLER_11760	Water Cyn	Routine Tree Trim
91ed7c40-fa11-4fe6-93ef-fa0239b1a6ff	SRID=4326;POINT(-118.488930166 35.0726246322)	35.07262	-118.489	2020-08-04	METTLER_11760	Water Cyn	Routine Tree Trim
0ed1aef5-aa05-44b4-a480-b762e083c88e	SRID=4326;POINT(-118.488705195 35.0724980481)	35.0725	-118.489	2020-08-04	METTLER_11760	Water Cyn	Routine Tree Trim
e1f89c92-2809-4dbd-94ab-012ab5d7c7ab	SRID=4326;POINT(-118.488096334 35.0720544113)	35.07205	-118.488	2020-08-04	METTLER_11760	Water Cyn	Routine Tree Trim
5899592a-907d-434d-bc57-662ef6eb042c	SRID=4326;POINT(-118.488142267 35.0720806048)	35.07208	-118.488	2020-08-04	METTLER_11760	Water Cyn	Routine Tree Trim

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0fcfc703-ce98-4ff5-846a-f2be6b926049	SRID=4326;POINT(-118.484705016 35.0715565682)	35.07156	-118.485	2020-08-04	METTLER_11760	Water Cyn	Remove Tree(s)
bceb967d-3b04-4d72-a995-d34ef7fc7470	SRID=4326;POINT(-118.484350629 35.0689906162)	35.06899	-118.484	2020-08-03	METTLER_11760	Water Cyn	Routine Tree Trim
6ae86470-57a7-4050-ba7d-bbe1bc62462c	SRID=4326;POINT(-118.483757358 35.0676288084)	35.06763	-118.484	2020-08-03	METTLER_11760	Water Cyn	Routine Tree Trim
36b2ec02-4885-48f0-bef0-d58bc5af1577	SRID=4326;POINT(-118.48413907 35.0685698446)	35.06857	-118.484	2020-08-03	METTLER_11760	Water Cyn	Remove Tree(s)
b9145333-7ce7-4d0d-90ef-debb8053d8b5	SRID=4326;POINT(-118.494940912 35.6018491974)	35.60185	-118.495	2020-07-08	ERSKINE_6040	Kern River Canyon Rd.	Remove Tree(s)
3de047cb-8921-440d-99bf-d1eb20ecdb90	SRID=4326;POINT(-118.495698553 35.1029687981)	35.10297	-118.496	2020-07-29	GUST_7793	Water Cyn	Not Routine Top/Heavy Trim
1f19fc93-8c5a-48cf-9946-3b33a44da842	SRID=4326;POINT(-118.506388245 35.0973470137)	35.09735	-118.506	2020-07-28	GUST_7793	Water Cyn	Remove Tree(s)
f237dce5-9bcc-4eb0-8730-9fe5cff775c9	SRID=4326;POINT(-118.482489009 35.1061336371)	35.10613	-118.482	2020-07-28	GUST_7793	Water Cyn	Routine Tree Trim
efa4d80a-129c-4ee8-805e-aa03175e7ea1	SRID=4326;POINT(-118.503112178 35.1081880415)	35.10819	-118.503	2020-07-28	GUST_7793	Water Cyn	Remove Tree(s)
f7a12e4c-cd53-4530-bf0b-cf8026bcfc7b	SRID=4326;POINT(-117.837494016 34.150710685)	34.15071	-117.837	2020-07-13	LEMONADE_10333	Big Dalton	Not Routine Top/Heavy Trim
164ce3b4-4b61-4964-bf58-8d6f72ae4ad9	SRID=4326;POINT(-117.740895934 34.1234630926)	34.12346	-117.741	2020-07-16	PALMER_13578	Webb Canyon	Remove Overhang
8bf17e1e-e402-4aea-af2b-fdfd92037c6b	SRID=4326;POINT(-117.757046521 34.1216237364)	34.12162	-117.757	2020-08-04	PALMER_13578	Marshall Canyon	Remove Tree(s)
5d78578b-2ed8-4044-8ac1-2e5c4f082e92	SRID=4326;POINT(-117.740027569 34.1231924791)	34.12319	-117.74	2020-07-16	PALMER_13578	Webb Canyon	Not Routine Top/Heavy Trim
06d5238c-66f3-446a-a224-c52f9fddf1da	SRID=4326;POINT(-118.498877222 35.0733359624)	35.07334	-118.499	2020-07-28	METTLER_11760	paradise Valley Rd	Routine Tree Trim
e470967d-8f21-4370-b93c-c08a8cbf9c6c	SRID=4326;POINT(-118.499172097 35.0724825589)	35.07248	-118.499	2020-07-28	METTLER_11760	Paradise valley Road	Routine Tree Trim
21b72822-f784-428a-9108-9a0c8c77d69b	SRID=4326;POINT(-118.501836453 35.0719673233)	35.07197	-118.502	2020-07-28	METTLER_11760	Paradise valley rd	Not Routine Top/Heavy Trim
46603b2a-97e9-4626-b64d-90833b923d6e	SRID=4326;POINT(-118.501040675 35.0706284819)	35.07063	-118.501	2020-07-28	METTLER_11760	Water Cyn	Routine Tree Trim
e74e6caa-0bbc-4f17-836a-6a5fa7bab168	SRID=4326;POINT(-118.501996715 35.0640937407)	35.06409	-118.502	2020-07-28	METTLER_11760	Water Cyn	Routine Tree Trim
1a2f84da-687f-4e52-966e-00a4e358c4b1	SRID=4326;POINT(-118.502464463 35.0599698126)	35.05997	-118.502	2020-08-03	METTLER_11760	Water Cyn	Routine Tree Trim
f40cce6c-4b80-43c4-9b75-6109d1874fe9	SRID=4326;POINT(-118.502490425 35.0599403741)	35.05994	-118.502	2020-08-03	METTLER_11760	Water Cyn	Routine Tree Trim
f9c88d2d-4517-4f32-8120-c3124368c829	SRID=4326;POINT(-118.501999241 35.0567320043)	35.05673	-118.502	2020-08-03	METTLER_11760	Water Cyn	Not Routine Top/Heavy Trim
d08ace68-d9b0-4cce-b1f5-a595c1a1996e	SRID=4326;POINT(-117.946630754 33.9602220079)	33.96022	-117.947	2020-07-15		La Habra Heights	Not Routine Top/Heavy Trim
97e1d439-2ba2-4e4c-9dd5-5898a75f4e03	SRID=4326;POINT(-118.9199806 34.4359984495)	34.436	-118.92	2020-07-27	ANGUS_560	Goodenough Rd.	Not Routine Top/Heavy Trim
f6cc387c-9703-4dcd-be65-aec6c1856917	SRID=4326;POINT(-118.919956125 34.4360214008)	34.43602	-118.92	2020-07-27	ANGUS_560	Goodenough Rd.	Not Routine Top/Heavy Trim
73cfc394-dbae-4143-b762-44ea741cbad5	SRID=4326;POINT(-118.918335401 34.4367536271)	34.43675	-118.918	2020-07-27	ANGUS_560	Goodenough Rd.	Not Routine Top/Heavy Trim
0583f745-51e0-4dca-8ec1-3d19f7192c08	SRID=4326;POINT(-118.918329701 34.4368122492)	34.43681	-118.918	2020-07-27	ANGUS_560	Goodenough Rd.	Not Routine Top/Heavy Trim
ced7476e-fe2e-44be-ba3b-1be5811eeb75	SRID=4326;POINT(-118.923594877 34.4488595942)	34.44886	-118.924	2020-07-28	ANGUS_560	Goodenough Rd.	Not Routine Top/Heavy Trim
35de023e-a083-45ea-87dd-34991245776a	SRID=4326;POINT(-119.900465123 34.444840872)	34.44484	-119.9	2020-07-08	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim

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4ee9928c-1251-4ee6-8122-308130b7d06b	SRID=4326;POINT(-117.952408232 33.9545772188)	33.95458	-117.952	2020-07-20	WHIPSTOCK_19244	La Habra Heights	Not Routine Top/Heavy Trim
063290f7-cdf1-4dcf-9f74-726062afa858	SRID=4326;POINT(-119.08697594 34.4304512382)	34.43045	-119.087	2020-07-14	CASTRO_4632	Koenigstein Rd. Area	Remove Overhang
4f2df4ab-26d2-4788-9321-339b2aa18ba8	SRID=4326;POINT(-118.501842655 35.0562023598)	35.0562	-118.502	2020-08-03	METTLER_11760	Water Cyn	Not Routine Top/Heavy Trim
8b5c6cc3-a3fb-4fce-a6c3-76e06dd778ab	SRID=4326;POINT(-118.50168474 35.0556045982)	35.0556	-118.502	2020-08-10	METTLER_11760	Water Cyn	Routine Tree Trim
ff416a05-0c34-4289-bd1e-d27edce63256	SRID=4326;POINT(-118.502435256 35.057737073)	35.05774	-118.502	2020-08-03	METTLER_11760	Coldwater Canyon	Not Routine Top/Heavy Trim
fec41cdc-cf88-4231-a558-8c9e8b73dc62	SRID=4326;POINT(-117.953376509 33.9596141084)	33.95961	-117.953	2020-07-20		La Habra Heights	Remove Overhang
a61ea6cd-10aa-406e-a13a-a5e99659c6d0	SRID=4326;POINT(-117.4157542 33.6508639)	33.65086	-117.416	2020-06-03	SWIFTWATER_17421	Ortega Hwy including Main Divide Rd	Remove Tree(s)
dbe4f69e-f5c3-496d-bac7-5f64bd3e58fa	SRID=4326;POINT(-117.272734791 34.2621405801)	34.26214	-117.273	2020-07-08	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
66709a75-e405-471c-afd4-0f18733c91b5	SRID=4326;POINT(-117.272765636 34.2622081915)	34.26221	-117.273	2020-07-08	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
15c12fb1-1b0d-4e56-b539-b7c61d34f4c2	SRID=4326;POINT(-117.273819745 34.2625803301)	34.26258	-117.274	2020-07-08	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
88b50954-64c4-4eed-88b3-a6344ed93c70	SRID=4326;POINT(-117.27391798 34.2626792527)	34.26268	-117.274	2020-07-08	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
3f4dd7ab-93ab-4147-ba17-af00402453f7	SRID=4326;POINT(-117.274138592 34.2635149642)	34.26351	-117.274	2020-07-08	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
6cc4f6f8-071a-4128-b203-a3856a673d15	SRID=4326;POINT(-117.302198522 34.2282468759)	34.22825	-117.302	2020-06-02	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
6dbda865-3a0b-4d03-8a3d-51fbbea3da9a	SRID=4326;POINT(-117.303623612 34.229139514)	34.22914	-117.304	2020-06-02	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
afb7aca6-b6e6-4c4d-b551-05759bf30067	SRID=4326;POINT(-117.298341754 34.2345600095)	34.23456	-117.298	2020-06-03	CLUB OAKS_3712	Crestline	Not Routine Top/Heavy Trim
2cb914b1-8ba2-4410-8c52-3753f6cf4c37	SRID=4326;POINT(-117.299899204 34.2310326496)	34.23103	-117.3	2020-06-03	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
d13561af-257a-445b-ba5e-c5ed3dac7d6d	SRID=4326;POINT(-117.971814685 33.9539937524)	33.95399	-117.972	2020-07-14	OMEGA_13164	La Habra Heights	Not Routine Top/Heavy Trim
7c62dc59-f9af-4dae-b7a4-267433e603f2	SRID=4326;POINT(-117.971557863 33.9536628045)	33.95366	-117.972	2020-07-14	OMEGA_13164	La Habra Heights	Not Routine Top/Heavy Trim
fb0d57e9-1239-4722-afb1-6e3708e483a6	SRID=4326;POINT(-117.971729189 33.9539003084)	33.9539	-117.972	2020-07-14	OMEGA_13164	La Habra Heights	Not Routine Top/Heavy Trim
4a92d71e-9d44-4b45-b805-5e85646c14ce	SRID=4326;POINT(-117.971525006 33.9536202539)	33.95362	-117.972	2020-07-14	OMEGA_13164	La Habra Heights	Not Routine Top/Heavy Trim
8c1be1c2-3d3d-4be1-96bf-ff73199cceb2	SRID=4326;POINT(-117.971502207 33.9536016207)	33.9536	-117.972	2020-07-14	OMEGA_13164	La Habra Heights	Not Routine Top/Heavy Trim
78b71750-1178-473a-b955-6bcc6ff75bb6	SRID=4326;POINT(-117.971497849 33.953592165)	33.95359	-117.971	2020-07-14	OMEGA_13164	La Habra Heights	Not Routine Top/Heavy Trim
4ea1c816-5659-431f-aca5-af7e4a46a68f	SRID=4326;POINT(-117.493292838 34.2481452459)	34.24815	-117.493	2020-06-09	CASMALIA_3099	Lytle Creek	Not Routine Top/Heavy Trim
10aa33ba-5cc1-4978-84bd-b34defc40685	SRID=4326;POINT(-117.493317509 34.2480944606)	34.24809	-117.493	2020-06-09	CASMALIA_3099	Lytle Creek	Not Routine Top/Heavy Trim
a9ff74d3-cbae-4268-8a9c-cf71f1b8f14c	SRID=4326;POINT(-117.493329408 34.2480683375)	34.24807	-117.493	2020-06-09	CASMALIA_3099	Lytle Creek	Not Routine Top/Heavy Trim
e18eb88c-faf5-49ba-8002-ecb34de32b22	SRID=4326;POINT(-117.49344952 34.2479132867)	34.24791	-117.493	2020-06-09	CASMALIA_3099	Lytle Creek	Not Routine Top/Heavy Trim
3d734d71-4a6f-47c9-a0a5-fd5e43aa6219	SRID=4326;POINT(-117.49348931 34.2478309663)	34.24783	-117.493	2020-06-09	CASMALIA_3099	Lytle Creek	Not Routine Top/Heavy Trim
a8b38a54-4aea-4cde-abe5-0cbf77e2e06e	SRID=4326;POINT(-117.493523489 34.2477232923)	34.24772	-117.494	2020-06-09	CASMALIA_3099	Lytle Creek	Not Routine Top/Heavy Trim

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260391f6-1fc2-45ec-b39c-6827ff73fd13	SRID=4326;POINT(-117.493280649 34.2476090999)	34.24761	-117.493	2020-06-09	CASMALIA_3099	Lytle Creek	Not Routine Top/Heavy Trim
0516cab3-5650-40c1-a215-9ff3da6cf88e	SRID=4326;POINT(-119.956192039 34.4459437934)	34.44594	-119.956	2020-07-03	BIDDER_1610	Dos Pueblos Canyon	Remove Tree(s)
b1d6ae34-2cc6-4589-8cbc-79c1164dc8b6	SRID=4326;POINT(-118.230609298 34.2241341261)	34.22413	-118.231	2020-08-11	ROSEMONT_15441	Big Tujunga	Remove Tree(s)
44df4b2e-8038-4d93-960d-1995b17cc41a	SRID=4326;POINT(-118.23066026 34.2241377299)	34.22414	-118.231	2020-08-11	ROSEMONT_15441	Big Tujunga	Remove Tree(s)
81653ebf-7930-4c27-aa5c-163149c811a7	SRID=4326;POINT(-118.230655231 34.2241721053)	34.22417	-118.231	2020-07-06	ROSEMONT_15441	Big Tujunga	Remove Tree(s)
1cb4a193-3650-4780-82c8-e8bece1366e3	SRID=4326;POINT(-118.428933257 35.7623910159)	35.76239	-118.429	2020-07-02	BONANZA_1898	Kern River Hwy/ Serra Rd	Routine Tree Trim
404350fb-fc82-45a9-af45-9a2030a92b19	SRID=4326;POINT(-118.417855902 35.7518930594)	35.75189	-118.418	2020-06-29	BONANZA_1898	Kern River Hwy/ Serra Rd	Remove Tree(s)
086205eb-b771-42e5-9b18-3a8e27232bbf	SRID=4326;POINT(-118.415668979 35.7527744292)	35.75277	-118.416	2020-06-24	BONANZA_1898	Kern River Hwy/ Serra Rd	Remove Tree(s)
8172c4d3-7d0f-470c-8940-1e024816f421	SRID=4326;POINT(-117.615720592 33.7472933544)	33.74729	-117.616	2020-07-29		Silverado Canyon	Not Routine Top/Heavy Trim
5a63110b-45d3-4276-9be3-acbb50fff6ab	SRID=4326;POINT(-119.912560545 34.4799941968)	34.47999	-119.913	2020-06-29	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
d192c149-e287-4847-aba8-fc0800726b01	SRID=4326;POINT(-119.912179336 34.4831053049)	34.48311	-119.912	2020-06-29	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
3bf777e8-0555-4b87-91b7-0175f84e9b9a	SRID=4326;POINT(-119.911841713 34.4836721292)	34.48367	-119.912	2020-06-29	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
3a41a830-66cd-4732-8928-d4337fa8ed55	SRID=4326;POINT(-119.081825763 34.4041987561)	34.4042	-119.082	2020-07-13	CASTRO_4632	Koenigstein Rd. Area	Routine Tree Trim
ab7f03d2-5cf2-4506-bde5-69060f23f250	SRID=4326;POINT(-119.913479201 34.4747207736)	34.47472	-119.913	2020-06-29	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
8af38d9b-84c4-4e34-aaaf-eea45f23c912	SRID=4326;POINT(-119.912835807 34.4821018145)	34.4821	-119.913	2020-06-29	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
38a470c0-5f31-4e68-b153-fc6cabe8a40c	SRID=4326;POINT(-119.911194295 34.484263546)	34.48426	-119.911	2020-06-29	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
4ba3fff0-1a97-4e97-bae6-67d01fcede68	SRID=4326;POINT(-118.202975504 34.1928577974)	34.19286	-118.203	2020-07-27	LANE_10050	Flint Canyon/Chevy Chase Dr.	Not Routine Top/Heavy Trim
31f15b26-c6e9-4847-8474-6904ab20414e	SRID=4326;POINT(-118.213993013 34.210014079)	34.21001	-118.214	2020-07-28	ROSEMONT_15441	Flint Canyon/Chevy Chase Dr.	Not Routine Top/Heavy Trim
46c466cf-8b84-46d6-825e-881a12d215d8	SRID=4326;POINT(-119.913075529 34.4762934384)	34.47629	-119.913	2020-06-29	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
c12f19e7-2820-4af5-aa47-53643abf1e04	SRID=4326;POINT(-119.916738756 34.4534492998)	34.45345	-119.917	2020-06-25	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
9a63c569-d28c-4a1b-88e5-3e1c97bea1da	SRID=4326;POINT(-119.916942269 34.4404376124)	34.44044	-119.917	2020-07-08	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
838f0c48-12f0-4096-b541-f7818cc2d92a	SRID=4326;POINT(-119.839554168 34.5213162826)	34.52132	-119.84	2020-04-23	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
ffd1b8ca-877f-4517-8f16-e524c8a75f58	SRID=4326;POINT(-119.766757675 34.5381820145)	34.53818	-119.767	2020-04-11	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
9e01206b-beea-4e8e-b2ea-90f1b959785b	SRID=4326;POINT(-119.765757881 34.5384095892)	34.53841	-119.766	2020-04-11	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
cd64b796-566c-4de5-9646-2daea6f1c63d	SRID=4326;POINT(-119.767698459 34.5364061374)	34.53641	-119.768	2020-04-11	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
93a5b885-4a28-458b-b0a5-8c2520aba72b	SRID=4326;POINT(-119.834464006 34.5447074159)	34.54471	-119.834	2020-04-11	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
5b344d27-67a7-4899-97ca-2cdedb92b17d	SRID=4326;POINT(-119.865482412 34.5420857728)	34.54209	-119.865	2020-04-05	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
11dd79f7-bc2b-4180-ac49-6c0a1941a298	SRID=4326;POINT(-117.638711518 33.7529241482)	33.75292	-117.639	2020-06-11	ATENTO_817	Silverado Canyon	Remove Tree(s)

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c89b8134-75ec-41c3-9214-79f26b3ee3ea	SRID=4326;POINT(-119.148700275 34.3472883146)	34.34729	-119.149	2020-03-31	MIDDLE ROAD_11840	Wheeler Canyon	Not Routine Top/Heavy Trim
99602e43-8de2-4e15-b23f-c7c94c5d1a67	SRID=4326;POINT(-119.148028716 34.3471886611)	34.34719	-119.148	2020-05-14	MIDDLE ROAD_11840	Wheeler Canyon	Not Routine Top/Heavy Trim
2851ec41-cb73-4c85-b37e-e0dd3409692d	SRID=4326;POINT(-118.768262789 34.0382539823)	34.03825	-118.768	2020-06-24	MERLIN_11695	Latigo Canyon	Routine Tree Trim
21ec72ea-0e30-4b93-842a-4bad6bf3b881	SRID=4326;POINT(-118.873826489 34.1421613588)	34.14216	-118.874	2020-06-18	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
8f4774d7-b99a-46a5-a129-0e10ae454e6b	SRID=4326;POINT(-118.873799667 34.142212417)	34.14221	-118.874	2020-06-18	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
2c0de1b0-1287-437a-85d8-2c10b27a8f68	SRID=4326;POINT(-118.919395208 34.1519420541)	34.15194	-118.919	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
92ebfd9d-f345-4677-becb-6015a522b5e8	SRID=4326;POINT(-118.926320337 34.1462381504)	34.14624	-118.926	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Remove Overhang
17c94828-0248-47a4-9fab-01900f46b402	SRID=4326;POINT(-119.915101938 34.4584194223)	34.45842	-119.915	2020-07-08	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
83beb94a-efc0-4a93-a0a7-82a44e84c81c	SRID=4326;POINT(-119.917822704 34.4596584511)	34.45966	-119.918	2020-06-29	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
cd6c7de1-2621-480e-acb2-82e798bf6125	SRID=4326;POINT(-119.912631288 34.4780598179)	34.47806	-119.913	2020-06-29	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
53e77dc4-1395-479a-b8f9-d0d236ba48ee	SRID=4326;POINT(-119.912661798 34.4777016253)	34.4777	-119.913	2020-06-29	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
9384df7c-e28a-4e0c-9bfd-4260e354be8f	SRID=4326;POINT(-117.620770857 33.683175495)	33.68318	-117.621	2020-06-25	ATENTO_817	Silverado Canyon	Not Routine Top/Heavy Trim
1e4b453c-3ecc-4e20-8ff3-018b35e89de8	SRID=4326;POINT(-118.445537305 35.790385441)	35.79039	-118.446	2020-06-29	INTAKE_8930	Kern River Hwy/ Serra Rd	Not Routine Top/Heavy Trim
b10617dd-a909-4283-bf85-f6d2c91cd0f5	SRID=4326;POINT(-118.025871255 34.1721979678)	34.1722	-118.026	2020-06-16	BALDWIN_1000	Chantry Flats	Remove Tree(s)
21316de0-aa4c-4b57-aa27-77621425e316	SRID=4326;POINT(-118.011854365 34.1604396207)	34.16044	-118.012	2020-06-17	CHANTRY_3335	Chantry Flats	Remove Overhang
47cf4289-ed94-4fae-ae42-e85bf4ceeb7a	SRID=4326;POINT(-118.16648908 34.2083462989)	34.20835	-118.166	2020-06-10	CROSBY_4410	Mt. Lowe/Channey Trail	Not Routine Top/Heavy Trim
99d20e9f-98c9-47f4-a937-020738e7f6d5	SRID=4326;POINT(-118.054639958 34.1668599489)	34.16686	-118.055	2020-06-16	LIMA_10470	Chantry Flats	Remove Tree(s)
9bba3da1-088d-434f-8318-2500e8a9b5de	SRID=4326;POINT(-117.989869304 34.1759659736)	34.17597	-117.99	2020-06-17	PRIMROSE_14410	Chantry Flats	Not Routine Top/Heavy Trim
0d435982-e5d4-4f6b-8c6d-5ba52bf8a9bc	SRID=4326;POINT(-118.5085693 35.5449189758)	35.54492	-118.509	2020-07-14	FLYING D_6585	Bodfish Cyn Rd	Remove Tree(s)
6480bb06-9ef1-4d9c-b4e1-d1ea46369b7b	SRID=4326;POINT(-118.523466373 35.5021700543)	35.50217	-118.523	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Remove Tree(s)
44973194-17d2-4cab-baec-bfc250a9adef	SRID=4326;POINT(-118.407572061 35.6150421873)	35.61504	-118.408	2020-07-01	TUNGSTEN_18300	Bodfish Cyn Rd	Not Routine Top/Heavy Trim
4ed9bb3a-ad1f-4535-9130-91cfa9af1946	SRID=4326;POINT(-118.296447471 34.6255086416)	34.62551	-118.296	2020-06-10	HUGHES LAKE_8810	Bouquet Canyon	Routine Tree Trim
6791173f-4544-4944-bcd7-594f1867b45b	SRID=4326;POINT(-118.757251315 34.030106189)	34.03011	-118.757	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
24200af5-eec4-4994-b429-1684c2d0d576	SRID=4326;POINT(-117.686466537 34.4557856646)	34.45579	-117.686	2020-06-05	DEALER_4726	Llano	Tree Trim - Clear S/W
1f193235-ee03-4d3a-a9d4-8be3f06abbeb	SRID=4326;POINT(-117.584743425 34.4058623742)	34.40586	-117.585	2020-06-08	DEALER_4726	Pinon hills	Not Routine Top/Heavy Trim
d14749ac-4a14-40d9-98cf-825978b2ebda	SRID=4326;POINT(-117.584735379 34.4057508956)	34.40575	-117.585	2020-06-08	DEALER_4726	Pinon hills	Not Routine Top/Heavy Trim
e13b5b05-d67c-4c0b-aaa5-33b798e6ef1f	SRID=4326;POINT(-117.58474879 34.4061105033)	34.40611	-117.585	2020-06-08	GAMBLER_6987	Lone Pine and Canyon Areas	Remove Tree(s)
00320b7d-31fd-4f93-b252-aff3145768dc	SRID=4326;POINT(-118.885522932 34.0408072132)	34.04081	-118.886	2020-07-01	GALAHAD_6924	Encinal Canyon	Tree Trim - Clear S/W

_record_id	_geometry	_latitude	_longitude	assessment_date	circuit	work_location	type_of_service
80b0cc0a-b24b-4b2c-868e-2e4224b6097b	SRID=4326;POINT(-118.765418306 34.0292298205)	34.02923	-118.765	2020-06-24	CUTHBERT_4526	Latigo Canyon	Remove Overhang
f00f80d1-9982-444c-abd4-5b0072650134	SRID=4326;POINT(-117.620962299 33.6825285171)	33.68253	-117.621	2020-06-25	ATENTO_817	Silverado Canyon	Not Routine Top/Heavy Trim
f049ca55-2227-445a-85d4-71ec44c2586a	SRID=4326;POINT(-119.954685308 34.4466319714)	34.44663	-119.955	2020-07-03	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
f440b4f3-d788-47db-9fd6-918ae83357a4	SRID=4326;POINT(-117.716381885 33.7675028526)	33.7675	-117.716	2020-07-07	TAIWAN_17487	Santiago Canyon	Not Routine Top/Heavy Trim
4475ba2f-ffb8-4226-a00a-3e39bd91e884	SRID=4326;POINT(-117.715995982 33.7673172282)	33.76732	-117.716	2020-07-09	TAIWAN_17487	Irvine Park/Peters Canyon, Blue Diamond Haul Rd.	Not Routine Top/Heavy Trim
96541caf-bc37-4989-9bdf-b9d7c6fb7186	SRID=4326;POINT(-117.715917863 33.7674563072)	33.76746	-117.716	2020-07-09	TAIWAN_17487	Irvine Park/Peters Canyon, Blue Diamond Haul Rd.	Not Routine Top/Heavy Trim
013b1b0b-2083-4706-a230-532822ea33fe	SRID=4326;POINT(-118.167340681 34.2092382812)	34.20924	-118.167	2020-06-10	CROSBY_4410	Mt. Lowe/Channey Trail	Not Routine Top/Heavy Trim
749fd723-eb38-4c49-824b-6681f6b6e43b	SRID=4326;POINT(-118.167458028 34.2093979885)	34.2094	-118.167	2020-06-10	CROSBY_4410	Mt. Lowe/Channey Trail	Not Routine Top/Heavy Trim
77723e5b-bb3c-40b1-b062-d9d49143ef7b	SRID=4326;POINT(-118.168315999 34.2096841301)	34.20968	-118.168	2020-06-10	CROSBY_4410	Mt. Lowe/Channey Trail	Not Routine Top/Heavy Trim
014f08ff-1b10-446b-9216-5ce6a55bf9a8	SRID=4326;POINT(-118.166991659 34.2088803249)	34.20888	-118.167	2020-06-10	CROSBY_4410	Mt. Lowe/Channey Trail	Not Routine Top/Heavy Trim
24481151-e315-4c53-9fc7-5bac64197ef3	SRID=4326;POINT(-118.166665435 34.2084131217)	34.20841	-118.167	2020-06-10	CROSBY_4410	Mt. Lowe/Channey Trail	Remove Overhang
b9875865-d130-40f3-b76b-f359cc8b0b8d	SRID=4326;POINT(-118.166521601 34.2085018489)	34.2085	-118.167	2020-06-10	CROSBY_4410	Mt. Lowe/Channey Trail	Not Routine Top/Heavy Trim
ba407054-b610-42aa-996b-48a4ac3d212f	SRID=4326;POINT(-118.166519925 34.2084239353)	34.20842	-118.167	2020-06-10	CROSBY_4410	Mt. Lowe/Channey Trail	Not Routine Top/Heavy Trim
0eaae08f-6088-42b4-8711-574918c4d6b6	SRID=4326;POINT(-117.872426435 33.9358759368)	33.93588	-117.872	2020-05-14	TONNER_17970	Brea Canyon	Not Routine Top/Heavy Trim
9240380f-4da0-4359-9a42-f9b8f550c8c1	SRID=4326;POINT(-117.621227276 33.7475628924)	33.74756	-117.621	2020-06-10	ATENTO_817	Silverado Canyon	Not Routine Top/Heavy Trim
c04d3a34-4aed-42a7-913b-9babe8fda5e3	SRID=4326;POINT(-118.850158341 34.0370451298)	34.03705	-118.85	2020-07-01	GALAHAD_6924	Encinal Canyon	Not Routine Top/Heavy Trim
26a7d02d-126c-4610-9bb8-f423d8aadd2e	SRID=4326;POINT(-118.890252002 34.0467321354)	34.04673	-118.89	2020-06-29	GALAHAD_6924	Decker Canyon	Tree Trim - Clear S/W
58fc7857-6917-4362-9f8d-d5bf5240b639	SRID=4326;POINT(-118.202085681 34.2036475011)	34.20365	-118.202	2020-07-23	LANE_10050	Flint Canyon/Chevy Chase Dr.	Not Routine Top/Heavy Trim
263f5130-5dce-4064-8a32-7984fa6106c8	SRID=4326;POINT(-118.332728051 34.5830641065)	34.58306	-118.333	2020-06-09	HUCKLEBERRY_8795	Bouquet cyn	Routine Tree Trim
b4b3cc5c-e7e6-4feb-bd7b-e3d7ccc7e5fe	SRID=4326;POINT(-118.195287287 34.2011524234)	34.20115	-118.195	2020-07-16	RAVINE_14726	Flint Canyon/Chevy Chase Dr.	Not Routine Top/Heavy Trim
b5e5e66f-f582-4cda-9c2b-ea9957e03ce3	SRID=4326;POINT(-117.764773294 33.9686693032)	33.96867	-117.765	2020-07-20	DEL CARBON_4795	Carbon Canyon	Not Routine Top/Heavy Trim
1bd5a97a-ac7b-4221-9a0c-6f90a6154a52	SRID=4326;POINT(-117.764757536 33.9689712747)	33.96897	-117.765	2020-07-20	DEL CARBON_4795	Carbon Canyon	Remove Overhang
09d0b16a-4ff7-4c52-bcf8-2d8f126c4641	SRID=4326;POINT(-117.764558382 33.9682786294)	33.96828	-117.765	2020-07-20	DEL CARBON_4795	Carbon Canyon	Remove Overhang
dcde7352-24d5-40bf-b01b-48dca432eae3	SRID=4326;POINT(-119.036465921 34.1081966397)	34.1082	-119.036	2020-06-17	RAMAC_14652	Sycamore Canyon Park	Routine Tree Trim
2ae6e59c-d32f-430c-9468-c5409dbc3d54	SRID=4326;POINT(-118.794522621 34.1242055406)	34.12421	-118.795	2020-06-15	TRIUNFO_18164	Triunfo Canyon	Remove Overhang
62ecbaee-2d05-4ab3-9889-2591cb51ce28	SRID=4326;POINT(-118.778878972 34.1176265306)	34.11763	-118.779	2020-06-17	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
83fc56b7-968c-4587-9a06-d463459f628b	SRID=4326;POINT(-119.197562076 34.4137645232)	34.41376	-119.198	2020-06-16	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
05734ed1-e0ea-49cc-936e-f89cea8055b1	SRID=4326;POINT(-119.138312414 34.4258445055)	34.42584	-119.138	2020-06-24	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim

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0b5e8c7e-4090-485e-adc3-0944417d5789	SRID=4326;POINT(-119.177979939 34.4117802047)	34.41178	-119.178	2020-06-30	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
131b02db-40cf-42de-938f-dc8f22327ae7	SRID=4326;POINT(-119.184731729 34.4136547148)	34.41365	-119.185	2020-06-30	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
3a4f49aa-83ef-4b71-9ac0-3f68eeea9a9f	SRID=4326;POINT(-119.183246121 34.4140372458)	34.41404	-119.183	2020-06-30	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
514f6d57-110e-4ab0-a909-d8d322667e95	SRID=4326;POINT(-119.178708829 34.4119525275)	34.41195	-119.179	2020-06-30	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
8aaf3aad-be9b-47bf-ab47-3c83b430ac13	SRID=4326;POINT(-119.191498943 34.4147074314)	34.41471	-119.191	2020-06-16	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
af4f7322-c682-4ca5-80a0-44a746c546d6	SRID=4326;POINT(-118.752004243 34.1424319115)	34.14243	-118.752	2020-06-15	TRIUNFO_18164	Triunfo Canyon	Tree Trim - Clear S/W
bca6cbed-7934-4cac-a285-415820eea641	SRID=4326;POINT(-118.764742054 34.1071778344)	34.10718	-118.765	2020-06-16	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
cc2819bb-0e93-4235-9af7-2f4d6705a696	SRID=4326;POINT(-119.136609212 34.4274988435)	34.4275	-119.137	2020-06-24	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
d7abbbd8-0138-4f70-b82a-4e9e4bc0a889	SRID=4326;POINT(-119.170689024 34.4127939445)	34.41279	-119.171	2020-06-15	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
69009ff8-17a6-444d-a6ac-e07bd3efe386	SRID=4326;POINT(-118.888368756 34.0659017427)	34.0659	-118.888	2020-06-29	MAGUIRE_10934	Decker Canyon	Not Routine Top/Heavy Trim
3640aca0-3576-4cb8-8e5d-cc846f6018ee	SRID=4326;POINT(-119.152310863 34.3494776159)	34.34948	-119.152	2020-03-31	MIDDLE ROAD_11840	Wheeler Canyon	Not Routine Top/Heavy Trim
6e3b2c27-0ac8-4d00-b3f3-ce623b0f0381	SRID=4326;POINT(-118.795889877 34.1270542599)	34.12705	-118.796	2020-06-10	MULHOLLAND_12350	Triunfo Canyon	Remove Tree(s)
f2e6c4ca-ce85-4315-b44d-7c38420ad03e	SRID=4326;POINT(-119.15894933 34.4364748952)	34.43647	-119.159	2020-07-02	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
c6720e7c-d987-4330-a4af-9b5b33aec95a	SRID=4326;POINT(-118.473071605 35.6322241249)	35.63222	-118.473	2020-07-06	TUNGSTEN_18300	Kern River Canyon Rd.	Routine Tree Trim
4b835033-deec-450f-9636-d17c58ddb682	SRID=4326;POINT(-118.491003011 35.6009243802)	35.60092	-118.491	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Routine Tree Trim
268987bb-4586-450b-80f2-4355ced7a4b3	SRID=4326;POINT(-118.487790814 35.6068769563)	35.60688	-118.488	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Routine Tree Trim
c9e1b134-b4a0-479c-93a1-db94a8b282e6	SRID=4326;POINT(-119.166192301 34.4135775446)	34.41358	-119.166	2020-07-02	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
9a97533e-7f5f-4c62-9e90-4d53f5497217	SRID=4326;POINT(-118.640004918 34.1383174734)	34.13832	-118.64	2020-07-01	PARADISE_13658	Old Topanga Canyon	Not Routine Top/Heavy Trim
fa55af9f-a7c5-4510-81c8-cf34890e3ece	SRID=4326;POINT(-118.855146244 34.1305439767)	34.13054	-118.855	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Remove Tree(s)
f81af140-d4e5-4ec8-a06a-e328a822e0f8	SRID=4326;POINT(-118.672847226 34.098899239)	34.0989	-118.673	2020-06-29	PLATEAU_14190	Piuma Canyon	Not Routine Top/Heavy Trim
666daf12-4e7c-48c8-b125-31457f633ce3	SRID=4326;POINT(-119.823077358 34.5436880973)	34.54369	-119.823	2020-05-21	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
30a19c38-8604-4279-adf7-26bce2017edf	SRID=4326;POINT(-118.805390261 34.1198293055)	34.11983	-118.805	2020-06-11	TRIUNFO_18164	Triunfo Canyon	Remove Overhang
d428a9a1-05f3-48dd-accf-f63ae7967384	SRID=4326;POINT(-118.766176365 34.0279502618)	34.02795	-118.766	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
e96f2041-249d-4cf2-8a10-ba3c07ea19c9	SRID=4326;POINT(-118.765188642 34.0293084551)	34.02931	-118.765	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
287c545b-9f64-4432-af0a-bb241ba9e239	SRID=4326;POINT(-118.765103146 34.0293473556)	34.02935	-118.765	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
299bc4cb-dd6b-4a94-8c65-2ec76a4b48d6	SRID=4326;POINT(-118.76535628 34.0291956436)	34.0292	-118.765	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
6a8327fc-37e9-43b8-b584-f87436928e88	SRID=4326;POINT(-118.763949126 34.0283312139)	34.02833	-118.764	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
96ba97d2-8cac-4435-b1e4-2cb6d421a940	SRID=4326;POINT(-118.765027374 34.0293890346)	34.02939	-118.765	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim

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bb670dbe-a355-4ec2-8b45-63b22e684c92	SRID=4326;POINT(-119.165666252 34.4128467748)	34.41285	-119.166	2020-07-02	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
5cf80d7b-868e-4eea-84e3-f632d987edbf	SRID=4326;POINT(-118.755734526 34.1433584442)	34.14336	-118.756	2020-06-15	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
18ceed7a-520f-489d-a273-ffc136aa30eb	SRID=4326;POINT(-118.769891481 34.0265354283)	34.02654	-118.77	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
fadb1e66-57e4-45f3-8f78-7d54e316e239	SRID=4326;POINT(-118.759131879 34.0297424722)	34.02974	-118.759	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
4c2569ff-7fdf-4464-b6b6-dfe829b2e3af	SRID=4326;POINT(-118.758005016 34.030162872)	34.03016	-118.758	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
6cd1a40d-ec31-43a3-a5fb-8ea861f98425	SRID=4326;POINT(-118.758694343 34.0299322498)	34.02993	-118.759	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
3d022585-bfdd-4293-a007-6710dbb457de	SRID=4326;POINT(-118.624589257 34.1117348804)	34.11173	-118.625	2020-07-08	PARADISE_13658	Topanga Canyon	Routine Tree Trim
5f91f95a-d944-4f3f-afc6-678b76a95cb3	SRID=4326;POINT(-118.764405772 34.0260788203)	34.02608	-118.764	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
62b5c8fa-d08f-4698-adf8-4b808ba1bff4	SRID=4326;POINT(-118.483081358 35.6116950419)	35.6117	-118.483	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Routine Tree Trim
4e42b41d-41a2-40ca-9f95-f245f112024a	SRID=4326;POINT(-118.489955776 35.6009159983)	35.60092	-118.49	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Routine Tree Trim
0b225999-d5e9-4527-85ef-b3d4b0dd0c65	SRID=4326;POINT(-118.489891822 35.6010747096)	35.60107	-118.49	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Routine Tree Trim
d3406a4c-eab9-424b-8804-573875e5fa25	SRID=4326;POINT(-119.91807919 34.4568262397)	34.45683	-119.918	2020-06-29	BIDDER_1610	Dos Pueblos Canyon	Not Routine Top/Heavy Trim
2099088b-eeb8-40ae-a1de-9738fea76c5a	SRID=4326;POINT(-118.197274134 34.199860766)	34.19986	-118.197	2020-07-22	RAVINE_14726	Flint Canyon/Chevy Chase Dr.	Remove Overhang
6451a27c-d9d0-41fa-8e65-b89d1e9f449d	SRID=4326;POINT(-118.203101903 34.1929623484)	34.19296	-118.203	2020-07-27	LANE_10050	Flint Canyon/Chevy Chase Dr.	Not Routine Top/Heavy Trim
0de83595-a85c-47c6-a297-4d25bf319244	SRID=4326;POINT(-118.18425402 34.1865728498)	34.18657	-118.184	2020-07-16	BERKSHIRE_1540	Flint Canyon/Chevy Chase Dr.	Not Routine Top/Heavy Trim
78011e7c-b764-4fa1-8b2a-90f741c6a0fb	SRID=4326;POINT(-118.376864791 34.3075329666)	34.30753	-118.377	2020-06-29	LOPEZ_10705	Lopez Canyon	Remove Tree(s)
87068159-63f0-41ce-8ab3-432fc04fdefe	SRID=4326;POINT(-118.525943561 35.5027644569)	35.50276	-118.526	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Remove Tree(s)
55a3df00-1618-46d6-b56c-d94b7c8a34d6	SRID=4326;POINT(-118.49973008 35.5872162385)	35.58722	-118.5	2020-07-13	ERSKINE_6040	Kern River Canyon Rd.	Remove Tree(s)
bb864beb-6c8a-440f-9001-1625d51273aa	SRID=4326;POINT(-119.165188819 34.4125914741)	34.41259	-119.165	2020-07-02	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
d1e96f7a-3fb9-41e6-8f07-f236055f4cdd	SRID=4326;POINT(-119.189536907 34.4141902024)	34.41419	-119.19	2020-06-24	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
45ee9b3a-4cca-4506-9481-f04092991101	SRID=4326;POINT(-118.525953954 35.5027605174)	35.50276	-118.526	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
50d22bfb-7dee-4e5b-987a-8104f56a0076	SRID=4326;POINT(-118.51796533 35.5163554615)	35.51636	-118.518	2020-07-15	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
d859fd78-2128-4b23-83a7-ee4623533a53	SRID=4326;POINT(-118.513753424 35.5120372307)	35.51204	-118.514	2020-07-15	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
eb4c4704-d5d0-4ad7-bff2-07b9e7bd836d	SRID=4326;POINT(-118.521123799 35.5028061569)	35.50281	-118.521	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
afa67925-920d-4072-a0f0-9f04ffc643ae	SRID=4326;POINT(-118.530189498 35.487253326)	35.48725	-118.53	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
de1158ae-1681-4a54-abf8-c444e7c01340	SRID=4326;POINT(-118.498109691 35.5914167455)	35.59142	-118.498	2020-07-07	ERSKINE_6040	Kern River Canyon Rd.	Remove Tree(s)
d9b64dcb-e738-4d05-bf38-aa048b532605	SRID=4326;POINT(-118.679397192 35.2088643764)	35.20886	-118.679	2020-07-23	CUDDEBACK_4495	Deer Trail Dr, Paramaount Dr	Routine Tree Trim
0f2251f0-7237-4893-8d78-7b50f6a2e36f	SRID=4326;POINT(-118.529147459 35.4577733763)	35.45777	-118.529	2020-07-14	FLYING D_6585	Caliente Bodfish Rd	Remove Tree(s)

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99d61e62-d245-4d7b-9fee-9d6a12de5cec	SRID=4326;POINT(-118.508102596 35.5079034856)	35.5079	-118.508	2020-07-15	FLYING D_6585	Caliente Bodfish Rd	Remove Tree(s)
1611d60f-db87-4057-8efb-5a012ef1f8ff	SRID=4326;POINT(-118.530334002 35.4872470815)	35.48725	-118.53	2020-07-16	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
504c4c75-12b7-425c-9a5c-f416d23e7e44	SRID=4326;POINT(-119.057536013 34.3852709045)	34.38527	-119.058	2020-07-13	CASTRO_4632	Koenigstein Rd. Area	Not Routine Top/Heavy Trim
c6224e3f-5483-414f-bd6a-f01848530af0	SRID=4326;POINT(-119.089047275 34.4261083389)	34.42611	-119.089	2020-07-16	CASTRO_4632	Koenigstein Rd. Area	Not Routine Top/Heavy Trim
60371d4e-369f-4497-a56b-a7282a9f31af	SRID=4326;POINT(-118.511252347 35.5127263069)	35.51273	-118.511	2020-07-15	FLYING D_6585	Caliente Bodfish Rd	Remove Tree(s)
01c3a305-6672-4627-99dd-489a50bb4c9b	SRID=4326;POINT(-118.511784095 35.5124303)	35.51243	-118.512	2020-07-15	FLYING D_6585	Caliente Bodfish Rd	Remove Tree(s)
e559c11c-15a8-4e80-82ec-b9eb0b406d38	SRID=4326;POINT(-118.504120605 35.5735005113)	35.5735	-118.504	2020-07-14	FLYING D_6585	Bodfish Cyn Rd	Routine Tree Trim
ee583630-6b29-481b-a803-1f3f5d9eaf1a	SRID=4326;POINT(-118.503669324 35.5755949812)	35.57559	-118.504	2020-07-14	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
a3e0f058-bc27-4531-9306-31d55763fcf7	SRID=4326;POINT(-119.058729932 34.3850586833)	34.38506	-119.059	2020-07-13	CASTRO_4632	Koenigstein Rd. Area	Not Routine Top/Heavy Trim
fafcaf61-e454-49c9-bad2-28a34527ae55	SRID=4326;POINT(-118.504236946 35.5749633629)	35.57496	-118.504	2020-07-14	FLYING D_6585	Caliente Bodfish Rd	Routine Tree Trim
8179ae9a-74fe-46a3-b53d-40c0bcc5f5ba	SRID=4326;POINT(-118.503880128 35.5752739543)	35.57527	-118.504	2020-07-14	FLYING D_6585	Bodfish Cyn Rd	Routine Tree Trim
1ebe91b6-8703-43f4-8404-3d4d5d008dfd	SRID=4326;POINT(-118.492531115 35.5948553793)	35.59486	-118.493	2020-07-09	ERSKINE_6040	Kern River Canyon Rd.	Remove Tree(s)
2be053dd-df9f-43fb-8758-d8e86910411f	SRID=4326;POINT(-118.89318198 34.1427882074)	34.14279	-118.893	2020-06-18	LA MANCHA_10034	Carlisle Canyon	Remove Overhang
202f3514-7ae2-44ed-9b5a-03ae4c8d4ade	SRID=4326;POINT(-118.921765611 34.1556937625)	34.15569	-118.922	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
f71924ad-804c-4172-bd05-28edead94e95	SRID=4326;POINT(-118.895128593 34.1428606319)	34.14286	-118.895	2020-06-18	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
14b4e0a0-e343-46e3-be14-73242e1b82f6	SRID=4326;POINT(-118.879172131 34.1201768147)	34.12018	-118.879	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Remove Overhang
67958c6c-319c-4ad3-a21a-0cc630ca9c4a	SRID=4326;POINT(-118.876021542 34.1233631738)	34.12336	-118.876	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
03eac9f9-b24a-4106-8341-107794b76063	SRID=4326;POINT(-118.875894137 34.1247256666)	34.12473	-118.876	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Routine Tree Trim
11d93b55-f66a-4c77-adc3-36b99b4fc01b	SRID=4326;POINT(-118.879991211 34.1191639825)	34.11916	-118.88	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Remove Overhang
a9b6ca63-59d2-4db6-b9cf-4b1add0a64fa	SRID=4326;POINT(-118.895910792 34.1428634067)	34.14286	-118.896	2020-06-18	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
13666a8d-cd91-4544-863a-bd10eadb7818	SRID=4326;POINT(-118.398124399 35.6077511469)	35.60775	-118.398	2020-07-01	TUNGSTEN_18300	Bodfish Cyn Rd	Remove Tree(s)
e6436367-4f4b-40c4-99e3-a0c16cbf2ca9	SRID=4326;POINT(-118.871756159 34.039114977)	34.03911	-118.872	2020-07-01	GALAHAD_6924	Encinal Canyon	Tree Trim - Clear S/W
add10bcd-bd7e-4308-8781-dd60d98d1521	SRID=4326;POINT(-118.707128875 34.1050541271)	34.10505	-118.707	2020-06-29	PLATEAU_14190	Piuma Canyon	Not Routine Top/Heavy Trim
5a072281-b06a-4377-abbf-a06ae6c80ed8	SRID=4326;POINT(-118.884859085 34.0413861942)	34.04139	-118.885	2020-07-01	GALAHAD_6924	Encinal Canyon	Tree Trim - Clear S/W
0b5e69aa-35c0-4954-b4fe-6e1983bcca82	SRID=4326;POINT(-119.161283188 34.4181520401)	34.41815	-119.161	2020-06-30	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
ef132f27-9125-40e9-bdd1-5acfe8dd297d	SRID=4326;POINT(-119.162200503 34.4185541877)	34.41855	-119.162	2020-06-30	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
8fdf0d38-f5c8-45b7-92a5-6c8fa2775c41	SRID=4326;POINT(-118.770055175 34.0283884538)	34.02839	-118.77	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
0bf63770-6745-4c30-9e68-65ac5efc40f7	SRID=4326;POINT(-118.693366796 34.1107830177)	34.11078	-118.693	2020-06-29	PLATEAU_14190	Piuma Canyon	Remove Overhang

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5ac1ef71-d619-468c-a9c1-ab1366e7601a	SRID=4326;POINT(-118.697154745 34.1093778279)	34.10938	-118.697	2020-06-29	PLATEAU_14190	Piuma Canyon	Remove Overhang
8072d9e1-4b9b-4f48-8e13-94e1dcaf9bed	SRID=4326;POINT(-118.905977793 34.0428519652)	34.04285	-118.906	2020-07-06	MAGUIRE_10934	Decker Canyon	Not Routine Top/Heavy Trim
953d1888-0e74-450a-acf8-0a065a9248b1	SRID=4326;POINT(-118.914966546 34.044639138)	34.04464	-118.915	2020-06-30	GALAHAD_6924	Decker Canyon	Tree Trim - Clear S/W
2e841634-5890-4e47-9084-ff9f015af4a4	SRID=4326;POINT(-118.89886491 34.0419862854)	34.04199	-118.899	2020-06-30	GALAHAD_6924	Decker Canyon	Tree Trim - Clear S/W
8398c8ce-b1f8-417e-8dbc-46cbddfb1b7a	SRID=4326;POINT(-118.885166198 34.0400409742)	34.04004	-118.885	2020-07-01	GALAHAD_6924	Encinal Canyon	Tree Trim - Clear S/W
bc6144dd-fa50-4816-a58e-8bda239bea39	SRID=4326;POINT(-118.68096225 34.0448619416)	34.04486	-118.681	2020-06-24	SERRA_16150	Tuna Canyon	Not Routine Top/Heavy Trim
1d3b2003-a1e7-4d04-8270-4c0215adb6ac	SRID=4326;POINT(-118.623555601 34.0427994579)	34.0428	-118.624	2020-06-23	TUNA_18290	Big Rock Canyon	Tree Trim - Clear S/W
df60d5de-1543-4738-90fd-7b2cdc8f8fc6	SRID=4326;POINT(-118.622050546 34.0448069353)	34.04481	-118.622	2020-06-23	TUNA_18290	Big Rock Canyon	Remove Overhang
9a762462-c694-4868-8cb4-0acdcd1966f6	SRID=4326;POINT(-118.889243491 34.0400876488)	34.04009	-118.889	2020-06-30	GALAHAD_6924	Decker Canyon	Tree Trim - Clear S/W
8ef05eda-edea-4840-9141-d3ec4dd25fdc	SRID=4326;POINT(-117.747807652 34.4689011036)	34.4689	-117.748	2020-06-05	DEALER_4726	Llano	Tree Trim - Clear S/W
580c9d01-5ff6-4484-8868-2dbb966f780a	SRID=4326;POINT(-117.733358592 34.4838437511)	34.48384	-117.733	2020-06-05	DEALER_4726	Llano	Tree Trim - Clear S/W
d0883b58-a524-48c8-a1ed-d5e7be145ff9	SRID=4326;POINT(-117.605344802 34.40543195)	34.40543	-117.605	2020-06-08	DEALER_4726	Pinon hills	Tree Trim - Clear S/W
f57d050c-2880-43e5-a5df-dbb216f552b4	SRID=4326;POINT(-118.912252821 34.1447688965)	34.14477	-118.912	2020-06-18	LA MANCHA_10034	Carlisle Canyon	Remove Tree(s)
2fa906f7-27ad-4ee3-9136-3000dc4b067b	SRID=4326;POINT(-118.623355776 34.0426933319)	34.04269	-118.623	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
8d45cfcb-509c-4abf-9de1-5b176041985d	SRID=4326;POINT(-118.623061404 34.0433125832)	34.04331	-118.623	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
0ede7db8-5865-4f5b-9b28-4bef3ea03b24	SRID=4326;POINT(-118.75411883 34.1103982723)	34.1104	-118.754	2020-06-16	TRIUNFO_18164	Triunfo Canyon	Remove Overhang
4b24a9c9-50a5-46e0-a9c6-b942ed6c2dda	SRID=4326;POINT(-118.698163256 34.108903689)	34.1089	-118.698	2020-06-29	PLATEAU_14190	Piuma Canyon	Not Routine Top/Heavy Trim
dbd20c60-9942-423b-ba0c-340b2b0e6a50	SRID=4326;POINT(-118.892225772 34.1461546297)	34.14615	-118.892	2020-06-18	LA MANCHA_10034	Carlisle Canyon	Remove Overhang
74316bb9-7824-4b81-a7a8-fd7042b13fe1	SRID=4326;POINT(-118.619650975 34.0411717161)	34.04117	-118.62	2020-06-23	TUNA_18290	Big Rock Canyon	Remove Tree(s)
839371ec-c80c-4a62-b41d-d9fb0ba307d5	SRID=4326;POINT(-118.619933277 34.0410383616)	34.04104	-118.62	2020-06-23	TUNA_18290	Big Rock Canyon	Remove Tree(s)
c8f90cca-efa5-4b6d-9111-38da0695714f	SRID=4326;POINT(-118.619661368 34.0446585847)	34.04466	-118.62	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
44b7a16d-c259-48a3-993b-cb6415deec4d	SRID=4326;POINT(-118.622163199 34.0447294263)	34.04473	-118.622	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
728dac56-bb2c-435f-96b5-e1d4bd4aa436	SRID=4326;POINT(-118.644912355 34.1320115353)	34.13201	-118.645	2020-07-01	PARADISE_13658	Old Topanga Canyon	Not Routine Top/Heavy Trim
78d3148a-3e7c-4998-a68c-ae52136d3926	SRID=4326;POINT(-118.642495349 34.1296436691)	34.12964	-118.642	2020-07-01	PARADISE_13658	Old Topanga Canyon	Not Routine Top/Heavy Trim
6252466b-152e-468b-b6a7-01834cf33f78	SRID=4326;POINT(-118.633565269 34.117879675)	34.11788	-118.634	2020-07-08	PARADISE_13658	Topanga Canyon	Not Routine Top/Heavy Trim
fddc1c3d-4942-460f-92bd-304f47a356dd	SRID=4326;POINT(-118.621863462 34.0450011241)	34.045	-118.622	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
f5021f60-81de-4b08-9321-35f88c85d9a7	SRID=4326;POINT(-118.61954134 34.0397117504)	34.03971	-118.62	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
13f8dd21-2ead-4091-829f-e311d8ae0887	SRID=4326;POINT(-117.274163738 34.2644055309)	34.26441	-117.274	2020-07-08	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim

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1288e8e2-6a65-4da0-b9bb-09fac6a7d972	SRID=4326;POINT(-117.274261303 34.264471755)	34.26447	-117.274	2020-07-08	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
d54592b1-ce9a-492b-b5e1-3985addf20ca	SRID=4326;POINT(-117.27433037 34.2642675408)	34.26427	-117.274	2020-07-08	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
a90715eb-df51-472a-9bee-3019cb4fac84	SRID=4326;POINT(-117.274253927 34.2642143397)	34.26421	-117.274	2020-07-08	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
ac0014d7-a5a0-49cc-b2ca-5c88d6d52bf3	SRID=4326;POINT(-118.715399802 34.3304385534)	34.33044	-118.715	2020-06-09	TAPO_17548	Tapo Canyon & Pepper Tree	Tree Trim - Clear S/W
14f6ac50-e93a-49d1-8cbb-c3a7376338aa	SRID=4326;POINT(-118.718288206 34.2990286262)	34.29903	-118.718	2020-06-10	TAPO_17548	Tapo Canyon & Pepper Tree	Not Routine Top/Heavy Trim
887ead22-f299-4bdd-8528-9cfa69ca0fd8	SRID=4326;POINT(-119.136160277 34.4276398838)	34.42764	-119.136	2020-06-24	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
f4a3b07c-737f-4bc1-87c9-e2f6c439e031	SRID=4326;POINT(-119.168520793 34.4303182223)	34.43032	-119.169	2020-06-23	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
5f550c1a-283c-460d-8f75-d2d36c311b9f	SRID=4326;POINT(-118.749948665 34.1213636642)	34.12136	-118.75	2020-06-15	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
4c274a3b-af79-49c9-bea0-b289abc259e5	SRID=4326;POINT(-118.762580529 34.1085611303)	34.10856	-118.763	2020-06-15	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
87102bb8-3d88-4dd0-830e-58573ec474b3	SRID=4326;POINT(-118.795033917 34.1268594265)	34.12686	-118.795	2020-06-15	TRIUNFO_18164	Triunfo Canyon	Remove Tree(s)
b376e94a-cd02-4bb1-aee5-bb30a98812fb	SRID=4326;POINT(-118.797783181 34.1289068196)	34.12891	-118.798	2020-06-15	TRIUNFO_18164	Triunfo Canyon	Remove Overhang
10d43e2c-3ed7-4d03-926f-a06eeeca2703	SRID=4326;POINT(-118.62071313 34.0401637729)	34.04016	-118.621	2020-06-23	TUNA_18290	Big Rock Canyon	Routine Tree Trim
f740323d-8297-4e71-9414-e67ccb825eb6	SRID=4326;POINT(-118.85361705 34.1433687112)	34.14337	-118.854	2020-06-18	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
fbd4b720-8c97-475c-b69d-db0be8dfa606	SRID=4326;POINT(-118.857313134 34.1433440149)	34.14334	-118.857	2020-06-18	LA MANCHA_10034	Carlisle Canyon	Routine Tree Trim
efd615e7-505b-4972-a108-31fbac39f2ac	SRID=4326;POINT(-118.869958073 34.1266332305)	34.12663	-118.87	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
b7831448-5911-460f-bfaf-c0087020e10f	SRID=4326;POINT(-118.889246508 34.119736044)	34.11974	-118.889	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Remove Overhang
40e1430b-2256-45bf-bdf0-59b03821f17e	SRID=4326;POINT(-119.813115299 34.5131936265)	34.51319	-119.813	2020-04-07	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
1b2cbae1-a91e-4561-b562-5551ba99759c	SRID=4326;POINT(-117.717135921 33.7678635091)	33.76786	-117.717	2020-07-09	TAIWAN_17487	Irvine Park/Peters Canyon, Blue Diamond Haul Rd.	Not Routine Top/Heavy Trim
3d441cfc-8016-4d2f-990c-b1feb56cc12b	SRID=4326;POINT(-117.4180733 33.64642145)	33.64642	-117.418	2020-06-04	KLEVEN_9811	Ortega Hwy including Main Divide Rd	Tree Trim - Clear S/W
85c90ae1-c08e-41be-8d5a-385b5c41614c	SRID=4326;POINT(-117.284946889 34.2708777888)	34.27088	-117.285	2020-07-14	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
0222a085-0d6d-4fef-a51e-1ac575d01cc2	SRID=4326;POINT(-117.28509441 34.2710479078)	34.27105	-117.285	2020-07-09	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
82ffb065-b2cb-4ea4-8d58-3dae1d4e7496	SRID=4326;POINT(-117.284971029 34.2709844595)	34.27098	-117.285	2020-07-09	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
574bb38b-b68f-4e63-a515-2627f9f3012f	SRID=4326;POINT(-117.285050154 34.2709949881)	34.27099	-117.285	2020-07-09	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
c3dbfa5e-6a29-4b8e-bdb3-418c9633244e	SRID=4326;POINT(-117.285034396 34.2711839473)	34.27118	-117.285	2020-07-09	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
b269d15b-cf5c-4e93-9e1a-6dc995a258f0	SRID=4326;POINT(-117.285240255 34.2723559284)	34.27236	-117.285	2020-07-13	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
b2f7304a-9c60-4a13-8be0-de827706ca98	SRID=4326;POINT(-117.284898609 34.2705658107)	34.27057	-117.285	2020-07-07	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
11863954-6639-4f15-9fe4-cc3626ddb98d	SRID=4326;POINT(-117.285385765 34.2720409081)	34.27204	-117.285	2020-07-09	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
e0ffa8f5-4eb0-49b5-84a1-6c594d48ca94	SRID=4326;POINT(-117.285456173 34.2722988536)	34.2723	-117.285	2020-07-09	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim

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8e11c836-75b3-4b25-ae0a-874f7baa2ea1	SRID=4326;POINT(-117.285298929 34.2717344757)	34.27173	-117.285	2020-07-09	MORITZ_12190	Crestline	Not Routine Top/Heavy Trim
0c1e60cf-11c1-4795-b932-01900a51bb9b	SRID=4326;POINT(-118.395405561 34.6599012517)	34.6599	-118.395	2020-06-22	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
e90def14-c105-4d03-b1c6-d9bb891226f1	SRID=4326;POINT(-118.454629071 34.6765706778)	34.67657	-118.455	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
5e770fd2-9ab0-4c69-8964-9d4028115759	SRID=4326;POINT(-118.453045227 34.6765770194)	34.67658	-118.453	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
6f5da9f3-a436-487c-b8bc-613a95f18c4f	SRID=4326;POINT(-118.455460891 34.6723351839)	34.67234	-118.455	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
2ab668cb-4f42-4703-95a7-70c5a043d7db	SRID=4326;POINT(-118.912258185 34.1443751487)	34.14438	-118.912	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Remove Overhang
f0604766-bc55-4642-b1e2-3522837615f2	SRID=4326;POINT(-118.907907978 34.1427213327)	34.14272	-118.908	2020-06-18	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
301d55ed-81df-4814-9a2a-a4bbe74623dc	SRID=4326;POINT(-118.455246985 34.6765588217)	34.67656	-118.455	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
0958759c-4796-499c-a002-f0c8e7beb998	SRID=4326;POINT(-118.913937248 34.1422487682)	34.14225	-118.914	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Remove Overhang
7e7f6c75-354e-4761-963f-d68e98e9799e	SRID=4326;POINT(-118.912343681 34.1449739553)	34.14497	-118.912	2020-06-18	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
83b57e46-ccf5-4649-88f4-88d86ae22621	SRID=4326;POINT(-118.601389825 34.1245813416)	34.12458	-118.601	2020-06-24	SYLVIA_17440	Red Rock Canyon	Remove Tree(s)
dbcc9702-7f1d-4e42-b366-ed6adc269fb9	SRID=4326;POINT(-118.60243924 34.1248833135)	34.12488	-118.602	2020-06-22	SYLVIA_17440	Red Rock Canyon	Routine Tree Trim
d0309c1a-cfcc-4238-9f5e-3fcd578e0eda	SRID=4326;POINT(-118.591003306 34.1213742115)	34.12137	-118.591	2020-06-24	SYLVIA_17440	Red Rock Canyon	Tree Trim - Clear S/W
5c9fed78-4464-4e74-b795-d1a2a0a96928	SRID=4326;POINT(-118.597127795 34.1355385117)	34.13554	-118.597	2020-06-22	SYLVIA_17440	Red Rock Canyon	Not Routine Top/Heavy Trim
1b188a8e-5366-41b9-933d-95375475b3e0	SRID=4326;POINT(-118.599691987 34.1246185331)	34.12462	-118.6	2020-06-24	SYLVIA_17440	Red Rock Canyon	Remove Overhang
a61fcccf-7d7e-40e3-820b-ae4ef9697690	SRID=4326;POINT(-117.717263326 33.7679827985)	33.76798	-117.717	2020-07-07	TAIWAN_17487	Irvine Park/Peters Canyon, Blue Diamond Haul Rd.	Not Routine Top/Heavy Trim
b832ab4e-3085-4524-a70b-fdf95a607397	SRID=4326;POINT(-117.601327859 34.407218085)	34.40722	-117.601	2020-06-08	DEALER_4726	Pinon hills	Not Routine Top/Heavy Trim
32c01930-6e97-4526-a457-38804054dc64	SRID=4326;POINT(-117.716696374 33.7676684092)	33.76767	-117.717	2020-07-07	TAIWAN_17487	Irvine Park/Peters Canyon, Blue Diamond Haul Rd.	Not Routine Top/Heavy Trim
3e907452-b695-4e9c-9eec-1e6d990e9a4b	SRID=4326;POINT(-117.717001475 33.7678504095)	33.76785	-117.717	2020-07-07	TAIWAN_17487	Irvine Park/Peters Canyon, Blue Diamond Haul Rd.	Not Routine Top/Heavy Trim
f4d22b53-57e5-4228-b842-dad45942b508	SRID=4326;POINT(-117.284961976 34.270388487)	34.27039	-117.285	2020-07-07	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
bf27af7b-d632-499f-afb1-8830182f122e	SRID=4326;POINT(-117.284987457 34.2702809843)	34.27028	-117.285	2020-07-07	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
b79883eb-6937-425d-b122-a7f490055e79	SRID=4326;POINT(-117.281882237 34.2674172574)	34.26742	-117.282	2020-07-07	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
f551d9ac-1808-437e-82ce-a7cf4f06ba02	SRID=4326;POINT(-117.282100105 34.2660038506)	34.266	-117.282	2020-07-07	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
89e0b346-af37-42f8-bf43-e0faf24a5a82	SRID=4326;POINT(-117.28211917 34.2659209135)	34.26592	-117.282	2020-07-07	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
26943bb5-d62b-45eb-b85d-cf8b9beb4807	SRID=4326;POINT(-117.282162849 34.2652219903)	34.26522	-117.282	2020-07-07	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
1095874f-5305-4467-abb9-fae3ca0d70f7	SRID=4326;POINT(-118.396839201 34.6588505279)	34.65885	-118.397	2020-06-22	PRONGHORN_14450	Lake Hughes Canyon	Tree Trim - Clear S/W
f0fa59ca-0729-4dba-b79f-e98692d1d0f9	SRID=4326;POINT(-118.397126868 34.6589533946)	34.65895	-118.397	2020-06-22	PRONGHORN_14450	Lake Hughes Canyon	Tree Trim - Clear S/W
b4123c21-003b-4488-8fd4-98979ee3ef93	SRID=4326;POINT(-118.454970047 34.6770206569)	34.67702	-118.455	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W

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c809c0e6-ef5a-4080-8b79-b4df7868560a	SRID=4326;POINT(-118.453873023 34.6771190896)	34.67712	-118.454	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
4bd8bf7a-0fb0-4bf6-8f3b-0cd08661252f	SRID=4326;POINT(-118.452484645 34.6779680316)	34.67797	-118.452	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
850668fb-04ed-48cf-8cf8-1299e9ee7be5	SRID=4326;POINT(-119.202381 34.4372823303)	34.43728	-119.202	2020-06-22	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
e4800682-a219-4787-b5a2-67d800817df2	SRID=4326;POINT(-119.171329066 34.412268129)	34.41227	-119.171	2020-06-15	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
573f3c99-9818-4e59-9672-5ca59369d9ee	SRID=4326;POINT(-119.194753468 34.4149447472)	34.41494	-119.195	2020-06-16	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
66d4fb39-dd57-49a9-83cb-509699c330ee	SRID=4326;POINT(-119.196536802 34.4140812243)	34.41408	-119.197	2020-06-16	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
3c9b5024-e4b6-486c-bc14-12fd403317c1	SRID=4326;POINT(-117.282626215 34.2639608732)	34.26396	-117.283	2020-07-07	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
e2b16221-9133-4846-a246-6fe6e8348466	SRID=4326;POINT(-117.282661875 34.2638142492)	34.26381	-117.283	2020-07-07	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
1a42f8ba-253c-4786-8ec0-fe9077221e80	SRID=4326;POINT(-117.282739557 34.2636049001)	34.2636	-117.283	2020-07-07	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
997d2840-2355-49e2-a45f-fe1b6da94eae	SRID=4326;POINT(-117.282347455 34.260800999)	34.2608	-117.282	2020-07-06	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
4e3d2133-ec3b-42c7-8bcd-c4aa2d9553c1	SRID=4326;POINT(-117.282366023 34.2607700277)	34.26077	-117.282	2020-07-06	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
584379d6-36e4-4244-a038-b3c81489c1e7	SRID=4326;POINT(-118.387462199 34.6681386302)	34.66814	-118.387	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
669043b1-4acc-4fbe-ba32-86a7889cb28f	SRID=4326;POINT(-118.402583152 34.6630850566)	34.66309	-118.403	2020-06-22	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
c7595b71-0bfe-41e5-b6f5-43f30b0c79b9	SRID=4326;POINT(-118.402676024 34.6629559969)	34.66296	-118.403	2020-06-22	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
cdcc8019-9419-47f0-a3ef-acd940866424	SRID=4326;POINT(-118.402175792 34.6636798864)	34.66368	-118.402	2020-06-22	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
236349ba-fc33-4cc0-a479-93ba410fce32	SRID=4326;POINT(-117.281853838 34.2595073143)	34.25951	-117.282	2020-07-06	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
775700db-6534-4960-93cd-b674dd09f485	SRID=4326;POINT(-117.281727354 34.2593565813)	34.25936	-117.282	2020-07-06	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
0d75db60-757b-41c5-ab5e-8b86d7e49949	SRID=4326;POINT(-117.282008149 34.259623004)	34.25962	-117.282	2020-07-06	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
95dbace2-5290-41a2-ac97-dc566c97282c	SRID=4326;POINT(-117.281778452 34.2550141313)	34.25501	-117.282	2020-07-06	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
2d3c6271-d16c-45c1-88be-553bbcdfd31b	SRID=4326;POINT(-118.765092753 34.1058375453)	34.10584	-118.765	2020-06-16	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
60cb0146-bf34-45df-a34e-275e309514a4	SRID=4326;POINT(-118.755614161 34.1362275717)	34.13623	-118.756	2020-06-15	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
3a889588-e099-40f7-93d7-69dbc1fef094	SRID=4326;POINT(-118.479955159 34.6889216088)	34.68892	-118.48	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
1467121c-5a0b-48c2-b125-151409dfc78a	SRID=4326;POINT(-118.480097651 34.6890547632)	34.68905	-118.48	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
90663252-a0d9-4df2-8eda-8e1377e74259	SRID=4326;POINT(-118.912595138 34.142393618)	34.14239	-118.913	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Remove Overhang
efb4c82e-fdae-4cb4-8cb3-c57a20a3a23f	SRID=4326;POINT(-118.916456178 34.1434278158)	34.14343	-118.916	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
dbba1961-0474-4213-b58a-f243f204cf88	SRID=4326;POINT(-118.91400598 34.1432344076)	34.14323	-118.914	2020-06-17	LA MANCHA_10034	Carlisle Canyon	Not Routine Top/Heavy Trim
bafc6db4-75de-4684-b171-7981580b6cca	SRID=4326;POINT(-117.736093104 33.7144617597)	33.71446	-117.736	2020-06-24	BEIJING_1516	Sand Canyon	Not Routine Top/Heavy Trim
c7730a7f-bc9e-4fef-af3c-cb5c24a2b615	SRID=4326;POINT(-119.179276451 34.4129015413)	34.4129	-119.179	2020-06-29	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim

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ebef45d5-fc20-41fb-a812-00948be88b01	SRID=4326;POINT(-118.392028995 34.6608681265)	34.66087	-118.392	2020-06-22	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
ddb6f1bd-268b-4abf-a6b0-d246bba49f9c	SRID=4326;POINT(-116.909189808 34.0849249229)	34.08492	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
cb653eaa-afc4-4f4d-974a-3efb04720652	SRID=4326;POINT(-118.391800672 34.6613168121)	34.66132	-118.392	2020-06-22	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
c9328b23-dfe9-447d-849f-29d787246d8a	SRID=4326;POINT(-117.649962343 34.4260508156)	34.42605	-117.65	2020-06-09	DEALER_4726	Pinon hills	Tree Trim - Clear S/W
c3c3c597-31ff-40bd-97be-355f0e6f3681	SRID=4326;POINT(-118.421533965 34.3885886231)	34.38859	-118.422	2020-06-25	PYTHON_14547	Sand Canyon	Not Routine Top/Heavy Trim
b734667f-9656-43d6-afe7-1c3c7419e02d	SRID=4326;POINT(-118.389346786 34.6671122773)	34.66711	-118.389	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
b5912eac-54eb-4958-bcf1-632eab180838	SRID=4326;POINT(-116.9108475 34.08455581)	34.08456	-116.911	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
9130bc5e-5f11-4d5f-9f0c-95ef7b3feafe	SRID=4326;POINT(-118.37232884 34.3119531884)	34.31195	-118.372	2020-06-29	LOPEZ_10705	Lopez Canyon	Tree Trim - Clear S/W
8e359eb0-c63f-42c6-82f4-305649d4a1aa	SRID=4326;POINT(-118.395625502 34.6595898969)	34.65959	-118.396	2020-06-22	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
8c17e762-8bd1-4516-b67c-b82916d0a700	SRID=4326;POINT(-118.48052077 34.6892940546)	34.68929	-118.481	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
84ea3222-babf-4668-9158-853903f09e28	SRID=4326;POINT(-117.4213966 33.64788452)	33.64788	-117.421	2020-06-04	KLEVEN_9811	Ortega Hwy including Main Divide Rd	Tree Trim - Clear S/W
77fa9dff-90a4-401d-98c9-e6e109f63159	SRID=4326;POINT(-118.414226286 34.4193136715)	34.41931	-118.414	2020-06-29	PYTHON_14547	Sand Canyon	Not Routine Top/Heavy Trim
774542fe-5954-403e-9359-75003b0347ed	SRID=4326;POINT(-116.9088519 34.08525084)	34.08525	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
5dcbdbec-b42c-4c93-a009-ccdce2c08021	SRID=4326;POINT(-118.417565301 34.3826893513)	34.38269	-118.418	2020-06-25	PYTHON_14547	Sand Canyon	Tree Trim - Clear S/W
4e3d0a13-341d-46e0-bc97-495e1f4f2cb8	SRID=4326;POINT(-117.730567753 33.7190339967)	33.71903	-117.731	2020-06-25	BEIJING_1516	Rattlesnake Rd./Dam & Orchard Grove	Not Routine Top/Heavy Trim
47748084-c2e0-4541-9706-0f679710a42e	SRID=4326;POINT(-118.393892795 34.660653297)	34.66065	-118.394	2020-06-22	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
45dd4212-54bb-410f-8390-f9b02b505a6f	SRID=4326;POINT(-117.62099348 34.4218589708)	34.42186	-117.621	2020-06-09	DEALER_4726	Lone Pine and Canyon Areas	Tree Trim - Clear S/W
42b1231b-8839-4748-aa27-f86039aefd39	SRID=4326;POINT(-117.490824893 34.2530560471)	34.25306	-117.491	2020-06-09	CASMALIA_3099	Lytle Creek	Not Routine Top/Heavy Trim
41a160c8-832e-4d76-8c35-05c8381eaec7	SRID=4326;POINT(-118.372358009 34.3119980513)	34.312	-118.372	2020-06-29	LOPEZ_10705	Lopez Canyon	Tree Trim - Clear S/W
40f85ecc-db04-4635-b05b-3f26ab549b06	SRID=4326;POINT(-118.395933285 34.6618810439)	34.66188	-118.396	2020-06-22	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
2c7507ec-1902-4334-89c2-0ea37d31086f	SRID=4326;POINT(-117.490010675 34.2529596833)	34.25296	-117.49	2020-06-09	CASMALIA_3099	Lytle Creek	Not Routine Top/Heavy Trim
2c10195a-2a7d-41b3-878f-f81fd3632ab3	SRID=4326;POINT(-117.645729147 34.4351116394)	34.43511	-117.646	2020-06-09	DEALER_4726	Pinon hills	Tree Trim - Clear S/W
26f3fde8-eba7-46c8-a336-3a15cbcdff8c	SRID=4326;POINT(-117.748274356 34.4679723512)	34.46797	-117.748	2020-06-05	DEALER_4726	Llano	Tree Trim - Clear S/W
266e9a09-5f90-4728-b58b-c947ecdb3434	SRID=4326;POINT(-117.4195908 33.64672428)	33.64672	-117.42	2020-06-04	KLEVEN_9811	Ortega Hwy including Main Divide Rd	Tree Trim - Clear S/W
254c4e9a-cd78-417d-ba78-f43148a564f2	SRID=4326;POINT(-117.730635814 33.7190044362)	33.719	-117.731	2020-06-25	BEIJING_1516	Rattlesnake Rd./Dam & Orchard Grove	Not Routine Top/Heavy Trim
08382c42-abee-4a7f-8d5f-cb6a5cc44ce2	SRID=4326;POINT(-117.6510024 34.44040747)	34.44041	-117.651	2020-06-05	DEALER_4726	Pinon hills	Tree Trim - Clear S/W
39d5885b-ee1c-42cf-8617-2e0916b3a3cd	SRID=4326;POINT(-117.281843105 34.2550084095)	34.25501	-117.282	2020-07-06	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
674b8f76-6d45-4cf0-a3c3-9ccd3febcf1b	SRID=4326;POINT(-117.281651609 34.2551574948)	34.25516	-117.282	2020-07-06	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim

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d8edb5d8-98ac-4412-bd7c-49f4a925dde4	SRID=4326;POINT(-117.281000548 34.2569194023)	34.25692	-117.281	2020-07-06	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
eac21412-e49b-4946-affb-dd1a9e098bcf	SRID=4326;POINT(-117.281602726 34.255444508)	34.25544	-117.282	2020-07-06	SAWPIT_15954	Crestline	Not Routine Top/Heavy Trim
6a1602c5-3e42-45ae-a4e3-0720faa9764b	SRID=4326;POINT(-118.511548229 34.6991948186)	34.69919	-118.512	2020-06-22	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
168afb55-1047-4d02-a97d-876b164abe2a	SRID=4326;POINT(-118.890758604 34.0466490721)	34.04665	-118.891	2020-06-29	GALAHAD_6924	Decker Canyon	Not Routine Top/Heavy Trim
9782abd0-14e9-43a2-9876-14e23b16ccb0	SRID=4326;POINT(-118.89156159 34.0435081645)	34.04351	-118.892	2020-06-29	GALAHAD_6924	Decker Canyon	Not Routine Top/Heavy Trim
7154be6c-98a1-4ac3-a61d-4ff7f4d2085d	SRID=4326;POINT(-118.764928803 34.0270433055)	34.02704	-118.765	2020-06-25	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
b0f1bb8c-e100-443f-aef8-762c410d83a2	SRID=4326;POINT(-118.765260726 34.0266648485)	34.02666	-118.765	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
ca8bc596-1fe1-471b-af05-dd9c90a036ea	SRID=4326;POINT(-118.765360303 34.0268379608)	34.02684	-118.765	2020-06-24	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
0e53ac40-b5ba-45a6-b8a5-35031db900b3	SRID=4326;POINT(-118.766170666 34.0277407513)	34.02774	-118.766	2020-06-25	CUTHBERT_4526	Latigo Canyon	Routine Tree Trim
3e66acb5-e42a-49cc-a518-b67d3d77d12e	SRID=4326;POINT(-118.398921601 34.5639448164)	34.56394	-118.399	2020-06-10	BOUQUET_2035	Bouquet Canyon	Remove Tree(s)
c4e7d1ba-cdda-4d5a-b846-8c6ba855a50f	SRID=4326;POINT(-118.398799896 34.5642261595)	34.56423	-118.399	2020-06-10	BOUQUET_2035	Bouquet Canyon	Remove Tree(s)
b31bf3cb-14d8-4da6-a5d6-4152fdc80e3b	SRID=4326;POINT(-117.570121028 33.6612427702)	33.66124	-117.57	2020-07-01	RUSTIC_15586	Santiago Canyon	Not Routine Top/Heavy Trim
8672c147-9a96-460b-9c66-3c93a37d7167	SRID=4326;POINT(-117.570164073 33.6610094727)	33.66101	-117.57	2020-06-17	RUSTIC_15586	Santiago Canyon	Not Routine Top/Heavy Trim
574ede19-7d4c-4028-a788-79d34313186b	SRID=4326;POINT(-117.4208621 33.64765063)	33.64765	-117.421	2020-06-04	KLEVEN_9811	Ortega Hwy including Main Divide Rd	Remove Tree(s)
11ad367c-05ed-48eb-a7fc-52da8fc2d47f	SRID=4326;POINT(-118.376853727 34.6493630745)	34.64936	-118.377	2020-06-10	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
66140eb7-01f7-4fde-b375-3b8ddb9d37b1	SRID=4326;POINT(-118.39430552 34.6559351821)	34.65594	-118.394	2020-06-12	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
7f4c7c43-e4f9-4c82-99e5-1b7484048336	SRID=4326;POINT(-118.664649054 34.075566567)	34.07557	-118.665	2020-06-23	PLATEAU_14190	Big Rock Canyon	Routine Tree Trim
884eae33-0e20-4776-98ca-c919be6feac3	SRID=4326;POINT(-118.787356429 34.4213238089)	34.42132	-118.787	2020-06-16	BUCKHORN_2360	Piru Cyn	Remove Tree(s)
1ffa2267-4248-41b3-bcfc-65ad7b7e6f0e	SRID=4326;POINT(-118.786673136 34.4217140488)	34.42171	-118.787	2020-06-24	BUCKHORN_2360	Piru Cyn	Not Routine Top/Heavy Trim
848901f9-fa5f-4b28-a948-b74f6ceaacf6	SRID=4326;POINT(-118.547962904 34.482180027)	34.48218	-118.548	2020-06-17	ORION_13253	San Francisquito Canyon	Tree Trim - Clear S/W
728f097f-5732-4623-a56c-0af49f07336b	SRID=4326;POINT(-118.547970827 34.4821424614)	34.48214	-118.548	2020-06-17	ORION_13253	San Francisquito Canyon	Tree Trim - Clear S/W
3db3bb1f-b002-4b4e-b033-1bb267fe5a04	SRID=4326;POINT(-119.169711694 34.4131336069)	34.41313	-119.17	2020-06-17	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
8f802ab0-ae51-4d39-a0b4-e06bd405f8a5	SRID=4326;POINT(-119.134588838 34.4264244402)	34.42642	-119.135	2020-06-23	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
a2aa0c71-e775-4bf0-b893-c5893c5e708c	SRID=4326;POINT(-116.900401432 34.0831588582)	34.08316	-116.9	2020-06-05	CRUMP_4428	Forest Falls	Tree Trim - Clear S/W
1118bdf4-1d1b-451e-89e1-26f4cdf28e17	SRID=4326;POINT(-116.900367988 34.0832148493)	34.08321	-116.9	2020-06-05	CRUMP_4428	Forest Falls	Remove Overhang
4e67a5b5-361c-467c-9ae0-817dc8ba9e55	SRID=4326;POINT(-116.900335131 34.0829978837)	34.083	-116.9	2020-06-05	CRUMP_4428	Forest Falls	Remove Overhang
428aed9d-877d-430f-994f-e9bd0216b45b	SRID=4326;POINT(-116.909214235 34.0847769955)	34.08478	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
a1e3bdda-de9b-4f19-a4c8-1c05570ea5ef	SRID=4326;POINT(-117.459128872 34.2539932914)	34.25399	-117.459	2020-06-09	VERDEMONT_18674	Lytle Creek	Remove Tree(s)

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f0750735-4460-4166-9a9e-b2e998898d61	SRID=4326;POINT(-119.134357497 34.4255823306)	34.42558	-119.134	2020-06-23	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
a0a75a61-a808-4cb5-9895-b65b1c5e6040	SRID=4326;POINT(-118.416926935 34.4075461521)	34.40755	-118.417	2020-06-23	PYTHON_14547	Sand Canyon	Routine Tree Trim
d242ac32-de41-448e-9eb5-8704e0361955	SRID=4326;POINT(-118.399960957 34.392815335)	34.39282	-118.4	2020-06-23	PYTHON_14547	Sand Canyon	Routine Tree Trim
4b722666-90c0-42e8-b4f3-7ee78674bc45	SRID=4326;POINT(-118.408355936 34.390133582)	34.39013	-118.408	2020-06-23	PYTHON_14547	Sand Canyon	Routine Tree Trim
d473eabd-0ba9-4497-9d6d-b017a98af6b4	SRID=4326;POINT(-118.404355422 34.3877060137)	34.38771	-118.404	2020-06-23	PYTHON_14547	Sand Canyon	Tree Trim - Clear S/W
36d43e96-8f5a-482c-885b-ec0c5b298279	SRID=4326;POINT(-118.428408466 34.3958970453)	34.3959	-118.428	2020-06-23	PYTHON_14547	Sand Canyon	Tree Trim - Clear S/W
9209be08-5054-4e69-863c-ed90b97b696f	SRID=4326;POINT(-118.775353208 34.0456195251)	34.04562	-118.775	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
48dcb393-acd7-4aab-a62f-de646cb06b07	SRID=4326;POINT(-118.740634695 34.0612447368)	34.06124	-118.741	2020-06-25	MERLIN_11695	Tuna Canyon	Not Routine Top/Heavy Trim
179f201b-ff0e-4ec4-a6b7-192b68b1210a	SRID=4326;POINT(-118.87945544 34.0774830151)	34.07748	-118.879	2020-06-24	MAGUIRE_10934	Decker Canyon	Routine Tree Trim
cdee147c-79cb-422c-a246-8ebacbbf0f8b	SRID=4326;POINT(-118.876446672 34.0751219538)	34.07512	-118.876	2020-06-24	MAGUIRE_10934	Decker Canyon	Routine Tree Trim
8a10c6e2-c810-4a2e-87e0-9c8d62057dce	SRID=4326;POINT(-116.908249128 34.0858857851)	34.08589	-116.908	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
3f9da818-8961-425c-a4ff-0178a4056895	SRID=4326;POINT(-117.652852759 34.4406773437)	34.44068	-117.653	2020-06-05	DEALER_4726	Pinon Hills	Tree Trim - Clear S/W
7137ff29-9a47-4fc7-968b-b1fe7229aa32	SRID=4326;POINT(-117.603552416 34.4154326531)	34.41543	-117.604	2020-06-09	GAMBLER_6987	Pinon hills	Tree Trim - Clear S/W
a04226be-2556-45dd-95ed-e8a23154ea33	SRID=4326;POINT(-117.598819323 34.4046623816)	34.40466	-117.599	2020-06-08	DEALER_4726	Pinon hills	Tree Trim - Clear S/W
994b1910-2994-4135-a824-174c5ae84b13	SRID=4326;POINT(-117.590496093 34.4107481966)	34.41075	-117.59	2020-06-08	GAMBLER_6987	Pinon hills	Tree Trim - Clear S/W
526323fe-bb5d-48e1-ace0-89e9e966a3e0	SRID=4326;POINT(-117.584424242 34.4072523855)	34.40725	-117.584	2020-06-08	DEALER_4726	Pinon hills	Tree Trim - Clear S/W
e79aeca8-fcc9-4b1d-b3bd-378cc372aa2a	SRID=4326;POINT(-117.584552653 34.4072200214)	34.40722	-117.585	2020-06-08	DEALER_4726	Pinon hills	Tree Trim - Clear S/W
19ebd624-fbb6-4e43-a23e-4d501a461c50	SRID=4326;POINT(-116.909241922 34.0846979438)	34.0847	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
73f13beb-1744-4982-8789-de2957ae8d22	SRID=4326;POINT(-116.902082191 34.0824832575)	34.08248	-116.902	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
2ab281b3-4846-4b36-9279-391faa944457	SRID=4326;POINT(-116.901693849 34.0825648716)	34.08256	-116.902	2020-06-08	CRUMP_4428	Forest Falls	Tree Trim - Clear S/W
5d1d5fa4-cfe3-4a20-b162-754ae237fa60	SRID=4326;POINT(-118.289520331 34.6075441199)	34.60754	-118.29	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Routine Tree Trim
fc0f9811-3b45-4791-93ca-8a81ab41649f	SRID=4326;POINT(-118.298667669 34.6082477968)	34.60825	-118.299	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
4d61f0bc-cb73-48af-a1b8-81eb5affc1dd	SRID=4326;POINT(-118.298168778 34.6087268456)	34.60873	-118.298	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
c05118b6-259a-4875-9331-916278ad0ce0	SRID=4326;POINT(-118.294245042 34.6151700041)	34.61517	-118.294	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
61fa5fda-ad7d-42b5-a2c9-d6dbc3390a30	SRID=4326;POINT(-118.30812715 34.6138118776)	34.61381	-118.308	2020-06-10	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
6166c513-4578-4b0f-bd6d-cb5c6184a867	SRID=4326;POINT(-118.30802992 34.6137768342)	34.61378	-118.308	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
2063a8a1-9f3f-4d5e-be96-d830d4a0b276	SRID=4326;POINT(-117.295382841 34.2425450646)	34.24255	-117.295	2020-06-03	TWIN PEAKS_18375	Crestline	Not Routine Top/Heavy Trim
6d84b742-c5c5-47b5-a8ea-09e6e421aea1	SRID=4326;POINT(-117.295480864 34.2424451045)	34.24245	-117.295	2020-06-03	TWIN PEAKS_18375	Crestline	Not Routine Top/Heavy Trim

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b2e9993a-3c7e-44db-9be1-cbc4d48943f8	SRID=4326;POINT(-117.295543036 34.2421530344)	34.24215	-117.296	2020-06-03	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
9c72d685-8f29-4f52-9ec9-fdc2f91c0f97	SRID=4326;POINT(-117.295590326 34.2421220691)	34.24212	-117.296	2020-06-03	TWIN PEAKS_18375	Crestline	Not Routine Top/Heavy Trim
6e72a3e8-5727-4a75-8b7f-0c74ce21fce9	SRID=4326;POINT(-117.295597425 34.2421169559)	34.24212	-117.296	2020-06-03	TWIN PEAKS_18375	Crestline	Not Routine Top/Heavy Trim
c8cdb22f-678f-4ffd-85e3-0498c3f40aa4	SRID=4326;POINT(-117.29574278 34.2417269486)	34.24173	-117.296	2020-06-03	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
707972a5-209e-4fc6-afe4-48e64385dc43	SRID=4326;POINT(-117.295845087 34.2414994857)	34.2415	-117.296	2020-06-03	TWIN PEAKS_18375	Crestline	Not Routine Top/Heavy Trim
a87fa593-26f3-43ef-9bc6-d2a94ce32305	SRID=4326;POINT(-117.29596312 34.2414475312)	34.24145	-117.296	2020-06-03	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
bfaf99fe-17aa-41db-9a77-c0b23e8fd4ea	SRID=4326;POINT(-117.296044933 34.2412732785)	34.24127	-117.296	2020-06-03	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
03b20b23-7d0e-400f-9e82-ac0b232827a7	SRID=4326;POINT(-117.296151637 34.2406293914)	34.24063	-117.296	2020-06-03	SKYLAND_16480	Crestline	Not Routine Top/Heavy Trim
80d5c91e-1aac-460d-962c-f9675c6a5019	SRID=4326;POINT(-117.296355923 34.2403546142)	34.24035	-117.296	2020-06-03	SKYLAND_16480	Crestline	Not Routine Top/Heavy Trim
1421ad1c-9f8e-49a1-923c-3ec62a4ae736	SRID=4326;POINT(-117.296447208 34.2403029171)	34.2403	-117.296	2020-06-03	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
0176cd67-31b5-4c26-acce-fee1eedf84af	SRID=4326;POINT(-117.296457249 34.2403188536)	34.24032	-117.296	2020-06-03	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
4ef6afae-4473-4122-bbe9-2286f94862df	SRID=4326;POINT(-117.296406815 34.240140528)	34.24014	-117.296	2020-06-03	SKYLAND_16480	Crestline	Not Routine Top/Heavy Trim
625b1626-acac-4266-8c2f-52c07afce2a4	SRID=4326;POINT(-117.296560491 34.2400467481)	34.24005	-117.297	2020-06-03	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
dba24cb1-d777-404e-a71b-10b15310c747	SRID=4326;POINT(-117.296893074 34.2390460801)	34.23905	-117.297	2020-06-03	TWIN PEAKS_18375	Crestline	Not Routine Top/Heavy Trim
63f9f0ce-8fc2-473b-aae9-ce17624ae546	SRID=4326;POINT(-117.296878196 34.2389009357)	34.2389	-117.297	2020-06-03	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
e9ca18a2-ac25-4dbf-b862-f73c7e0e4486	SRID=4326;POINT(-117.29706683 34.2387947174)	34.23879	-117.297	2020-06-03	CRESTLINE_4360	Crestline	Not Routine Top/Heavy Trim
557a6b7f-b11b-47d6-ad42-e411d3fe69d5	SRID=4326;POINT(-118.765179925 34.0594034727)	34.0594	-118.765	2020-06-24	MAGUIRE_10934	Latigo Canyon	Routine Tree Trim
06273f4e-3d24-490e-8840-3d3c93f7f52f	SRID=4326;POINT(-117.49584577 34.2362490995)	34.23625	-117.496	2020-06-09	CASMALIA_3099	Lytle Creek	Not Routine Top/Heavy Trim
29edb294-f381-484d-918b-d8fb2d1d08f7	SRID=4326;POINT(-118.579180129 34.1174619308)	34.11746	-118.579	2020-06-23	SYLVIA_17440	Red Rock Canyon	Tree Trim - Clear S/W
df382792-3830-4f24-9760-33695124821a	SRID=4326;POINT(-116.901319185 34.0826095587)	34.08261	-116.901	2020-06-08	CRUMP_4428	Forest Falls	Tree Trim - Clear S/W
3cd45f05-e107-43bf-8d3d-066f55c71320	SRID=4326;POINT(-116.901434858 34.0825827125)	34.08258	-116.901	2020-06-08	CRUMP_4428	Forest Falls	Tree Trim - Clear S/W
85ea1a02-8fa7-443d-8771-0b1f491d5aed	SRID=4326;POINT(-116.901839533 34.0824963709)	34.0825	-116.902	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
ee2969e8-8864-4d40-8d78-81c4de44a03a	SRID=4326;POINT(-116.897763563 34.0820750362)	34.08208	-116.898	2020-06-03	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
10eac87d-48de-4eb7-a990-6d3dc90e2931	SRID=4326;POINT(-116.897789779 34.0822293799)	34.08223	-116.898	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
35f18f9e-f96c-459c-9a48-f53e76e6337e	SRID=4326;POINT(-116.897835139 34.0822669871)	34.08227	-116.898	2020-06-08	CRUMP_4428	Forest Falls	Tree Trim - Clear S/W
2ae47746-9b5f-4f69-8d3c-158d9bda070b	SRID=4326;POINT(-116.897985759 34.0822647631)	34.08226	-116.898	2020-06-08	CRUMP_4428	Forest Falls	Tree Trim - Clear S/W
62f8c72b-3de0-4de1-ba8e-74eb580f7a6a	SRID=4326;POINT(-116.898193488 34.0823061067)	34.08231	-116.898	2020-06-08	CRUMP_4428	Forest Falls	Tree Trim - Clear S/W
62140f57-3188-42df-83fa-c6732be936b1	SRID=4326;POINT(-116.906023122 34.0848322749)	34.08483	-116.906	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim

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279d3eef-87b9-4004-9224-18caba8a26f7	SRID=4326;POINT(-116.907164259 34.0855503252)	34.08555	-116.907	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
52913dca-c4bd-424c-9d2e-a97bf4a3b7b7	SRID=4326;POINT(-116.907396513 34.0855078485)	34.08551	-116.907	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
e3719e3a-cda6-4267-99eb-ba0647725729	SRID=4326;POINT(-116.907692194 34.085752294)	34.08575	-116.908	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
3929e765-2949-483c-b463-6acd6cf5d585	SRID=4326;POINT(-116.907853752 34.0858104733)	34.08581	-116.908	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
84fb19f0-fe29-47ba-89ab-bc2f2f5bb95e	SRID=4326;POINT(-116.909629517 34.08339107)	34.08339	-116.91	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
d7225420-7866-45dd-b8c8-2890c85dc487	SRID=4326;POINT(-116.909974307 34.0833402727)	34.08334	-116.91	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
c0b707e6-c8af-4cf8-922f-ad386ccb0d4f	SRID=4326;POINT(-116.910060222 34.0833914874)	34.08339	-116.91	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
1eba539c-e3e1-4f27-a4ea-255136cb6c4a	SRID=4326;POINT(-117.095481285 34.2083816069)	34.20838	-117.095	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
8bc6b7b6-a148-4fb6-909d-5031fd91ecba	SRID=4326;POINT(-117.095690556 34.2084117353)	34.20841	-117.096	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
b2c9799d-07a0-4594-81a9-c36faa404002	SRID=4326;POINT(-116.903888345 34.0828653554)	34.08287	-116.904	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
c5ed3c3c-de1e-43f7-b34a-49248dda9d6c	SRID=4326;POINT(-116.904032471 34.08293818)	34.08294	-116.904	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
c546b046-61f4-431f-b0da-b51656d328ee	SRID=4326;POINT(-116.908539395 34.0858394912)	34.08584	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
78813202-6e0d-486f-9fc7-2b58c26e298b	SRID=4326;POINT(-117.098654818 34.2084405814)	34.20844	-117.099	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
6b66595e-3799-421e-be65-73b63673cc1b	SRID=4326;POINT(-117.0991493 34.2084942871)	34.20849	-117.099	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
79f2088f-d0c7-4e7a-89fc-bc55f4125ac3	SRID=4326;POINT(-117.100203595 34.2083630142)	34.20836	-117.1	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
d20c1b8f-0326-4e82-93f8-5e350a9e113d	SRID=4326;POINT(-117.102394104 34.2098730884)	34.20987	-117.102	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
4efdb6be-50c2-412d-bcba-1634e264580f	SRID=4326;POINT(-117.10245327 34.2099421779)	34.20994	-117.102	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
3b678697-3154-4d9e-9097-4ba096aeb371	SRID=4326;POINT(-117.101837237 34.2102206055)	34.21022	-117.102	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
343fe750-62dd-4878-849f-fd9dc30b2595	SRID=4326;POINT(-117.101771415 34.2101605937)	34.21016	-117.102	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
c45ef4fe-9655-45dd-9fef-cde570b16d55	SRID=4326;POINT(-117.101669406 34.2103298273)	34.21033	-117.102	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
c6dca3c1-af7a-4d14-aea9-e16fd407ff5c	SRID=4326;POINT(-117.101569531 34.2102493994)	34.21025	-117.102	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
a372d68f-e4a2-474c-b105-81b324e21c50	SRID=4326;POINT(-117.101161368 34.2104815754)	34.21048	-117.101	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
bf142c3e-d0f5-4267-a778-db8760bbc1cb	SRID=4326;POINT(-117.10082742 34.2105347452)	34.21053	-117.101	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
da92eb85-d766-4939-9920-437784bea977	SRID=4326;POINT(-117.1006335 34.2106393619)	34.21064	-117.101	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
b8b5a065-3ebf-4f82-a823-6507792f0a57	SRID=4326;POINT(-117.098905235 34.2118007664)	34.2118	-117.099	2020-06-04	SNOW VALLEY_16595	Running Springs	Not Routine Top/Heavy Trim
4700d8fc-77b9-4d47-bc46-68b72b5a68ad	SRID=4326;POINT(-117.097635157 34.2140512733)	34.21405	-117.098	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
ce49043b-05a2-4e86-8061-ed836dc0a947	SRID=4326;POINT(-117.097727169 34.2146366833)	34.21464	-117.098	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
4aaef239-3957-4ecf-b1bb-80bdde89ce75	SRID=4326;POINT(-117.097544968 34.215602496)	34.2156	-117.098	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim

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aa230828-3a3f-4029-9e82-74af1b273e7d	SRID=4326;POINT(-117.097369194 34.2162778386)	34.21628	-117.097	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
33583a67-23da-40a4-a29f-8950f78ac91d	SRID=4326;POINT(-117.097445833 34.2188208427)	34.21882	-117.097	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
721fa960-f155-4bc8-942f-1e0e8e229083	SRID=4326;POINT(-117.098672837 34.2220779531)	34.22208	-117.099	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
f670d025-f9a7-44e2-99cb-4e5df57da367	SRID=4326;POINT(-117.097937576 34.2235098221)	34.22351	-117.098	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
c075e9bb-b9dd-43bd-8cf3-08a5178d701e	SRID=4326;POINT(-117.097562392 34.2238570444)	34.22386	-117.098	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
18841000-e31c-4352-9406-ba2b7a7445c0	SRID=4326;POINT(-117.096895538 34.2243459134)	34.22435	-117.097	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
233b6ac9-2840-4962-aedb-645d0ec65eff	SRID=4326;POINT(-117.096805603 34.2244872789)	34.22449	-117.097	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
02d2ebe7-dae6-4aac-a80d-feeec39ea93f	SRID=4326;POINT(-119.1557072 34.42563294)	34.42563	-119.156	2020-06-03	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
27dc8216-e484-4b25-9101-9cf9ea118bde	SRID=4326;POINT(-119.1669705 34.41406242)	34.41406	-119.167	2020-06-01	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
ff7bcf7b-e066-4833-82b5-7e358008a473	SRID=4326;POINT(-117.094585524 34.2258918017)	34.22589	-117.095	2020-06-04	TAGGERT_17475	Running Springs	Routine Tree Trim
a2ce5c00-5bb9-425c-b08e-cd78076bc938	SRID=4326;POINT(-117.094211476 34.2261802018)	34.22618	-117.094	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
8575463a-a16e-4741-a390-e3239fbc28d4	SRID=4326;POINT(-119.1629981 34.4160901)	34.41609	-119.163	2020-06-02	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
eacc615d-7c9a-4788-836b-f9bfa3fd127c	SRID=4326;POINT(-117.094197907 34.2274737408)	34.22747	-117.094	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
98f7a894-f267-46ac-a267-c5653be96e51	SRID=4326;POINT(-119.1634621 34.41579471)	34.41579	-119.163	2020-06-02	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
36d31159-5863-4045-aca3-5a691cca58fb	SRID=4326;POINT(-117.094758824 34.2275350042)	34.22754	-117.095	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
6297da59-b483-4387-a635-3c086c9a8628	SRID=4326;POINT(-117.095680833 34.2283774405)	34.22838	-117.096	2020-06-04	TAGGERT_17475	Running Springs	Not Routine Top/Heavy Trim
a68d00aa-5b87-4f2b-ba45-041f17a17a59	SRID=4326;POINT(-119.1636093 34.41544455)	34.41544	-119.164	2020-06-03	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
38fc9b91-4e52-411c-9bc5-fda7e6ce8890	SRID=4326;POINT(-119.1642906 34.41506506)	34.41507	-119.164	2020-06-02	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
5ce93a98-e474-4b6f-9ff7-d337dddeb6e6	SRID=4326;POINT(-119.1646064 34.41508055)	34.41508	-119.165	2020-06-01	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
0d52bee6-df42-46cf-a43d-ac636be96f6c	SRID=4326;POINT(-119.192042425 34.4148501529)	34.41485	-119.192	2020-06-16	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
02253482-7e56-40b5-8600-201a65727dbc	SRID=4326;POINT(-119.199736677 34.4126044743)	34.4126	-119.2	2020-06-15	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
e9fb8fc8-aad4-4d95-bc1d-5ea7c4b7a5e1	SRID=4326;POINT(-119.196300432 34.4123430877)	34.41234	-119.196	2020-06-15	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
2f28ac61-c017-422f-ac13-1a739d728d79	SRID=4326;POINT(-118.421635463 34.5537101743)	34.55371	-118.422	2020-06-11	BOUQUET_2035	Bouquet cyn	Tree Trim - Clear S/W
b0dbbd59-714b-4d40-910a-9cf8d5ad7ec7	SRID=4326;POINT(-118.455703631 34.4911626376)	34.49116	-118.456	2020-06-12	BOUQUET_2035	Bouquet Canyon	Routine Tree Trim
12012ee5-e3cb-4056-874d-80cec35008c8	SRID=4326;POINT(-118.454857729 34.4911844683)	34.49118	-118.455	2020-06-12	BOUQUET_2035	Bouquet Canyon	Routine Tree Trim
3a2f9ad3-d802-4ed4-a230-bff3629e8ae2	SRID=4326;POINT(-118.424035212 34.5527118193)	34.55271	-118.424	2020-06-11	BOUQUET_2035	Bouquet Canyon	Tree Trim - Clear S/W
b00ee227-5981-485f-ad9f-4e28b118dc97	SRID=4326;POINT(-118.466278911 34.479613626)	34.47961	-118.466	2020-06-12	BOUQUET_2035	Bouquet Canyon	Routine Tree Trim
a40f9ce9-b61c-4ce7-afef-96a07bd2267b	SRID=4326;POINT(-118.780863136 34.4237216394)	34.42372	-118.781	2020-06-16	BUCKHORN_2360	Piru Cyn	Routine Tree Trim

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d45245ca-2ebf-4f7a-94ff-a4ecbaa13ccf	SRID=4326;POINT(-118.780775294 34.4237183207)	34.42372	-118.781	2020-06-15	BUCKHORN_2360	Piru Cyn	Remove Tree(s)
f3eeb985-67d4-4b4e-8396-cdf32de49f2f	SRID=4326;POINT(-116.9110771 34.08455525)	34.08456	-116.911	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
9b8d016f-0652-440e-857a-49257480213f	SRID=4326;POINT(-116.910265759 34.0845148405)	34.08451	-116.91	2020-06-03	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
d3b193db-dffa-4542-9540-37d87d400538	SRID=4326;POINT(-116.909534198 34.0845533855)	34.08455	-116.91	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
f69d3c2e-0c50-49d4-bb44-980b2f3ca54d	SRID=4326;POINT(-116.909324666 34.0843119827)	34.08431	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
12ec7083-39e1-4aff-b753-aa8affe076dd	SRID=4326;POINT(-116.897598859 34.0813967726)	34.0814	-116.898	2020-06-05	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
680cc09e-6931-4626-8510-7ea2786f90b9	SRID=4326;POINT(-116.897671362 34.0814795439)	34.08148	-116.898	2020-06-03	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
bd7164ac-0b90-4dab-aa7d-359b96de3fd2	SRID=4326;POINT(-116.89930466 34.0824764455)	34.08248	-116.899	2020-06-05	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
bef5a73a-636e-47ce-96c5-7729cad6202c	SRID=4326;POINT(-116.908640984 34.085866287)	34.08587	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
26c17bf5-06ef-40d0-abc2-3922c7b4a5dc	SRID=4326;POINT(-116.914661815 34.0865417524)	34.08654	-116.915	2020-06-05	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
d8ea0a18-840f-4712-bc92-74904b44795f	SRID=4326;POINT(-116.367111057 33.7038709157)	33.70387	-116.367	2020-06-22	ACROBAT_50	Aliso Canyon Rd./Aliso Summit Trail	Remove Overhang
0d37cf12-119b-4411-8886-b171eceb87c1	SRID=4326;POINT(-118.7069837 34.3301276271)	34.33013	-118.707	2020-06-09	TAPO_17548	Tapo Canyon & Pepper Tree	Remove Overhang
c8311bd0-c8cd-48ed-8a38-f8136b22ea70	SRID=4326;POINT(-118.709052019 34.3258069338)	34.32581	-118.709	2020-06-08	TAPO_17548	Tapo Canyon & Pepper Tree	Tree Trim - Clear S/W
de5f6f55-914a-47ca-9025-db50f6057076	SRID=4326;POINT(-118.706888482 34.3241552931)	34.32416	-118.707	2020-06-08	TAPO_17548	Tapo Canyon & Pepper Tree	Not Routine Top/Heavy Trim
aa4be752-29df-4027-826e-2d7f50abe129	SRID=4326;POINT(-118.383258842 34.661513163)	34.66151	-118.383	2020-06-12	PRONGHORN_14450	Lake Hughes Canyon	Tree Trim - Clear S/W
8c01c02b-0a6e-4891-a71f-62ae8389c717	SRID=4326;POINT(-118.384089321 34.6619033815)	34.6619	-118.384	2020-06-12	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
f4e4b257-6f44-46eb-9cf1-23975e2eeb0c	SRID=4326;POINT(-116.915853722 34.0869072033)	34.08691	-116.916	2020-06-03	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
39f5589a-7e69-42ea-98b1-2372f61193d6	SRID=4326;POINT(-116.917021657 34.0874708025)	34.08747	-116.917	2020-06-03	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
a8986bb2-60e7-4075-a49e-01e7259229d8	SRID=4326;POINT(-118.375426792 34.6490547141)	34.64905	-118.375	2020-06-10	PRONGHORN_14450	Lake Hughes Canyon	Tree Trim - Clear S/W
93794a62-929f-4ce7-9d47-3893afb46c9a	SRID=4326;POINT(-118.751944564 34.1102644715)	34.11026	-118.752	2020-06-16	TRIUNFO_18164	Triunfo Canyon	Not Routine Top/Heavy Trim
f3631724-6b37-44dc-8916-f9f1ce15c9a1	SRID=4326;POINT(-118.752449155 34.1096690278)	34.10967	-118.752	2020-06-16	TRIUNFO_18164	Triunfo Canyon	Remove Overhang
513c8791-0a2a-4fc3-8896-0562abe41828	SRID=4326;POINT(-118.423023261 34.5530131131)	34.55301	-118.423	2020-06-11	BOUQUET_2035	Bouquet Canyon	Tree Trim - Clear S/W
4b7a3ef7-0b9b-456a-8da2-e4994f7f4ff0	SRID=4326;POINT(-118.423581161 34.5528993458)	34.5529	-118.424	2020-06-11	BOUQUET_2035	Bouquet Canyon	Tree Trim - Clear S/W
335f2f76-a7f0-45c8-a8a3-d40d89fd2135	SRID=4326;POINT(-118.423452415 34.552854612)	34.55285	-118.423	2020-06-11	BOUQUET_2035	Bouquet Canyon	Tree Trim - Clear S/W
bcb8bb8d-3837-4e2c-b3d3-b50f5064a10a	SRID=4326;POINT(-118.40537969 34.5582705385)	34.55827	-118.405	2020-06-10	BOUQUET_2035	Bouquet Canyon	Tree Trim - Clear S/W
88aaa7d7-34da-433d-b56b-77f851701424	SRID=4326;POINT(-118.293197304 34.6133389286)	34.61334	-118.293	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
d561c098-0a10-4f23-a9e6-0b067cc338c2	SRID=4326;POINT(-118.293427639 34.613199582)	34.6132	-118.293	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
1e0a0e05-4320-4f3d-93ce-e73b572b210e	SRID=4326;POINT(-118.293712623 34.6131962708)	34.6132	-118.294	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W

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70673da0-1363-42ae-8964-85c667c47ea9	SRID=4326;POINT(-118.406699887 34.5562305335)	34.55623	-118.407	2020-06-10	BOUQUET_2035	Bouquet Canyon	Tree Trim - Clear S/W
3cb294e1-2abb-4c2b-b916-ea9a47e94d8a	SRID=4326;POINT(-118.406433798 34.5566494424)	34.55665	-118.406	2020-06-10	BOUQUET_2035	Bouquet Canyon	Tree Trim - Clear S/W
406ac3f6-e6c2-4d6c-bed2-b21ee1478646	SRID=4326;POINT(-118.722995818 34.332520041)	34.33252	-118.723	2020-06-09	TAPO_17548	Tapo Canyon & Pepper Tree	Not Routine Top/Heavy Trim
cebf3ca8-5e0c-47b4-a65f-3ff32e5e70fd	SRID=4326;POINT(-118.281314112 34.6051521257)	34.60515	-118.281	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
da98a186-5f8b-407b-9970-f14de972f782	SRID=4326;POINT(-118.282451034 34.6051717189)	34.60517	-118.282	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
e6a177dc-0a63-4a5f-8a0a-3c1b3c299108	SRID=4326;POINT(-118.283807561 34.6049619884)	34.60496	-118.284	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Routine Tree Trim
507dd918-b635-406e-9058-7adac051bfbe	SRID=4326;POINT(-118.284259178 34.611842527)	34.61184	-118.284	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Not Routine Top/Heavy Trim
71aeedd3-82e1-4f8a-8d9e-01a40fccf8b7	SRID=4326;POINT(-118.284834176 34.6118466661)	34.61185	-118.285	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
7380c57c-9518-4615-8d63-a5e78ec06b16	SRID=4326;POINT(-118.297559246 34.6118452864)	34.61185	-118.298	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
9eddaf7a-fd3f-4283-8b9e-74121ca101d4	SRID=4326;POINT(-118.30490984 34.6112876126)	34.61129	-118.305	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
411bc8d1-6a2a-401b-8de0-4a564708aedf	SRID=4326;POINT(-118.303941898 34.6129647618)	34.61296	-118.304	2020-06-10	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
4f3348e2-cf11-4359-ba81-7a04f326ba5f	SRID=4326;POINT(-118.308020867 34.6147757027)	34.61478	-118.308	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
ed3d1ca4-9c41-41cc-9c4c-863f4e3616b3	SRID=4326;POINT(-118.319118842 34.6141714163)	34.61417	-118.319	2020-06-10	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
011b2aaa-21a7-414f-8d55-6597f593cc1c	SRID=4326;POINT(-118.421278428 34.5540266221)	34.55403	-118.421	2020-06-11	BOUQUET_2035	Bouquet Canyon	Tree Trim - Clear S/W
07f76315-e490-4307-a8df-434cc610f43b	SRID=4326;POINT(-118.420822173 34.5542399674)	34.55424	-118.421	2020-06-11	BOUQUET_2035	Bouquet Canyon	Tree Trim - Clear S/W
be8629b5-1a89-4c52-9cd3-d07a29c56663	SRID=4326;POINT(-118.419504203 34.5539108199)	34.55391	-118.42	2020-06-11	BOUQUET_2035	Bodfish Cyn Rd	Tree Trim - Clear S/W
41258567-c263-4214-a00c-08d3b452daaf	SRID=4326;POINT(-118.713934645 34.3565555688)	34.35656	-118.714	2020-06-10	TAPO_17548	Tapo Canyon & Pepper Tree	Not Routine Top/Heavy Trim
7a317528-8881-483a-9856-e8fc56933ded	SRID=4326;POINT(-118.713040799 34.3577592955)	34.35776	-118.713	2020-06-10	TAPO_17548	Tapo Canyon & Pepper Tree	Not Routine Top/Heavy Trim
1d602b8c-40f1-43c6-b026-87ce18546421	SRID=4326;POINT(-118.712098338 34.3580786995)	34.35808	-118.712	2020-06-09	TAPO_17548	Tapo Canyon & Pepper Tree	Remove Overhang
f91e33f4-fa41-4bb0-9d6f-23b0460cba2f	SRID=4326;POINT(-118.711890131 34.358870008)	34.35887	-118.712	2020-06-10	TAPO_17548	Tapo Canyon & Pepper Tree	Not Routine Top/Heavy Trim
8c64a94f-d878-4aba-8cc5-5e7e05000ce4	SRID=4326;POINT(-118.711182028 34.3722187183)	34.37222	-118.711	2020-06-10	TAPO_17548	Tapo Canyon & Pepper Tree	Tree Trim - Clear S/W
7507021c-409f-446a-8e75-275309d92346	SRID=4326;POINT(-118.708878681 34.3248776995)	34.32488	-118.709	2020-06-08	TAPO_17548	Tapo Canyon & Pepper Tree	Remove Overhang
ab60e25a-746b-4a5b-8d48-d1c2c40a1931	SRID=4326;POINT(-118.711398616 34.3722466683)	34.37225	-118.711	2020-06-10	TAPO_17548	Tapo Canyon & Pepper Tree	Not Routine Top/Heavy Trim
6cc7194e-bc96-46b4-8018-73189e2fec6a	SRID=4326;POINT(-118.358146995 34.5841852855)	34.58419	-118.358	2020-06-09	HUCKLEBERRY_8795	Bouquet Canyon	Routine Tree Trim
3793d1a9-93df-4b02-af89-4169b8e9c679	SRID=4326;POINT(-118.301949687 34.6101923977)	34.61019	-118.302	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
3f23057b-cf17-4ace-88c7-2afdf985fc69	SRID=4326;POINT(-118.380006999 34.6556505643)	34.65565	-118.38	2020-06-11	PRONGHORN_14450	Lake Hughes Canyon	Remove Tree(s)
243b7986-697a-4684-bfc9-601d823c917b	SRID=4326;POINT(-118.379915133 34.655686969)	34.65569	-118.38	2020-06-11	PRONGHORN_14450	Lake Hughes Canyon	Not Routine Top/Heavy Trim
85f856b4-4c4e-4619-a110-6f6ae4a86602	SRID=4326;POINT(-118.38100411 34.6569437473)	34.65694	-118.381	2020-06-12	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim

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8cf649e8-89d1-46c6-8611-3c4cb1469c38	SRID=4326;POINT(-119.1629284 34.41685653)	34.41686	-119.163	2020-06-02	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
79ebd3fd-fe65-46c5-9968-e8b8b4dcdea7	SRID=4326;POINT(-118.397417553 34.5645580272)	34.56456	-118.397	2020-06-10	BOUQUET_2035	Bouquet Canyon	Tree Trim - Clear S/W
960ff6bc-3dde-478f-b157-a83bee250c0e	SRID=4326;POINT(-118.398374431 34.5640312349)	34.56403	-118.398	2020-06-10	BOUQUET_2035	Bodfish Cyn Rd	Tree Trim - Clear S/W
8d12e04e-1f14-42b1-a02d-65e3512b5add	SRID=4326;POINT(-118.397252597 34.5650657656)	34.56507	-118.397	2020-06-09	BOUQUET_2035	Bouquet Canyon	Remove Tree(s)
e4286b0f-1ddc-4998-9aba-abffd3df1da1	SRID=4326;POINT(-118.314675374 34.5853765527)	34.58538	-118.315	2020-06-09	HUCKLEBERRY_8795	Bouquet Canyon	Routine Tree Trim
3607fb7d-88cb-436e-a60a-d249e4b74658	SRID=4326;POINT(-118.376993872 34.6548256636)	34.65483	-118.377	2020-06-11	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
06c7a914-187d-495d-ba5d-ff674e031620	SRID=4326;POINT(-118.380849548 34.654000203)	34.654	-118.381	2020-06-11	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
5440a1d6-cce3-4936-b394-165d60a998d3	SRID=4326;POINT(-118.385703675 34.6575306234)	34.65753	-118.386	2020-06-12	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
e318fd76-5c3c-4bc5-b6bd-fce1868a5af7	SRID=4326;POINT(-118.30392044 34.6101223078)	34.61012	-118.304	2020-06-10	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
d9366ea4-2f05-4170-a9bd-8c82dbfea84a	SRID=4326;POINT(-118.304103501 34.6099978569)	34.61	-118.304	2020-06-10	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
999a3dc5-9e08-4389-bdb7-fba181f29ad1	SRID=4326;POINT(-118.313660776 34.5854337789)	34.58543	-118.314	2020-06-08	HUCKLEBERRY_8795	Bouquet Canyon	Tree Trim - Clear S/W
25aed29c-9146-4a12-b9ea-fce0e176411c	SRID=4326;POINT(-118.313812762 34.5855568698)	34.58556	-118.314	2020-06-08	HUCKLEBERRY_8795	Bouquet Canyon	Remove Tree(s)
ff76c32f-6ca3-4936-a722-3c0e864342b8	SRID=4326;POINT(-118.31394922 34.5855345117)	34.58553	-118.314	2020-06-08	HUCKLEBERRY_8795	Bouquet Canyon	Remove Tree(s)
f46145f9-509f-45f4-b123-cdb286befa26	SRID=4326;POINT(-118.314023437 34.5855075747)	34.58551	-118.314	2020-06-08	HUCKLEBERRY_8795	Bouquet Canyon	Routine Tree Trim
51693761-103d-4e9c-84aa-ce3c21faead0	SRID=4326;POINT(-118.314170801 34.5854679686)	34.58547	-118.314	2020-06-08	HUCKLEBERRY_8795	Bouquet Canyon	Not Routine Top/Heavy Trim
cda7f0d1-9159-4036-8798-eb2c44bb6aa5	SRID=4326;POINT(-118.325698972 34.6059584794)	34.60596	-118.326	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
f276e67e-fa16-4360-ac87-e3be68b4446c	SRID=4326;POINT(-119.04600352 34.1169159458)	34.11692	-119.046	2020-06-01	RAMAC_14652	Azusa Canyon	Routine Tree Trim
8787fac5-a38e-4943-bd17-fff9f6597b79	SRID=4326;POINT(-119.057389162 34.1310460245)	34.13105	-119.057	2020-05-20	RAMAC_14652		Not Routine Top/Heavy Trim
fe800c38-cc3c-4eec-9f95-1629b55dd1fd	SRID=4326;POINT(-119.331786856 34.4380466213)	34.43805	-119.332	2020-03-12	TICO_17820		Not Routine Top/Heavy Trim
a9c6911f-68e2-4da1-aa7d-d29470061980	SRID=4326;POINT(-119.056327343 34.1311018074)	34.1311	-119.056	2020-05-21	RAMAC_14652		Not Routine Top/Heavy Trim
5dd18c68-0766-48c2-a2a2-fb604b9ef6a6	SRID=4326;POINT(-119.050722867 34.1339322557)	34.13393	-119.051	2020-05-20	RAMAC_14652		Not Routine Top/Heavy Trim
1cf42a2d-79d8-4cf3-95a9-54372430f6c6	SRID=4326;POINT(-119.144423828 34.3445597047)	34.34456	-119.144	2020-04-01	MIDDLE ROAD_11840		Tree Trim - Clear S/W
c7a0e825-d146-48b8-8008-e7ea7f961d96	SRID=4326;POINT(-119.05635383 34.1311054153)	34.13111	-119.056	2020-04-20	RAMAC_14652		Not Routine Top/Heavy Trim
b3c42d8c-28b4-4518-96bf-c3911c06b6c1	SRID=4326;POINT(-119.058277644 34.1309277979)	34.13093	-119.058	2020-04-20	RAMAC_14652		Not Routine Top/Heavy Trim
b6b6aae4-2830-459a-9271-462af815f6bf	SRID=4326;POINT(-119.060173966 34.1305642363)	34.13056	-119.06	2020-04-20	RAMAC_14652		Not Routine Top/Heavy Trim
7fc34552-098b-4dc7-aa8e-a00ceea19583	SRID=4326;POINT(-119.059340805 34.1305262149)	34.13053	-119.059	2020-04-01	RAMAC_14652		Not Routine Top/Heavy Trim
b1467c6a-81c6-4f63-bb5a-e5c535f04c76	SRID=4326;POINT(-119.337361827 34.444782532)	34.44478	-119.337	2020-03-13	TICO_17820		Not Routine Top/Heavy Trim
46787d1b-25d4-4f11-ba49-9f7b801c556a	SRID=4326;POINT(-119.337272644 34.4444501871)	34.44445	-119.337	2020-03-12	TICO_17820		Not Routine Top/Heavy Trim

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d643f648-b25d-40cf-9f7f-35a17a66266b	SRID=4326;POINT(-119.336895794 34.4436787658)	34.44368	-119.337	2020-03-12	TICO_17820		Not Routine Top/Heavy Trim
420c41a7-dac3-4f06-8cbf-818165e631a3	SRID=4326;POINT(-119.334996119 34.4410058326)	34.44101	-119.335	2020-03-12	TICO_17820		Not Routine Top/Heavy Trim
5034c9b6-0d46-4d2c-85e2-c60e0d39195e	SRID=4326;POINT(-119.33468163 34.4405429616)	34.44054	-119.335	2020-03-12	TICO_17820		Not Routine Top/Heavy Trim
90eba206-1520-482f-95d5-daa7e69a4629	SRID=4326;POINT(-119.342668913 34.4196914748)	34.41969	-119.343	2020-05-18	TICO_17820		Not Routine Top/Heavy Trim
3b178793-0c3e-46c5-a359-647567269ba8	SRID=4326;POINT(-119.346699268 34.4252806072)	34.42528	-119.347	2020-03-20	TICO_17820		Not Routine Top/Heavy Trim
8d733558-18aa-4ba3-9223-ad7b81814922	SRID=4326;POINT(-119.365573637 34.4103971837)	34.4104	-119.366	2020-03-05	TICO_17820		Not Routine Top/Heavy Trim
cd127694-dc22-46b7-975c-9f99c8d0c27b	SRID=4326;POINT(-119.393518567 34.3844491325)	34.38445	-119.394	2020-03-05	SEACLIFF_16040		Not Routine Top/Heavy Trim
c86c5664-2cb1-4b5c-8a1f-7c1c1adf185a	SRID=4326;POINT(-119.400103055 34.3834881748)	34.38349	-119.4	2020-03-04	SEACLIFF_16040		Not Routine Top/Heavy Trim
f39438e6-cebc-4946-8aa3-4ed57b150ca0	SRID=4326;POINT(-119.151440486 34.3488799858)	34.34888	-119.151	2020-03-31	MIDDLE ROAD_11840		Not Routine Top/Heavy Trim
80848c18-d681-4b90-b9aa-f689773a8ddc	SRID=4326;POINT(-119.138660096 34.3322226888)	34.33222	-119.139	2020-05-14	MIDDLE ROAD_11840		Not Routine Top/Heavy Trim
964446ea-feda-459a-a159-555d8100d96c	SRID=4326;POINT(-119.139846973 34.3333868969)	34.33339	-119.14	2020-03-30	MIDDLE ROAD_11840		Not Routine Top/Heavy Trim
5149de3f-85a3-494a-88ab-40b93e2e8cf5	SRID=4326;POINT(-119.139629044 34.3345106677)	34.33451	-119.14	2020-03-31	MIDDLE ROAD_11840		Not Routine Top/Heavy Trim
db427e1f-fe49-4c72-9bd4-9999569c6b67	SRID=4326;POINT(-119.8226479 34.5107887)	34.51079	-119.823	2020-04-04	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
0f5e9682-469f-4a89-8c72-e27821facaa3	SRID=4326;POINT(-119.404035844 34.3817731989)	34.38177	-119.404	2020-03-04	SEACLIFF_16040		Not Routine Top/Heavy Trim
51497dbf-c19f-48ca-a571-b4c7e807b408	SRID=4326;POINT(-119.839577 34.52130744)	34.52131	-119.84	2020-04-23	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
a8767f40-0db8-483b-b4f5-03438ddbde50	SRID=4326;POINT(-119.1610518 34.41588847)	34.41589	-119.161	2020-05-27	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
e204036f-dbb9-4f7a-8185-7dd22d742ac1	SRID=4326;POINT(-119.1594378 34.4155408)	34.41554	-119.159	2020-06-04	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
12c75833-ed4e-4117-87ee-c5fd6efc922f	SRID=4326;POINT(-119.158797786 34.4166618093)	34.41666	-119.159	2020-05-27	THACHER_17731	Sulphur Mountain	Not Routine Top/Heavy Trim
6fa54432-80b8-40b1-86cc-9f98b95dea2a	SRID=4326;POINT(-119.158448428 34.4168139313)	34.41681	-119.158	2020-05-27	THACHER_17731	Sulphur Mountain	Not Routine Top/Heavy Trim
d00248c7-8b48-4d24-b7da-44fd7acb1462	SRID=4326;POINT(-119.150817543 34.416635257)	34.41664	-119.151	2020-05-28	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
69e8b0fc-ce28-4ed4-a394-09e03dd4e05a	SRID=4326;POINT(-119.1480525 34.41538923)	34.41539	-119.148	2020-05-28	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
9e43df21-d14c-4594-9906-3bb3f2e775f9	SRID=4326;POINT(-119.145413898 34.4155557355)	34.41556	-119.145	2020-05-28	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
f8d8b310-b442-42aa-ad06-82368681e458	SRID=4326;POINT(-119.1451313 34.41606798)	34.41607	-119.145	2020-05-29	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
1ff2e339-adea-46bd-946d-6c6621b32b06	SRID=4326;POINT(-119.1275571 34.42144135)	34.42144	-119.128	2020-05-28	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
4471baba-193e-4bc7-8512-e8c053501ab4	SRID=4326;POINT(-119.157828502 34.4249703094)	34.42497	-119.158	2020-05-19	THACHER_17731	Thacher_17731	Not Routine Top/Heavy Trim
bf6a47a6-f60a-4a92-a93d-b58a4bc54bc4	SRID=4326;POINT(-119.1595776 34.42674275)	34.42674	-119.16	2020-05-26	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
d304e55a-8f94-42d6-b68c-5edc6d57b879	SRID=4326;POINT(-119.1662181 34.41435118)	34.41435	-119.166	2020-06-01	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
03efad5b-da5b-43cd-9380-10be3d53c729	SRID=4326;POINT(-119.1664364 34.4140425)	34.41404	-119.166	2020-06-04	THACHER_17731	Sulphur Mountain	Not Routine Top/Heavy Trim

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91ba8316-395c-4023-b9bc-9e06b73feb47	SRID=4326;POINT(-118.28875456 34.6191184335)	34.61912	-118.289	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
f386e4bb-b0ea-4004-b920-21306a1a4cdf	SRID=4326;POINT(-118.288559765 34.623036326)	34.62304	-118.289	2020-06-10	HUGHES LAKE_8810	Bouquet Canyon	Routine Tree Trim
2430afef-121f-4e29-895f-6a7428b140b4	SRID=4326;POINT(-118.288603351 34.6226892413)	34.62269	-118.289	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
4bca4db7-07c6-4c55-b42f-4f2a70f7cea5	SRID=4326;POINT(-118.304352611 34.6281919353)	34.62819	-118.304	2020-06-10	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
abdf35c8-fc0d-45ce-94e4-9eb8a8b3c6b2	SRID=4326;POINT(-118.304756954 34.6283309809)	34.62833	-118.305	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Routine Tree Trim
382632a3-7cce-4c75-814d-69bc670503ef	SRID=4326;POINT(-118.287700787 34.6139263893)	34.61393	-118.288	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
a5f4a452-025c-416d-9554-e2233f6bd246	SRID=4326;POINT(-118.388515636 34.5724998165)	34.5725	-118.389	2020-06-09	BOUQUET_2035	Bouquet Canyon	Routine Tree Trim
18acfeff-08ac-462a-97fa-72ba6a174057	SRID=4326;POINT(-118.282833919 34.6029322669)	34.60293	-118.283	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
32c26b3f-e5de-4229-ba54-6741435268b4	SRID=4326;POINT(-118.284322545 34.6112743675)	34.61127	-118.284	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
d30a9c4b-89f1-47d8-97a2-2c861c670dc4	SRID=4326;POINT(-118.307981975 34.6139608807)	34.61396	-118.308	2020-06-10	HUGHES LAKE_8810	Bouquet Canyon	Remove Tree(s)
ecfc5bc4-d731-4459-a0cb-d0c52f880de2	SRID=4326;POINT(-118.375596627 34.6496492561)	34.64965	-118.376	2020-06-11	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
ddad189a-90b0-415c-93dd-860356d23026	SRID=4326;POINT(-118.376072869 34.6497602455)	34.64976	-118.376	2020-06-10	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
0a18848c-5dad-4124-9e8a-9565b5944b07	SRID=4326;POINT(-116.943854056 34.0915237042)	34.09152	-116.944	2020-06-05	POULTRY_14372	Forest Falls	Remove Overhang
d63b8caf-d0a6-4473-8bc3-01afaa713e96	SRID=4326;POINT(-116.94472611 34.0913184733)	34.09132	-116.945	2020-06-05	POULTRY_14372	Forest Falls	Not Routine Top/Heavy Trim
e1892177-12fe-41ff-9bb5-6df0a800d830	SRID=4326;POINT(-116.909210507 34.0840252137)	34.08403	-116.909	2020-06-08	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
ad97296e-0687-4518-9565-5cf60016c76d	SRID=4326;POINT(-116.899292087 34.0822928399)	34.08229	-116.899	2020-06-05	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
243adabf-7a22-4bd2-8685-99e4a5faf303	SRID=4326;POINT(-116.899298336 34.0827581378)	34.08276	-116.899	2020-06-05	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
87e046ae-2c2c-4ab1-9432-b12db4129f2a	SRID=4326;POINT(-118.375977986 34.6496992909)	34.6497	-118.376	2020-06-10	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
21c4e048-bc96-4e00-8294-679a2bde776c	SRID=4326;POINT(-118.375438526 34.6495484212)	34.64955	-118.375	2020-06-10	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
4de981a9-d62a-4923-9f76-2280c3939d66	SRID=4326;POINT(-118.375272565 34.649539871)	34.64954	-118.375	2020-06-10	PRONGHORN_14450	Lake Hughes Canyon	Routine Tree Trim
c73c4003-2f88-4b22-95be-9c549f22a048	SRID=4326;POINT(-118.285175823 34.6128074787)	34.61281	-118.285	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
3a9c1531-f041-4fa6-b080-e9c837745721	SRID=4326;POINT(-118.285349469 34.6128839618)	34.61288	-118.285	2020-06-09	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
45d99f63-2ba8-4ff6-a799-e8c151da29c8	SRID=4326;POINT(-118.371557705 34.6428585773)	34.64286	-118.372	2020-06-10	HUGHES LAKE_8810	Lake Hughes Canyon	Remove Tree(s)
222a9ee6-25ae-4b9f-baac-c98c1d3f40f1	SRID=4326;POINT(-118.281659447 34.6036942117)	34.60369	-118.282	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Remove Tree(s)
2b6df8f0-d420-4e93-adc1-cb69b3b96113	SRID=4326;POINT(-118.394067138 34.5669078444)	34.56691	-118.394	2020-06-09	BOUQUET_2035	Bouquet Canyon	Routine Tree Trim
1327ac75-35f7-4b52-9a74-533e1b312b95	SRID=4326;POINT(-118.39856787 34.5633026834)	34.5633	-118.399	2020-06-10	BOUQUET_2035	Bouquet Canyon	Remove Tree(s)
64348d69-548d-4e72-952f-e36c25453040	SRID=4326;POINT(-118.398547098 34.5632774855)	34.56328	-118.399	2020-06-10	BOUQUET_2035	Bouquet Canyon	Remove Tree(s)
aa58ace7-c021-4d5f-aee0-5144e38380aa	SRID=4326;POINT(-118.344246112 34.5830179443)	34.58302	-118.344	2020-06-09	HUCKLEBERRY_8795	Bouquet Canyon	Tree Trim - Clear S/W

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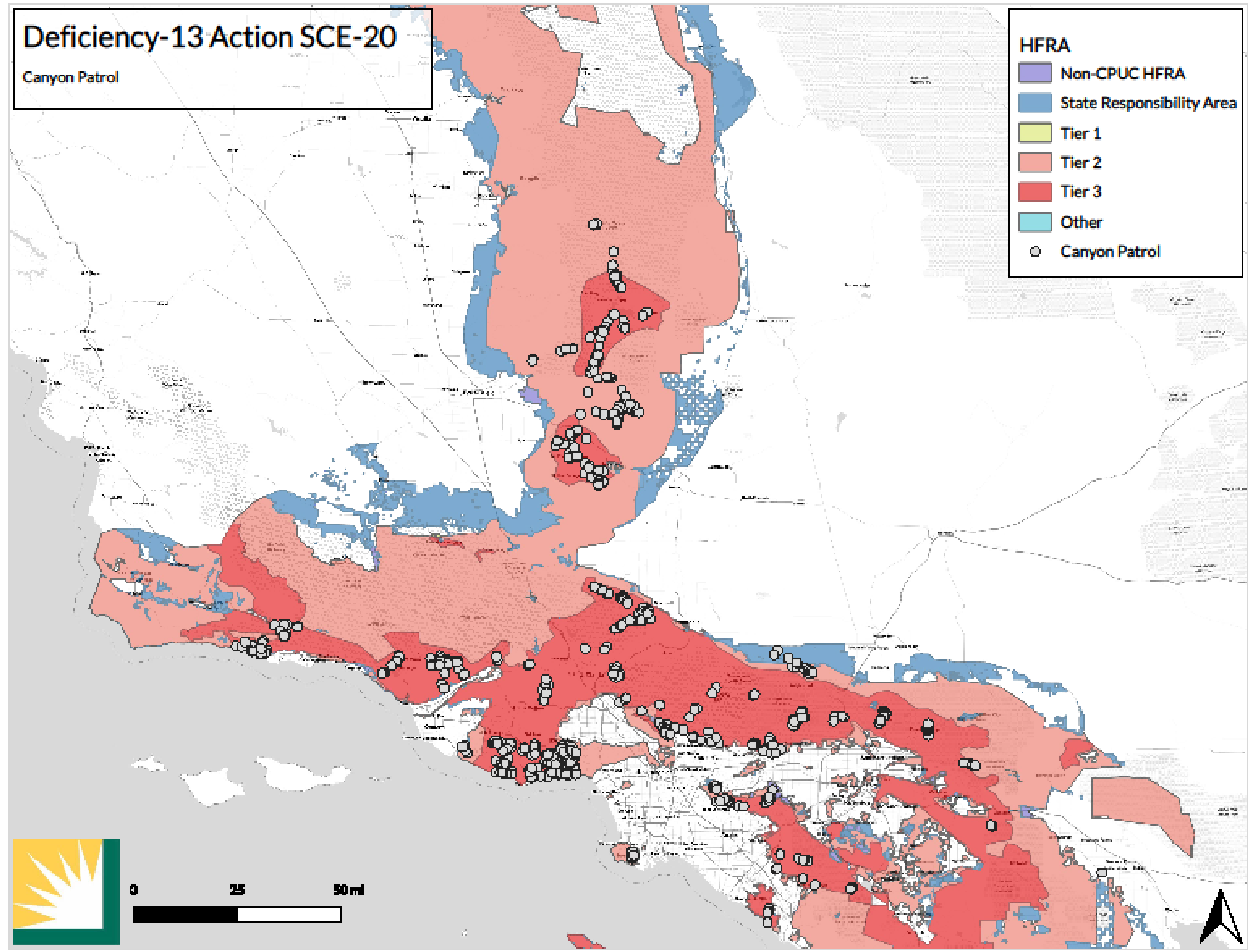
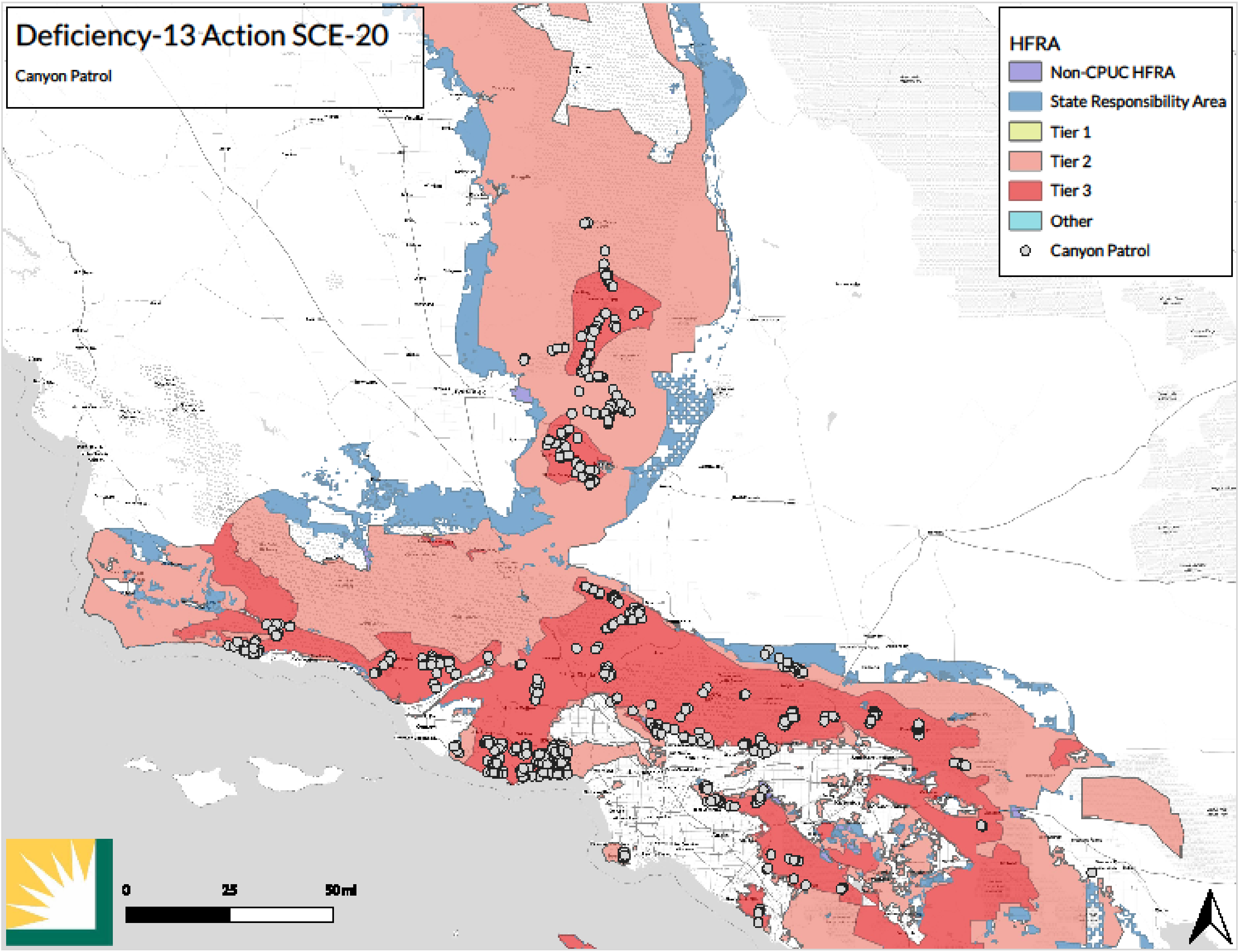
5eb507ec-d7e0-4179-8298-856fdfbf7270	SRID=4326;POINT(-118.284266554 34.608811286)	34.60881	-118.284	2020-06-09	HUGHES LAKE_8810	Lake Hughes Canyon	Tree Trim - Clear S/W
4b86fde2-7573-4873-bbd0-98bb50aaa065	SRID=4326;POINT(-116.896473756 34.0819630539)	34.08196	-116.896	2020-06-03	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
3d4f33d1-4d5c-4705-b032-b6fd868f60ca	SRID=4326;POINT(-119.1619038 34.41549516)	34.4155	-119.162	2020-06-03	THACHER_17731	Sulphur Mountain rd	Not Routine Top/Heavy Trim
e8fe8c85-fd60-4077-8507-6360c5ec32ab	SRID=4326;POINT(-118.287055111 34.617783283)	34.61778	-118.287	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Tree Trim - Clear S/W
1b5cd8c3-0f06-4183-9702-38ea957630b0	SRID=4326;POINT(-118.286451407 34.6173619615)	34.61736	-118.286	2020-06-09	HUCKLEBERRY_8795	Bouquet Canyon	Tree Trim - Clear S/W
ee77e5df-3150-439c-899b-955b43b77cb5	SRID=4326;POINT(-118.279309832 34.6150455607)	34.61505	-118.279	2020-06-09	HUCKLEBERRY_8795	Bouquet Canyon	Tree Trim - Clear S/W
ddec5cf8-9316-4098-ba08-909afacf758a	SRID=4326;POINT(-118.279282622 34.6148766487)	34.61488	-118.279	2020-06-09	HUCKLEBERRY_8795	Bouquet Canyon	Remove Tree(s)
eaea4706-cc06-4d82-b41d-87fa813f1e1a	SRID=4326;POINT(-116.896041418 34.0818293626)	34.08183	-116.896	2020-06-03	CRUMP_4428	Forest Falls	Not Routine Top/Heavy Trim
bdaed77a-6254-410f-b84f-65c421b1d8a8	SRID=4326;POINT(-118.274691775 34.5912875136)	34.59129	-118.275	2020-06-08	HUCKLEBERRY_8795	Bouquet Canyon	Tree Trim - Clear S/W
814d9a49-035e-4982-abd9-56b9082083ec	SRID=4326;POINT(-118.310937099 34.5841866657)	34.58419	-118.311	2020-06-08	HUCKLEBERRY_8795	Bouquet Canyon	Tree Trim - Clear S/W
d1e791cb-f9e0-48c5-ac5e-477b450d52d0	SRID=4326;POINT(-118.314818213 34.5853482997)	34.58535	-118.315	2020-06-09	HUCKLEBERRY_8795	Bouquet Canyon	Routine Tree Trim
1e7da7bd-3614-4498-9be5-a89cbdd13e87	SRID=4326;POINT(-118.314999018 34.585237682)	34.58524	-118.315	2020-06-09	HUCKLEBERRY_8795	Bouquet Canyon	Routine Tree Trim
2d5fc006-7206-45b3-a3b4-ab8da44520bd	SRID=4326;POINT(-118.351140108 34.5837975828)	34.5838	-118.351	2020-06-09	HUCKLEBERRY_8795	Bouquet Canyon	Routine Tree Trim
25285c05-5663-4a8c-a49b-e250f2e42dba	SRID=4326;POINT(-118.353461511 34.58385184)	34.58385	-118.353	2020-06-09	HUCKLEBERRY_8795	Bouquet Canyon	Routine Tree Trim
92e4b160-b148-4cda-91bd-ed7434d93d93	SRID=4326;POINT(-118.359067482 34.5848291239)	34.58483	-118.359	2020-06-09	HUCKLEBERRY_8795	Bouquet cyn	Routine Tree Trim
7c649291-49dd-4812-894a-381234f2f2a4	SRID=4326;POINT(-118.393214867 34.5674865226)	34.56749	-118.393	2020-06-09	BOUQUET_2035	Bouquet Canyon	Routine Tree Trim
f2eee290-18e7-43eb-a030-f076af84067e	SRID=4326;POINT(-118.285075575 34.608708633)	34.60871	-118.285	2020-06-09	HUGHES LAKE_8810	Lake Hughes Canyon	Remove Tree(s)
cc08d7b2-f188-448a-9e2e-446ae94aca80	SRID=4326;POINT(-118.284410052 34.608374458)	34.60837	-118.284	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Remove Tree(s)
be3b21d0-9a50-412a-afb4-f12f32acafa1	SRID=4326;POINT(-118.284400329 34.6082420019)	34.60824	-118.284	2020-06-09	HUGHES LAKE_8810	Bouquet Canyon	Remove Tree(s)
857059f0-06d3-49c9-ba34-f38bf85b76bd	SRID=4326;POINT(-119.139370881 34.3868693247)	34.38687	-119.139	2020-05-29	MIDDLE ROAD_11840	Wheeler Canyon	Not Routine Top/Heavy Trim
6f689d1a-4da6-431f-8322-eb9b090f3c93	SRID=4326;POINT(-119.8216866 34.50131748)	34.50132	-119.822	2020-04-04	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim
3017f55e-b1a9-49aa-8399-f852c3cf62be	SRID=4326;POINT(-119.8234301 34.5042645)	34.50426	-119.823	2020-05-20	CACHUMA_2595	San Marcos Pass	Not Routine Top/Heavy Trim


Deficiency-13 Action SCE-20
Canyon Patrol
HFRA
Non-CPUC HFRA
State Responsibility Area
Tier 1
Tier 2
Tier 3
Other
Canyon Patrol
0
25
50 mi

_record_id	_geometry	_latitude	_longitude	assessment_date	tree_species	work_type
6a7cdc37-95e5-40f0-a629-1b6d97d655ae	SRID=4326;POINT(-119.117423706 36.3846709044)	36.38467	-119.117	2020-07-06	Locust	Prune
49475a4c-ea17-4b54-bbd2-94b6f242aaaa	SRID=4326;POINT(-119.117648341 36.3846736035)	36.38467	-119.118	2020-07-06	Cottonwood	Prune
7da876a4-4e90-4f00-af00-25b4f982ac37	SRID=4326;POINT(-117.586517371 34.3850520428)	34.38505	-117.587	2020-07-15	Pine	Prune
d5340a73-4c54-4d88-bccd-50a65b78872d	SRID=4326;POINT(-117.613491341 34.3918885034)	34.39189	-117.613	2020-07-15	Pine	Prune
72d1915e-6f80-404f-a8dc-1f2ec10168d5	SRID=4326;POINT(-117.223853543 34.2490096471)	34.24901	-117.224	2020-07-08	Oak	Prune
d4fcff55-2a2c-4d65-81aa-f9af427edc34	SRID=4326;POINT(-117.258479856 34.2419093217)	34.24191	-117.258	2020-07-14	Maple	Prune
ef3a9cc3-2823-4ed2-8cc7-e24e21e93406	SRID=4326;POINT(-117.511913404 34.1400038428)	34.14	-117.512	2020-07-07	Eucalyptus	Prune
6ac75022-0230-4b5f-8418-3483683e5e4b	SRID=4326;POINT(-118.104588389 34.1717904783)	34.17179	-118.105	2020-07-06	Elm	Prune
69362309-6feb-48c0-a97e-bca4f27de9b3	SRID=4326;POINT(-117.227846682 34.2467478847)	34.24675	-117.228	2020-07-08	Pine	Prune
abf0e364-5320-4fea-b207-447de631bb65	SRID=4326;POINT(-117.259679139 34.2421213507)	34.24212	-117.26	2020-07-14	Redwood	Prune
7005cac0-784b-4c6d-81fa-716e7d9465d5	SRID=4326;POINT(-117.259401195 34.2426936878)	34.24269	-117.259	2020-07-14	Oak	Prune
826bf40b-5186-49de-84a0-889f118fc2eb	SRID=4326;POINT(-117.251605354 34.2453751668)	34.24538	-117.252	2020-07-13	Oak	Prune
9ac8df56-f11e-430c-b32d-1cd01153817b	SRID=4326;POINT(-117.230936922 34.244888211)	34.24489	-117.231	2020-07-08	Pine	Prune
db00154f-0490-40a3-9215-a841d3122ff5	SRID=4326;POINT(-117.026972361 34.0321325829)	34.03213	-117.027	2020-07-09	Eucalyptus	Prune
36d229b3-e94e-4de2-aa32-4c8e02166435	SRID=4326;POINT(-117.026740685 34.0296491115)	34.02965	-117.027	2020-07-09	Ailanthus	Prune
9dfa3b9c-15a8-4025-ab2c-190060846c1b	SRID=4326;POINT(-117.000919059 33.9641001152)	33.9641	-117.001	2020-07-07	Eucalyptus	Prune
3c484bbb-8298-41ab-a0f8-92aa357c8ac7	SRID=4326;POINT(-119.12253432 36.3730761156)	36.37308	-119.123	2020-07-06	Walnut	Prune
affc2d4a-268d-476a-bb3d-ed728c60166e	SRID=4326;POINT(-119.121786654 36.3729729927)	36.37297	-119.122	2020-07-06	Walnut	Prune
697f6bef-6d60-47cf-8317-ffd9d99771c1	SRID=4326;POINT(-119.121198244 36.3729484267)	36.37295	-119.121	2020-07-06	Walnut	Prune
eadcb151-c045-4687-a4de-4e07e947ae35	SRID=4326;POINT(-119.121041 36.3729805515)	36.37298	-119.121	2020-07-06	Walnut	Prune
d7167f3c-cf59-48b2-b983-e4f25f563fc6	SRID=4326;POINT(-119.120591059 36.3730175353)	36.37302	-119.121	2020-07-06	Walnut	Prune
d5f51632-be89-4765-962e-8130e861c756	SRID=4326;POINT(-119.119727388 36.3730070071)	36.37301	-119.12	2020-07-06	Walnut	Prune
f284b1a7-4944-45a0-806c-04078528fda5	SRID=4326;POINT(-119.119531587 36.3729705631)	36.37297	-119.12	2020-07-06	Walnut	Prune
5fd1f877-c6f6-4c34-8c27-39bdbb597050	SRID=4326;POINT(-119.119470231 36.3729524761)	36.37295	-119.119	2020-07-06	Walnut	Prune
fca80959-90a8-4aae-8db6-4de1aa444f1b	SRID=4326;POINT(-118.10885679 34.1737494058)	34.17375	-118.109	2020-07-06	Liq Amber-Gum	Prune
632fea84-3f42-4e0f-8d00-b76b9269a1a4	SRID=4326;POINT(-119.709773138 34.4508355679)	34.45084	-119.71	2020-07-17	Redwood	Prune
60158e23-d687-4e87-ba54-542b55cd4514	SRID=4326;POINT(-119.710168093 34.45612377)	34.45612	-119.71	2020-07-16	Sycamore	Prune
a3fb632f-db55-4e03-8880-8ebaec571849	SRID=4326;POINT(-118.113725334 34.1738087665)	34.17381	-118.114	2020-07-06	Elm	Prune
936b32a7-353b-4f8f-b6e7-6aba81326f8a	SRID=4326;POINT(-118.100968748 34.1764156045)	34.17642	-118.101	2020-07-06	Eugenia	Prune
1ee4af8b-27aa-4bed-b909-6f23b20c43e8	SRID=4326;POINT(-118.103487343 34.1834698622)	34.18347	-118.103	2020-07-07	Palm Other	Prune
bc845a18-6382-41a4-bd50-93de329f638a	SRID=4326;POINT(-117.767615095 33.7786239741)	33.77862	-117.768	2020-07-07	Palm Other	Prune
d22659c1-68e8-44f3-a8f2-00370fdd1a34	SRID=4326;POINT(-117.773789875 33.7806987127)	33.7807	-117.774	2020-07-07	Eucalyptus	Remove
3b9d755d-5d35-4fea-9d22-cc3bddf6b7a5	SRID=4326;POINT(-117.770098485 33.7782488716)	33.77825	-117.77	2020-07-07	Ash	Prune
21aef89b-1ab4-4367-b6fa-b722a95a4b4a	SRID=4326;POINT(-118.114496469 34.1756536439)	34.17565	-118.114	2020-07-06	Locust	Prune
66089ac5-b1db-4c6c-a8ac-9f093aaab316	SRID=4326;POINT(-118.111168854 34.172938878)	34.17294	-118.111	2020-07-06	Elm	Prune
2b6d08a3-ea42-40e7-8c22-0e6a28a71656	SRID=4326;POINT(-117.769247554 33.7789260614)	33.77893	-117.769	2020-07-08	Oak	Prune
e2391425-9ae3-4733-b77d-9b1d971c08da	SRID=4326;POINT(-117.769314777 33.7791938335)	33.77919	-117.769	2020-07-08	Eucalyptus	Prune
2660374c-d7a4-4a0c-b6ae-941f82ec1350	SRID=4326;POINT(-117.769309245 33.7792015449)	33.7792	-117.769	2020-07-08	Ash	Prune


Deficiency-13 Action SCE-20
Canyon Patrol
HFRA
Non-CPUC HFRA
State Responsibility Area
Tier 1
Tier 2
Tier 3
Other
Canyon Patrol
0
25
50 mi

WMP Class B Deficiency Action Statements
Guidance-12, Lack of detail on long-term planning

Action SCE-9: In its 2021 WMP Update, SCE shall: 1) define what “continue” or “increase” means for each instance it is used and 2 either a) implement quantitative benchmarks that are reasonable and achievable for each such instance, or b) explain how it intends to track progress of each instance if a quantitative benchmark is not provided.

Response:
SCE’s response to this action is incorporated directly into this WMP update. The response can be found in Sections 5.2, 7.1.1 and 7.1.2.

WMP Class B Deficiency Action Statements
SCE-1, Lessons learned not sufficiently described

Action SCE-10: *In its 2021 WMP Update, SCE shall detail how it incorporates lessons learned into the decision-making process for the selection and prioritization of its WMP programs and initiatives.*

Response:
Please see Section 4.1 of this WMP update for an explanation of how SCE incorporates lessons learned into the decision-making process for the selection and prioritization of its WMP programs and initiatives.

WMP Class B Deficiency Action Statements
SCE-5, Detailed timeline of WRRM implementation not provided

Action SCE-12: *In its 2021 WMP Update, SCE shall clarify whether its Q1 2021 timeline for planning and executing its transition from REAX+ to WRRM is accurate.*

Response:
Yes, SCE transitioned from using Reax to using WRRM for all risk modeling and assessment in Q1 2021 to plan and execute all future work. Due to the lead time for planning and scoping work, certain activities could not fully transition to WRRM for 2021 scope, please refer to Section 7.3.2 in this WMP update for more details on an activity-level for information on the model choice. Please also see SCE's response to Action SCE-19 related to Vegetation Management activities. SCE's transition from using Reax to WRRM for future scoping is complete.

WMP Class B Deficiency Action Statements
SCE-6, SCE lacks sufficient weather station coverage

Action SCE-14: *In its 2021 WMP Update, SCE shall discuss 1) how the present and future effects of climate change are considered in weather station placement and 2) how SCE's weather station network is and can be used in its operations beyond PSPS deenergization related decision-making.*

Response:
1) Current and future effects of climate change should have no bearing on where SCE installs additional weather stations across its service territory. Given that the main purpose for installing weather stations is to record hourly changes in meteorological parameters such as temperature, winds, and relative humidity at specific locations to inform and improve PSPS execution, it does not make sense to base a weather observing network on expected changes in climate. This is because climate modeling only provides projections of regional generic changes in temperature and precipitation that may occur over a multidecadal period. SCE's weather stations do not measure precipitation, so that aspect of climate change cannot not be observed. Furthermore, SCE's weather stations are placed strategically to observe maximum wind speeds, however, the impact of climate change on local wind speeds is very uncertain and thus cannot be used reasonably as a factor for weather station placement. In summary, using the current and future effects of climate change to structure further expansion of SCE's weather station network would be a misalignment of goals.

2) SCE's weather stations are strategically placed to help monitor increased fire danger conditions primarily along circuits located in HFRA. SCE's weather station network provides critical situational awareness not only for PSPS, but also for extreme weather events such as heatwaves and snowstorms that have the potential to impact SCE's infrastructure and subsequent rehabilitation activities. In addition, SCE's weather station observation network is useful for improving SCE's in-house weather modeling efforts which would provide more accurate forecasts of wind speed and temperature along its infrastructure. Finally, SCE's weather stations could be used to help forecast load/generation and metering.

Action SCE-15: *In its 2021 WMP Update, SCE shall: 1) break down the cost of environmental review and land rights fees it expects from the USFS, as detailed in Table 25 of its QR, and 2) provide information regarding partnerships with or applications to the USFS to install weather stations and "meteorological sample sites" as it relates to 36.2 CFR 220.6.*

Response:
1) SCE partnered with environmental consultants to perform a more detailed investigation of environmental and expected USFS fees, evaluating examples of similar projects outside of the ROW, and worked with SCE's internal group that manages government land to determine the cost of installing a weather station within USFS land on a standalone structure outside of our existing Right-of-Way (ROW). Please note that each installation would vary in costs due to the location, the amount of ground disturbance, including vegetation trimming required, proximity to an existing road, environmental constraints, and other factors. As such, SCE is providing two estimates. The low-range estimate would be installation of a weather station within a previously surveyed area or developed area that wouldn't need field surveys, and/or little to no ground disturbance. The mid-range estimate is a representational location within Inyo National Forest, near an access road, avoiding all environmental resources, such as water

features, sensitive biological resources and archaeological and historical resources, but would follow a traditional process with the USFS. As represented below, these estimated costs can also vary dependent on location.

Environmental Tasks and Government Land Fees	Low-Range Estimate	Mid-Range Estimate
1. Field visit to review site location	$ 0	$5,000
Low-Range Assumption: Assume no field visit required. Mid-Range Assumption: Assume minimum three SMEs (archaeologist, biologist, waters specialist); Assume Travel time one day		
2. SME reports for agency review and approval	$ 1,000	$5,000
Low-Range Assumption: Assume desktop report Mid-Range Assumption: minimal reporting and negative findings		
3. SF 299 Application. Staff Time	$ 1,000	$2,000
Low-Range Assumption: Assume 2 meetings, internal and with the USFS. Distribution and coordination with the team. Mid-Range Assumption: Assume more staff time for application.		
4. USFS Cost Recovery to agency time	$ 1,000	$5,000
Low Range Assumption: Assumes staff time to review the application, technical reports and preparation of the agreement. Mid-Range Assumption: Assumes USFS field verification and more agency time to review the technical reports.		
5. Yearly Lease for a Structure	$ 2,000	$2,000
Low and Mid-Range Assumption: Assumes a lease of $100 for 20 years		
Estimated Total For A Weather Station At A Single Location	**$5,000**	**$19,000**

2) SCE currently has a Master Agreement with the USFS to conduct operation and maintenance activities within our existing ROWs. To-date all the weather stations installed are located within our ROW and have had a streamlined approval process under this agreement. SCE does not have an existing agreement to install facilities and structures outside of our ROW. While we have done outreach to the USFS on installing weather stations outside of our ROW, we received clarification from the USFS that any structure outside

of the ROW would require submittal of a SF-299 application, long-term lease, and agency review of environmental surveys to demonstrate no impacts to resources. The USFS showed support for installation of weather stations as long as we followed the standard process for structures being built on USFS land. In addition, based on limited USFS staff time, this process could take approximately 6-12 months, depending on the amount of weather stations proposed within the forest. In our assumptions above, we assumed that this activity would be exempt from NEPA per 36.2 CFR 220.6. If NEPA would be required, the cost for Task 4 above would increase significantly.

WMP Class B Deficiency Action Statements
SCE-17, Details not provided for collaborative research programs

Action SCE-24: *In its 2021 WMP Update, SCE shall present a table outlining collaborative efforts with academic institutions and what role SCE plays in that research, similar to the submitted Table 28 - SCE-17, with an additional column detailing whether funding is ongoing, or subject to renewal, and if so, when.*

Response:

Opportunity Title	Project Description	Partner Lead	SCE's Role	Funding	Timing
University of California, Los Angeles (UCLA) Luskin Center for Innovation's Microgrid Study	SCE is sponsoring and serving as a technical lead for a microgrid study with the UCLA Luskin Center for Innovation to produce a report that develops a performance evaluation for microgrids to be used to inform microgrid siting decisions that maximize resiliency, equity, and grid service benefits for California communities.	UCLA	Sponsor and technical lead	SCE sponsorship – one-time payment $49,081	Dec. 2019 – Apr. 2021
Cal Poly San Luis Obispo's Wildland Urban Interface Fire Information Research and Education (Cal Poly SLO WUI FIRE) Institute	SCE is co-funding and serving as a technical lead for the WUI FIRE Institute to tackle research needs in several wildfire risk such as fuels sampling/management, forest/vegetation management, land policy, infrastructure hardening (property hardening, building codes etc.), fire suppression/long duration fire retardants, and early fire detection.	Cal Poly San Luis Obispo	Co-funder	SCE is providing funding for 3 years, subject to renewal ($111k/year for 3 years)	2021-2023
San Jose State University (SJSU)'s Wildfire Interdisciplinary Research Center.	SCE is partnering with SJSU's Wildfire Interdisciplinary Research Center (WIRC) to conduct high-impact wildfire research so that improved tools and policies can be provided to community and industry stakeholders. The WIRC mission is to develop new prediction and observational tools to better understand extreme fire behavior in a changing climate.	SJSU	Technical Advisory	Funding is pending National Science Foundation grant; if awarded SCE will provide a one-time commitment of $50K, subject to renewal	2021

Opportunity Title	Project Description	Partner Lead	SCE's Role	Funding	Timing
Fighting Wildfires under Climate Change: A Data-Informed Physics-Based Computational Framework for Probabilistic Risk Assessment and Mitigation, and Emergency Response Management	This project features three distinct and novel components that will be developed and implemented into practice to fill the present knowledge gaps and technical capabilities. These are (i) a probabilistic framework for wildfire risk and loss assessment that integrates the uncertainties in the predictive models, input data, and socioeconomic losses due to WUI fires; (ii) machine learning techniques for heterogeneous data fusion and uncertainty quantification; and (iii) a novel Bayesian inference framework for efficient assimilation of measurements during a live fire into the near-real-time forward simulation models.	University of Nevada Reno	Technical Advisory	Funding is provided by the National Science Foundation	Anticipated dates: Feb./Mar. 2021 – Jan. 2025
Electric Grid Situational Awareness for Wildfire Risk Reduction	This project will conduct an experimental research to understand the dynamics of electrical fires and identify factors that influence the occurrence and spread of fires caused by electrical equipment. In addition, it develops an analytical tool to detect and diagnose electrical grid faults before they spark a blaze by real-time mining the high-frequency sensor data.	University of California, Riverside	Technical Advisory	Funding is provided by the U.S. Department of Homeland Security	2021
Fuels Regrowth Model & Fuels Potential Model	SCE is engaging with the University of Colorado, Boulder to create a statement of work for two efforts: 1) Fuels Regrowth Model – For areas that have recently burned, this model would provide an estimate of how long it would take for the vegetation to return to a pre-fire state based upon current remote sensing data as well as historic data. Use case would be to help prioritize work activities and grid hardening efforts.	University of Colorado, Boulder	Technical Advisory	Funding is pending National Science Foundation grant	Anticipated dates: Jul. 2021 – Jun. 2026

Opportunity Title	Project Description	Partner Lead	SCE's Role	Funding	Timing
	2) Fuels Potential Model – Output from this index would be in the form of a heat map showing the areas that would have the greatest likelihood for a major fire based on the type, age, and current status of fuel conditions. Use case would be to prioritize P2 remediations and grid hardening efforts				
SJSU's LiDAR system	SCE is engaging with the University of San Jose State University to work on a Wind Profiler project to profile winds in the lower atmosphere using LiDAR technology to collect wind observations above ground level, using multiple deployments of SJSU's LiDAR system to sample wind speeds at specific locations on demand. .	SJSU	Project/research collaboration	SCE is providing funding for 1 year, subject to renewal ($75k for year one)	2021
Texas A&M Distribution Fault Anticipation (DFA) deployment	SCE continues to collaborate with Texas A&M on its DFA deployment. SCE is working closely with Texas A&M to provide information about SCE's system configuration/networks and to provide an on-going exchange of the field validations to optimize the DFA software algorithms – which will continue to improve through the plan term as it collects additional grid event data.	Texas A&M	Project/research collaboration	N/A	Ongoing

WMP Class B Deficiency Action Statements
SCE-18, Discussion of centralized data repository lacks detail

Action SCE-25*: In its 2021 WMP Update, SCE shall identify what program or initiatives (listed in subpart (iii)) corresponds with the data sources listed as part of its response to this condition.*

Response:
In the Table below, SCE responds to this condition with the identified program or initiatives (listed in deficiency SCE-18 subpart (iii)) along with the corresponding data sources utilized.

Data Source	**Programs or Initiatives**
ArcGIS Online (AGOL)	Asset Management Inspections, Vegetation Management
Consolidated GIS (cGIS)	Asset Management Inspection, Grid Hardening, Vegetation Management, Wildfire risk analysis
Customer Service System (CSS)	Public Safety Power Shutoff
Fire Investigation Preliminary Analysis (FIPA)	Wildfire risk analysis
Google Cloud Platform	Asset Management Inspections, Grid Hardening
Outage Database & Reliability Metrics (ODRM)	Wildfire risk analysis
Outage Management System (OMS)	Wildfire risk analysis, Public Safety Power Shutoff
Primavera P6	Grid Hardening, Grid Resilience Alternative Technology Programs
Salesforce	Asset Management Inspections, Vegetation Management
SAP	Asset Management Inspection, Grid Hardening, Vegetation Management
SAS	Wildfire risk analysis
Scope Mapping Tool (SMT)	Grid Hardening
Technosylva	Wildfire risk analysis

WMP Class B Deficiency Action Statements
SCE-19, SCE does not sufficiently justify the relative resource allocation of its WMP initiatives to its covered conductor program.

Action SCE-26: *In its 2021 WMP Update, SCE shall clarify whether the "additional benefits" are solely accounted for in the covered conductor program or if the cost is distributed amongst several initiatives.*

Response:
The "additional benefits" as described in SCE-19, namely reducing equipment/facility failures risk drivers, are solely accounted for in the covered conductor program.

WMP Class B Deficiency Action Statements
SCE-22, SCE does not describe resources needed on fuel reduction efforts.

Action SCE-28: *In its 2021 WMP Update, SCE shall provide a copy of its study to "determine the best use of fuel reduction" as an attachment.*

Response:
WSD deemed SCE's Condition SCE-22 response sufficient on January 8, 2020 and requested a copy of the study to determine the best use of fuel reduction. However, when SCE filed the response to SCE-22 on September 9, 2020, SCE inadvertently stated that the study would be complete by year-end 2020. However, the study was always intended to be completed by year-end 2021, not 2020. In the table below, SCE provides an updated schedule by major task for completing the study by The Electric Power Research Institute (EPRI).

Major Tasks	Estimated Completion Date
1. Kickoff Meeting with EPRI	December 16, 2020
2. Data Collection and establishing baseline	February 26, 2020
3. Review of data, methodologies, stakeholder outreach, evaluation of opportunities	May 30, 2021
4. Report Production	September 30, 2021
5. SCE Review and finalization of Report	October 29, 2021
6. Submittal of the Report to external stakeholders	November 1, 2021

9.7 DATA TABLES (1-12)

Location of Change		Nature of Change	Change First Reported In
Table	Cell(s)		
Table 1	H17-M17, W17	Corrected Total Level 1 findings in HFTD for patrol inspections - Distribution Lines 2018 - 2020	Q1 2021 QDR
	G18-M18, W18	Corrected Total Level 1 findings in HFTD for detailed inspections - Distribution Lines 2017 - 2020	Q1 2021 QDR
	H19-M19, W19	Corrected Total Level 1 findings in HFTD for other inspections - Distribution Lines 2018 - 2020	Q1 2021 QDR
	H20-M20, W20	Corrected Total Level 2 findings in HFTD for patrol inspections - Distribution Lines 2018 - 2020	Q1 2021 QDR
	H21-M21, W21	Corrected Total Level 2 findings in HFTD for detailed inspections - Distribution Lines 2018 - 2020	Q1 2021 QDR
	H22-M22, W22	Corrected Total Level 2 findings in HFTD for other inspections - Distribution Lines 2018 - 2020	Q1 2021 QDR
	H23-M23, W23	Corrected Total Level 3 findings in HFTD for patrol inspections - Distribution Lines 2018 - 2020	Q1 2021 QDR
	H24-M24, W24	Corrected Total Level 3 findings in HFTD for detailed inspections - Distribution Lines 2018 - 2020	Q1 2021 QDR
	H25-M25, W25	Corrected Total Level 3 findings in HFTD for other inspections - Distribution Lines 2018 - 2020	Q1 2021 QDR
	H45-M45, W45	Corrected Grid condition findings from inspection - Transmission lines in HFTD - Number of Circuit Miles	Q1 2021 QDR
	H46-M46, W46	Corrected Grid condition findings from inspection - Transmission lines in HFTD - Detailed Inspections	Q1 2021 QDR
	I78-M78, W78	Corrected Number of spans inspected where at least some vegetation was found in non-compliant condition - total 2019-2020	Q1 2021 QDR
	I79-M79, W79	Corrected Number of spans inspected for vegetation compliance - total 2019 - 2020	Q1 2021 QDR
Table 2	E26 – M26	Corrected sum of total ignitions to equal: number of ignitions in HFTD (subtotal) + number of ignitions in Non-CPUC HFTD + number of ignitions in non-HFTD (subtotal)	Q1 2021 QDR
Table 3	C16, X16	Updated language pertaining to customers de-energized	Q1 2021 QDR
	Q13 - W13	• Corrected 2021 and 2022 projected risk events for the following Risk Event /Cause/Sub-Cause Categories: • Wire down event – Distribution; Equipment / facility failure; Connector damage or failure	Q1 2021 QDR
	Q27 – W27	• Wire down event –Wire-to-wire contact - Distribution	Q1 2021 QDR
	G62 - O62, Q62 -W62	• Outage Distribution - Contact From Object Distribution / Other Contact From Object	Q1 2021 QDR
	F64 - W64	• Outage Distribution - Contact From Object Distribution / Other Contact From Object/Lightning	Q1 2021 QDR
	Q70 – W70	• Outage - Distribution; Equipment / facility failure; Switch damage or failure	Q1 2021 QDR
	Q78 – W78	• Outage - Distribution; Equipment / facility failure; Connection device damage or failure - Distribution	Q1 2021 QDR

Table 7.1	Q87 – W87	• Outage - Distribution; Equipment / facility failure; Utility Work/Operation	Q1 2021 QDR
	G89 - O89, Q89 -W89	• Outage - Distribution; Equipment / facility failure; Other - Distribution /All Other Distribution	Q1 2021 QDR
	G101 - O101, Q101 - W101	• Outage - Transmission; Contact From Object / Other Contact From Object	Q1 2021 QDR
	F103 - O103, Q103 - W103	• Outage - Transmission; Contact From Object / Lightning	Q1 2021 QDR
	Q105 - W105	• Outage - Transmission / Equipment/ Facility Failure/ Conductor damage or failure — Transmission	Q1 2021 QDR
	Q107 - W107	• Outage - Transmission / Equipment/ Facility Failure / Fuse Damage or Failure	Q1 2021 QDR
	Q109 - W109	• Outage - Transmission / Equipment/ Facility Failure / Switch Damage or Failure	Q1 2021 QDR
	Q113 - W113	• Outage - Transmission / Equipment/ Facility Failure / Voltage Regulator	Q1 2021 QDR
	Q117 - W117	• Outage - Transmission / Equipment/ Facility Failure / Connection Device Damage or Failure	Q1 2021 QDR
	Q118 - W118	• Outage - Transmission / Equipment/ Facility Failure / Transformer Damage or Failure	Q1 2021 QDR
	Q126 - W126	• Outage - Transmission / Equipment/ Facility Failure / Utility Work Operation	Q1 2021 QDR
	G128 - O128, Q128 - W128	• Outage - Transmission / Equipment/ Facility Failure / Other Transmission/ All Other Transmission	Q1 2021 QDR
	Q153 - W153	• Outage - Distribution / Equipment/ Facility Failure / Connection Device Damage or Failure	Q1 2021 QDR
	K163	• Ignition - Transmission / Contact From Object /Animal Contact	Q1 2021 QDR
	Q179 - W179	• Outage - Transmission; Utility work / Operation; Utility work / Connection Device Damage or Failure	Q1 2021 QDR
Table 7.2	AK25 – AT25	· Updated 2021 and 2022 Projected Ignitions per Tier for the following Risk Event Categories / Metric Types / and Risk Drivers: • Ignition - Distribution / Equipment / Facility Failure / Connection Device Damage or Failure	Q1 2021 QDR
	AD33	• Ignition - Distribution / Unknown	Q1 2021 QDR
	AK51 – AT51	• Ignition - Transmission / Equipment / Facility Failure / Connection Device Damage or Failure	Q1 2021 QDR
	AD55	• Ignition - Transmission / Equipment / Facility Failure / Contamination	Q1 2021 QDR

Table 8	Y8, AA8, AB8 Y9, AA9, AB9 Y16, AA16, AB16 Y17, AA17, AB17 Y18, AA18, AB18 Y19, AA19, AB19 Y20, AA20, AB20 Y21, AA21, AB21 Y24, AA24, AB24	Corrected 2020 counts for urban for: • Circuit miles (including WUI and non-WUI) in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles in WUI in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles of overhead transmission lines (including WUI and non-WUI) in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles of overhead transmission lines in WUI in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles of overhead distribution lines (including WUI and non-WUI) in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles of overhead distribution lines in WUI in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Substations (including WUI and non-WUI) in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Substations in WUI in Non-HFTD, HFTD Tier 2, and HFTD Tier 3	Q1 2021 QDR
	Y24, AA24, AB24 Y25, AA25, AB25 Y32, AA32, AB32 Y33, AA33, AB33 Y34, AA34, AB34 Y35, AA35, AB35 Y36, AA36, AB36 Y37, AA37, AB37	Corrected 2020 counts for rural for: • Circuit miles (including WUI and non-WUI) in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles in WUI in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles of overhead transmission lines (including WUI and non-WUI) in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles of overhead transmission lines in WUI in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles of overhead distribution lines (including WUI and non-WUI) in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles of overhead distribution lines in WUI in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Substations (including WUI and non-WUI) in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Substations in WUI in Non-HFTD, HFTD Tier 2, and HFTD Tier 3	Q1 2021 QDR

	Y40, AA40, AB40 Y41, AA41, AB41 Y48, AA48, AB48 Y49, AA49, AB49 Y50, AA50, AB50 Y51, AA51, AB51 Y52, AA52, AB52 Y53, AA53, AB53 AA54, AB54 AA55, AB55	Corrected 2020 counts for highly rural for: • Circuit miles (including WUI and non-WUI) in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles in WUI in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles of overhead transmission lines (including WUI and non-WUI) in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles of overhead transmission lines in WUI in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles of overhead distribution lines (including WUI and non-WUI) in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Circuit miles of overhead distribution lines in WUI in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Substations (including WUI and non-WUI) in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Substations in WUI in Non-HFTD, HFTD Tier 2, and HFTD Tier 3 • Weather Stations (including WUI and non-WUI) in HFTD Tier 2, and HFTD Tier 3 • Weather Stations in WUI in HFTD Tier 2, and HFTD Tier 3	Q1 2021 QDR
	Column AL	Updated “Comment” field to provide more detail on the composition of 2019 and 2020 data	Q1 2021 QDR
Table 11	I17, M17	Corrected “Critical Infrastructure impacted by PSPS” amounts for 2019 and Q4 2020	Q1 2021 QDR
	I26, L26, M26, P26, Q26	Corrected Customer hours of PSPS per RFW OH circuit mile day for 2019, Q3 2020, Q4 2020, Q3 2021 and Q4 2021	Q1 2021 QDR
	L27, P27	Corrected Frequency of PSPS events (total) - High Wind Warning wind conditions Q3 2020 and Q3 2021	Q1 2021 QDR
	L28, M28, P28, Q28	Corrected Scope of PSPS events (total) - High Wind Warning wind conditions	Q1 2021 QDR
	L29, M29, P29, Q29	Corrected Duration of PSPS events (total) - High Wind Warning wind conditions	Q1 2021 QDR
	U8, V8, Z8, AD8, U10, V10, Z10, AD10, U12, V12, Z12, AD12, U21, V21, Z21, AD21, Z22, AD22.	Fire Science licensing costs for various sub-activities previously mapped in 7.3.2.6.1 and 7.3.2.6.2 have been moved to Risk Assessment & Mapping in 7.3.1.1, 7.3.1.3 and 7.3.1.5.	Q1 2021 QDR
	V46, Z46, V92, Z92,	Remapped 2020 recorded and 2021 forecast costs belonging to Improvement of Inspections (7.3.4.3) that were in Allocation methodology development and application (7.3.8.1).	Q1 2021 QDR
	N71, Q71, Z71, AD71, N72, Q72, Z72, AD72, V81, Z81, AD81	Removed Summer Readiness/Canyon Patrol inspections 2021 and 2022 Forecast from Line Clearing totals (7.3.5.20), to their respective sections in table 12 (Patrol inspections of vegetation around distribution /transmission electric lines and equipment (Distr.- 7.3.5.11, Trans- 7.3.5.12). 2020 Recorded costs could not be isolated due to the process in which the work was executed and invoiced by contractors.	Q1 2021 QDR

Table 12	Q77, V77, Z77, AD77, V81, Z81, AD81,	Moved Drought Remediation 2021 and 2022 forecast from Line Clearing totals (7.3.5.20) into VM-4 (7.3.5.16.2). Also, added in 2020 recorded Drought Remediation costs, previously inadvertently excluded (7.3.5.16.2). Please note that the Drought Remediation RSE appropriately included the 2020 recorded costs as submitted on 2/5, and thus has not changed. Removed duplicate System-Wide HFRA Forecast costs (2021- $11,379, 2022- $11,739) for Detailed Inspections of Vegetation around Distribution electrical lines, previously double counted in Vegetation Line Clearing (7.3.5.20).	Q1 2021 QDR
	U30	Revised recorded capital costs for Current Limiting Fuses (7.3.3.7).	Q1 2021 QDR
	L81, M81	Updated Estimated Tier 2 and Tier 3 RSE scores for Line Clearing (7.3.5.20) due to cost changes made in rows above	Q1 2021 QDR
	V99	Revised 2020 recorded costs for Preparedness and planning for service restoration (7.3.9.5).	Q1 2021 QDR
	F73	Removed the WMP Identifier from "Quality assurance / quality control of vegetation inspections" and replaced with "NA"	Q1 2021 QDR
	J13-M13	SA-1 RSE Updates in all zones/tiers	Revision Notice
	K14	SA-9 RSE Updates in zone 1	Revision Notice
	J24, K24	SH-6 RSE Updates in Non-HFTD and Zone 1	Revision Notice
	J25-M25	SH-1 RSE Updates in all zones/tiers	Revision Notice
	J30, K30	SH-4 RSE Updates in Non-HFTD and Zone 1	Revision Notice
	J33-M33	SH-5 RSE Updates in all zones/tiers	Revision Notice
	J36, K36	SH-14 RSE Updates in Non-HFTD and Zone 1	Revision Notice
	J39-M39	SH-13 RSE Updates in all zones/tiers	Revision Notice
	J40, K40	SH-2 RSE Updates in Non-HFTD and Zone 1	Revision Notice
	J41, K41, L41	SH-15 RSE Updates in Non-HFTD, Zone 1 and Tier 2	Revision Notice
	J47, K47	IN-3 RSE Updates in Non-HFTD and Zone 1	Revision Notice
	J48, K48, L48	IN-4 RSE Updates in Non-HFTD, Zone 1 and Tier 2	Revision Notice
	J52-M52	IN-1.1 RSE Updates in all zones/tiers	Revision Notice
	J54-M54	IN-1.2 RSE Updates in all zones/tiers	Revision Notice
	J64, K64	VM-2 RSE Updates in Non-HFTD and Zone 1	Revision Notice
	J76 K76	VM-1 RSE Updates in Non-HFTD and Zone 1	Revision Notice
	J77, K77	VM-4 RSE Updates in Non-HFTD and Zone 1	Revision Notice
	J81-M81	Vegetation management to achieve clearances around electric lines and equipment (7.3.5.20) RSE Updates in all zones/tiers	Revision Notice
	J86, K86	PSPS-2 RSE Updates in Non-HFTD and Zone 1	Revision Notice
	J105, K105	DEP-5 RSE Updates in Non-HFTD and Zone 1	Revision Notice

Wildfire Safety Division Attachment 2.3

Wildfire Mitigation Plan Quarterly report - non-spatial data template

Resolution WSD-011 Attachment 2.3

Instructions for use	
1.	Fill out the tan cells (color represented here) starting with the cell below (D17: Utility). The Utility name will populate the Table tabs to follow. Date modified will vary by table.
2.	Cells will only accept valid entries. For most cells, this is positive numbers
3.	For each Table tab, after a modification is made, denote the date of the change in cell C4 for each Table tab.
4.	Some columns have an additional header in row 5 to serve as clarification for several columns. With the exception of projected data, row 5 will be highlighted in blue (color represented here)
5.	Some required metrics are future projections. For these, row 5, above the projections will be highlighted light green (color represented here)
	In future submissions, report updated projected numbers if / when projections have changed, and report actuals once the quarter / year has passed.
6.	For data required annually rather than quarterly (see Tables 7.3 - 10), report for entire year even if part of the year is projected. Once year has passed, update cell with actuals
7.	Some tables will have additional instructions provided in a **Notes** box located in cells D2 - D4
	Notes will explain terms, signal where projections are required, and provide other useful information.
8.	For the initial quarterly submission, utilities are required to submit data on annual metrics for 2015 - 2020, which should represent the most updated data from the 2020 WMP for years 2015-2019
*	Do not add or manipulate the template for any of the tabs

Update the below table to establish which year, quarter of the WMP cycle this submission this represents.

Utility	Southern California Edison Company
First year of 3-year WMP cycle	2020
Submission year	2021
Submission quarter	N/A (Response to Critical Issue SCE-01)
Date Modified	6/3/2021

Utility	Southern California Edison Company
Table No.	1
Date Modified	5/3/2021

Notes:
Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV.

Note: These columns are placeholders for future QR submissions.

Table 1: Recent performance on progress metrics

Metric type	#	Progress metric name	2015	2016	2017	2018	2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Unit(s)	Comments
1. Grid condition findings from inspection - Distribution lines in HFTD	1.a.	Number of circuit miles inspected from patrol inspections in HFTD - Distribution lines	9,729	9,734	9,738	9,751	9,814	1,587	6,954	1,250	233	3,783								# circuit miles	SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected.
	1.b.	Number of circuit miles inspected from detailed inspections in HFTD - Distribution lines (Total)	1,986	2,425	2,049	2,550	15,215	3,100	4,769	4,749	3,832	3,852								# circuit miles	This row is the sum of the four detailed inspection programs below it
		Overhead Detailed Inspections	1,986	2,425	2,049	1,618	1,906	518	1,352	48	4	653									From 2015-2019, the number represents the completed detailed inspections completed in circuit miles. Starting in 2020, the numbers represent completed compliance-due detailed inspections by circuit miles. SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected.
		Enhanced Overhead Inspections	NA	NA	NA	932	9,448	NA	NA	NA	NA	NA									SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected.
		High Fire Risk Informed Inspections	NA	NA	NA	NA	NA	154	990	2274	1401	2,984									SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected.
		Aerial Inspections	NA	NA	NA	NA	3,861	2,427	2,427	2,427	2,427	215									SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected. Additionally, for 2020, SCE tracked the completed asset inspected by the year and in order to represent the 2020 completed asset inspection in circuit mile by quarter, SCE evenly distributed the completed inspections to each of the four quarters in 2020.
	1.c.	Number of circuit miles inspected from other inspections (list types of "other" inspections in comments) in HFTD - Distribution lines (total)	NA	NA	NA	12,605	5,663	1,382	1,382	1,382	1382.478	2,548								# circuit miles	This row is the sum of the two programs below that are considered as "other"
		Infrared Scan	NA	NA	NA	11,775	4,962	1,112	1,112	1,112	1,112	2,465									For 2020, SCE tracks the completed asset inspected by year and in order to represent the 2020 completed asset inspection by quarter, SCE evenly distributed the completed inspections to each of the four quarters in 2020.
		Intrusive Pole Inspections	NA	NA	NA	830	701	271	271	271	271	83									SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected. Additionally, for 2020, SCE tracked the completed asset inspected by year and in order to represent the 2020 completed asset inspection by quarter, SCE evenly distributed the completed inspections to each of the four quarters in 2020.
	1.d.	Level 1 findings in HFTD for patrol inspections - Distribution lines	0	0	3	1	17	0	18	0	1	5								# findings	Historical data was updated as an error was found in the logic that summed up the numbers for each type of inspection method
	1.e.	Level 1 findings in HFTD for detailed inspections - Distribution lines	2,163	3,146	3,114	2,834	4,144	797	716	706	739	778								# findings	Historical data was updated as an error was found in the logic that summed up the numbers for each type of inspection method
	1.f.	Level 1 findings in HFTD for other inspections (list types of "other" inspections in comments) - Distribution lines	246	773	325	167	617	91	115	306	261	90								# findings	Historical data was updated as an error was found in the logic that summed up the numbers for each type of inspection method
	1.g.	Level 2 findings in HFTD for patrol inspections - Distribution lines	6,392	5,124	3,781	3,730	6,498	1,028	1,513	1,227	1,054	1,509								# findings	Historical data was updated as an error was found in the logic that summed up the numbers for each type of inspection method
	1.h.	Level 2 findings in HFTD for detailed inspections - Distribution lines	7,297	7,751	5,841	16,646	71,791	9,890	9,045	5,647	3,807	9,174								# findings	Historical data was updated as an error was found in the logic that summed up the numbers for each type of inspection method
	1.i.	Level 2 findings in HFTD for other inspections (list types of "other" inspections in comments) - Distribution lines	4,448	4,167	3,934	3,348	5,304	1,463	1,737	534	1,924	1,166								# findings	Historical data was updated as an error was found in the logic that summed up the numbers for each type of inspection method
	1.j.	Level 3 findings in HFTD for patrol inspections - Distribution lines	43	10	33	51	228	117	6	0	2	26								# findings	Historical data was updated as an error was found in the logic that summed up the numbers for each type of inspection method
	1.k.	Level 3 findings in HFTD for detailed inspections - Distribution lines	14,301	18,081	12,647	13,725	108,873	8,982	9,381	9,536	824	13,987								# findings	Historical data was updated as an error was found in the logic that summed up the numbers for each type of inspection method
	1.l.	Level 3 findings in HFTD for other inspections (list types of "other" inspections in comments) - Distribution lines	256	142	206	214	1,563	1,267	1,136	138	298	471								# findings	Historical data was updated as an error was found in the logic that summed up the numbers for each type of inspection method
1. Grid condition findings from inspection - Distribution lines total	1.a.ii.	Number of total circuit miles inspected from patrol inspections - Distribution lines	39,125	39,139	39,129	39,193	39,464	1,011	23,406	10,641	2,691	5,336								# circuit miles	SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected.
	1.b.ii.	Number of total circuit miles inspected from detailed inspections - Distribution lines (Total)	8,347	8,200	8,007	8,813	21,245	3,378	5,605	6,442	6,935	3,891								# circuit miles	This row is the sum of the four detailed inspection programs below it
		Overhead Detailed Inspections	8,347	8,200	8,007	7,881	7,936	796	2,188	1,740	3,107	839									From 2015-2019, the number represents the completed detailed inspections completed in circuit miles. Starting in 2020, the numbers represent completed compliance-due detailed inspections by circuit miles. SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected.
		Enhanced Overhead Inspections	NA	NA	NA	932	9,448	NA	NA	NA	NA	NA									SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected.
		High fire Risk Informed Inspections	NA	NA	NA	NA	NA	154	990	2274	1401	3,188									SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected.
		Aerial Inspections	NA	NA	NA	NA	3,861	2,427	2,427	2,427	2,427	215									SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected. Additionally, for 2020, SCE tracked the completed asset inspected by the year and in order to represent the 2020 completed asset inspection in circuit mile by quarter, SCE evenly distributed the completed inspections to each of the four quarters in 2020.
	1.c.ii.	Number of total circuit miles inspected from other inspections (list types of "other" inspections in comments) - Distribution lines	4,320	4,509	4,093	29,902	8,887	2,106	2,106	2,106	2,106	3,458								# circuit miles	This row is the sum of the two programs below that are considered as "other"
		Infrared Scan	NA	NA	NA	26,055	4,962	1,112	1,112	1,112	1,112	2,465									For 2020, SCE tracks the completed asset inspected by the year and in order to represent the 2020 completed asset inspection by quarter, SCE just evenly distributed the completed inspections to each of the four quarters in 2020.
		Intrusive Pole Inspections	4,320	4,509	4,093	3,847	3,925	995	995	995	995	993									SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected. Additionally, for 2020, SCE tracked the completed asset inspected by the year and in order to represent the 2020 completed asset inspection by quarter, SCE just evenly distributed the completed inspections to each of the four quarters in 2020.
	1.d.ii.	Level 1 findings for patrol inspections - Distribution lines	5	2	4	10	28	0	76	3	19	19								# findings	
	1.e.ii.	Level 1 findings for detailed inspections - Distribution lines	17,812	19,726	21,832	19,482	21,320	4,300	4,923	6,308	5,039	4,918								# findings	
	1.f.ii.	Level 1 findings for other inspections (list types of "other" inspections in comments) - Distribution lines	1,742	2,636	1,762	1,506	2,680	557	596	682	576	370								# findings	
	1.g.ii.	Level 2 findings for patrol inspections - Distribution lines	26,406	17,649	15,545	30,305	83,237	8,457	4,779	4,808	3,665	4,551								# findings	
	1.h.ii.	Level 2 findings for detailed inspections - Distribution lines	51,016	48,323	41,641	39,640	40,771	8,510	13,463	13,300	15,593	13,769								# findings	
	1.i.ii.	Level 2 findings for other inspections (list types of "other" inspections in comments) - Distribution lines	14,687	13,466	12,071	12,873	26,158	6,250	6,497	4,403	6,114	3,411								# findings	
	1.j.ii.	Level 3 findings for patrol inspections - Distribution lines	328	64	128	7,790	35,237	142	12	4	17	26								# findings	
	1.k.ii.	Level 3 findings for detailed inspections - Distribution lines	84,111	76,240	63,267	62,133	62,271	11,811	16,961	18,740	19,548	17,760								# findings	
	1.l.ii.	Level 3 findings for other inspections (list types of "other" inspections in comments) - Distribution lines	1,149	753	1,013	2,851	92,092	2,428	2,514	1,240	1,510	664								# findings	
1. Grid condition findings from inspection - Transmission lines in HFTD	1.a.iii.	Number of circuit miles inspected from patrol inspections in HFTD - Transmission lines	4,438	4,438	4,438	4,438	4,438	1,109	1,109	1,109	1,109	434								# circuit miles	For 2015-2017, patrol inspections doubled as detailed inspections being completed on every transmission asset in the service territory. Beginning in 2018, the recorded inspection numbers estimate the patrol type inspections in circuit miles being completed. Additionally, SCE tracks completed inspections by "Grids". SCE's complete transmission line network is broken out into large areas called "Grids" and all execution and tracking are recorded at the grid level. The number being represented uses the current transmission circuit mile counts in HFTD for each year. 2020 in particular, evenly distributes the current transmission mile circuit counts into each quarter.
	1.b.iii.	Number of circuit miles inspected from detailed inspections in HFTD - Transmission lines	NA	NA	NA	1,479	6,629	2,327	2,327	2,327	2,327	1,824								# circuit miles	This row is the sum of the three detailed inspection programs below it. An updated historical number for detailed inspections occurred requiring a new summation of the programs below.
		Detailed Inspections	NA	NA	NA	1,479	1,479	370	370	370	370	311									For 2015-2017, patrol inspections doubled as detailed inspections being completed on every transmission asset in the service territory. Beginning in 2018 the recorded inspection numbers estimate the detail inspections in circuit miles being completed. Additionally, the detailed inspection program completes inspections of 1/3 of all SCE transmission assets per year. The completed inspections are tracked by "Grids". SCE's complete transmission line network is broken out into large areas called "Grids" and all execution and tracking are recorded at the grid level. The number being represented uses 1/3rd of the current transmission circuit mile counts in HFTD for each year. 2020 in particular, evenly distributes the 1/3rd of the current transmission mile circuit counts into each quarter. An error was found in the calculation methodology for the historical years, therefore the outlined methodology was properly applied and the historical numbers were updated.
		High Fire Inspections	NA	NA	NA	NA	520	1,089	1,089	1,089	1,089	966									SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected.
		Aerial Inspections	NA	NA	NA	NA	4,630	868	868	868	868	546									SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected. Additionally, for 2020, SCE tracked the completed asset inspected by the year and in order to represent the 2020 completed asset inspection by quarter, just evenly distributed the completed inspections to each of the four quarters in 2020.
	1.c.iii	Number of total circuit miles inspected from other inspections (list types of "other" inspections in comments) - Transmission lines	NA	NA	NA	103	5,003	284	284	284	284	43									This row is the sum of the two programs below that are considered as "other"
		IR Corona	NA	NA	NA	NA	4,901	251	251	251	251	0									For 2020, SCE tracked the completed inspections by the year. In order to represent the 2020 completed inspection by quarter, SCE evenly distributed the completed inspections to each of the four quarters evenly in 2020.

		Intrusive Pole Inspections	NA	NA	NA	103	102	32	32	32	32	43		SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected. Additionally, for 2020, SCE tracked the completed asset inspected by the year and in order to represent the 2020 completed asset inspection by quarter, SCE just evenly distributed the completed inspections to each of the four quarters in 2020.
	1.d.iii.	Level 1 findings in HFTD for patrol inspections - Transmission lines	50	82	40	32	108	12	23	54	63	11	# findings	
	1.e.iii.	Level 1 findings in HFTD for detailed inspections - Transmission lines	0	0	0	1	0	0	0	0	0	18	# findings	
	1.f.iii.	Level 1 findings in HFTD for other inspections (list types of "other" inspections in comments) - Transmission lines	0	0	0	0	0	6	0	0	0	0	# findings	
	1.g.iii.	Level 2 findings in HFTD for patrol inspections - Transmission lines	697	855	977	1,215	15,029	1,245	2,522	549	138	319	# findings	
	1.h.iii.	Level 2 findings in HFTD for detailed inspections - Transmission lines	3	1	2	1	14	609	4,400	1,783	961	537	# findings	
	1.i.iii.	Level 2 findings in HFTD for other inspections (list types of "other" inspections in comments) - Transmission lines	278	128	408	419	456	15	46	45	85	24	# findings	
	1.j.iii.	Level 3 findings in HFTD for patrol inspections - Transmission lines	935	735	719	382	2,545	130	437	166	48	166	# findings	
	1.k.iii.	Level 3 findings in HFTD for detailed inspections - Transmission lines	0	2	0	4	3	44	309	366	186	207	# findings	
	1.l.iii.	Level 3 findings in HFTD for other inspections (list types of "other" inspections in comments) - Distribution lines	0	0	0	0	103	3	1	0	3	0	# findings	
1. Grid condition findings from inspection - Transmission lines total	1.a.iv.	Number of total circuit miles inspected from patrol inspections - Transmission lines	13,068	13,068	13,068	13,068	13,068	3,267	3,267	3,267	3,267	1,713	# circuit miles	For 2015-2017, patrol inspections doubled as detailed inspections being completed on every transmission asset in the service territory. Beginning in 2018, the recorded inspection numbers estimate the patrol type inspections in circuit miles being completed. Additionally, SCE tracks completed inspections by "Grids". SCE's complete transmission line network is broken out into large areas called "Grids" and all execution and tracking are recorded at the grid level. The number being represented uses the current transmission circuit mile counts in HFTD for each year. 2020 in particular, evenly distributes the current transmission mile circuit counts into each quarter.
	1.b.iv.	Number of total circuit miles inspected from detailed inspections - Transmission lines	NA	NA	NA	4,210	6,389	2,697	3,189	3,230	2,984	3,958	# circuit miles	This row is the sum of the three detailed inspection programs below it
		Detailed Inspections	NA	NA	NA	4,210	4,760	697	1,188	1,229	983	823		For 2015-2017, patrol inspections doubled as detailed inspections being completed on every transmission asset in the service territory. Beginning in 2018 the recorded inspection numbers estimate the detail inspections in circuit miles being completed. Additionally, the detailed inspection program completes inspections of 1/3 of all SCE transmission assets per year. The completed inspections are tracked by "Grids". SCE's complete transmission line network is broken out into large areas called "Grids" and all execution and tracking are recorded at the grid level. The number being represented uses 1/3rd of the current transmission circuit mile counts in HFTD for each year. 2020 in particular, evenly distributes the 1/3rd of the current transmission mile circuit counts into each quarter.
		High Fire Inspections	NA	NA	NA	NA	520	1,089	1,089	1,089	1,089	966		SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected.
		Aerial Inspections	NA	NA	NA	NA	1,109	911	911	911	911	546		SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected. Additionally, for 2020, SCE tracked the completed asset inspected by the year and in order to represent the 2020 completed asset inspection by quarter, just evenly distributed the completed inspections to each of the four quarters in 2020.
	1.c.iv.	Number of total circuit miles inspected from other inspections (list types of "other" inspections in comments) - Transmission lines	6,460	4,592	6,226	7,309	5,529	1,594	1,594	1,594	1,594	267	# circuit miles	This row is the sum of the two programs below that are considered as "other"
		IR Corona	0	0	0	0	0	43	43	43	43	0		For 2020, SCE tracked the completed inspections by the year. In order to represent the 2020 completed inspection by quarter, SCE evenly distributed the completed inspections to each of the four quarters evenly in 2020.
		Intrusive Pole Inspections	6,460	4,592	6,226	7,309	5,529	1,594	1,594	1,594	1,594	267		SCE tracks completed inspections by tracking the counts of assets inspected instead of tracking by circuit miles. In order to present completed inspections in the requested format, SCE used a calculated average span length multiplied by the number of structures inspected. Additionally, for 2020, SCE tracked the completed asset inspected by the year and in order to represent the 2020 completed asset inspection by quarter, SCE just evenly distributed the completed inspections to each of the four quarters in 2020.
	1.d.iv.	Level 1 findings for patrol inspections - Transmission lines	241	252	211	178	304	51	51	106	108	48	# findings	
	1.e.iv.	Level 1 findings for detailed inspections - Transmission lines	0	1	0	1	0	0	0	1	0	19	# findings	
	1.f.iv.	Level 1 findings for other inspections (list types of "other" inspections in comments) - Transmission lines	1	2	2	1	1	7	0	1	0	0	# findings	
	1.g.iv.	Level 2 findings for patrol inspections - Transmission lines	3,912	4,600	5,393	5,871	22,007	2,536	3,644	1,200	802	1,486	# findings	
	1.h.iv.	Level 2 findings for detailed inspections - Transmission lines	10	8	7	4	37	628	4,494	1,889	1,072	553	# findings	
	1.i.iv.	Level 2 findings for other inspections (list types of "other" inspections in comments) - Transmission lines	1,428	583	999	1,150	1,003	101	140	245	375	131	# findings	
	1.j.iv.	Level 3 findings for patrol inspections - Transmission lines	7,020	3,350	3,060	1,732	5,049	744	904	475	383	371	# findings	
	1.k.iv.	Level 3 findings for detailed inspections - Transmission lines	4	2	1	10	3	44	312	388	210	209	# findings	
	1.l.iv.	Level 3 findings for other inspections (list types of "other" inspections in comments) - Transmission lines	1	1	4	3	136	3	2	0	3	0	# findings	
2. Vegetation clearance findings from inspection - total	2.a.i	Number of spans inspected where at least some vegetation was found in non-compliant condition - total	NA	NA	NA	NA	2,430	122	522	1,389	849	370	# of spans inspected with noncompliant clearance based on applicable rules and regulations at the time of inspection	Prior to July 2019, SCE's work management system did not track the reason why a tree was trimmed, just that trimming was required. In other words, a tree may have been trimmed because it was nearing the regulatory clearance distance (RCD) or because it was inside the RCD. Starting in July of 2019, SCE implemented a new work management system that required inspectors to document whether the tree was found inside the RCD, or other SCE program distances related to clearance which exceed RCD clearance. The historical numbers were updated as a calculation error was discovered.
	2.a.ii	Number of spans inspected for vegetation compliance - total	NA	NA	NA	NA	120,314	34,719	53,842	64,299	67,392	61,691	# of spans inspected for vegetation compliance	SCE tracks completed vegetation compliance inspections by circuit miles. In order to present completed vegetation compliance inspections in the requested format, SCE divided the recorded circuit miles inspected by the calculated average span length. The historical numbers were updated as a calculation error was discovered.
2. Vegetation clearance findings from inspection - in HFTD	2.b.i	Number of spans inspected where at least some vegetation was found in non-compliant condition in HFTD	NA	NA	NA	NA	530	32	135	306	242	104	# of spans inspected with noncompliant clearance based on applicable rules and regulations at the time of inspection	SCE tracks findings by count and does not record specific data that associate the findings to a specific span. Therefore SCE is unable to understand how many findings are on each span. The number being presented are just the counts of findings.
	2.b.ii	Number of spans inspected for vegetation compliance in HFTD	NA	NA	NA	NA	25,479	8,996	13,089	12,870	18,168	15,186	# of spans inspected for vegetation compliance	SCE tracks completed vegetation compliance inspections by circuit miles. In order to present completed vegetation compliance inspections in the requested format, SCE divided the recorded circuit miles inspected by the calculated average span length.
3. Customer outreach metrics	3.a.	# Customers in an evacuation zone for utility-ignited wildfire	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	# customers (if customer was in an evacuation zone for multiple wildfires, count the customer for each relevant wildfire)	SCE has no jurisdiction over evacuation orders. SCE diligently requested and followed up with local governments and law enforcement, and was only able to obtain information from one county. Even then, the information provided included high-level estimations of evacuation counts estimated by the local government and law enforcement entity for a limited amount of fires. Because of this, SCE is unable to obtain the requested data, analyze it, and report on evacuation related requirements in this table. SCE anticipates this to be a recurring challenge going forward.
	3.b.	# Customers notified of evacuation orders	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	# customers (count customer multiple times for each unique wildfire of which they were notified)	SCE has no jurisdiction over evacuation orders. SCE diligently requested and followed up with local governments and law enforcement, and was only able to obtain information from one county. Even then, the information provided included high-level estimations of evacuation counts estimated by the local government and law enforcement entity for a limited amount of fires. Because of this, SCE is unable to obtain the requested data, analyze it, and report on evacuation related requirements in this table. SCE anticipates this to be a recurring challenge going forward.
	3.c.	% of customers notified of evacuation in evacuation zone of a utility-ignited wildfire	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Percentage of customers notified of evacuation	SCE has no jurisdiction over evacuation orders. SCE diligently requested and followed up with local governments and law enforcement, and was only able to obtain information from one county. Even then, the information provided included high-level estimations of evacuation counts estimated by the local government and law enforcement entity for a limited amount of fires. Because of this, SCE is unable to obtain the requested data, analyze it, and report on evacuation related requirements in this table. SCE anticipates this to be a recurring challenge going forward.

Utility	Southern California Edison Company	**Notes:**
Table No.	2	Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV.
Date Modified	5/3/2021	

Table 2: Recent performance on outcome metrics

Note: These columns are placeholders for future QR submissions. (Q2 2021 – Q4 2022)

Metric type	#	Outcome metric name	2015	2016	2017	2018	2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Unit(s)	Comments
1. Risk events	1.a.	Number of all events with probability of ignition, including wires down, contacts with objects, line slap, events with evidence of heat generation, and other events that cause sparking or have the potential to cause ignition	12,337	12,406	13,243	14,635	16,794	2,902	3,368	5,077	3,178	3,578								Number per year	
	1.b.	Number of wires down (total)	1,532	1,865	1,639	1,217	1,524	391	537	523	593	503								Number of wires down per year	
	1.c.	Number of outage events not caused by contact with vegetation (total)	11,930	11,833	12,621	14,211	16,260	2,798	3,298	5,051	3,062	3554								Number of outage events per year	
	1.d.	Number of outage events caused by contact with vegetation (total)	407	573	622	424	534	104	70	26	116	95								Number of outage events per year	
2. Utility inspection findings - Distribution	2.a.	Number of Level 1 findings (distribution - total)	19,559	22,364	23,598	20,998	24,028	4,857	5,595	6,993	5,634	5307								# findings	
	2.b.	Number of Level 2 findings (distribution - total)	92,109	79,438	69,257	82,818	150,166	23,217	24,739	22,511	25,372	21731								# findings	
	2.c.	Number of Level 3 findings (distribution - total)	85,588	77,057	64,408	72,774	189,600	14,381	19,487	19,984	21,075	18450								# findings	
	2.d.	Number of distribution circuit miles inspected	51,792	51,848	51,228	77,908	69,596	6,496	31,118	19,189	11,733	12,685								# circuit miles	This total is a summation of all the completed distribution inspection program circuit miles, therefore will be a significantly larger number than the circuit miles of the distribution system.
2. Utility inspection findings - Transmission	2.a.ii	Number of Level 1 findings (transmission - total)	242	255	213	180	305	58	51	108	108	67								# findings	Transmission lines for faults and wire downs are typically 65kV and above, but may include some lower voltages (such as 55kV and 33kV).
	2.b.ii	Number of Level 2 findings (transmission - total)	5,350	5,191	6,399	7,025	23,047	3,265	8,278	3,334	2,249	2170								# findings	
	2.c.ii	Number of Level 3 findings (transmission - total)	7,025	3,353	3,065	1,745	5,188	791	1,218	863	596	580								# findings	
	2.d.ii	Number of transmission circuit miles inspected	19,528	17,661	19,295	24,588	24,986	7,558	8,050	8,091	7,845	5,937								# circuit miles	This total is a summation of all the completed transmission inspection program circuit miles, therefore will be a significantly larger number than the circuit miles of the transmission system.
3. Utility ignited wildfire fatalities	3.a.	Fatalities due to utility-ignited wildfire (total)	0	0	2	3	1	0	0	0	0	0								Number of fatalities per year	The information provided in conjunction with the “utility-ignited” wildfire statistics should not be construed as an admission of any wrongdoing or liability by SCE. SCE further notes that the damages metrics provided may be tracked by other agencies and thus, SCE does not guarantee the accuracy of such information. Additionally, in many instances the cause of wildfires are still under investigation and even where an Authority Having Jurisdiction (AHJ) has issued a report on the cause, SCE may dispute the conclusions of such report. Data provided includes wildfires reported in SCE’s Fire Incident Data Report, Electric Incident Safety Report and fatalities data from CAL FIRE. Thomas and Woosley CAL FIRE data contributed to the entirety of the 2017 and 2018 values.
	3.b.	Injuries due to utility-ignited wildfire (total)	0	3	2	3	3	0	0	6	2	0								Number of injuries per year	The information provided in conjunction with the “utility-ignited” wildfire statistics should not be construed as an admission of any wrongdoing or liability by SCE. SCE further notes that the damages metrics provided may be tracked by other agencies and thus, SCE does not guarantee the accuracy of such information. Additionally, in many instances the cause of wildfires are still under investigation and even where an Authority Having Jurisdiction (AHJ) has issued a report on the cause, SCE may dispute the conclusions of such report. Data provided includes wildfires reported in SCE’s Fire Incident Data Report and Electric Incident Safety Report.
4. Value of assets destroyed by utility-ignited wildfire, listed by asset type	4.a.	Value of assets destroyed by utility-ignited wildfire (total)	$ 21,944,989	$ 483,632,927	$ 1,601,205,795	$ 3,342,821,539	$ 21,714,000	$ 150,400	$ 300,800	$ 120,688,284	$ 12,082,300	$ 169,200								Dollars of damage or destruction per year	The information provided in conjunction with the “utility-ignited” wildfire statistics should not be construed as an admission of any wrongdoing or liability by SCE. SCE further notes that the damages metrics provided may be tracked by other agencies and thus, SCE does not guarantee the accuracy of such information. Additionally, in many instances the cause of wildfires are still under investigation and even where an Authority Having Jurisdiction (AHJ) has issued a report on the cause, SCE may dispute the conclusions of such report. Asset type listed is either SCE or Third Party. Asset per the WSD guidance is utility electrical equipment or third party property. SCE asset value using a per unit cost based on the identified equipment failure for each CPUC reportable ignition. Data provided includes wildfires reported in SCE’s Fire Incident Data Report, Electric Incident Safety Report and asset value data from CAL FIRE and the California Department of Insurance. Where third party source of information was unavailable, SCE applied a proxy cost per structure destroyed of $819,472 based on its methodology used in its RAMP report. The California Department of Insurance and proxy cost data use information from insured claims.
5. Structures damaged or destroyed by utility-ignited wildfire	5.a.	Number of structures destroyed by utility-ignited wildfire (total)	45	290	1,072	1,667	26	0	0	47	13	0								Number of structures destroyed per year	The information provided in conjunction with the “utility-ignited” wildfire statistics should not be construed as an admission of any wrongdoing or liability by SCE. SCE further notes that the damages metrics provided may be tracked by other agencies and thus, SCE does not guarantee the accuracy of such information. Additionally, in many instances the cause of wildfires are still under investigation and even where an Authority Having Jurisdiction (AHJ) has issued a report on the cause, SCE may dispute the conclusions of such report. Structure is defined as a dwelling, per WSD guidance. Data provided includes wildfires reported in SCE’s Fire Incident Data Report and Electric Incident Safety Reports and structures destroyed data from CAL FIRE.
	5.b.	Critical infrastructure damaged/destroyed by utility-ignited wildfire (total)	NA	NA	36	31	NA	NA	NA	NA	NA	NA								Number of critical infrastructure damaged/destroyed per year	The information provided in conjunction with the “utility-ignited” wildfire statistics should not be construed as an admission of any wrongdoing or liability by SCE. SCE further notes that the damages metrics provided may be tracked by other agencies and thus, SCE does not guarantee the accuracy of such information. Additionally, in many instances the cause of wildfires are still under investigation and even where an Authority Having Jurisdiction (AHJ) has issued a report on the cause, SCE may dispute the conclusions of such report. Data was drawn from available subrogation claims. These numbers may be updated as more information becomes available.
6. Acreage burned by utility-ignited wildfire	6.a.	Acreage burned by utility-ignited wildfire (total)	15,711	82,897	292,051	97,240	22,784	4	574	115,871	12,863	12								Acres burned per year	The information provided in conjunction with the “utility-ignited” wildfire statistics should not be construed as an admission of any wrongdoing or liability by SCE. SCE further notes that the damages metrics provided may be tracked by other agencies and thus, SCE does not guarantee the accuracy of such information. Additionally, in many instances the cause of wildfires are still under investigation and even where an Authority Having Jurisdiction (AHJ) has issued a report on the cause, SCE may dispute the conclusions of such report. Data provided includes wildfires reported in SCE’s Fire Incident Data Report and Electric Incident Safety Reports and acreage burned data from CAL FIRE.
7. Number of utility wildfire ignitions	7.a.	Number of ignitions (total) according to existing ignition data reporting requirement	107	96	105	110	124	16	56	45	32	28								Number per year	Data are from SCE's CPUC reportable ignitions data set. Historical numbers were updated due to a tabulation error.
	7.b.	Number of ignitions in HFTD (subtotal)	45	41	32	37	35	3	21	17	9	7								Number in HFTD per year	
	7.c.	Number of ignitions in HFTD Zone 1	0	0	0	0	0	0	0	0	0	0								Number in HFTD Zone 1 per year	
	7.c.ii.	Number of ignitions in HFTD Tier 2	13	12	9	15	13	1	5	6	3	1								Number in HFTD Tier 2 per year	
	7.c.iii.	Number of ignitions in HFTD Tier 3	32	29	23	22	22	2	16	11	6	6								Number in HFTD Tier 3 per year	
		Number of ignitions in Non-CPUC HFTD	1	0	3	1	3	0	0	0	0	0								Number in Non-CPUC HFTD	
	7.d.	Number of ignitions in non-HFTD (subtotal)	61	55	70	72	86	13	35	28	23	21								Number in non-HFTD per year	
8. Fatalities resulting from utility wildfire mitigation initiatives	8.a.	Fatalities due to utility wildfire mitigation activities (total) - "activities" defined as all activities accounted for in the 2020 WMP proposed WMP spend	0	0	0	0	0	1	0	0	0	0								Number of fatalities per year	By providing this data, SCE is not admitting that 1) any responsibility or liability for any incident reported herein or 2) that a wildfire mitigation activity caused a fatality.
9. OSHA-reportable injuries from utility wildfire mitigation initiatives	9.a.	OSHA-reportable injuries due to utility wildfire mitigation activities (total) - "activities" defined as all activities accounted for in the 2020 WMP proposed WMP spend	0	0	0	0	1	0	1	3	0	0								Number of OSHA-reportable injuries per year	By providing this data, SCE is not admitting that 1) any responsibility or liability for any incident reported herein or 2) that a wildfire mitigation activity caused an injury.

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Table No.	3
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Table 3: List and description of additional metrics

Note: These columns are placeholders for future QR submissions. (Q2 2021 – Q4 2022)

Metric	Definition	Purpose	Assumptions made to connect metric to purpose	Third-party validation (if any)	2015	2016	2017	2018	2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Unit(s)	Comments
CPUC reportable ignitions in High Fire Risk Areas (HFRA)	Events meeting reportable ignition status per Decision 14-02-015 and falling within BL322, HFTD Zone 1 HFTD Tier 2 and 200 ft. Outer Buffer, and HFTD Tier 3 and 200 ft. Outer Buffer areas	To measure changes in rate of ignitions between years	Factors outside of SCE's control (e.g., wind, live fuel moisture) have a significant effect on CPUC reportable ignition counts in HFRA.	Annual submission of CPUC reportable ignition totals to CPUC	46	41	35	37	38	3	22	16	9	7								Number of reportable ignitions in HFRA	HFRA includes HFTD Tier 3, HFTD Tier 2, HFTD Zone 1, and BL322 (non-CPUC HFRA)
Faults in HFRA	Events in which electrical current deviates from the anticpated path via SCE facilities within BL322, HFTD Zone 1 HFTD Tier 2 and 200 ft. Outer Buffer, and HFTD Tier 3 and 200 ft. Outer Buffer areas	To measure changes in rate of fault events which are a pre-cursor both ignition and safety events	Number of faults in HFRA based on cause. These metrics may help to provide insight on controllable and uncontrollable risks or help plan future activities to focus on a particular type of fault or outage that may be of wildfire risk.	Deep-dive audits of select portions of utility grid	3,723	4,004	4,286	4,558	6,578	1011	1147	1436	1132	912								Number of faults in HFRA	HFRA includes HFTD Tier 3, HFTD Tier 2, HFTD Zone 1, and BL322 (non-CPUC HFRA). Note: SCE is incorporating additional Transmission outage data as an improvement to its outage reporting. Historical reporting has been revised to reflect the additional Transmission outage data.
Wire Down Incidents in HFRA	Events in which SCE overhead conductors (energized or de-energized) fall within 8ft above ground or lower, within BL322, HFTD Tier 2 and 200 ft. Outer Buffer, and HFTD Tier 3 and 200 ft. Outer Buffer areas	To measure changes in rate of wire down events which are a pre-cursor both ignition and safety events	Number of wire down incidents in HFRA based on cause. These metrics may help to provide insight on controllable and uncontrollable risks or help plan future activities to focus on a particular type of fault or outage that may be of wildfire risk.	Deep-dive audits of select portions of utility grid	245	338	304	199	303	72	86	77	85	116								Number of wire downs per year in HFRA	HFRA includes HFTD Tier 3, HFTD Tier 2, HFTD Zone 1, and BL322 (non-CPUC HFRA)
Number of customers and average duration of Public Safety Power Shutoff (PSPS) events																							
Total # of customers de-	Count of customers de-energized, with duplicates, per year	To measure the scale of impact of outages due to PSPS to customers, with duplicates	Not Applicable	Not Applicable	Refer to Table 11, # 4.a.	Refer to Table 11, # 4.a.	Refer to Table 11, # 4.a.	Refer to Table 11, # 4.a.	Refer to Table 11, # 4.a.	Refer to Table 11, # 4.a.	Refer to Table 11, # 4.a.	Refer to Table 11, # 4.a.	Refer to Table 11, # 4.a.	Refer to Table 11, # 4.a.								Number of customers	None
Average duration of de-energizatio	Average outage duration experienced by PSPS de-energization per customer de-energized	Of the customers de-energized due to PSPS, to measure the magnitude of the effect of the PSPS de-energization	Not Applicable	Not Applicable	N/A	N/A	30.3	23.2	27	N/A	N/A	2.2	18.3	23.9								Hours	Applies to each instance of a customer being de-energized due to PSPS
Timeliness and accuracy of PSPS notifications																							
% of customers notified prior to a PSPS event	# of customers notified prior to initiation of PSPS event who were impacted by PSPS/ # of customers impacted by PSPS (if multiple PSPS events impact the same customer, count each event as a separate customer)	To measure success rate of notification for the customers who were impacted by de-energization	Not Applicable	Not Applicable	Refer to Table 11, # 4.e.	Refer to Table 11, # 4.e.	Refer to Table 11, # 4.e.	Refer to Table 11, # 4.e.	Refer to Table 11, # 4.e.	Refer to Table 11, # 4.e.	Refer to Table 11, # 4.e.	Refer to Table 11, # 4.e.	Refer to Table 11, # 4.e.	Refer to Table 11, # 4.e.								Percentage	None
% of customers notified prior to a PSPS event that did not impact them	% of customers notified of potential de-energization that were not de-energized for that PSPS event (on a total customer basis) 1 - (# of total customers de-energized / # of imminent de-energization notifications sent)	To measure the occurrence of PSPS notifications and de-energizations	Not Applicable	Not Applicable	N/A	N/A	N/A	N/A	N/A	N/A	100%	39%	61%	65%								% of customers notified of imminent potential de-energization that were not de-energized for that PSPS event (on a total customer basis)	This data was not recorded prior to 2020.

Utility	Southern California Edison Company
Table No.	4
Date Modified	5/3/2021

Note: These columns are placeholders for future QR submissions. (Q2 2021 – Q4 2022)

Table 4: Fatalities due to utility wildfire mitigation initiatives

Metric type	#	Outcome metric name	2015	2016	2017	2018	2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Unit(s)	Comments
1. Fatalities - Full-time Employee	1.a.	Fatalities due to utility inspection - Full-time employee	0	0	0	0	0	0	0	0	0	0								# fatalities	
	1.b.	Fatalities due to vegetation management - Full-time employee	0	0	0	0	0	0	0	0	0	0								# fatalities	
	1.c.	Fatalities due to utility fuel management - Full-time employee	0	0	0	0	0	0	0	0	0	0								# fatalities	
	1.d.	Fatalities due to grid hardening - Full-time employee	0	0	0	0	0	0	0	0	0	0								# fatalities	
	1.e.	Fatalities due to other - Full-time employee	0	0	0	0	0	0	0	0	0	0								# fatalities	
2. Fatalities - Contractor	2.a.	Fatalities due to utility inspection - Contractor	0	0	0	0	0	0	0	0	0	0								# fatalities	
	2.b.	Fatalities due to vegetation management - Contractor	0	0	0	0	0	1	0	0	0	0								# fatalities	By providing this data, SCE is not admitting: 1) any responsibility or liability for any incident reported herein or 2) that a wildfire mitigation activity caused a fatality.
	2.c.	Fatalities due to utility fuel management - Contractor	0	0	0	0	0	0	0	0	0	0								# fatalities	
	2.d.	Fatalities due to grid hardening - Contractor	0	0	0	0	0	0	0	0	0	0								# fatalities	
	2.e.	Fatalities due to other - Contractor	0	0	0	0	0	0	0	0	0	0								# fatalities	
3. Fatalities - Member of public	3.a.	Fatalities due to utility inspection - Public	0	0	0	0	0	0	0	0	0	0								# fatalities	
	3.b.	Fatalities due to vegetation management - Public	0	0	0	0	0	0	0	0	0	0								# fatalities	
	3.c.	Fatalities due to utility fuel management - Public	0	0	0	0	0	0	0	0	0	0								# fatalities	
	3.d.	Fatalities due to grid hardening - Public	0	0	0	0	0	0	0	0	0	0								# fatalities	
	3.e.	Fatalities due to other - Public	0	0	0	0	0	0	0	0	0	0								# fatalities	

Utility	Southern California Edison Company
Table No.	5
Date Modified	5/3/2021

Note: These columns are placeholders for future QR submissions.

Table 5: OSHA-reportable injuries due to utility wildfire mitigation initiatives

Metric type	#	Outcome metric name	2015	2016	2017	2018	2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Unit(s)	Comments
1. OSHA injuries - Full-time Employee	1.a.	OSHA injuries due to utility inspection - Full-time employee	0	0	0	0	1	0	0	0	0	0								# OSHA-reportable injuries	SCE's 2020 WMP inadvertantly excluded an injury that an employee incurred during the course of asset inspections.
	1.b.	OSHA injuries due to vegetation management - Full-time employee	0	0	0	0	0	0	0	0	0	0								# OSHA-reportable injuries	
	1.c.	OSHA injuries due to utility fuel management - Full-time employee	0	0	0	0	0	0	0	0	0	0								# OSHA-reportable injuries	
	1.d.	OSHA injuries due to grid hardening - Full-time employee	0	0	0	0	0	0	0	0	0	0								# OSHA-reportable injuries	In a data request response to WSD dated August 14, 2020, SCE inadvertently classified a serious injury to an employee as incurred during performance of a wildfire mitigation initiative. That employee was replacing a deteriorated pole, which is not a wildfire mitigation initiative and as such, that incident is not included in this data. By providing this data, SCE is not admitting that 1) any responsibility or liability for any incident reported herein or 2) that a wildfire mitigation activity caused an injury.
	1.e.	OSHA injuries due to other - Full-time employee	0	0	0	0	0	0	0	0	0	0								# OSHA-reportable injuries	
2. OSHA injuries - Contractor	2.a.	OSHA injuries due to utility inspection - Contractor	0	0	0	0	0	0	0	0	0	0								# OSHA-reportable injuries	
	2.b.	OSHA injuries due to vegetation management - Contractor	0	0	0	0	0	0	1	0	0	0								# OSHA-reportable injuries	In a data request response to WSD dated August 14, 2020, SCE inadvertently classified an injury to a contractor as OSHA-reportable when it actually did not meet that definition and as such, that incident is not included in this data. By providing this data, SCE is not admitting that 1) any responsibility or liability for any incident reported herein or 2) that a wildfire mitigation activity caused an injury.
	2.c.	OSHA injuries due to utility fuel management - Contractor	0	0	0	0	0	0	0	0	0	0								# OSHA-reportable injuries	
	2.d.	OSHA injuries due to grid hardening - Contractor	0	0	0	0	0	0	0	3	0	0								# OSHA-reportable injuries	In a data request response to WSD dated August 14, 2020, SCE inadvertently classified a serious injury to a contractor as incurred during performance of a wildfire mitigation initiative. That contractor was replacing a deteriorated pole, which is not a wildfire mitigation initiative and as such, that incident is not included in this data. By providing this data, SCE is not admitting that 1) any responsibility or liability for any incident reported herein or 2) that a wildfire mitigation activity caused an injury.
	2.e.	OSHA injuries due to other - Contractor	0	0	0	0	0	0	0	0	0	0								# OSHA-reportable injuries	
3. OSHA injuries - Member of public	3.a.	OSHA injuries due to utility inspection - Public	0	0	0	0	0	0	0	0	0	0								# OSHA-reportable injuries	
	3.b.	OSHA injuries due to vegetation management - Public	0	0	0	0	0	0	0	0	0	0								# OSHA-reportable injuries	
	3.c.	OSHA injuries due to utility fuel management - Public	0	0	0	0	0	0	0	0	0	0								# OSHA-reportable injuries	
	3.d.	OSHA injuries due to grid hardening - Public	0	0	0	0	0	0	0	0	0	0								# OSHA-reportable injuries	
	3.e.	OSHA injuries due to other - Public	0	0	0	0	0	0	0	0	0	0								# OSHA-reportable injuries	

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Table 6: Weather patterns

Note: These columns are placeholders for future QR submissions.

Metric type	#	Outcome metric name	2015	2016	2017	2018	2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Unit(s)	Comments
1. Red Flag Warning Overhead circuit mile Days	1.a.	Red Flag Warning Overhead circuit mile days - entire utility territory	80,504	286,327	476,404	283,806	201,423	0	24,845	62,241	162,422	58,515								Sum of overhead circuit miles of utility grid subject to Red Flag Warning each day within a given time period, calculated as the number of overhead circuit miles that were under an RFW multiplied by the number of days those circuit miles were under said RFW. For example, if 100 overhead circuit miles were under an RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW OH circuit mile days would be 110.	GIS systems are used in order to overlay the locational information of each red flag warning. GIS models are updated frequently with changes within SCE's service territroy and does not have the ability to analyze and calculate information in previous years. As such, the overhead lengths of distribution and transmission circuits are based on 2020 circuit mile information for the calculation of historical years 2015-2019. Additionally, this overall number may be slightly different than the 2020 WMP filing due to the use of the 2020 GIS information. Historical information was re-calculated as high fire threat district break outs are new requirements in the 2021 WMP.
	1.b.	Red Flag Warning Overhead circuit mile days - HFTD Zone 1	0.8	8.0	4.1	2.8	1.7	0.0	0.4	1.3	1.7	1								Red Flag Warning Overhead circuit mile days, see above for definition	GIS systems are used in order to overlay the locational information of each red flag warning. GIS models are updated frequently with changes within SCE's service territroy and does not have the ability to analyze and calculate information in previous years. As such, the overhead lengths of distribution and transmission circuits are based on 2020 circuit mile information for the calculation of historical years 2015-2019. Additionally, this overall number may be slightly different than the 2020 WMP filing due to the use of the 2020 GIS information. Historical information was re-calculated as high fire threat district break outs are new requirements in the 2021 WMP.
	1.c.	Red Flag Warning Overhead circuit mile days - HFTD Tier 2	9,214	31,921	50,039	31,295	21,598	0	4,391	10,011	17,964	7,003								Red Flag Warning Overhead circuit mile days, see above for definition	GIS systems are used in order to overlay the locational information of each red flag warning. GIS models are updated frequently with changes within SCE's service territroy and does not have the ability to analyze and calculate information in previous years. As such, the overhead lengths of distribution and transmission circuits are based on 2020 circuit mile information for the calculation of historical years 2015-2019. Additionally, this overall number may be slightly different than the 2020 WMP filing due to the use of the 2020 GIS information. Historical information was re-calculated as high fire threat district break outs are new requirements in the 2021 WMP.
	1.d.	Red Flag Warning Overhead circuit mile days - HFTD Tier 3	25,523	88,117	127,005	82,216	57,321	0	4,031	13,920	36,805	17,404								Red Flag Warning Overhead circuit mile days, see above for definition	GIS systems are used in order to overlay the locational information of each red flag warning. GIS models are updated frequently with changes within SCE's service territroy and does not have the ability to analyze and calculate information in previous years. As such, the overhead lengths of distribution and transmission circuits are based on 2020 circuit mile information for the calculation of historical years 2015-2019. Additionally, this overall number may be slightly different than the 2020 WMP filing due to the use of the 2020 GIS information. Historical information was re-calculated as high fire threat district break outs are new requirements in the 2021 WMP.
	1.e.	Red Flag Warning Overhead circuit mile days - Non-HFTD	45,766	166,281	299,356	170,293	122,502	0	16,423	38,309	107,651	34,108								Red Flag Warning Overhead circuit mile days, see above for definition	GIS systems are used in order to overlay the locational information of each red flag warning. GIS models are updated frequently with changes within SCE's service territroy and does not have the ability to analyze and calculate information in previous years. As such, the overhead lengths of distribution and transmission circuits are based on 2020 circuit mile information for the calculation of historical years 2015-2019. Additionally, this overall number may be slightly different than the 2020 WMP filing due to the use of the 2020 GIS information. Historical information was re-calculated as high fire threat district break outs are new requirements in the 2021 WMP.
2. Wind conditions	2.a.	High wind warning overhead circuit mile days	78,965	116,378	144,820	133,880	95,208	61,545	9,235	62	57,072	78,101								Sum of overhead circuit miles of utility grid subject to High Wind Warnings (HWW, as defined by the National Weather Service) each day within a given time period, calculated as the number of overhead circuit miles that were under an HWW multiplied by the number of days those miles were under said HWW. For example, if 100 overhead circuit miles were under an HWW for 1 day, and 10 of those miles were under HWW for an additional day, then the total HWW OH circuit mile days would be 110.	GIS systems are used in order to overlay the locational information of each red flag warning. GIS models are updated frequently with changes within SCE's service territroy and does not have the ability to analyze and calculate information in previous years. As such, the overhead lengths of distribution and transmission circuits are based on 2020 circuit mile information for the calculation of historical years 2015-2019. Additionally, this overall number may be slightly different than the 2020 WMP filing due to the use of the 2020 GIS information. Historical information was re-calculated as high fire threat district break outs are new requirements in the 2021 WMP.
3. Other	3.a.	Other relevant weather pattern metrics tracked (add additional rows as needed)																			

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Notes:
Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV. Transmission lines for faults and wire downs are typically 65kV and above, but may include some lower voltages (such as 55kV and 33kV).
Data from 2015 - 2020 Q2 should be actual numbers. 2020 Q3 - 2023 should be projected. In future submissions update projected numbers with actuals

Table 7.1: Key recent and projected drivers of risk events

					Number of risk events										Projected risk events								
Risk Event category	Cause category	#	Sub-cause category	events tracked for ignition driver? (	2015	2016	2017	2018	2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Unit(s)	Comments
Wire down event - Distribution	1. Contact from object - Distribution	1.a.	Veg. contact- Distribution	Yes	279	357	384	158	308	86	105	82	151	114	73	78	88	77	72	77	87	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		1.b.	Animal contact- Distribution	Yes	74	57	53	48	38	10	19	29	12	11	13	14	14	13	13	13	13	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		1.c.	Balloon contact- Distribution	Yes	115	112	115	134	98	22	47	27	12	24	43	21	11	23	41	20	10	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		1.d.	Vehicle contact- Distribution	Yes	227	349	248	267	269	76	121	88	98	79	70	72	72	76	69	71	70	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		1.e.	Other contact from object - Distribution	Yes	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	2. Equipment / facility failure - Distribution	2.a.	Connector damage or failure- Distribution	Yes	84	106	81	75	68	25	36	38	23	21	22	22	22	21	22	22	22	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.b.	Splice damage or failure — Distribution	Yes	35	28	24	24	28	3	9	10	7	10	7	7	7	7	7	7	7	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.c.	Crossarm damage or failure - Distribution	Yes	31	26	26	25	35	10	10	6	9	15	10	6	9	10	10	6	9	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.d.	Insulator damage or failure- Distribution	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.e.	Lightning arrestor damage or failure- Distribution	Yes	0	0	3	0	2	0	1	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.f.	Tap damage or failure - Distribution	Yes	0	0	4	5	12	4	3	1	2	5	2	2	2	2	2	2	2	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.g.	Tie wire damage or failure - Distribution	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.h.	Other - Distribution	Yes	685	824	667	423	607	144	171	198	238	104	170	170	165	173	170	170	165	# risk events (excluding ignitions)	The total of all sub-cause category types
			Pole damage or failure - Distribution	Yes	13	12	28	39	37	9	24	20	20	14	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of wire-down events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Pothead damage or failure - Distribution	Yes	0	0	3	8	6	3	2	5	1	1	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of wire-down events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Fuse failure damage or failure - Distribution	Yes	0	0	0	1	2	0	1	2	1	1	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of wire-down events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Guy damage or failure - Distribution	Yes	0	0	1	3	5	1	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of wire-down events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Conductor failure damage or failure - Distribution	Yes	0	0	28	44	120	33	51	63	57	49	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of wire-down events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Various other damage or failure - Distribution	Yes	672	812	607	328	437	98	93	108	159	39	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of wire-down events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
	3. Wire-to-wire contact - Distribution	3.a.	Wire-to-wire contact / contamination- Distribution	Yes	0	0	1	2	1	0	4	2	1	4	1	1	1	1	1	1	1	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	4. Contamination - Distribution	4.a.	Contamination - Distribution	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	5. Utility work / Operation	5.a.	Utility work / Operation	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	6. Vandalism / Theft - Distribution	6.a.	Vandalism / Theft - Distribution	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	7. Other- Distribution	7.a.	All Other- Distribution	Yes	0	0	33	53	54	11	11	41	39	116	39	39	39	39	39	39	39	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	8. Unknown- Distribution	8.a.	Unknown - Distribution	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
Wire down event - Transmission	9. Contact from object - Transmission	9.a.	Veg. contact- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		9.b.	Animal contact- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		9.c.	Balloon contact- Transmission	Yes	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		9.d.	Vehicle contact- Transmission	Yes	0	2	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		9.e.	Other contact from object - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	10. Equipment / facility failure - Transmission	10.a.	Connector damage or failure- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared
		10.b.	Splice damage or failure — Transmission	Yes	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.c.	Crossarm damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.d.	Insulator damage or failure- Transmission	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.e.	Lightning arrestor damage or failure- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.f.	Tap damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.

		10.g.	Tie wire damage or failure - Transmission	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.h.	Other - Transmission	Yes	1	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	The total of all sub-cause category types
			Pole damage or failure - Transmission	Yes	0	1	0	0	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of wire-down events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Pothead damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of wire-down events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Fuse failure damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of wire-down events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Guy damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of wire-down events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Conductor failure damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of wire-down events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Various other damage or failure - Transmission	Yes	1	2	0	1	1	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of wire-down events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
	11. Wire-to-wire contact - Transmission	11.a.	Wire-to-wire contact / contamination- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	12. Contamination - Transmission	12.a.	Contamination - Transmission	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	13. Utility work / Operation	13.a.	Utility work / Operation	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	14. Vandalism / Theft - Transmission	14.a.	Vandalism / Theft - Transmission	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	15. Other- Transmission	15.a.	All Other- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	16. Unknown- Transmission	16.a.	Unknown - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
Outage - Distribution	17. Contact from object - Distribution	17.a.	Veg. contact- Distribution	Yes	395	557	609	416	527	104	70	25	112	93	38	22	101	103	32	18	99	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		17.b.	Animal contact- Distribution	Yes	655	598	622	648	686	122	201	169	163	79	196	153	153	111	191	141	146	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		17.c.	Balloon contact- Distribution	Yes	758	785	911	975	776	178	348	275	191	247	321	223	153	220	307	209	144	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		17.d.	Vehicle contact- Distribution	Yes	508	586	528	647	517	116	113	153	132	145	134	131	131	132	130	124	125	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		17.e.	Other contact from object - Distribution	Yes	870	393	289	369	449	44	28	35	43	64	79	106	110	107	79	105	110	# risk events (excluding ignitions)	The total of all sub-cause category types below. An additional sub-cause category type was added below requiring a new summation for the total.
			Ice/Snow - Distribution	Yes	4	15	19	9	3	0	0	0	0	1	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Lightning - Distribution	Yes	757	264	167	225	323	20	2	15	27	29	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. The new sub-cause categories were originally forecasted under "23. Other- Distribution" and now has been moved to "17. Contact from object - Distribution"
			Various other contact from object - Distribution	Yes	109	114	103	135	123	24	26	20	16	34	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
	18. Equipment / facility failure - Distribution	18.a.	Capacitor bank damage or failure- Distribution	Yes	319	309	425	376	457	128	160	73	44	111	94	92	95	88	94	92	95	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.b.	Conductor damage or failure — Distribution	Yes	463	594	654	713	1,116	205	143	211	250	277	225	180	146	133	195	149	85	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.c.	Fuse damage or failure - Distribution	Yes	232	195	245	508	1,245	169	176	316	167	180	166	132	166	168	166	132	166	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.d.	Lightning arrestor damage or failure- Distribution	Yes	105	127	99	105	216	27	21	26	25	12	31	30	31	31	31	30	31	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.e.	Switch damage or failure- Distribution	Yes	51	46	45	67	78	17	11	16	18	15	15	14	15	15	15	14	15	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.f.	Pole damage or failure - Distribution	Yes	98	126	130	207	541	57	36	31	41	32	41	38	41	41	41	38	41	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.g.	Insulator and brushing damage or failure - Distribution	Yes	42	75	79	123	121	28	14	11	43	30	17	15	31	24	16	15	31	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.h.	Crossarm damage or failure - Distribution	Yes	127	143	138	354	834	98	45	29	45	39	75	60	74	75	75	60	74	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.i.	Voltage regulator / booster damage or failure - Distribution	Yes	1	2	1	2	4	0	0	1	1	0	0	0	0	1	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.j.	Recloser damage or failure - Distribution	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.k.	Anchor / guy damage or failure - Distribution	Yes	17	20	18	17	20	3	3	3	4	3	4	2	6	6	4	2	6	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.l.	Sectionalizer damage or failure - Distribution	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.m.	Connection device damage or failure - Distribution	Yes	386	490	406	501	500	123	111	86	97	111	112	110	112	111	112	110	112	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.n.	Transformer damage or failure - Distribution	Yes	1,889	1,649	1,978	2,594	2,489	416	559	1,894	536	403	762	1154	712	671	757	1141	709	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		18.o.	Other - Distribution	Yes	96	147	116	173	291	37	40	51	60	49	59	57	59	59	58	57	59	# risk events (excluding ignitions)	The total of all sub-cause category types
			Pole Top Sub damage or failure - Distribution	Yes					1		1			0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Pothead damage or failure - Distribution	Yes	91	143	109	155	128	24	27	27	40	28	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.

			Tower damage or failure - Distribution	Yes	0	0	0	0	2	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Various other damage or failure - Distribution	Yes	5	4	7	18	160	13	12	24	20	21	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
	19. Wire-to-wire contact - Distribution	19.a.	Wire-to-wire contact / contamination- Distribution	Yes	46	78	64	41	13	6	5	8	7	3	7	7	7	7	7	6	7	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	20. Contamination - Distribution	20.a.	Contamination - Distribution	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	21. Utility work / Operation	21.a.	Utility work / Operation	Yes	149	117	99	94	67	32	15	18	10	16	16	16	16	16	16	16	16	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	22. Vandalism / Theft - Distribution	22.a.	Vandalism / Theft - Distribution	Yes	78	80	78	102	103	23	21	21	15	8	22	22	22	22	22	22	22	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	23. Other- Distribution	23.a.	All Other- Distribution	Yes	2,010	2,251	2,359	3,147	3,125	481	586	977	453	377	651	959	615	574	651	959	615	# risk events (excluding ignitions)	The total of all sub-cause category types. A sub-cause category type was removed below requiring a new summation for the total.
			De-Energize - Distribution	Yes	0	0	0	0	0	0	0	1	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Dig In - Distribution	Yes	42	51	57	83	48	10	7	18	13	15	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Source Lost - Distribution	Yes	5	2	26	49	96	12	14	14	4	15	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Substation - Distribution	Yes	10	18	30	61	106	16	24	22	18	29	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Underground Equipment - Distribution	Yes	1,949	2,166	2,234	2,944	2,846	442	531	909	409	318	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Various other - Distribution	Yes	4	14	12	10	29	1	10	13	9	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
	24. Unknown- Distribution	24.a.	Unknown - Distribution	Yes	2,142	2,141	2,408	1,741	1,883	364	466	513	558	603	530	525	496	551	530	525	496	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
Outage - Transmission	25. Contact from object - Transmission	25.a.	Veg. contact- Transmission	Yes	12	16	13	8	7	0	0	1	4	2	2	3	2	3	2	3	2	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		25.b.	Animal contact- Transmission	Yes	80	75	67	67	31	7	19	4	8	4	7	8	8	8	6	8	8	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		25.c.	Balloon contact- Transmission	Yes	23	39	55	36	24	2	13	5	8	9	10	8	8	8	10	8	8	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		25.d.	Vehicle contact- Transmission	Yes	36	37	40	29	18	3	5	5	3	7	4	4	4	4	4	4	4	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		25.e.	Other contact from object - Transmission	Yes	75	36	35	18	28	7	4	5	3	1	7	8	8	8	7	8	8	# risk events (excluding ignitions)	The total of all sub-cause category types below. An additional sub-cause category type was added below requiring a new summation for the total.
			Ice/Snow - Transmission	Yes		2	2	0	3	0	2	0	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Lighting - Transmission	Yes	64	22	28	33	21	4	1	5	2	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. The new sub-cause categories were originally forecasted under "31. Other- Transmission" and now has been moved to "25. Contact from object - Transmission"
			Various other contact from object - Transmission	Yes	11	12	5	5	4	3	1	0	1	1	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
	26. Equipment / facility failure - Transmission	26.a.	Capacitor bank damage or failure- Transmission	Yes	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.b.	Conductor damage or failure — Transmission	Yes	22	15	89	44	36	5	2	13	7	10	9	10	10	10	9	10	10	# risk events (excluding ignitions)	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.c.	Fuse damage or failure - Transmission	Yes	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.d.	Lightning arrestor damage or failure- Transmission	Yes	2	5	2	4	1	0	0	1	1	0	1	1	1	1	1	1	1	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.e.	Switch damage or failure- Transmission	Yes	5	3	4	5	2	3	2	0	0	1	1	1	1	1	1	1	1	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.f.	Pole damage or failure - Transmission	Yes	12	12	17	7	14	3	0	1	3	2	3	3	3	3	3	3	3	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.g.	Insulator and brushing damage or failure - Transmission	Yes	10	13	21	4	9	2	3	1	1	0	2	3	3	2	2	3	3	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.h.	Crossarm damage or failure - Transmission	Yes	11	7	7	6	8	2	1	1	0	0	2	2	2	2	2	2	2	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.i.	Voltage regulator / booster damage or failure - Transmission	Yes	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.j.	Recloser damage or failure - Transmission	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.k.	Anchor / guy damage or failure - Transmission	Yes	3	8	8	1	4	0	1	2	4	0	1	1	1	1	1	1	1	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.l.	Sectionalizer damage or failure - Transmission	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.m.	Connection device damage or failure - Transmission	Yes	1	1	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.n.	Transformer damage or failure - Transmission	Yes	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		26.o.	Other - Transmission	Yes	14	26	10	19	41	3	8	6	8	9	6	6	6	6	6	6	6	# risk events (excluding ignitions)	The total of all sub-cause category types
			Pole Tops Sub damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.

			Pothead damage or failure - Transmission	Yes	6	4	0	12	5	0	0	1	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Tower damage or failure - Transmission	Yes	0	2	1	2	0	1	1	2	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Various other - Transmission	Yes	8	20	9	5	36	2	7	3	8	9	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
	27. Wire-to-wire contact - Transmission	27.a.	Wire-to-wire contact / contamination- Transmission	Yes	14	17	15	19	42	9	10	1	3	0	5	5	5	5	5	5	5	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	28. Contamination - Transmission	28.a.	Contamination - Transmission	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	29. Utility work / Operation	29.a.	Utility work / Operation	Yes	10	15	8	9	8	0	1	1	1	2	2	2	2	2	2	2	2	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	30. Vandalism / Theft - Transmission	30.a.	Vandalism / Theft - Transmission	Yes	4	7	2	10	2	0	0	1	1	0	1	1	1	1	1	1	1	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	31. Other- Transmission	31.a.	All Other- Transmission	Yes	194	238	240	242	193	40	67	47	54	52	67	47	54	40	67	47	54	# risk events (excluding ignitions)	The total of all sub-cause category types. A sub-cause category type was removed below requiring a new summation for the total.
			De-energized - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Dig In - Transmission	Yes	1	1	0	2	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Source Lost - Transmission	Yes	7	2	21	38	36	5	3	7	7	3	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Substation - Transmission	Yes	179	221	208	188	146	35	63	39	47	39	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Underground Equipment	Yes	5	4	7	14	7	0	1	1	0	1	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
			Various other - Transmission	Yes	2	10	4	0	4	0	0	0	0	9	NA	NA	NA	NA	NA	NA	NA	# risk events (excluding ignitions)	This is a new sub-cause category type added to increase transparency of outage events. New sub-cause categories were forecasted as an aggregate rather as individual line items and forecast data is not included for these categories.
	32. Unknown- Transmission	32.a.	Unknown - Transmission	Yes	371	326	306	160	266	38	60	39	54	50	50	53	52	55	50	53	52	# risk events (excluding ignitions)	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
Ignition - Distribution	33. Contact from object - Distribution	33.a.	Veg. contact- Distribution	Yes	13	12	16	15	13	0	2	3	2	3	3	3	2	2	3	3	2	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		33.b.	Animal contact- Distribution	Yes	9	8	6	12	18	0	8	3	4	2	7	6	5	3	7	5	4	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		33.c.	Balloon contact- Distribution	Yes	12	10	18	30	15	0	7	1	2	3	9	6	3	0	9	6	3	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		33.d.	Vehicle contact- Distribution	Yes	11	6	6	13	10	0	2	1	0	1	3	3	2	2	3	3	2	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		33.e.	Other contact from object - Distribution	Yes	3	6	5	0	6	0	0	3	1	3	1	1	1	1	1	1	1	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	34. Equipment / facility failure - Distribution	34.a.	Capacitor bank damage or failure- Distribution	Yes	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.b.	Conductor damage or failure — Distribution	Yes	2	19	15	5	11	3	6	8	6	5	6	6	4	3	5	6	3	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.c.	Fuse damage or failure - Distribution	Yes	1	1	1	0	2	0	1	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.d.	Lightning arrestor damage or failure- Distribution	Yes	2	0	2	0	1	0	2	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.e.	Switch damage or failure- Distribution	Yes	0	0	0	1	2	1	1	1	2	1	2	2	2	1	2	2	2	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.f.	Pole damage or failure - Distribution	Yes	1	2	1	0	1	0	1	0	2	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.g.	Insulator and brushing damage or failure - Distribution	Yes	1	2	2	1	2	3	1	2	1	0	1	1	1	1	1	1	1	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.h.	Crossarm damage or failure - Distribution	Yes	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.i.	Voltage regulator / booster damage or failure - Distribution	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.j.	Recloser damage or failure - Distribution	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.k.	Anchor / guy damage or failure - Distribution	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.l.	Sectionalizer damage or failure - Distribution	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.m.	Connection device damage or failure - Distribution	Yes	4	4	3	1	7	0	0	2	1	1	1	1	1	1	1	1	1	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.n.	Transformer damage or failure - Distribution	Yes	3	2	2	10	3	1	3	3	3	0	2	2	2	2	2	2	2	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		34.o.	Other - Distribution	Yes	6	7	1	7	2	0	2	2	0	2	1	1	1	1	1	1	1	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	35. Wire-to-wire contact - Distribution	35.a.	Wire-to-wire contact / contamination- Distribution	Yes	1	1	3	3	8	0	2	2	1	3	1	1	1	0	1	1	1	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	36. Contamination - Distribution	36.a.	Contamination - Distribution	Yes	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.

	37. Utility work / Operation	37.a.	Utility work / Operation	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	38. Vandalism / Theft - Distribution	38.a.	Vandalism / Theft - Distribution	Yes	3	0	0	1	6	2	1	2	1	1	1	1	1	1	1	1	1	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	39. Other- Distribution	39.a.	All Other- Distribution	Yes	4	0	1	0	4	1	3	1	2	2	1	0	0	1	1	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	40. Unknown- Distribution	40.a.	Unknown - Distribution	Yes	21	5	12	6	1	0	2	0	1	1	2	3	2	1	2	3	2	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
Ignition - Transmission	41. Contact from object - Transmission	41.a.	Veg. contact- Transmission	Yes	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		41.b.	Animal contact- Transmission	Yes	3	2	3	0	2	1	1	1	0	0	1	1	0	0	1	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		41.c.	Balloon contact- Transmission	Yes	1	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		41.d.	Vehicle contact- Transmission	Yes	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		41.e.	Other contact from object - Transmission	Yes	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	42. Equipment / facility failure - Transmission	42.a.	Capacitor bank damage or failure- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.b.	Conductor damage or failure — Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.c.	Fuse damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.d.	Lightning arrestor damage or failure- Transmission	Yes	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.e.	Switch damage or failure- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.f.	Pole damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.g.	Insulator and brushing damage or failure - Transmission	Yes	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.h.	Crossarm damage or failure - Transmission	Yes	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.i.	Voltage regulator / booster damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.j.	Recloser damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.k.	Anchor / guy damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.l.	Sectionalizer damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.m.	Connection device damage or failure - Transmission	Yes	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.n.	Transformer damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		42.o.	Other - Transmission	Yes	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	43. Wire-to-wire contact - Transmission	43.a.	Wire-to-wire contact / contamination- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	44. Contamination - Transmission	44.a.	Contamination - Transmission	Yes	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	45. Utility work / Operation	45.a.	Utility work / Operation	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	46. Vandalism / Theft - Transmission	46.a.	Vandalism / Theft - Transmission	Yes	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	47. Other- Transmission	47.a.	All Other- Transmission	Yes	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	48. Unknown- Transmission	48.a.	Unknown - Transmission	Yes	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.

Utility	Southern California Edison Company
Table No.	7.2
Date Modified	5/3/2021

Notes:
Transmission lines refer to all lines at or above 65kV. and distribution lines refer to all lines below 65kV.
Data from 2015 - 2019 should be actual numbers. 2020 - 2023 should be projected. In future submissions update projected numbers with actuals

Table 7.2: Key recent and projected drivers of ignitions by HFTD region

					Number of ignitions by HFTD tier																														Projected ignitions by HFTD tier											
	Metric type	#	Ignition driver	Are ignitions tracked for ignition driver? (yes / no)	Non-HFTD 2015	HFTD Zone 1 2015	HFTD Tier 2 2015	HFTD Tier 3 2015	Non-CPUC HFTD 2015	Non-HFTD 2016	HFTD Zone 1 2016	HFTD Tier 2 2016	HFTD Tier 3 2016	Non-CPUC HFTD 2016	Non-HFTD 2017	HFTD Zone 1 2017	HFTD Tier 2 2017	HFTD Tier 3 2017	Non-CPUC HFTD 2017	Non-HFTD 2018	HFTD Zone 1 2018	HFTD Tier 2 2018	HFTD Tier 3 2018	Non-CPUC HFTD 2018	Non-HFTD 2019	HFTD Zone 1 2019	HFTD Tier 2 2019	HFTD Tier 3 2019	Non-CPUC HFTD 2019	Non-HFTD 2020	HFTD Zone 1 2020	HFTD Tier 2 2020	HFTD Tier 3 2020	Non-CPUC HFTD 2020	Non-HFTD 2021	HFTD Zone 1 2021	HFTD Tier 2 2021	HFTD Tier 3 2021	Non-CPUC HFTD 2021	Non-HFTD 2022	HFTD Zone 1 2022	HFTD Tier 2 2022	HFTD Tier 3 2022	Non-CPUC HFTD 2022	Unit(s)	Comments
Ignition - Distribution	1. Contact from object - Distribution	1.a.	Veg. contact- Distribution	Yes	7	0	2	4	0	7	0	1	4	0	10	0	1	5	0	10	0	4	1	0	10	0	1	1	1	8	0	2	1	0	9	0	1	0	0	9	0	1	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		1.b.	Animal contact- Distribution	Yes	2	0	1	6	0	4	0	2	2	0	3	0	1	2	0	8	0	3	1	0	14	0	2	2	0	15	0	2	5	0	16	0	2	2	0	16	0	1	2	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		1.c.	Balloon contact- Distribution	Yes	10	0	0	2	0	7	0	0	3	0	11	0	3	4	0	24	0	1	5	0	10	0	2	3	0	10	0	2	5	0	14	0	1	4	0	14	0	1	3	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		1.d.	Vehicle contact- Distribution	Yes	7	0	0	4	0	4	0	0	2	0	4	0	1	1	0	4	0	3	5	1	8	0	2	0	0	3	0	1	2	0	5	0	1	3	0	5	0	1	3	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		1.e.	Other contact from object - Distribution	Yes	1	0	1	1	0	3	0	1	2	0	3	0	0	1	1	0	0	0	0	0	4	0	0	2	0	4	0	1	0	0	3	0	1	0	0	3	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	2. Equipment / facility failure - Distribution	2.a.	Capacitor bank damage or failure- Distribution	Yes	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.b.	Conductor damage or failure — Distribution	Yes	1	0	1	0	0	14	0	2	3	0	14	0	0	1	0	1	0	1	3	0	6	0	2	3	0	11	0	2	12	0	4	0	1	14	0	4	0	1	12	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.c.	Fuse damage or failure - Distribution	Yes	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.d.	Lightning arrestor damage or failure- Distribution	Yes	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	1	0	0	0	0	1	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.e.	Switch damage or failure- Distribution	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	5	0	0	0	0	6	0	0	0	0	6	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.f.	Pole damage or failure - Distribution	Yes	1	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	1	0	0	1	0	0	0	0	1	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.g.	Insulator and brushing damage or failure - Distribution	Yes	0	0	1	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	1	0	2	0	0	0	0	5	0	1	1	0	4	0	0	0	0	4	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.h.	Crossarm damage or failure - Distribution	Yes	1	0	0	0	0	2	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.i.	Voltage regulator / booster damage or failure - Distribution	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.j.	Recloser damage or failure - Distribution	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.k.	Anchor / guy damage or failure - Distribution	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.l.	Sectionalizer damage or failure - Distribution	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.m.	Connection device damage or failure - Distribution	Yes	1	0	1	2	0	1	0	2	1	0	2	0	0	1	0	0	0	0	1	0	4	0	0	2	1	3	0	0	0	0	2	0	0	1	0	2	0	0	1	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.n.	Transformer damage or failure - Distribution	Yes	2	0	0	1	0	1	0	1	0	0	1	0	0	1	0	8	0	0	2	0	2	0	0	1	0	8	0	1	1	0	7	0	0	0	0	7	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		2.o.	Other - Distribution	Yes	4	0	0	2	0	4	0	0	3	0	0	0	0	1	0	6	0	0	1	0	2	0	0	0	0	2	0	1	1	0	3	0	0	1	0	3	0	0	1	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	3. Wire-to-wire contact - Distribution	3.a.	Wire-to-wire contact / contamination- Distribution	Yes	0	0	0	1	0	1	0	0	0	0	2	0	0	1	0	1	0	2	0	0	6	0	1	1	0	4	0	0	1	0	3	0	0	1	0	3	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	4. Contamination - Distribution	4.a.	Contamination - Distribution	Yes	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	5. Utility work / Operation	5.a.	Utility work / Operation	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	6. Vandalism / Theft - Distribution	6.a.	Vandalism / Theft - Distribution	Yes	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	0	1	1	0	4	0	0	2	0	1	0	0	3	0	1	0	0	3	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	7. Other- Distribution	7.a.	All Other- Distribution	Yes	2	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	1	0	6	0	0	1	0	1	0	0	0	0	1	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	8. Unknown- Distribution	8.a.	Unknown - Distribution	Yes	14	0	1	6	0	3	0	0	2	0	7	0	1	3	1	5		1	1	0	0	0	0	1	0	3	0	0	0	0	8	0	0	0	0	8	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
Ignition - Transmission	9. Contact from object - Transmission	9.a.	Veg. contact- Transmission	Yes	0	0	0	1	0	0	0	0	2	0		0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		9.b.	Animal contact- Transmission	Yes	0	0	2	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	1	0	0	0	0	1	0	# ignitions	Note that due to certain enhancements made to determining cause sub-categories of events, figures in this table may not tie exactly to those provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		9.c.	Balloon contact- Transmission	Yes	0	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		9.d.	Vehicle contact- Transmission	Yes	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		9.e.	Other contact from object - Transmission	Yes	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	10. Equipment / facility failure - Transmission	10.a.	Capacitor bank damage or failure- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.b.	Conductor damage or failure — Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.c.	Fuse damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.d.	Lightning arrestor damage or failure- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.e.	Switch damage or failure- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.f.	Pole damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.g.	Insulator and brushing damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.h.	Crossarm damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.i.	Voltage regulator / booster damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.j.	Recloser damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.k.	Anchor / guy damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.l.	Sectionalizer damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.m.	Connection device damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.n.	Transformer damage or failure - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
		10.o.	Other - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	11. Wire-to-wire contact - Transmission	11.a.	Wire-to-wire contact / contamination- Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	12. Contamination - Transmission	12.a.	Contamination - Transmission	Yes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	13. Utility work / Operation	13.a.	Utility work / Operation	No	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	14. Vandalism / Theft - Transmission	14.a.	Vandalism / Theft - Transmission	Yes	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	15. Other- Transmission	15.a.	All Other- Transmission	Yes	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.
	16. Unknown- Transmission	16.a.	Unknown - Transmission	Yes	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# ignitions	Note that SCE enhanced its mapping of outage data to faults; this may have shifted numbers in this table compared to the numbers provided in SCE's Remedial Compliance Plan SCE-2 - Determining Cause of Near Misses.

Utility	Southern California Edison Company
Table No.	8
Date Modified	5/3/2021

Table 8: State of service territory and utility equipment

Metric type	#	Outcome metric name	Non-HFTD 2015	HFTD Zone 1 2015	HFTD Tier 2 2015	HFTD Tier 3 2015	Non-HFTD 2016	HFTD Zone 1 2016	HFTD Tier 2 2016	HFTD Tier 3 2016	Non-HFTD 2017	HFTD Zone 1 2017	HFTD Tier 2 2017	HFTD Tier 3 2017	Non-HFTD 2018	HFTD Zone 1 2018	HFTD Tier 2 2018	HFTD Tier 3 2018
1. State of service territory and equipment in urban areas	1.a.	Circuit miles (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.b.	Circuit miles in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.c.	Number of critical facilities (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.d.	Number of critical facilities in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.e.	Number of customers (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.f.	Number of customers in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.g.	Number of customers belonging to access and functional needs populations (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.h.	Number of customers belonging to access and functional needs populations in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.i.	Circuit miles of overhead transmission lines (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.j.	Circuit miles of overhead transmission lines in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.k.	Circuit miles of overhead distribution lines (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.l.	Circuit miles of overhead distribution lines in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.m.	Number of substations (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1.n	Number of substations in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
.	1.o.	Number of weather stations (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note: These columns are placeholders for future QR submissions. (columns 2021–2022)

#	Non-HFTD 2019	HFTD Zone 1 2019	HFTD Tier 2 2019	HFTD Tier 3 2019	Non-HFTD 2020	HFTD Zone 1 2020	HFTD Tier 2 2020	HFTD Tier 3 2020	Non-HFTD 2021	HFTD Zone 1 2021	HFTD Tier 2 2021	HFTD Tier 3 2021	Non-HFTD 2022	HFTD Zone 1 2022	HFTD Tier 2 2022	HFTD Tier 3 2022	Unit(s)	Comments
1.a.	17,160	1	1,126	1,453	17,053	1	1,035	1,428									Circuit miles	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.b.	3,446	0	750	1,364	3,482	0	674	1,339									Circuit miles in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.c.	36,757	6	2,550	3,923	36,911	6	2,207	3,917									Number of critical facilities	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included some locations outside of SCE's service territory within California, whereas 2020 data solely includes critical facilities within SCE's service territory within California. SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.d.	7,305	5	1,676	3,489	7,502	5	1,417	3,489									Number of critical facilities in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included some locations outside of SCE's service territory within California, whereas 2020 data solely includes critical facilities within SCE's service territory within California. SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.e.	3,790,432	545	209,126	323,745	3,790,432	545	209,126	323,745									Number of customers	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.f.	778,819	525	149,646	294,005	778,819	525	149,646	294,005									Number of customers in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.g.	1,032,899	32	30,783	44,840	1,032,899	32	30,783	44,840									Number of customers belonging to access and functional needs populations	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.h.	206,260	21	23,970	41,362	206,260	21	23,970	41,362									Number of customers belonging to access and functional needs populations in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.i.	1,954	0	218	224	1,937	0	204	215									Circuit miles of overhead transmission lines	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.j.	293	0	131	182	301	0	121	174									Circuit miles of overhead transmission lines in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.k.	15,206	1	908	1,229	15,116	1	831	1,213									Circuit miles of overhead distribution lines	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.l.	3,153	0	619	1,181	3,181	0	553	1,166									Circuit miles of overhead distribution lines in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.m.	231	0	23	17	230	0	12	13									Number of substations	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all substations, including those outside of California, whereas 2020 data solely includes substations within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.n	47	0	16	16	43	0	6	12									Number of substations in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all substations, including those outside of California, whereas 2020 data solely includes substations within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
1.o.	35	0	18	32	51	0	107	94									Number of weather stations	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.

	1.p.	Number of weather stations in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20	0	11	31	29	0	63	89	Number of weather stations in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
2. State of service territory and equipment in rural areas	2.a.	Circuit miles (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8,536	0	2,127	3,724	8,543	0	2,012	3,676	Circuit miles	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE’s service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.b.	Circuit miles in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3,263	0	1,492	2,729	3,307	0	1,408	2,695	Circuit miles in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE’s service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.c.	Number of critical facilities (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7,692	0	1,456	2,894	7,744	0	1,338	2,890	Number of critical facilities	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.Furthermore, 2019 data included some locations outside of SCE’s service territory within California, whereas 2020 data solely includes critical facilities within SCE’s service territory within California. SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.d.	Number of critical facilities in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,397	0	1,036	2,348	2,460	0	940	2,343	Number of critical facilities in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.Furthermore, 2019 data included some locations outside of SCE’s service territory within California, whereas 2020 data solely includes critical facilities within SCE’s service territory within California. SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.e.	Number of customers (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	225,587	20	53,624	92,195	225,587	20	53,624	92,195	Number of customers	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.f.	Number of customers in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	94,950	16	44,971	83,235	94,950	16	44,971	83,235	Number of customers in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.g.	Number of customers belonging to access and functional needs populations (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	37,100	4	7,741	9,410	37,100	4	7,741	9,410	Number of customers belonging to access and functional needs populations	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.h.	Number of customers belonging to access and functional needs populations in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	19,384	1	6,718	8,676	19,384	1	6,718	8,676	Number of customers belonging to access and functional needs populations in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.i.	Circuit miles of overhead transmission lines (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,353	0	454	772	1,348	0	444	757	Circuit miles of overhead transmission lines	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE’s service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.j.	Circuit miles of overhead transmission lines in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	334	0	284	419	336	0	277	410	Circuit miles of overhead transmission lines in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE’s service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.k.	Circuit miles of overhead distribution lines (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7,183	0	1,673	2,952	7,195	0	1,567	2,919	Circuit miles of overhead distribution lines	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE’s service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.l.	Circuit miles of overhead distribution lines in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,929	0	1,208	2,310	2,970	0	1,131	2,285	Circuit miles of overhead distribution lines in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE’s service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.m.	Number of substations (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	125	0	18	32	112	0	13	29	Number of substations	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.Furthermore, 2019 data included all substations, including those outside of California, whereas 2020 data solely includes substations within the state of California for assets SCE maintains (which does include some assets outside of SCE’s service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.n	Number of substations in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25	0	10	26	21	0	6	24	Number of substations in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.Furthermore, 2019 data included all substations, including those outside of California, whereas 2020 data solely includes substations within the state of California for assets SCE maintains (which does include some assets outside of SCE’s service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	2.o.	Number of weather stations (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20	0	53	152	30	0	144	273	Number of weather stations	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.

	2.p.	Number of weather stations in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9	0	39	119	14	0	105	216	Number of weather stations in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
3. State of service territory and equipment in highly rural areas	3.a.	Circuit miles (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12,179	1	2,758	2,992	11,688	1	2,645	2,916	Circuit miles	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.b.	Circuit miles in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	94	0	35	44	94	0	25	44	Circuit miles in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.c.	Number of critical facilities (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	21,784	0	1,767	2,598	21,728	0	1,613	2,560	Number of critical facilities	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included some locations outside of SCE's service territory within California, whereas 2020 data solely includes critical facilities within SCE's service territory within California. SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.d.	Number of critical facilities in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98	0	22	32	99	0	18	29	Number of critical facilities in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included some locations outside of SCE's service territory within California, whereas 2020 data solely includes critical facilities within SCE's service territory within California. SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.e.	Number of customers (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	379,812	8	24,861	37,774	379,812	8	24,861	37,774	Number of customers	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.f.	Number of customers in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,566	0	968	1,578	2,566	0	968	1,578	Number of customers in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.g.	Number of customers belonging to access and functional needs populations (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	44,535	0	2,492	2,674	44,535	0	2,492	2,674	Number of customers belonging to access and functional needs populations	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.h.	Number of customers belonging to access and functional needs populations in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	342	0	54	100	342	0	54	100	Number of customers belonging to access and functional needs populations in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.i.	Circuit miles of overhead transmission lines (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5,161	0	1,286	1,400	4,764	0	1,256	1,372	Circuit miles of overhead transmission lines	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.j.	Circuit miles of overhead transmission lines in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8	0	3	3	8	0	3	5	Circuit miles of overhead transmission lines in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.k.	Circuit miles of overhead distribution lines (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7,018	1	1,472	1,593	6,924	1	1,389	1,544	Circuit miles of overhead distribution lines	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.l.	Circuit miles of overhead distribution lines in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	86	0	31	41	86	0	21	39	Circuit miles of overhead distribution lines in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all circuit miles, including those outside of California, whereas 2020 data solely includes circuit miles within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.m.	Number of substations (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	420	0	62	49	322	0	49	40	Number of substations	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all substations, including those outside of California, whereas 2020 data solely includes substations within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.n	Number of substations in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	0	0	0	2	0	0	1	Number of substations in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.Furthermore, 2019 data included all substations, including those outside of California, whereas 2020 data solely includes substations within the state of California for assets SCE maintains (which does include some assets outside of SCE's service territory). SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.
	3.o.	Number of weather stations (including WUI and non-WUI)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36	0	90	137	47	0	348	465	Number of weather stations	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE's 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.

3.p.	Number of weather stations in WUI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	3	0	0	0	10	4	Number of weather stations in WUI	GIS models are updated frequently to reflect changes within SCE's service area and for data clean-up. SCE does not have the ability to analyze and calculate information in previous years. As such, only 2020 information was obtained from GIS. 2015-2018 data is not available and 2019 data is the same as what was provided in SCE’s 2020 WMP filing.SCE is still conducting quality control review of all the data and will correct any errors once its review is complete.

Utility	Southern California Edison Company	Notes:
Table No.	9	Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV. Report net additions using positive numbers and net removals and undergrounding using negative numbers for circuit miles and numbers of substations. Only report changes expected within the target year.
Date Modified	2/5/2021	For example, if 20 net overhead circuit miles are planned for addition by 2023, with 15 being added by 2022 and 5 more added by 2023, then report "15" for 2022 and "5" for 2023. Do not report cumulative change across years. In this case, do not report "20" for 2023, but instead the number planned to be added for just that year, which is "5".

Table 9: Location of actual and planned utility equipment additions or removal year over year

			Actual				Projected									
			Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3		
Metric type	**#**	**Outcome metric name**	**2020**	**2020**	**2020**	**2020**	**2021**	**2021**	**2021**	**2021**	**2022**	**2022**	**2022**	**2022**	**Unit(s)**	**Comments**
1. Planned utility equipment net addition (or removal) year over year - in urban areas	1.a.	Circuit miles of overhead transmission lines (including WUI and non-WUI)	4.0	0.0	1.5	1.5	7.3	0.0	2.5	1.0	10.5	0.0	0.0	0.0	Circuit miles	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	1.b.	Circuit miles of overhead distribution lines (including WUI and non-WUI)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Circuit miles	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map the distribution projects in GIS and subdivide as requested.
	1.c.	Circuit miles of overhead transmission lines in WUI	0.1	0.0	1.5	1.1	0.7	0.0	2.5	1.0	0.6	0.0	0.0	0.0	Circuit miles in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	1.d.	Circuit miles of overhead distribution lines in WUI	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Circuit miles in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map the distribution projects in GIS and subdivide as requested.
	1.e.	Number of substations (including WUI and non-WUI)	0	0	0	0	0	0	0	0	0	0	0	0	Number of substations	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	1.f.	Number of substations in WUI	0	0	0	0	0	0	0	0	0	0	0	0	Number of substations in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	1.g.	Number of weather stations (including WUI and non-WUI)	16	0	89	62	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Number of weather stations	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	1.h.	Number of weather stations in WUI	9	0	52	58	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Number of weather stations in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
2. Planned utility equipment net addition (or removal) year over year - in rural areas	2.a.	Circuit miles of overhead transmission lines (including WUI and non-WUI)	3.5	0.0	3.7	5.5	2.6	0.0	5.9	2.7	8.8	0.0	0.0	0.0	Circuit miles	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	2.b.	Circuit miles of overhead distribution lines (including WUI and non-WUI)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Circuit miles	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map the distribution projects in GIS and subdivide as requested.
	2.c.	Circuit miles of overhead transmission lines in WUI	2.5	0.0	2.5	3.9	1.4	0.0	4.5	2.5	0.0	0.0	0.0	0.0	Circuit miles in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	2.d.	Circuit miles of overhead distribution lines in WUI	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Circuit miles in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map the distribution projects in GIS and subdivide as requested.
	2.e.	Number of substations (including WUI and non-WUI)	0	0	0	0	0	0	0	0	0	0	0	0	Number of substations	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	2.f.	Number of substations in WUI	0	0	0	0	0	0	0	0	0	0	0	0	Number of substations in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	2.g.	Number of weather stations (including WUI and non-WUI)	10	0	91	121	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Number of weather stations	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.

	2.h.	Number of weather stations in WUI	5	0	66	97	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Number of weather stations in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
3. Planned utility equipment net addition (or removal) year over year - in highly rural areas	3.a.	Circuit miles of overhead transmission lines (including WUI and non-WUI)	4.3	0.0	5.7	18.9	3.6	0.0	4.3	5.3	4.5	0.0	0.0	0.0	Circuit miles	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	3.b.	Circuit miles of overhead distribution lines (including WUI and non-WUI)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Circuit miles	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map the distribution projects in GIS and subdivide as requested.
	3.c.	Circuit miles of overhead transmission lines in WUI	0	0	0	0.3	0.1	0	0	0	0	0	0	0	Circuit miles in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	3.d.	Circuit miles of overhead distribution lines in WUI	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Circuit miles in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map the distribution projects in GIS and subdivide as requested.
	3.e.	Number of substations (including WUI and non-WUI)	1	0	0	0	0	0	0	0	0	0	0	0	Number of substations	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	3.f.	Number of substations in WUI	0	0	0	0	0	0	0	0	0	0	0	0	Number of substations in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	3.g.	Number of weather stations (including WUI and non-WUI)	11	0	91	102	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Number of weather stations	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	3.h.	Number of weather stations in WUI	0	0	2	2	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Number of weather stations in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.

Utility	Southern California Edison Company
Table No.	10
Date Modified	2/5/2021

Notes:
Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV.
In future submissions update planned upgrade numbers with actuals
In the comments column on the far-right, enter the relevant program target(s) associated

Table 10: Location of actual and planned utility infrastructure upgrades year over year

			Actual				Projected									
			Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3		
Metric type	**#**	**Outcome metric name**	**2020**	**2020**	**2020**	**2020**	**2021**	**2021**	**2021**	**2021**	**2022**	**2022**	**2022**	**2022**	**Unit(s)**	**Comments**
1. Planned utility infrastructure upgrades year over year - in urban areas	1.a.	Circuit miles of overhead transmission lines planned for upgrades (including WUI and non-WUI)	0	0	0	0	0	0	0	0	0	0	0	0	Circuit miles	
	1.b.	Circuit miles of overhead distribution lines planned for upgrades (including WUI and non-WUI)	4.7	0.0	16.4	46.2	32.3	0.0	63.9	252.6	35.2	0.0	73.5	149.4	Circuit miles	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	1.c.	Circuit miles of overhead transmission lines planned for upgrades in WUI	0	0	0	0	0	0	0	0	0	0	0	0	Circuit miles in WUI	
	1.d.	Circuit miles of overhead distribution lines planned for upgrades in WUI	4.3	0.0	16.1	44.9	16.4	0.0	62.3	247.1	28.5	0.0	66.8	148.1	Circuit miles in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	1.e.	Number of substations planned for upgrades (including WUI and non-WUI)	1	0	6	1	4	0	1	2	5	0	0	2	Number of substations	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	1.f.	Number of substations planned for upgrades in WUI	1	0	4	1	1	0	1	2	2	0	0	2	Number of substations in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	1.g.	Number of weather stations planned for upgrades (including WUI and non-WUI)	0	0	0	0	0	0	0	0	0	0	0	0	Number of weather stations	
	1.h.	Number of weather stations planned for upgrades in WUI	0	0	0	0	0	0	0	0	0	0	0	0	Number of weather stations in WUI	
2. Planned utility infrastructure upgrades year over year - in rural areas	2.a.	Circuit miles of overhead transmission lines planned for upgrades (including WUI and non-WUI)	0	0	0	0	0	0	0	0	0	0	0	0	Circuit miles	
	2.b.	Circuit miles of overhead distribution lines planned for upgrades (including WUI and non-WUI)	9.5	0.0	93.0	390.4	60.7	0.0	304.9	938.6	28.8	0.0	186.9	268.3	Circuit miles	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	2.c.	Circuit miles of overhead transmission lines planned for upgrades in WUI	0	0	0	0	0	0	0	0	0	0	0	0	Circuit miles in WUI	
	2.d.	Circuit miles of overhead distribution lines planned for upgrades in WUI	7.4	0.0	58.5	296.2	47.9	0.0	247.8	763.9	19.9	0.0	132.5	202.2	Circuit miles in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	2.e.	Number of substations planned for upgrades (including WUI and non-WUI)	0	0	0	4	2	0	1	2	2	0	3	2	Number of substations	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	2.f.	Number of substations planned for upgrades in WUI	0	0	0	4	1	0	1	2	2	0	2	2	Number of substations in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	2.g.	Number of weather stations planned for upgrades (including WUI and non-WUI)	0	0	0	0	0	0	0	0	0	0	0	0	Number of weather stations	
	2.h.	Number of weather stations planned for upgrades in WUI	0	0	0	0	0	0	0	0	0	0	0	0	Number of weather stations in WUI	
3. Planned utility infrastructure upgrades year over year - in highly rural areas	3.a.	Circuit miles of overhead transmission lines planned for upgrades (including WUI and non-WUI)	0	0	0	0	0	0	0	0	0	0	0	0	Circuit miles	
	3.b.	Circuit miles of overhead distribution lines planned for upgrades (including WUI and non-WUI)	3.0	0.0	121.2	88.8	30.9	0.0	109.6	381.8	19.2	0.0	108.5	149.7	Circuit miles	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
	3.c.	Circuit miles of overhead transmission lines planned for upgrades in WUI	0	0	0	0	0	0	0	0	0	0	0	0	Circuit miles in WUI	
	3.d.	Circuit miles of overhead distribution lines planned for upgrades in WUI	0.1	0.0	1.8	2.2	0.4	0.0	1.5	12.1	0.1	0.0	2.2	2.6	Circuit miles in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.

3.e.	Number of substations planned for upgrades (including WUI and non-WUI)	5	0	1	3	1	0	2	2	8	0	8	5	Number of substations	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
3.f.	Number of substations planned for upgrades in WUI	0	0	0	0	0	0	0	0	0	0	0	0	Number of substations in WUI	SCE does not routinely track planned additions, removals, or upgrades by circuit mile, population density, or WUI. While SCE has a number of planned distribution projects over the next few years, they are not far enough along in the project lifecycle to have a complete list of affected structures (new or existing), circuit path/route geometries, and/or geospatial coordinates. Therefore, SCE is unable to map all projects in GIS and subdivide as requested.
3.g.	Number of weather stations planned for upgrades (including WUI and non-WUI)	0	0	0	0	0	0	0	0	0	0	0	0	Number of weather stations	
3.h.	Number of weather stations planned for upgrades in WUI	0	0	0	0	0	0	0	0	0	0	0	0	Number of weather stations in WUI	

Utility	Southern California Edison Company	Notes:
Table No.	11	"PSPS" = Public Safety Power Shutoff
		In future submissions update planned
Date Modified	5/3/2021	upgrade numbers with actuals

Table 11: Recent use of PSPS and other PSPS metrics

			Actual										Projected								
								Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
Metric type	**#**	**Outcome metric name**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2020**	**2020**	**2020**	**2021**	**2021**	**2021**	**2021**	**2022**	**2022**	**2022**	**2022**	**Unit(s)**	**Comments**
1. Recent use of PSPS	1.a.	Frequency of PSPS events (total)	0	0	1	3	7	0	0	2	8	1	0	Low 1 / High 3	Low 3 / High 11					Number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability, per year. Only include events in which de-energization ultimately occurred	During 2020, SCE initiated 12 PSPS events (2 of which SCE did not de-energize, Table 11, Metric Type 5.a.) with 16 periods of concern, i.e., periods of time when de-energization was likely to occur due to forecast weather and fuel conditions, 16 relates to periods of concerns. For Q2-Q4 2021 time periods, SCE used 2020 recorded data adjusted for improvement expected based on SCE's planned wildfire mitigation activities to create a baseline. To factor in weather variability, which has significant impacts on PSPS events, SCE developed a range around the baseline. The range was based on an 18 year backcast analysis that analyzed how current PSPS triggers would have resulted in PSPS events when applied to historical weather data. For further details on calculating the range, please see section 8.5
	1.b.	Scope of PSPS events (total)	0	0	7	6	267	0	0	7	417	160	0	Low 2 / High 7	Low 147 / High 473					Circuit-events, measured in number of events multiplied by number of circuits de-energized per year	SCE interprets this line item as de-energized circuit count. Additionally, the numbers being reported may not align with the ESRB-8 report because that report uses preliminary operations data that has not been fully validated. For Q2-Q4 2021 time periods, SCE used 2020 recorded data adjusted for improvement expected based on SCE's planned wildfire mitigation activities to create a baseline. To factor in weather variability, which has significant impacts on PSPS events, SCE developed a range around the baseline. The range was based on an 18 year backcast analysis that analyzed how current PSPS triggers would have resulted in PSPS events when applied to historical weather data. For further details on calculating the range, please see section 8.5
	1.c.	Duration of PSPS events (total)	0	0	87,019	3,570	5,275,193	0	0	3,981	4,451,955	1,953,962	0	Low 1,129 / High 3,622	Low 1,213,366 / High 3,893,102					Customer hours per year	For Q2-Q4 2021 time periods, SCE used 2020 recorded data adjusted for improvement expected based on SCE's planned wildfire mitigation activities to create a baseline. To factor in weather variability, which has significant impacts on PSPS events, SCE developed a range around the baseline. The range was based on an 18 year backcast analysis that analyzed how current PSPS triggers would have resulted in PSPS events when applied to historical weather data. For further details on calculating the range, please see section 8.5
2. Customer hours of PSPS and other outages	2.a.	Customer hours of planned outages including PSPS (total)	0	11,067,182	10,406,442	9,556,442	10,918,480	1,236,491	770,811	1,295,679	6,103,855	3,778,268	1,729,343	1,830,060	4,539,429					Total customer hours of planned outages per year	SCE has not traditionally calculated reliability metrics tied to planned outages. Since 2019, SCE has been improving and refining its planned outage reliability reporting, therefore the years after 2018 reflect not only actual changes but changes due to the improved process. Further, SCE does not consider PSPS to be planned outages but has included PSPS metrics in this row as requested by WSD. Forecast is based on time-series forecast.
	2.b.	Customer hours of unplanned outages, not including PSPS (total)	8,401,612	9,276,813	7,788,697	6,088,158	7,617,913	1,480,964	1,496,752	2,350,456	2,224,812	1,615,913	1,496,752	2,350,456	2,224,812					Total customer hours of unplanned outages per year	Forecast is based on time-series forecast.
	2.c.	System Average Interruption Duration Index (SAIDI) (including PSPS)	100.15	241.21	214.28	183.09	215.91	31.46	26.25	42.21	96.41	63.08	37.34	48.39	78.29					SAIDI index value = sum of all interruptions in time period where each interruption is defined as sum(duration of interruption * # of customer interruptions) / Total number of customers served	SCE has not traditionally calculated reliability metrics tied to planned outages. Since 2019, SCE has been improving and refining its planned outage reliability reporting, therefore the years after 2018 reflect not only actual changes but changes due to the improved process. Further, SCE does not consider PSPS to be planned outages but has included PSPS metrics in this row as requested by WSD. Forecast is based on time-series forecast.
	2.d.	System Average Interruption Duration Index (SAIDI) (excluding PSPS)	100.15	241.21	213.25	183.04	154.47	31.46	26.25	42.16	44.88	39.76	34.17	46.75	41.68					SAIDI index value = sum of all interruptions in time period where each interruption is defined as sum(duration of interruption * # of customer interruptions) / Total number of customers served	SCE has not traditionally calculated reliability metrics tied to planned outages. Since 2019, SCE has been improving and refining its planned outage reliability reporting, therefore the years after 2018 reflect not only actual changes but changes due to the improved process. Forecast is based on time-series forecast.
	2.e.	System Average Interruption Frequency Index (SAIFI) (including PSPS)	1.164	1.335	1.203	1.029	1.105	0.222	0.216	0.282	0.321	0.293	0.28	0.31	0.279					SAIFI index value = sum of all interruptions in time period where each interruption is defined as (total # of customer interruptions) / (total # of customers served)	SCE has not traditionally calculated reliability metrics tied to planned outages. Since 2019, SCE has been improving and refining its planned outage reliability reporting, therefore the years after 2018 reflect not only actual changes but changes due to the improved process. Further, SCE does not consider PSPS to be planned outages but has included PSPS metrics in this row as requested by WSD. Forecast is based on time-series forecast.
	2.f.	System Average Interruption Frequency Index (SAIFI) (excluding PSPS)	1.164	1.335	1.203	1.029	1.067	0.222	0.216	0.281	0.279	0.270	0.28	0.309	0.278					SAIFI index value = sum of all interruptions in time period where each interruption is defined as (total # of customer interruptions) / (total # of customers served)	Forecast is based on time-series forecast.
3. Critical infrastructure impacted by PSPS	3.a.	Critical infrastructure impacted by PSPS	0	0	NA	NA	5,868	0	0	12	5,123	2,066	0	Low 1 / High 4	Low 1,658 / High 5,320					Number of critical infrastructure (in accordance with D.19-05-042) locations impacted per hour multiplied by hours offline per year	The numbers being reported may not align with the ESRB-8 report because that report uses preliminary operations data that has not been fully validated. SCE also notes, that earlier PSPS events were not tracked and recorded in the same level of detail as it is now, therefore not all data is available. For Q2-Q4 2021 time periods, SCE used 2020 recorded data adjusted for improvement expected based on SCE's planned wildfire mitigation activities to create a baseline. To factor in weather variability, which has significant impacts on PSPS events, SCE developed a range around the baseline. The range was based on an 18 year backcast analysis that analyzed how current PSPS triggers would have resulted in PSPS events when applied to historical weather data. For further details on calculating the range, please see section 8.5 Historical data was updated as a typing error was discovered.
4. Community outreach of PSPS metrics	4.a.	# of customers impacted by PSPS	0	0	2,861	112	198,826	0	0	270	229,530	116,349	0	Low 58 / High 185	Low 67,220 / High 215,678					# of customers impacted by PSPS (if multiple PSPS events impact the same customer, count each event as a separate customer)	The numbers being reported may not align with the ESRB-8 report because that report uses preliminary operations data that has not been fully validated. For Q2-Q4 2021 time periods, SCE used 2020 recorded data adjusted for improvement expected based on SCE's planned wildfire mitigation activities to create a baseline. To factor in weather variability, which has significant impacts on PSPS events, SCE developed a range around the baseline. The range was based on an 18 year backcast analysis that analyzed how current PSPS triggers would have resulted in PSPS events when applied to historical weather data. For further details on calculating the range, please see section 8.5
	4.b.	# of medical baseline customers impacted by PSPS	0	0	NA	NA	4,043	0	0	11	7,725	3,415	0	Low 4 / High 12	Low 2,443 / High 7,837					# of customers impacted by PSPS (if multiple PSPS events impact the same customer, count each event as a separate customer)	The numbers being reported may not align with the ESRB-8 report because that report uses preliminary operations data that has not been fully validated. SCE also notes, that earlier PSPS events were not tracked and recorded in the same level of detail as it is now, therefore not all data is available. For Q2-Q4 2021 time periods, SCE used 2020 recorded data adjusted for improvement expected based on SCE's planned wildfire mitigation activities to create a baseline. To factor in weather variability, which has significant impacts on PSPS events, SCE developed a range around the baseline. The range was based on an 18 year backcast analysis that analyzed how current PSPS triggers would have resulted in PSPS events when applied to historical weather data. For further details on calculating the range, please see section 8.5
	4.c.	# of customers notified prior to initiation of PSPS event	0	0	NA	NA	155,824	0	0	232	143,908	110,217	0	Low 36 / High 116	Low 41,960 / High 134,628					# of customers notified of PSPS event prior to initiation (if multiple PSPS events impact the same customer, count each event in which customer was notified as a separate customer)	The numbers being reported may not align with the ESRB-8 report because that report uses preliminary operations data that has not been fully validated. SCE also notes, that earlier PSPS events were not tracked and recorded in the same level of detail as it is now, therefore not all data is available.

	4.d.	# of medical baseline customers notified prior to initiation of PSPS event	0	0	NA	NA	3,044	0	0	15	7,531	3,138	0	Low 4 / High 12	Low ,296 / High 7,367	# of customers notified of PSPS event prior to initiation (if multiple PSPS events impact the same customer, count each event in which customer was notified as a separate customer)	The numbers being reported may not align with the ESRB-8 report because that report uses preliminary operations data that has not been fully validated. SCE also notes, that earlier PSPS events were not tracked and recorded in the same level of detail as it is now, therefore not all data is available.
	4.e.	% of customers notified prior to a PSPS event impacting them	0	0	NA	NA	78%	0	0	85%	62%	95%	0	62%	62%	=4.c. / 4.a.	SCE also notes, that earlier PSPS events were not tracked and recorded in the same level of detail as it is now, therefore not all data is available.
	4.f.	% of medical baseline customers notified prior to a PSPS event impacting them	0	0	NA	NA	75%	0	0	100%	88%	92%	0	100%	94%	=4.d. / 4.b.	SCE also notes, that earlier PSPS events were not tracked and recorded in the same level of detail as it is now, therefore not all data is available.
5. Other PSPS metrics	5.a.	Number of PSPS events triggered where no de-energization occurred	0	0	NA	NA	7	0	2	0	0	0	2	0	0	Number of instances where utility notified the public of a potential PSPS event but no de-energization followed	SCE also notes, that earlier PSPS events were not tracked and recorded in the same level of detail as it is now, therefore not all data is available.
	5.b.	Number of customers located on de-energized circuit	0	0	NA	NA	237,666	0	0	5,820	407,853	597,448	0	Low 1,226 / High 3,933	Low 118,918 / High 381,552	Number of customers	This data includes the number of customers on a circuit whether they were de-energized or not For Q2-Q4 2021 time periods, SCE used 2020 recorded data adjusted for improvement expected based on SCE's planned wildfire mitigation activities to create a baseline. To factor in weather variability, which has significant impacts on PSPS events, SCE developed a range around the baseline. The range was based on an 18 year backcast analysis that analyzed how current PSPS triggers would have resulted in PSPS events when applied to historical weather data. For further details on calculating the range, please see section 8.5 SCE also notes, that earlier PSPS events were not tracked and recorded in the same level of detail as it is now, therefore not all data is available.
	5.c.	Customer hours of PSPS per RFW OH circuit mile day	0	0	NA	NA	NA	0	0	17	434	875	0	L 6 / H1 8	L 158 / H 507	=1.c. / RFW OH circuit mile days in time period	For Q2-Q4 2021 time periods, SCE used 2020 recorded data adjusted for improvement expected based on SCE's planned wildfire mitigation activities to create a baseline. To factor in weather variability, which has significant impacts on PSPS events, SCE developed a range around the baseline. The range was based on an 18 year backcast analysis that analyzed how current PSPS triggers would have resulted in PSPS events when applied to historical weather data. For further details on calculating the range, please see section 8.5 SCE also notes, that earlier PSPS events were not tracked and recorded in the same level of detail as it is now, therefore not all data is available. Historical numbers were corrected as the original anlaysis methodology was found to be faulty. Additionally, Since historical numbers were adjusted, the forecast numbers were re-forecasted.
	5.d.	Frequency of PSPS events (total) - High Wind Warning wind conditions	0	0	NA	NA	NA	0	0	1	8	1	0	L 0 / H 1	L 3 / H 11	Events over time period that overlapped with a High Wind Warning as defined by the National Weather Service	For Q2-Q4 2021 time periods, SCE used 2020 recorded data adjusted for improvement expected based on SCE's planned wildfire mitigation activities to create a baseline. To factor in weather variability, which has significant impacts on PSPS events, SCE developed a range around the baseline. The range was based on an 18 year backcast analysis that analyzed how current PSPS triggers would have resulted in PSPS events when applied to historical weather data. For further details on calculating the range, please see section 8.5 SCE also notes, that earlier PSPS events were not tracked and recorded in the same level of detail as it is now, therefore not all data is available. Historical numbers were corrected as the original anlaysis methodology was found to be faulty. Additionally, Since historical numbers were adjusted, the forecast numbers were re-forecasted.
	5.e.	Scope of PSPS events (total) - High Wind Warning wind conditions	0	0	NA	NA	NA	0	0	7	392	151	0	L 2 / H 5	L 104 / H 335	Estimated customers impacted over time period that overlapped with a High Wind Warning as defined by the National Weather Service	For Q2-Q4 2021 time periods, SCE used 2020 recorded data adjusted for improvement expected based on SCE's planned wildfire mitigation activities to create a baseline. To factor in weather variability, which has significant impacts on PSPS events, SCE developed a range around the baseline. The range was based on an 18 year backcast analysis that analyzed how current PSPS triggers would have resulted in PSPS events when applied to historical weather data. For further details on calculating the range, please see section 8.5 SCE also notes, that earlier PSPS events were not tracked and recorded in the same level of detail as it is now, therefore not all data is available. SCE interprets this line item as de-energized circuit counts that overlap with High Wind Warnings. Historical numbers were corrected as the original anlaysis methodology was found to be faulty. Additionally, since historical numbers were adjusted, the forecast numbers were re-forecasted.
	5.f.	Duration of PSPS events (total) - High Wind Warning wind conditions	0	0	NA	NA	NA	0	0	3,500	4,298,692	1,826,480	0	L 910 / H 2,920	L 1,175,242 / H 3,770,782	Customer hours over time period that overlapped with a High Wind Warning as defined by the National Weather Service	For Q2-Q4 2021 time periods, SCE used 2020 recorded data adjusted for improvement expected based on SCE's planned wildfire mitigation activities to create a baseline. To factor in weather variability, which has significant impacts on PSPS events, SCE developed a range around the baseline. The range was based on an 18 year backcast analysis that analyzed how current PSPS triggers would have resulted in PSPS events when applied to historical weather data. For further details on calculating the range, please see section 8.5 SCE also notes, that earlier PSPS events were not tracked and recorded in the same level of detail as it is now, therefore not all data is available. Historical numbers were corrected as the original anlaysis methodology was found to be faulty. Additionally, Since historical numbers were adjusted, the forecast numbers were re-forecasted.

Utility	Southern California Edison Company
Table No.	12
Date Modified	6/3/2021

Notes:
Risk-Spend-Efficiency (RSE) is defined as "An estimate of the cost-effectiveness of initiative, calculated by dividing the mitigation risk reduction benefit by the mitigation cost estimate based on the full set of risk reduction benefits estimated from the incurred costs."
CAPEX = Capital expenditure; OPEX = Operating expenditure. In future submissions update planned spend, line miles treated, RSE, etc. with updated projections and actuals. Additional instructions can be found in QR information.
All dollars shown are in nominal, thousands of dollars (000s).

Table 12: Mitigation initiative financials

Metric type	WMP Table # / Category	WMP Initiative #	Initative activity	WMP Identifier	Primary driver targeted	Secondary driver targeted	Year initiated	Estimated RSE in non-HFTD region [1]	Estimated RSE in HFTD Zone 1 [1]	Estimated RSE in HFTD Tier 2 [1]	Estimated RSE in HFTD Tier 3	If existing: most recent proceeding that has reviewed program	If new: memorandum account	Current compliance status - In / exceeding compliance with regulations	Associated rule(s) - if multiple, separate by semi-colon - ";"	If spend not disaggregated by this activity, note activity where relevant spend is tracked in or mark "general operations"	Alternative units in which initiative is reported (if not line miles); still required to report line miles	Comments	Actual CAPEX ($ thousands) 2020	Actual OPEX ($ thousands) 2020	Actual Line miles to be treated 2020	Actual Alternative units (if used) 2020	Projected CAPEX ($ thousands) 2021	Projected OPEX ($ thousands) 2021	Projected Line miles to be treated 2021	Projected Alternative units (if used) 2021	Projected CAPEX ($ thousands) 2022	Projected OPEX ($ thousands) 2022	Projected Line miles to be treated 2022	Projected Alternative units (if used) 2022
Other	Risk Assessment & Mapping	7.3.1.1.	A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment	NA									GSRPBA			Costs included in SA-4			$ 265	$ 175				$ 315				$ 175		
Other	Risk Assessment & Mapping	7.3.1.2.	Climate-driven risk map and modelling based on various relevant weather scenarios	NA												General operations														
Other	Risk Assessment & Mapping	7.3.1.3.	Ignition probability mapping showing the probability of ignition along the electric lines and equipment	NA									GSRPBA			Costs included in SA-4			$ 265	$ 175				$ 315				$ 175		
Other	Risk Assessment & Mapping	7.3.1.4.	Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	NA												General operations														
Other	Risk Assessment & Mapping	7.3.1.5.	Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment	NA									GSRPBA			Costs included in SA-4			$ 265	$ 175				$ 315				$ 175		
Other	Situational Awareness & Forecasting	7.3.2.1.	Advanced weather monitoring and weather stations	SA-1			2018	512	NA	417	598	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA	Exceeding compliance with regulations		NA	# of weather station installs	RSE has been developed for this mitigation in conjunction with SH-5.	$ 7,603	$ 4,309		593	$ 5,273	$ 7,360		475	$ 5,273	$ 7,871		475
Other	Situational Awareness & Forecasting	7.3.2.2.	Continuous monitoring sensors	SA-9	Equipment failure	Other contact with object	2018	925	NA	Sectionalizing Devices: 512	Sectionalizing Devices: 512	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA; WMPMA	Exceeding compliance with regulations		NA	# of devices	Distribution Fault Anticipation (DFA) devices are installed in substations and are used to monitor entire circuits which traverse HFTD Tier 2 and Tier 3. At the time of SCE's 2021 WMP submission, the specific substations in scope for 2021 were already identified. Accordingly, SCE was able to calculate an RSE for non-HFTD as some of the circuits traversed non-HFTD in addition to HFTD Tier 2 and Tier 3. Nonetheless, as the RSEs reflect, the primary benefits are in Tier 2 and Tier 3.	$ 260	$ 215			$ 9,554	$ 252		150	$ 19,609			300
Other	Situational Awareness & Forecasting	7.3.2.3.	Fault indicators for detecting faults on electric lines and equipment	NA			NA						NA			General operations	# of installations (395 are in HFRA)	This activity is not considered by SCE to be a WMP activity and only units have been provided as the dollars are not disaggregated in SCE's accounting system at this level. Year initiated noted as "NA" as initiative started pre-GSRP/WMP.				1,566				1,566				1,566
Other	Situational Awareness & Forecasting	7.3.2.4.1	Forecast of a fire risk index, fire potential index, or similar	SA-2												Costs included with SA-3														
Other	Situational Awareness & Forecasting	7.3.2.4.2	Forecast of a fire risk index, fire potential index, or similar	SA-5			2019					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	FRMMA	Exceeding compliance with regulations		NA	# of square miles			$ 193				$ 320		6,500		$ 604		6,500
Other	Situational Awareness & Forecasting	7.3.2.4.3	Forecast of a fire risk index, fire potential index, or similar	SA-7			2020					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations		NA								$ 1,467	14,000			$ 1,711	14,000	
Other	Situational Awareness & Forecasting	7.3.2.4.4	Forecast of a fire risk index, fire potential index, or similar	SA-8			2019					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations		NA				$ 414	14,000			$ 891	14,000			$ 500	14,000	
Other	Situational Awareness & Forecasting	7.3.2.5.	Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	NA			NA						NA			General operations		This activity is not considered by SCE to be a WMP activity and dollars/units represent SCE's full service area, not just its HFRA. Year initiated noted as "NA" as initiative started pre-GSRP/WMP.		$ 25,218	14,000			$ 24,099	14,000			$ 24,782	14,000	
Other	Situational Awareness & Forecasting	7.3.2.6.1	Weather forecasting and estimating impacts on electric lines and equipment	SA-3			2018					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA; WMPMA	Exceeding compliance with regulations		NA	# of HPCCs in 2021	Not intending to install new HPCCs in 2022	$ 3,310	$ 1,134			$ 6,552	$ 3,728		2	$ 700	$ 3,143		
Other	Situational Awareness & Forecasting	7.3.2.6.2	Weather forecasting and estimating impacts on electric lines and equipment	SA-4			2018					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	FRMMA	Exceeding compliance with regulations		NA				$ 1,029	14,000			$ 1,348	14,000			$ 828	14,000	
Grid hardening	Grid Design & System Hardening	7.3.3.1.	Capacitor maintenance and replacement program	NA			NA						NA	In compliance with regulations	GO 95; GO 165	General operations	2020: 112 OH Caps; 10 PM Caps; 23 Removals 2021: 41 OH Caps; 10 PM Caps; 6 Removals 2022: 55 OH Caps; 14 PM Caps; 8 Removals	This activity is not considered by SCE to be a WMP activity and dollars/units represent SCE's full service area, not just its HFRA. Year initiated noted as "NA" as initiative started pre-GSRP/WMP.	$ 5,275			145	$ 2,444			57	$ 3,413			77
Grid hardening	Grid Design & System Hardening	7.3.3.2.	Circuit breaker maintenance and installation to de-energize lines upon detecting a fault	SH-6	Equipment failure	Other contact with object	2018	NA	NA	1,958	3,308	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA	Exceeding compliance with regulations	GO 95; GO 165	NA	# of relays		$ 9,786	$ (9)		109	$ 12,898			86	$ 8,583			113
Grid hardening	Grid Design & System Hardening	7.3.3.3.1	Covered conductor installation	SH-1	Other contact with object	Wire-to-wire contact	2018	NA	NA	Covered Conductor: 3,765 FR Poles: 1,948	Covered Conductor: 4,514 FR Poles: 2,364	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA	Exceeding compliance with regulations	GO 95, Rule 31.1	NA	# of miles of covered conductor installs	For RSE purposes, this activity has been disaggregated into Covered Conductor and FR Poles. In 2020, there were 814 WCCP circuit miles and 151 non-WCCP circuit miles installed.	$ 546,151			965	$ 753,659			1,400	$ 883,813			1,600
Grid hardening	Grid Design & System Hardening	7.3.3.3.2	Covered conductor installation	SH-10	Other contact with object	Wire-to-wire contact	2018					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA	Exceeding compliance with regulations	GO 95, Rule 31.1	NA	# of remediations	405 tree attachments were remediated in 2020. The majority, 369, of these tree attachments were scoped for future years but were removed as a result of wildfires in the second half of the year.	$ 9,654			405	$ 22,231			689	$ 26,090			788
Grid hardening	Grid Design & System Hardening	7.3.3.4.	Covered conductor maintenance	NA										In compliance with regulations	GO 95	General operations														
Grid hardening	Grid Design & System Hardening	7.3.3.5.	Crossarm maintenance, repair, and replacement	NA										In compliance with regulations	GO 95	General operations														
Grid hardening	Grid Design & System Hardening	7.3.3.6.	Distribution pole replacement and reinforcement, including with composite poles	NA			NA						NA	In compliance with regulations	GO 95	General operations	# of pole remediations	This activity is not considered by SCE to be a WMP activity and dollars/units represent SCE's full service area, not just its HFRA. Year initiated noted as "NA" as initiative started pre-GSRP/WMP.	$ 181,874			9,511	$ 306,565			15,265	$ 219,403			11,611
Grid hardening	Grid Design & System Hardening	7.3.3.7.	Expulsion fuse replacement	SH-4	Equipment failure	Other contact with object	2018	0	NA	1,363	3,304	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA	Exceeding compliance with regulations	GO 95	NA	Location count	Detailed scope review has identified where due to recent changes to the HFRA classification, two fuse installations were outside of HFTD boundaries. These recent high fire boundary changes were a result of updates to the CPUC HFTD and adoption and changes to previous SCE HFRA classifications. These two fuse replacements will be de-scoped for the 2021 fuse replacement efforts for SH-4 and Table 12 has been updated to reflect 'N/A' for non-HFTD and Zone 1.	$ 8,955	$ 3,262		3,025		$ 1,154		421		$ 1,334		481
Grid hardening	Grid Design & System Hardening	7.3.3.8.1	Grid topology improvements to mitigate or reduce PSPS events	SH-7								This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.		Exceeding compliance with regulations	GO 95	NA		SCE does not plan to incur incremental costs for this initiative.												
Grid hardening	Grid Design & System Hardening	7.3.3.8.2	Grid topology improvements to mitigate or reduce PSPS events	SH-12			2020					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	MGOIR	Exceeding compliance with regulations	GO 95	NA							$ 4,000		9,715		$ 7,000		9,715	
Grid hardening	Grid Design & System Hardening	7.3.3.9.	Installation of system automation equipment	SH-5			2018	512	NA	417	598		GSRPBA; FHPMA	Exceeding compliance with regulations	GO 95	NA	# of devices	RSE has been developed for this mitigation in conjunction with SA-1. For purposes of developing this RSE, SCE utilized preliminary scope and cost estimates for SH-5 per the Action Plan.	$ 5,867			49								
Grid hardening	Grid Design & System Hardening	7.3.3.10.	Maintenance, repair, and replacement of connectors, including hotline clamps	NA										In compliance with regulations	GO 95	General operations														
Grid hardening	Grid Design & System Hardening	7.3.3.11.	Mitigation of impact on customers and other residents affected during PSPS event	NA												General operations														
Grid hardening	Grid Design & System Hardening	7.3.3.12.	Other corrective action	SH-14	Wire-to-wire contact	Equipment failure	2019	NA	NA	1,867	1,957	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations	GO 95	NA		Units to be determined by field assessments being conducted in Q1/Q2 2021.		$ 554	9,715		$ 5,943	$ 2,221	9,715		$ 33,590	$ 14,027	9,715	
Grid hardening	Grid Design & System Hardening	7.3.3.13.	Pole loading infrastructure hardening and replacement program based on pole loading assessment program	NA			NA						NA	In compliance with regulations	GO 95	General operations	# of pole remediations	This activity is not considered by SCE to be a WMP activity and dollars/units represent SCE's full service area, not just its HFRA. Year initiated noted as "NA" as initiative started pre-GSRP/WMP.	$ 97,292			3,805	$ 209,875			1,072	$ 307,949			15,135
Grid hardening	Grid Design & System Hardening	7.3.3.14.	Transformers maintenance and replacement	NA			NA						NA	In compliance with regulations	GO 95	General operations	Includes overhead, padmount and BURD transformers, and associated inspections.	This activity is not considered by SCE to be a WMP activity and dollars/units represent SCE's full service area, not just its HFRA. Year initiated noted as "NA" as initiative started pre-GSRP/WMP.	$ 96,400	$ 3,800		31,947	$ 96,262	$ 5,704		33,408	$ 98,187	$ 6,045		32,335
Grid hardening	Grid Design & System Hardening	7.3.3.15.	Transmission tower maintenance and replacement	SH-13	Contamination	Equipment failure	2020	NA	NA	1.15E-14	45		WMPMA	Exceeding compliance with regulations	GO 95	NA	# of structures	This mitigation should not have included an RSE value for non-HFTD and has been updated to reflect "N/A" in Table 12. Its previous value of 0 was in fact 0.006.						$ 1,000		53				
Grid hardening	Grid Design & System Hardening	7.3.3.16.	Undergrounding of electric lines and/or equipment	SH-2	Other contact with object	Wire-to-wire contact	2019	NA	NA	447	347	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations	GO 95	NA		In 2020, only design work was completed.	$ 961				$ 26,350		6		$ 54,347		11	
Grid hardening	Grid Design & System Hardening	7.3.3.17.1	Updates to grid topology to minimize risk of ignition in HFTDs	SH-15	Equipment failure		2019	NA	NA	NA	13	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations	GO 95	NA	# of replacements						$ 853			30	$ 1,751			60
Grid hardening	Grid Design & System Hardening	7.3.3.17.2	Updates to grid topology to minimize risk of ignition in HFTDs	SH-11			2019					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations	GO 95	NA				$ 74	9,715		$ 4,450	$ 820	9,715		$ 3,953	$ 225	9,715	
Grid hardening	Grid Design & System Hardening	7.3.3.17.3	Updates to grid topology to minimize risk of ignition in HFTDs	SH-8			2019					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations	GO 95	NA	Cicuit miles within HFRA			$ 125		6		$ 400		10		$ 750		13
Asset inspection	Asset Management & Inspections	7.3.4.1.	Detailed inspections of distribution electric lines and equipment	NA			NA							In compliance with regulations	GO 165	General operations	2020: 56,895 inspections in HFRA; 205,875 inspections in non-HFRA 2021: 27,000 inspections in HFRA; 244,000 inspections in non-HFRA 2022: 27,000 inspections in HFRA; 244,000 inspections in non-HFRA	Year initiated noted as "NA" as initiative started pre-GSRP/WMP.		$ 8,960		262,770		$ 4,223		271,000		$ 4,332		271,000
Asset inspection	Asset Management & Inspections	7.3.4.2.	Detailed inspections of transmission electric lines and equipment	NA			NA							In compliance with regulations	GO 165	General operations	# of inspections	Year initiated noted as "NA" as initiative started pre-GSRP/WMP.		$ 3,567		1,313		$ 7,604		1,313		$ 7,802		1,313
Asset inspection	Asset Management & Inspections	7.3.4.3.	Improvement of inspections	IN-8			2021					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations		NA			$ 28,719	$ 2,629	9,715		$ 17,422	$ 6,490	9,715		$ 6,600	$ 5,241	9,715	
Asset inspection	Asset Management & Inspections	7.3.4.4.	Infrared inspections of distribution electric lines and equipment	IN-3	Equipment failure		2017	NA	NA	156	1,879	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA	Exceeding compliance with regulations	GO 95, Rule 31.2; GO 95, Rule 31.1	NA				$ 791	4,416			$ 427	4,425			$ 427	4,425	

Metric type	WMP Table # / Category	WMP Initiative #	Initative activity	WMP Identifier	Primary driver targeted	Secondary driver targeted	Year initiated	Estimated RSE in non-HFTD region [1]	Estimated RSE in HFTD Zone 1 [1]	Estimated RSE in HFTD Tier 2 [1]	Estimated RSE in HFTD Tier 3	If existing: most recent proceeding that has reviewed program	If new: memorandum account	Current compliance status - In / exceeding compliance with regulations	Associated rule(s) - if multiple, separate by semi-colon - ";"	If spend not disaggregated by this activity, note activity where relevant spend is tracked in or mark "general operations"	Alternative units in which initiative is reported (if not line miles); still required to report line miles	Comments	2020	2020	2020	2020	2021	2021	2021	2021	2022	2022	2022	2022
Asset inspection	Asset Management & Inspections	7.3.4.5.	Infrared inspections of transmission electric lines and equipment	IN-4	Equipment failure		2019	NA	NA	NA	174	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations	GO 95, Rule 31.2; GO 95, Rule 31.1	NA				$ 384	1,005			$ 209	1,000			$ 216	1,000	
Asset inspection	Asset Management & Inspections	7.3.4.6.	Intrusive pole inspections	NA			NA							In compliance with regulations	GO 95	General operations		Year initiated noted as "NA" as initiative started pre-GSRP/WMP.						$ 4,223	14,000			$ 4,332	14,000	
Asset inspection	Asset Management & Inspections	7.3.4.7.	LiDAR inspections of distribution electric lines and equipment	NA												General operations														
Asset inspection	Asset Management & Inspections	7.3.4.8.	LiDAR inspections of transmission electric lines and equipment	NA												General operations														
Asset inspection	Asset Management & Inspections	7.3.4.9.1	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	IN-1.1	Equipment failure		2018	NA	NA	Distribution Ground & Remediation: 3,217 Distribution Aerial & Remediation: 1,056	Distribution Ground & Remediation: 3,225 Distribution Aerial & Remediation: 953	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	FRMMA; GSRPBA; WMPMA	Exceeding compliance with regulations	GO 95, Rule 31.2; GO 95, Rule 31.1; GO 165	NA	2020: # of Ground Inspections: 199,050; # of Aerial Inspections: 168,017; # of Remediations: 26,915 2021: # of Ground Inspections: 198,000; # of Aerial Inspections: 198,000; # of Remediations: 24,584 2022: # of Ground Inspections: 171,000; # of Aerial Inspections: 198,468; # of Remediations: 14,354	For RSE purposes, this activity has been disaggregated into Distribution Ground and Remediation and Distribution Aerial and Remediation	$ 85,219	$ 105,553		393,982	$ 147,938	$ 104,185		420,584	$ 88,698	$ 91,606		383,822
Asset inspection	Asset Management & Inspections	7.3.4.9.2	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	IN-5			2019					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	FRMMA; WMPMA	Exceeding compliance with regulations	GO 95 Rule 31.2; GO 165	NA				$ 403		268		$ 315		181				102
Asset inspection	Asset Management & Inspections	7.3.4.10.	Other discretionary inspection of transmission electric lines and	IN-1.2	Equipment failure		2018	NA	NA	Transmission Ground & Remediation: 921 Transmission Aerial & Remediation: 606	Transmission Ground & Remediation: 1,095 Transmission Aerial & Remediation: 695	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	FRMMA; GSRPBA; WMPMA	Exceeding compliance with regulations	GO 95, Rule 31.2; GO 95, Rule 31.1; GO 165	NA	2020: # of Ground Inspections: 35,562; # of Aerial Inspections: 31,381; # of Remediations: 6,486 2021: # of Ground Inspections: 22,800; # of Aerial Inspections: 22,800; # of Remediations: 5,902 2022: # of Ground Inspections: 14,902; # of Aerial Inspections: 22,834; # of Remediations: 3,605	For RSE purposes, this activity has been disaggregated into Transmission Ground and Remediation and Transmission Aerial and Remediation	$ 35,934	$ 51,821		73,429	$ 50,758	$ 25,181		51,502	$ 18,098	$ 23,825		41,341
Asset inspection	Asset Management & Inspections	7.3.4.11.	Patrol inspections of distribution electric lines and equipment	NA			NA									General operations		Year initiated noted as "NA" as initiative started pre-GSRP/WMP.		$ 25,218	9,715			$ 24,099	9,715			$ 24,782	9,715	
Asset inspection	Asset Management & Inspections	7.3.4.12.	Patrol inspections of transmission electric lines and equipment	NA												General operations														
Asset inspection	Asset Management & Inspections	7.3.4.13.	Pole loading assessment program to determine safety factor	NA			NA							In compliance with regulations	GO 95	General operations	# of assessments	Year initiated noted as "NA" as initiative started pre-GSRP/WMP.		$ 14,477		121,268		$ 3,210		14,400				
Asset inspection	Asset Management & Inspections	7.3.4.14.	Quality assurance / quality control of inspections	NA												General operations														
Asset inspection	Asset Management & Inspections	7.3.4.15.	Substation inspections	NA			NA						NA	In compliance with regulations	GO 174	General operations	# of inspections	This activity is not considered by SCE to be a WMP activity and dollars/units represent SCE's full service area, not just its HFRA. Year initiated noted as "NA" as initiative started pre-GSRP/WMP.		$ 2,672		4,209		$ 2,855		4,426		$ 2,986		5,644
Vegetation management project	Vegetation Management & Inspections	7.3.5.1.	Additional efforts to manage community and environmental impacts	NA												General operations														
Vegetation inspection	Vegetation Management & Inspections	7.3.5.2.	Detailed inspections of vegetation around distribution electric lines and equipment	NA			NA						NA	In compliance with regulations	GO 95; GO 174	General operations	# of ground inspection and aerial inspections	This activity is not considered by SCE to be a WMP activity and dollars/units represent SCE's full service area, not just its HFRA. Year initiated noted as "NA" as initiative started pre-GSRP/WMP.		$ 25,756		1,760,000		$ 15,020		1,149,000		$ 15,471		1,149,000
Vegetation inspection	Vegetation Management & Inspections	7.3.5.3.	Detailed inspections of vegetation around transmission electric lines and equipment	NA			NA						NA	In compliance with regulations	GO 95; GO 174	General operations	# of inspections	This activity is not considered by SCE to be a WMP activity and dollars/units represent SCE's full service area, not just its HFRA. Year initiated noted as "NA" as initiative started pre-GSRP/WMP.		$ 1,774		321,000		$ 2,753		234,000		$ 2,835		234,000
Vegetation management project	Vegetation Management & Inspections	7.3.5.4.	Emergency response vegetation management due to red flag warning or other urgent conditions	NA												General operations														
Vegetation management project	Vegetation Management & Inspections	7.3.5.5.1	Fuel management and reduction of "slash" from vegetation management activities	VM-2	Equipment failure		2019	NA	NA	1,426	1,881	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations	PRC 4292	NA	# of poles brushed			$ 7,459		234,000		$ 8,272		229,190		$ 6,787		229,190
Vegetation management project	Vegetation Management & Inspections	7.3.5.5.2	Fuel management and reduction of "slash" from vegetation management activities	VM-3			2019					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	FHPMA	Exceeding compliance with regulations	PRC 4291; PRC 4293	NA						61		$ 900		46		$ 1,089		49
Vegetation inspection	Vegetation Management & Inspections	7.3.5.6.	Improvement of inspections	NA												General operations														
Vegetation inspection	Vegetation Management & Inspections	7.3.5.7.	LiDAR inspections of vegetation around distribution electric lines and equipment	NA												General operations														
Vegetation inspection	Vegetation Management & Inspections	7.3.5.8.	LiDAR inspections of vegetation around transmission electric lines and equipment	NA			2019					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations	FAC-003-4	NA				$ 4,092	1,227			$ 1,485	1,227			$ 1,502	1,227	
Vegetation inspection	Vegetation Management & Inspections	7.3.5.9.	Other discretionary inspections of vegetation around distribution electric lines and equipment	NA												General operations														
Vegetation inspection	Vegetation Management & Inspections	7.3.5.10.	Other discretionary inspections of vegetation around transmission electric lines and equipment	NA												General operations														
Vegetation inspection	Vegetation Management & Inspections	7.3.5.11.	Patrol inspections of vegetation around distribution electric lines and equipment	NA	Contact with vegetation							2018 GRC	FHPMA	Exceeding compliance with regulations	GO 95; PRC 4293; FAC-003-4	NA		Year initiated noted as "NA" as initiative started pre-GSRP/WMP.						$ 10,009				$ 10,309		
Vegetation inspection	Vegetation Management & Inspections	7.3.5.12.	Patrol inspections of vegetation around transmission electric lines and equipment	NA	Contact with vegetation							2018 GRC	FHPMA	Exceeding compliance with regulations	GO 95; PRC 4293; FAC-003-4	NA		Year initiated noted as "NA" as initiative started pre-GSRP/WMP.						$ 4,306				$ 4,435		
Vegetation inspection	Vegetation Management & Inspections	7.3.5.13.	Quality assurance / quality control of vegetation inspections	NA			2019					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations	GO 95; PRC 4293; FAC-003-4	NA				$ 3,966	14,000			$ 5,547	14,000			$ 6,159	14,000	
Vegetation management project	Vegetation Management & Inspections	7.3.5.14.	Recruiting and training of vegetation management personnel	NA												General operations														
Vegetation management project	Vegetation Management & Inspections	7.3.5.15.	Remediation of at-risk species	NA												General operations														
Vegetation management project	Vegetation Management & Inspections	7.3.5.16.1	Removal and remediation of trees with strike potential to electric lines and equipment	VM-1	Contact with vegetation		2018	NA	NA	1,405	1,602	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA	Exceeding compliance with regulations	GO 95 Rule 35; PRC 4293	NA	# of tree assessments			$ 46,685		99,523		$ 80,722		200,000		$ 89,162		200,000
Vegetation management project	Vegetation Management & Inspections	7.3.5.16.2	Removal and remediation of trees with strike potential to electric lines and equipment	VM-4	Contact with vegetation		NA	NA	NA	2,284	2,413	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	CEMA	Exceeding compliance with regulations	GO 95; PRC 4293; FAC-003-4	NA		Year initiated noted as "NA" as initiative started pre-GSRP/WMP.		$ 37,604				$ 43,445				$ 44,748		
Vegetation inspection	Vegetation Management & Inspections	7.3.5.17.	Substation inspection	NA												General operations														
Vegetation management project	Vegetation Management & Inspections	7.3.5.18.	Substation vegetation management	NA												General operations														
Vegetation management project	Vegetation Management & Inspections	7.3.5.19.	Vegetation inventory system	VM-6			2021					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA; GSRPBA	Exceeding compliance with regulations		NA			$ 16,128	$ 1,056	14,000		$ 9,940	$ 4,152	14,000		$ 4,475	$ 4,691	14,000	
Vegetation management project	Vegetation Management & Inspections	7.3.5.20	Vegetation management to achieve clearances around electric lines and equipment	NA	Contact with vegetation		NA	NA	NA	4,042	4,512	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	FHPMA	Exceeding compliance with regulations	GO 95; PRC 4293; FAC-003-4	NA		Year initiated noted as "NA" as initiative started pre-GSRP/WMP.		$ 233,585	14,000			$ 182,747	14,000			$ 187,967	14,000	
Other	Grid Operations & Operating Protocols	7.3.6.1.	Automatic recloser operations	NA												General operations														
Other	Grid Operations & Operating Protocols	7.3.6.2.	Crew-accompanying ignition prevention and suppression resources and services	NA												General operations														
Other	Grid Operations & Operating Protocols	7.3.6.3.	Personnel work procedures and training in conditions of elevated fire risk	NA												General operations														
Other	Grid Operations & Operating Protocols	7.3.6.4.	Protocols for PSPS re-energization	NA												General operations														
Other	Grid Operations & Operating Protocols	7.3.6.5.	PSPS events and mitigation of PSPS impacts	PSPS-2			2018	CRCs/CCVs: NA CCBB: 16	NA	CRC/CCV: 108 CCBB: 12	CRC/CCV: 188 CCBB: 22	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	FRMMA; GSRPBA; WMPMA	Exceeding compliance with regulations	SB 167	NA		The CCBB program is for medical baseline customers enrolled in the CARE or FERA program and reside in SCE's HFTDs. At the time of the 2021 WMP submission, the circuits on which these customers reside had been identified. Accordingly, SCE was able to calculate an RSE for non-HFTD as some of those circuits traversed non-HFTD in addition to HFTD Tier 2 and Tier 3. Additionally, this activity is combined with CRCs/CCVs as part of PSPS-2, and Table 12 only reflected the RSE scores for CRCs/CCVs, while the comment field only mentioned the CCBB program's RSE in HFTD Tier 2 and 3.	$ 6,843	$ 23,977	14,000		$ 7,247	$ 48,526	14,000		$ 1,250	$ 48,378	14,000	
Other	Grid Operations & Operating Protocols	7.3.6.6.	Stationed and on-call ignition prevention and suppression resources and services	NA												General operations														
Other	Data Governance	7.3.7.1.	Centralized repository for data	DG-1			2021					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA	Exceeding compliance with regulations		NA			$ 1,796		14,000		$ 15,709	$ 1,052	14,000		$ 13,698	$ 2,252	14,000	
Other	Data Governance	7.3.7.2.	Collaborative research on utility ignition and/or wildfire	NA												General operations														
Other	Data Governance	7.3.7.3.	Documentation and disclosure of wildfire-related data and algorithms	NA												General operations														
Other	Data Governance	7.3.7.4.	Tracking and analysis of near miss data	NA												General operations														
Other	Resource Allocation Methodology	7.3.8.1.	Allocation methodology development and application	NA			2018					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	FRMMA; WMPMA	Exceeding compliance with regulations		NA				$ 45,202	14,000			$ 7,610	14,000			$ 6,086	14,000	
Other	Resource Allocation Methodology	7.3.8.2.	Risk reduction scenario development and analysis	NA												General operations														
Other	Resource Allocation Methodology	7.3.8.3.	Risk spend efficiency analysis	NA												General operations														
Other	Emergency Planning & Preparedness	7.3.9.1.	Adequate and trained workforce for service restoration	DEP-2			2018					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations	GO 166	NA				$ 616	14,000			$ 2,545	14,000			$ 1,957	14,000	
Other	Emergency Planning & Preparedness	7.3.9.2.	Community outreach, public awareness, and communications efforts	NA												General operations														
Other	Emergency Planning & Preparedness	7.3.9.3	Customer support in emergencies	NA												General operations														
Other	Emergency Planning & Preparedness	7.3.9.4.	Disaster and emergency preparedness plan	NA												General operations														
Other	Emergency Planning & Preparedness	7.3.9.5.	Preparedness and planning for service restoration	NA			2018					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA	Exceeding compliance with regulations		NA				$ 5,328	14,000		$ 200	$ 11,568	14,000		$ 600	$ 11,971	14,000	
Other	Emergency Planning & Preparedness	7.3.9.6.	Protocols in place to learn from wildfire events	NA												General operations														
Other	Stakeholder Cooperation & Community Engagement	7.3.10.1.1	Community engagement	DEP-1.2			2018					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA	Exceeding compliance with regulations	R-1812005	NA	# of meetings			$ 142		9		$ 110		18		$ 110		18
Other	Stakeholder Cooperation & Community Engagement	7.3.10.1.3	Community engagement	DEP-1.3			2018					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	FRMMA; GSRPBA	Exceeding compliance with regulations	R-1812005	NA				$ 1,655	14,000			$ 3,821	14,000			$ 3,904	14,000	
Other	Stakeholder Cooperation & Community Engagement	7.3.10.1.4	Community engagement	DEP-4			2018					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	FRMMA	Exceeding compliance with regulations		NA	# of surveys					5		$ 1,434		4		$ 1,465		3
Other	Stakeholder Cooperation & Community Engagement	7.3.10.2	Cooperation and best practice sharing with agencies outside CA	NA												General operations														

Metric type	WMP Table # / Category	WMP Initiative #	Initative activity	WMP Identifier	Primary driver targeted	Secondary driver targeted	Year initiated	Estimated RSE in non-HFTD region [1]	Estimated RSE in HFTD Zone 1 [1]	Estimated RSE in HFTD Tier 2 [1]	Estimated RSE in HFTD Tier 3	If existing: most recent proceeding that has reviewed program	If new: memorandum account	Current compiance status - In / exceeding compliance with regulations	Associated rule(s) - if multiple, separate by semi-colon - ";"	If spend not disaggregated by this activity, note activity where relevant spend is tracked in or mark "general operations"	Alternative units in which initiative is reported (if not line miles); still required to report line miles	Comments	2020	2020	2020	2020	2021	2021	2021	2021	2022	2022	2022	2022
Other	Stakeholder Cooperation & Community Engagement	7.3.10.3	Cooperation with suppression agencies	DEP-5			2020	NA	NA	1,962	3,306	This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	WMPMA	Exceeding compliance with regulations	PRC 4292; PRC 4293	NA	# of aerial suppression resources			$ 2,158		1		$ 18,000		5		$ 18,000		5
Other	Stakeholder Cooperation & Community Engagement	7.3.10.4	Forest service and fuel reduction cooperation and joint roadmap	NA												General operations														
Other		7.1.D	Alternative Technologies	NA			2018					This activity was not included in SCE's 2018 GRC, but is included in its pending 2021 GRC.	GSRPBA; WMPMA	Exceeding compliance with regulations		NA		SCE has included costs related to alternative technology projects described in Section 7.1.D.	$ 1,855	$ 159	14,000		$ 8,357		14,000		$ 1,546		14,000	

Footnotes: [1] "N/A" indicates that there is no identified scope for the associated mitigation and zone/tier

9.8 SCE-01: REGRESSION OF REPORTED RISK-SPEND EFFICIENCY (RSE) ESTIMATES FOR MITIGATION INITIATIVES COMPARED WITH 2020 WMP SUBMISSION[134]

WSD's Critical Issue Explanation: "SCE provides nine fewer RSE estimates for mitigation initiatives compared to its 2020 WMP submission. Furthermore, SCE provided only one RSE estimate for mitigation initiatives located in non-High Fire Threat District (HFTD) and Zone 1 territory." [135]

1. SCE SHALL IDENTIFY THE INITIATIVES THAT HAD RSE ESTIMATES IN ITS 2020 WMP BUT NOT IN ITS 2021 WMP UPDATE AND PROVIDE THE MISSING RSE ESTIMATES FOR THOSE INITIATIVES IN ITS 2021 WMP UPDATE

A. Background

Revision Notice Critical Issue SCE-01 states that, "[d]espite the insufficient findings of the Quarterly Report, SCE projects growth in the RSE related capabilities of the 2021 Maturity Model Survey, yet provides nine fewer RSE estimates for mitigation initiatives in its 2021 WMP Update. RSE estimates provide a pathway to assess the relative risk reduction benefit provided by mitigation initiatives and inform the initiative selection process."[136]

SCE has made significant progress in its risk analysis and risk-informed decision-making capabilities, as outlined in Chapter 4.3 in its 2021 WMP update, such as including PSPS risks along with ignition risks, adding asset-specific probability of ignition models, using customer-centric Multi-attribute Value Framework (MAVF) for consequence of ignition estimation and calculating RSEs at the asset level and then by tier, which all represent significant enhancements that are reflected in SCE's 2021 Maturity Model Survey response. RSEs are but one component of risk analysis and risk-informed decision-making and the enhancements SCE has made in RSE estimation cannot be measured simply by the count of RSEs. SCE agrees that RSEs are an important tool in the mitigation initiative selection process and this concept is further illustrated in our response to Revision Notice SCE-02. However, rather than simply comparing the overall change in the number of wildfire mitigation activities with RSEs from 2020 to 2021, it is important to understand why the total RSE counts are different.[137] SCE reduced the number of RSEs in 2021 when it combined certain activities into single RSEs to more accurately reflect the risk reduction benefits for these activities. Another reduction in the count of RSEs occurred because SCE did not score PSPS-related activities as a wildfire risk reduction mitigation activity pursuant to WSD's guidance.[138] These relative

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[134] Revision Notice, p. 2.
[135] Revision Notice, p. 2.
[136] Revision statement, p. 5.
[137] SCE has tallied 28 wildfire mitigation activities with RSEs in its 2020 WMP for fiscal year 2020 and 19 wildfire mitigation activities with RSEs in its 2021 WMP for fiscal year 2021, whereas WSD's Revision Notice asserted 27 and 18, respectively.
[138] WSD-002 at p.38 that states, "Therefore, electrical corporations shall not use RSE as a means of justifying or evaluating the efficacy of PSPS as a mitigation measure." Also see WSD-011, Attachment 1 at p. 8 and Attachment 2.1 at p. 9.

reductions in RSE counts are partly offset by the introduction of *seven new* RSEs in the 2021 WMP Update. Table 1 below provides a summary of the activities and associated number of RSEs.

Table SCE 9.8-1
Wildfire Mitigation Activity Differences in RSE Counts 2020 WMP vs. 2021 WMP

Category	Notes	RSE Count
A. New RSEs Added in 2021 WMP Update		**7**
• Aerial Suppression (DEP-5) • Critical Care Battery Backup (PSPS-2) • Distribution Fault Anticipation (SA-9) • C-Hooks (SH-13) • Long Span Initiative (LSI) (SH-14) • Vertical Switches (SH-15) • Line Clearing (N/A)	These represent additional RSEs provided in the 2021 WMP update	
B. RSEs not Calculated in 2021 WMP Update		**18**
a. Enabling/PSPS Activities in 2020	PSPS activities were originally unscored pursuant to WSD-002 guidance	12
• Community Outreach (Previously PSPS-7)	• A portion of PSPS-7 (CCVs) has been combined into PSPS-2	
• Wildfire Infrastructure Protection Team Additional Staffing (OP-2)	• Activity Completed	
• De-energization notifications (PSPS 1.1, 1.2, 1.3, 1.4)	• Activity PSPS-1.4 was completed; See Chapter 8	
• Customer Resiliency Equipment Incentives (PSPS-3)		
• MICOP Partnership (PSPS-5)	• See Section 7.3.10	
• Weather Stations (SA-1) • High Performing Computer Cluster (HPCC) Weather Modeling (SA-3) • Fuel Sampling Program (SA-5) • Surface and Canopy Fuels Mapping (SA-6) • Remote Sensing/Satellite Fuel Moisture (SA-7) • Fire Science Enhancements (SA-8) • PSPS-Driven Grid Hardening Work (SH-7)		
b. Combined Activities in 2021	These activities were combined to better reflect risk reduction benefits	5
• Aerial Inspections - Distribution (IN-6.1)	• Combined into IN-1.1	
• Aerial Inspections - Transmission (IN-6.2)	• Combined into IN-1.2	
• Distribution Remediations (SH-12.1)	• Combined into IN-1.1	
• Transmission Remediations (SH-12.2)	• Combined into IN-1.2	
• WCCP Fire Resistant Poles (SH-3)	• Combined into SH-1	
c. Undefined Scope in 2021		1
• Remote Controlled Automatic Reclosers Settings Update (SH-5)		
C. RSEs Calculated for SCE-01 Response		**5**

Category	Notes	RSE Count
• Aerial Inspections/Remediations – Distribution (IN-1.1) • Aerial Inspections/Remediations – Transmission (IN-1.2) • WCCP Fire Resistant Poles (SH-1) • Weather Stations (SA-1) • Remote Controlled Automatic Reclosers Settings Update (SH-5)		
Net RSE Difference (A - B + C)		(6)

In terms of *unique* RSEs calculated, SCE has actually increased its RSE count from 15 to 19 from 2020 to 2021. This is mainly due to the fact that in 2020, SCE had provided a combined RSE score for all 13 PSPS-related activities (of these, only one received an RSE in the 2021 Update submission). Thus, when PSPS-related activities are counted as a single unique RSE, SCE's unique RSE count from 2020 to 2021 increased by four. See Table 2 below for further illustration.

Table SCE 9.8-2
Comparison of Total and Unique RSEs in 2020 WMP vs. 2021 WMP

WMP Mitigation Activity	2020 WMP Identifier	2020 RSE Value	2021 WMP Identifier	2021 RSE Value	RSE Update Rationale
Aerial Inspections - Distribution	(IN-6.1)	10.55	N/A	N/A	Combined Activity in 2021 (into IN-1.1)
Aerial Inspections - Transmission	(IN-6.2)	0.83	N/A	N/A	Combined Activity in 2021 (into IN-1.2)
Distribution Remediations	(SH-12.1)	13.83	N/A	N/A	Combined Activity in 2021 (into IN-1.1)
Transmission Remediations	(SH-12.2)	0.54	N/A	N/A	Combined Activity in 2021 (into IN-1.2)
WCCP Fire Resistant Poles	(SH-3)	3.90	N/A	N/A	Combined Activity in 2021 (into SH-1)
Customer Resiliency Equipment Incentives	(PSPS-3)	57.51	N/A	N/A	Enabling / PSPS
MICOP Partnership	(PSPS-5)	57.51	N/A	N/A	Enabling / PSPS
Weather Stations	(SA-1)	57.51	(SA-1)	N/A	Enabling / PSPS
High-Performing Computer Cluster (HPCC) Weather Modeling System	(SA-3)	57.51	(SA-3)	N/A	Enabling / PSPS
Fuel Sampling Program	(SA-5)	57.51	(SA-5)	N/A	Enabling / PSPS
Surface & Canopy Fuels Mapping	(SA-6)	57.51	N/A	N/A	Enabling / PSPS
Remote Sensing / Satellite Fuel Moisture	(SA-7)	57.51	(SA-7)	N/A	Enabling / PSPS
Fire Science Enhancements	(SA-8)	57.51	(SA-8)	N/A	Enabling / PSPS
PSPS Driven Grid Hardening Work	(SH-7)	57.51	(SH-7)	N/A	Enabling / PSPS

WMP Mitigation Activity	2020 WMP Identifier	2020 RSE Value	2021 WMP Identifier	2021 RSE Value	RSE Update Rationale
Wildfire Infrastructure Protection Team Additional Staffing	(OP-2)	57.51	N/A	N/A	Enabling / PSPS Activity was completed
De-energization notifications	(PSPS-1.1, 1.2, 1.3, 1.4)	57.51	N/A	N/A	Enabling / PSPS Activity PSPS-1.4 was completed
Community Outreach	(PSPS-7)	57.51	N/A	N/A	Enabling / PSPS CCV portion now a Combined Activity in 2021 (into PSPS-2 CRCs/CCVs)
Community Resource Centers & Community Crew Vehicles	(PSPS-2)	57.51	(PSPS-2)	188	Enabling / PSPS New Scoring Methodology in 2021 WMP Update
Aerial Suppression	N/A	N/A	(DEP-5)	3,306	New Activity
Critical Care Battery Backup	(PSPS-4)	N/A	(PSPS-2)	22	New RSE Combined Activity in 2021 (into PSPS-2)
Distribution Fault Anticipation (DFA)	N/A	N/A	(SA-9)	2,756	New Activity
C-Hooks	N/A	N/A	(SH-13)	82	New Activity
Long Span Initiative	N/A	N/A	(SH-14)	1,957	New Activity
Vertical Switches	N/A	N/A	(SH-15)	13	New Activity
Line Clearing	N/A	N/A	N/A	3,592	New RSE
Remote Controlled Automatic Reclosers Settings Update	(SH-5)	1.93	(SH-5)	N/A	Scope was undefined at 2/5/21
Distribution High Fire Risk-Informed Inspections	(IN-1.1)	13.83	(IN-1.1)	2,777	
Transmission Risk-Informed Inspections in HFRA	(IN-1.2)	0.54	(IN-1.2)	764	
Infrared Inspection of Energized Overhead Distribution Facilities and Equipment	(IN-3)	4.80	(IN-3)	1,879	
Infrared Inspection, Corona Scanning, and High Definition Imagery of Energized Overhead Transmission Facilities and Equipment	(IN-4)	0.00	(IN-4)	174	
Covered Conductor	(SH-1)	25.96	(SH-1)	4,192	
Undergrounding	(SH-2)	N/A	(SH-2)	347	No RSE for 2020 (no scope identified) However, 2020 WMP did include RSE for 2021-2022
Branch Line Protection Strategy	(SH-4)	8.12	(SH-4)	3,304	
Circuit Breaker Relay Hardware for Fast Curve	(SH-6)	11.36	(SH-6)	3,308	

WMP Mitigation Activity	2020 WMP Identifier	2020 RSE Value	2021 WMP Identifier	2021 RSE Value	RSE Update Rationale
Hazard Tree	(VM-1)	25.02	(VM-1)	1,602	
Expanded Pole Brushing	(VM-2)	60.26	(VM-2)	1,881	
DRI Quarterly Inspections and Tree Removals	(VM-4)	31.72	(VM-4)	2,413	
Total Count of Wildfire Activities with RSE Scores		**28**		**19**	
Total Count of Unique RSE Scores		**15**		**19**	

Finally, SCE has matured its risk methodologies from 2020 to 2021 as discussed extensively in Chapter 4 of its 2021 WMP Update, highlighted in Table SCE-4.1 and an excerpt of which is included below for convenience.

SCE's 2021 WMP Update – Excerpt of Table SCE-4.1

Change	Description of Change in 2021 WMP
Transition to Technosylva Consequence model	SCE elected to transition from the Reax model to Technosylva's Consequence model. Technosylva is an industry recognized model that: • Uses more recent weather, fuels, and census data • Has more advanced fire propagation modeling techniques such as urban encroachment • Directly maps consequence scores to individual structures/assets without needing interpolation from raster to structure/asset • Is viewable within the company's proprietary geospatial viewer which also integrates with SCE's POI values
Include PSPS risk in risk analysis	For 2021, the Wildfire Risk Reduction Model (WRRM) includes a component that calculates the risk of PSPS de-energization based on the probability of de-energization and consequence of those de-energizations (safety, reliability and financial) at the circuit level. This integration of PSPS risk with wildfire risk allows for a more complete understanding of total risk that balances the need for targeting of wildfire risk with impacts to customers from PSPS events. This also allows SCE to better understand the impact that certain mitigations have on targeting individual risks.
Integration of enterprise level and program level risk analysis	For 2021, the WRRM includes a method to translate the expected values produced by the model into unitless Multi -Attribute Risk Scoring (MARS) values at the asset and location level. This enables SCE to both calculate risk and risk reduction at the asset and location level as well as aggregated as needed for circuit, or system level analysis. This will drive consistent risk-informed decision-making at the enterprise and program levels.

These enhancements have allowed for more granular (e.g. circuit level analysis with Technosylva consequences) and data-driven risk analysis and modeling capabilities as compared to previous model iterations that are inclusive of both wildfire and PSPS risk.

More information on SCE's RSEs is provided below. SCE provided additional RSE scores for certain activities that had been combined in its submittal on February 5 and for some PSPS-related activities that provide other quantifiable risk-reduction benefits that do not include wildfire risk reduction related to PSPS-events. Though SCE has performed this analysis in response to this revision notice, SCE believes that its initial RSE analysis is more appropriate since some activities are inextricably linked to provide full benefit and a combined score is more meaningful. Other activities are enabling activities that do not mitigate wildfire or PSPS risks by themselves but rather, are necessary to realize the benefits of other activities (for example, weather stations enable sectionalization).

B. RSEs not Calculated in SCE's 2021 WMP Update

In its 2021 WMP Update, SCE added several new activities, and consolidated related activities (e.g., inspections and remediations of inspection findings, various customer care programs to reduce the impact of PSPS). Additionally, SCE successfully concluded several activities that are not included going forward.[139]

i. Enabling/PSPS Activities in 2021

In its 2020 WMP, SCE aggregated the costs associated with 12 activities[140] that enable PSPS decision-making, but do not reduce wildfire ignition risk alone. In 2020, SCE used the aggregated costs from these activities and associated wildfire mitigation benefits to calculate a single RSE for PSPS-enabling activities. These activities reduced the probability of ignition by enabling PSPS to be used as a wildfire risk mitigation. For example, an HPCC Weather Modeling System serves as an assessment tool to inform decision-makers on when to implement PSPS. While the tool does not directly reduce the probability of a wildfire, it supports the analysis and decision-making process that informs whether or not to call a PSPS event. SCE thus included in 2020 the same RSE value for all 12 PSPS-enabling activities because their costs were aggregated into a single RSE equation, and the benefit assumed was the ability for PSPS events to reduce wildfire risk.

After SCE submitted its 2020 WMP, the WSD clarified in its directive to treat PSPS "as a risk with associated consequences" and to not use RSEs to evaluate PSPS as a mitigation measure.[141] Accordingly, SCE in its 2021 WMP Update did not calculate a RSE for PSPS as a mitigation to wildfire risk, but instead treated PSPS as a distinct risk. Because a PSPS RSE was not calculated, there were no RSE values available to confer upon the associated enabling activities. However, as part of this response, SCE has calculated certain RSEs for PSPS activities that have other quantifiable risk reduction benefits.

ii. Combined Activities in 2021

In SCE's 2021 WMP Update, SCE combined certain initiatives together to more accurately reflect the activities and associated risk reduction that were previously scored separately in its 2020 WMP. For example, as discussed in Section 7.3.3.3.1 of SCE's 2021 WMP Update, poles are being replaced with fire

[139] Please refer to Appendix 9.3 of SCE's 2021 WMP Update for a full list of the changes in WMP activities from the 2020 WMP to the 2021 WMP Update.
[140] See "Category B" in Table 1.
[141] WSD-002 at p.38 that states, "Therefore, electrical corporations shall not use RSE as a means of justifying or evaluating the efficacy of PSPS as a mitigation measure." Also see WSD-011, Attachment 1 at p. 8 and Attachment 2.1 at p. 9.

resistant poles (FRP) or are being wrapped in fire resistant wrapping, as part of SCE's Wildfire Covered Conductor Program (WCCP). Because installing FRP is part of SCE's WCCP, a combined RSE was calculated for both FRP and WCCP rather than for each activity separately. However, SCE has disaggregated this initiative identified above for purposes of this response and created new standalone RSEs for both the Wildfire Covered Conductor Program (without FRP), and FRP alone.

In addition, SCE included two separate activities for its Distribution enhanced inspections in 2020 which are: ground-based High Fire Risk Informed (HFRI) inspections (previously IN-1.1 in SCE's 2020 WMP) and aerial HFRI inspections (IN-6.1 in SCE's 2020 WMP). Given these activities generally have the same drivers and the findings from these inspection programs are consolidated for remediation work, SCE combined these into one activity (IN-1.1) in its 2021 WMP Update. Moreover, as inspections themselves do not reduce wildfire risk unless followed by timely remediations, SCE included Distribution Remediations (SH-12.1 in SCE's 2020 WMP) within this activity.

Similarly, SCE included two separate activities for its Transmission enhanced inspections: Transmission Risk Informed Inspections (previously IN-1.2 in SCE's 2020 WMP) and Transmission Aerial Inspections (previously IN-6.2 in SCE's 2020 WMP). These activities also generally have the same drivers and the findings from these inspection programs are consolidated for remediation work. Therefore, SCE combined these activities into one activity (IN-1.2) in its 2021 WMP update. These inspections also do not reduce wildfire risk unless followed by appropriate and timely remediations, so SCE included Transmission Remediations (previously SH-12.2 in SCE's 2020 WMP) within this activity in 2021.

For the purposes of this response, SCE has disaggregated these initiatives identified above and created the following new RSEs:

1) Distribution Ground Inspections & Associated Remediations
2) Distribution Aerial Inspections & Associated Remediations
3) Transmission Ground Inspections & Associated Remediations
4) Transmission Aerial Inspections & Associated Remediations

These RSEs are in addition to other inspection initiatives that were risk scored as part of SCE's 2021 WMP Update, such as Distribution Infrared and Transmission Infrared inspection initiatives.

iii. Activity with Undefined Scope at the Time of the 2021 WMP Update

In 2020, SCE calculated an RSE for Remote Controlled Reclosers Settings Update (SH-5) and completed the scoped activity for that year. At the time of SCE's 2021 WMP Update submission, SCE had not yet developed scope for this activity for 2021, thus did not include an RSE in its WMP Update. Since then, SCE has accelerated its plans to deploy these devices in 2021 as a result of its PSPS Action Plan via analysis performed as part of its Circuit Evaluation for PSPS Driven Grid Hardening Work (SH-7). SCE also has determined that these devices can limit the consequence of PSPS events for affected customers and is providing an RSE for this activity as part of this response.

C. RSEs Calculated for Revision Notice SCE-01 Response

In response to the request in this Revision Notice, SCE has calculated additional RSEs for the following activities:

1) Aerial and Ground Inspections/Remediations – Distribution (IN-1.1)

- As discussed above, these are being disaggregated from Distribution Inspections/Remediations

2) Aerial and Ground Inspections/Remediations – Transmission (IN-1.2)
   - As discussed above, this was disaggregated from Transmission Inspections/Remediations
3) WCCP Fire Resistant Poles and Covered Conductor (SH-1)
   - As discussed above, this was disaggregated from the Wildfire Covered Conductor Program (WCCP)
4) Weather Stations (SA-1)
   - Weather stations do not directly mitigate PSPS impacts but can help to enable circuit sectionalization during PSPS events, which can reduce the consequence of PSPS by limiting the number of customers impacted. Therefore, SCE has calculated a combined RSE score for weather stations in conjunction with Remote Controlled Automatic Reclosers Settings Update (SH-5).
5) Remote Controlled Automatic Reclosers Settings Update (SH-5)
   - As discussed above, SCE has identified scope of work associated with SH-5 post WMP submittal, and therefore estimated an RSE in combination with Weather Stations.

Table SCE 9.8-3
RSEs Calculated for Revision Notice SCE-01

<table>
<tr><th>Mitigation</th><th>2021 WMP Update RSE</th><th>New/Revised RSE (Tier 3)</th><th>Commentary</th></tr>
<tr><td>Ground Inspections/
Remediations – Distribution</td><td rowspan="2">2,777</td><td>3,225</td><td>Previously combined with Distribution Aerial Inspections/Remediations.
The RSE value is high relative to other mitigations.</td></tr>
<tr><td>Aerial Inspections/
Remediations – Distribution</td><td>953</td><td>Previously combined with Distribution Ground Inspections/Remediations.
The RSE value is medium relative to other mitigations.</td></tr>
<tr><td>Ground Inspections/
Remediations – Transmission</td><td rowspan="2">764</td><td>1,095</td><td>Previously combined with Transmission Aerial Inspections/Remediations.
The RSE value is medium relative to other mitigations.</td></tr>
<tr><td>Aerial Inspections/
Remediations – Transmission</td><td>695</td><td>Previously combined with Transmission Ground Inspections/Remediations.
The RSE value is medium relative to other mitigations.</td></tr>
</table>

Mitigation	2021 WMP Update RSE	New/Revised RSE (Tier 3)	Commentary
Fire Resistant Poles	4,192	2,364	Previously combined with Covered Conductor. The RSE value is medium relative to other mitigations.
Covered Conductor		4,514	Previously combined with FR Poles (still includes tree attachment costs). The RSE value is very high relative to other mitigations.
Weather Stations	N/A	598	New methodology: When combined with sectionalization devices, weather stations help to reduce the consequence of a PSPS event. This has been combined with Sectionalizing Devices for RSE calculations. The RSE value is medium relative to other mitigations.
Sectionalizing Devices	N/A	598	Scope was not previously identified prior to the submittal of the 2021 WMP Update but has now been defined in the PSPS Action Plan. This has been combined with Weather Stations for RSE calculations. The RSE value is medium relative to other mitigations.
C-Hooks	82	45	Revision to RSE previously provided, based on updated scope. The RSE value is low relative to other mitigations.

2. SCE SHALL PROVIDE THE RSE ESTIMATES FOR MITIGATION INITIATIVES LOCATED IN NON-HFTD AND ZONE 1 TERRITORY WHERE THEY HAVE CORRESPONDING RSE ESTIMATES IN TIER 2 AND TIER 3 HFTD AREAS. IF SUCH RSE ESTIMATES CANNOT BE PROVIDED, SCE SHALL RESPOND WITH A THOROUGH EXPLANATION FOR THE REASONS ASSOCIATED WITH THIS.

The 39 wildfire mitigation activities in SCE's 2021 WMP Update are primarily deployed in CPUC HFTD Tier 2 and Tier 3. Accordingly, SCE's 2021 WMP Update included very few RSEs outside of these two tiers.[142] Nonetheless, in order to help ensure a complete response to this Revision Notice, SCE conducted a thorough review of all the RSE-scored mitigations to confirm their intended deployment area. As a result of this review, SCE has identified that only a few mitigations may extend outside of Tier 2 and or Tier 3 on an exception basis, as follows:

- Fringe exceptions for Branch Line Protection Strategy (SH-4) and Circuit Breaker Relay Hardware for Fast Curve (SH-6)
    - Detailed scope review for Branch Line Protection Strategy (SH-4) has identified where due to recent changes to the HFRA classification, two fuse installations were outside of HFTD boundaries. These recent high fire boundary changes were a result of updates to the CPUC HFTD and adoption and changes to previous SCE HFRA classifications.[143] These two fuse replacements will be de-scoped for the 2021 fuse replacement efforts for SH-4 and Table 12 has been updated to reflect 'N/A' for non-HFTD and Zone 1. SCE target installation of 421 fuses in 2021 remain unchanged for the SH-4 activity.
    - Detailed scope review for Circuit Breaker Relay Hardware for Fast Curve (SH-6) has identified 9 relays in 2021 and 11 relays in 2022 located in substations which are outside of HFTD Tier 2 or Tier 3. However, the risk reduction benefit associated with these relays is on the circuits which originate from those substations and traverse HFTD Tier 2 or Tier 3. As a point of reference, SCE's 2021 WMP Update plan includes up to 86 relays in 2021 and up to 113 relays in 2022.

- Operational considerations for Covered Conductor (SH-1)
    - Covered conductor is scoped solely for Tier 2 and Tier 3, but design and installation considerations (e.g. extending the construction to the next structure with appropriate guying, or to a natural dead-end structure that the covered conductor can transition to bare wire, or to a structure with an isolatable sectionalizing device that can provide PSPS mitigation benefits) may very minimally extend installations into non-HFTD.

- Circumstantial or external exceptions may include Aerial Suppression (DEP-5) and Community Resource Centers (CRCs) / Community Crew Vehicles (CCVs) (part of PSPS-2)
    - Aerial Suppression efforts, which are conducted by external firefighting agencies, are expected to benefit HFTD Tier 2 or Tier 3 as needed, but the external agencies could deploy these resources if needed into SCE's non-HFTD.
    - CRCs/CCVs are targeted to HFTD Tier 2 or Tier 3 areas, though for logistical, customer convenience, and locational availability reasons, it is possible that CRC facility and/or CCV locations might be implemented in bordering non-HFTD areas. The intended

[142] Similarly, SDG&E's RSEs for non-HFTD and Zone 1 mostly contain blank entries, although SDG&E did not receive a similar revision notice

[143] *See* Decision (D.) 20-12-030 Modifying the High Fire-Threat District Boundaries in Southern California Edison Company's Service, issued December 21, 2020.

benefits are anticipated to almost entirely support impacts within HFTD Tier 2 and Tier 3 but are dependent on specific characteristics of PSPS events.

It should also be noted that the vast majority of SCE's Zone 1 is encompassed within either Tier 2 or Tier 3 and identified and treated as such. The portion of SCE's Zone 1 that falls outside of Tier 2 or Tier 3 is approximately 2.1 line miles, which is equal to 0.015% of the 14,000 line miles in CPUC's HFTD Tier 2 and Tier 3.

As evidenced by the above, the scope of the deployment of SCE's 39 wildfire mitigation activities in non-HFTD and Zone 1 is negligible compared with the total deployment, which is concentrated in HFTD Tier 2 and 3. Given the de minimis, largely incidental, and exceptions-based scope outside of HFTD Tier 2 and 3, SCE did not calculate RSE estimates for non-HFTD or Zone 1.

Note that SCE had calculated a handful of non-HFTD RSEs for the following wildfire mitigation activities as provided in Table 12. Two of these mitigations (DFA and CCBB) had known scope that could be modeled based on the entire circuit (traversing Tiers 2 & 3 and non-HFTD) at the time of the 2021 WMP Update. SCE also provides clarifications on the RSE values for a third mitigation, as described below:

1) Distribution Fault Anticipation (DFA) (SA-9) devices are installed in substations and are used to monitor entire circuits which traverse HFTD Tier 2 and Tier 3. At the time of SCE's 2021 WMP submission, the specific substations in scope for 2021 were already identified. Accordingly, SCE was able to calculate an RSE for non-HFTD as some of the circuits traversed non-HFTD in addition to HFTD Tier 2 and Tier 3. Nonetheless, as the RSEs reflect, the primary benefits are in Tier 2 and Tier 3.

2) Critical Care Battery Backup (CCBB) program (part of PSPS-2) is for Medical Baseline (MBL) customers who are enrolled in the CARE or FERA program and reside in HFTDs. At the time of SCE's 2021 WMP submission, the circuits on which these customers reside had been identified. Accordingly, SCE was able to calculate an RSE for non-HFTD as some of those circuits traversed non-HFTD in addition to HFTD Tier 2 and Tier 3. Additionally, this activity is combined with CRCs/CCVs as part of PSPS-2, and Table 12 only reflected the RSE scores for CRCs/CCVs, while the comment field only mentioned the CCBB program's RSE in HFTD Tier 2 and 3. This has now been revised in Table 12 to clearly show the RSEs for CCBB, including its non-HFTD score.

3) Lastly, C-Hooks Insulator Attachment Hardware Replacements (SH-13) should not have included an RSE value for non-HFTD and has been updated to reflect "N/A" in Table 12. Its previous value of 0 was in fact 0.006.

As further evidenced by this small subset of mitigation activities that have very limited deployment outside of CPUC HFTD Tier 2 and Tier 3, the calculation of RSEs for non-HFTD and Zone 1 does not offer much in the way of practical application for risk-informed decision-making where SCE's 39 wildfire mitigation activities are concerned.

Please refer to Table 12 for updated RSE values. SCE has input 'N/A' to clarify where no scope has been identified in non-HFTD or Zone 1.

9.9 SCE-02: INADEQUATE ALTERNATIVES ANALYSIS[144]

WSD's Critical Issue Explanation: "SCE lacks detailed alternative analysis for mitigation initiative selection by not calculating the RSE estimates for alternative mitigation initiatives."[145]

1. SCE SHALL ELABORATE ON ITS DECISION-MAKING PROCESS TO INCLUDE A THOROUGH OVERVIEW OF THE INITIATIVE SELECTION PROCEDURE. THE OVERVIEW MUST SHOW THE RANKINGS OF THE DECISION-MAKING FACTORS (I.E., PLANNING AND EXECUTION LEAD TIMES, RESOURCE CONSTRAINTS, ETC.) AND PINPOINT WHERE QUANTIFIABLE RISK REDUCTIONS AND RSE ESTIMATES ARE CONSIDERED IN THE INITIATIVE SELECTION PROCESS. THE WSD RECOMMENDS A CASCADING, DYNAMIC "IF-THEN" STYLE FLOWCHART TO ACCOMPLISH THIS PRIORITIZATION REQUIREMENT."[146]

Flowchart Outlining SCE's General Risk-Informed Decision-Making Process Wildfire and PSPS Mitigations

Below, SCE provides a detailed flowchart of our risk-informed decision-making process as generally used to select and deploy SCE initiatives that address wildfire and PSPS risks. The flowchart illustrates SCE's general approach to risk-informed decision-making when assessing and selecting wildfire and PSPS mitigations and prioritizing deployment for selected activities. We also provide a detailed narrative explanation of various entries in, and aspects of, the flowchart. For ease of reading and reference, we provide a "zoom in" of the particular portion of the flowchart when we are explaining it in narrative form.

Broadly speaking, the process can be broken down into four major stages, as outlined in the flowchart: First, we evaluate or reassess, and then prioritize, wildfire and PSPS risks. Second, we identify the choice of mitigations to address the risk. In other words, we pinpoint the various mitigation alternatives. Third, we evaluate the mitigations and then select the appropriate one(s) from amongst the alternatives, using decision-making factors. Fourth, we prudently scope and deploy the chosen mitigation(s). We then continue to monitor deployments in light of relevant conditions or circumstances, and we strive to improve through lessons learned, metrics information, and feedback from our customers, regulators, and other stakeholders.

Application of this process for each wildfire mitigation activity may vary, because SCE is continually in the process of improving how risk-informed decision-making is utilized across the enterprise. Applicability may also vary depending on the unique characteristics of the mitigation activities. While specific processes and steps continue to evolve as we build out our asset management capabilities, the flowchart generally captures the key elements of the process. With each cycle, SCE's overall risk-informed decision-making process generally is maturing in the level of quantitative analysis performed, granularity of analysis, and consistent application across the enterprise.

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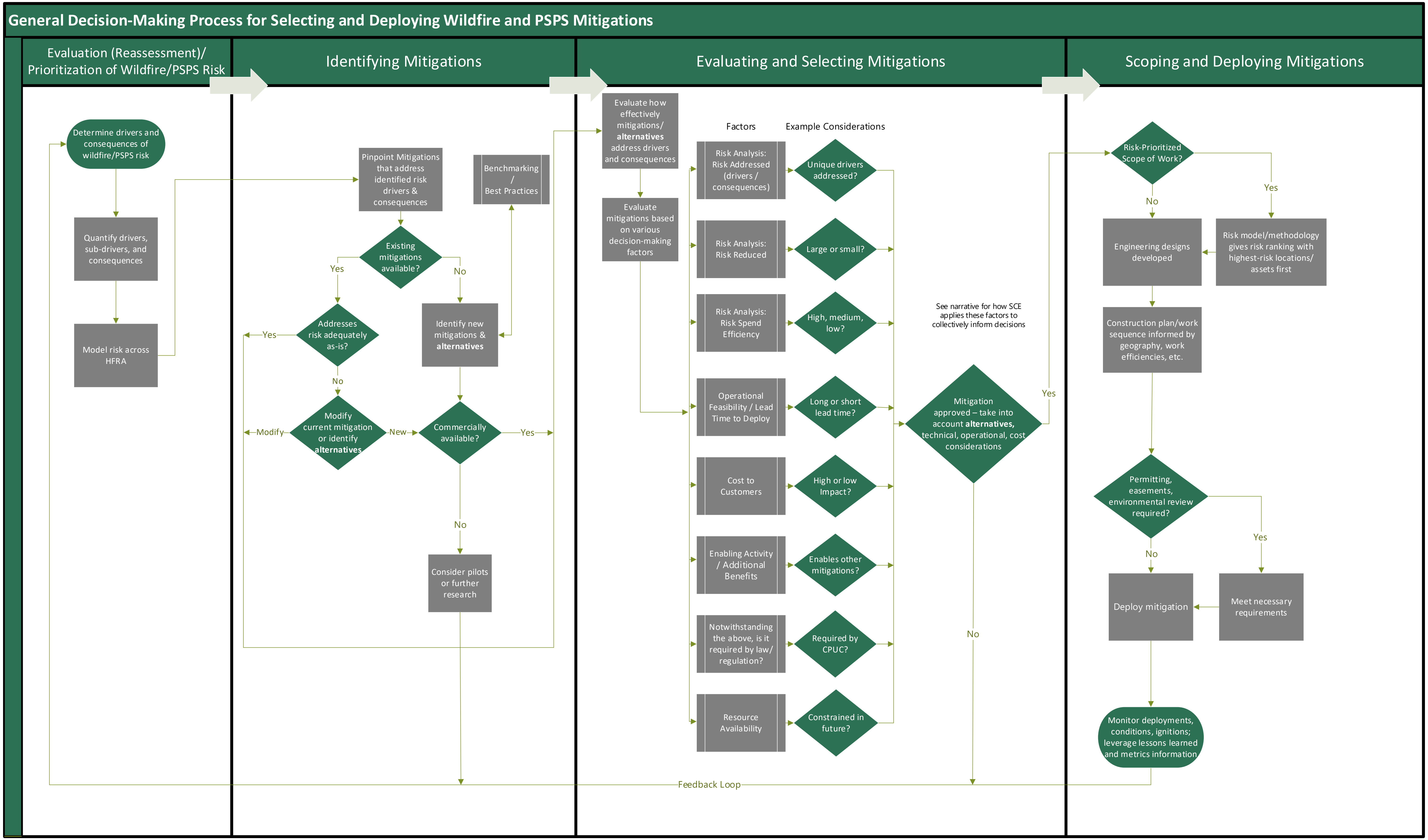
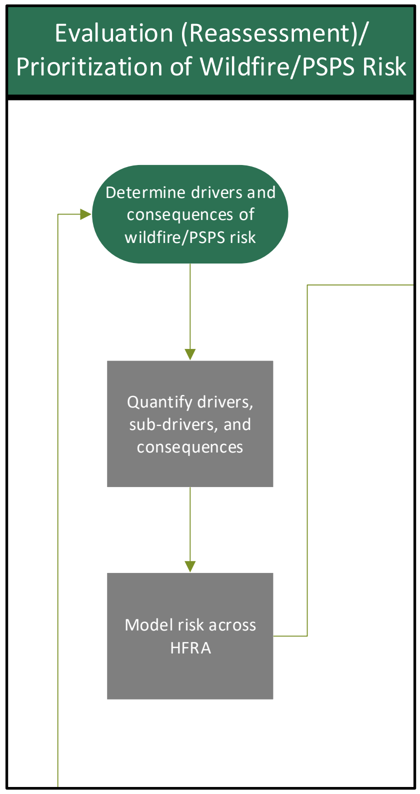
[144] Revision Notice, p. 2.
[145] Revision Notice, p. 2.
[146] Revision Notice, p. 2.


General Decision-Making Process for Selecting and Deploying Wildfire and PSPS Mitigations
Evaluation (Reassessment)/ Prioritization of Wildfire/PSPS Risk
Identifying Mitigations
Evaluating and Selecting Mitigations
Scoping and Deploying Mitigations
Determine drivers and consequences of wildfire/PSPS risk
Quantify drivers, sub-drivers, and consequences
Model risk across HFRA
Pinpoint Mitigations that address identified risk drivers & consequences
Benchmarking / Best Practices
Existing mitigations available?
Yes
No
Addresses risk adequately as-is?
Identify new mitigations & alternatives
Modify current mitigation or identify alternatives
Modify
New
Commercially available?
Consider pilots or further research
Evaluate how effectively mitigations/ alternatives address drivers and consequences
Evaluate mitigations based on various decision-making factors
Factors
Example Considerations
Risk Analysis: Risk Addressed (drivers / consequences)
Unique drivers addressed?
Risk Analysis: Risk Reduced
Large or small?
Risk Analysis: Risk Spend Efficiency
High, medium, low?
Operational Feasibility / Lead Time to Deploy
Long or short lead time?
Cost to Customers
High or low Impact?
Enabling Activity / Additional Benefits
Enables other mitigations?
Notwithstanding the above, is it required by law/ regulation?
Required by CPUC?
Resource Availability
Constrained in future?
See narrative for how SCE applies these factors to collectively inform decisions
Mitigation approved – take into account alternatives, technical, operational, cost considerations
Risk-Prioritized Scope of Work?
Engineering designs developed
Risk model/methodology gives risk ranking with highest-risk locations/ assets first
Construction plan/work sequence informed by geography, work efficiencies, etc.
Permitting, easements, environmental review required?
Deploy mitigation
Meet necessary requirements
Monitor deployments, conditions, ignitions; leverage lessons learned and metrics information
Feedback Loop

Below, SCE outlines in greater detail the specific steps and key considerations in the decision-making process. Then, in response to part (2) of Critical Issue SCE-02, SCE explains how this generalized decision-making process was applied to help select five wildfire initiatives.

1. Evaluation (or Reassessment) and Prioritization of Wildfire/PSPS Risks

Figure SCE 9.9-1



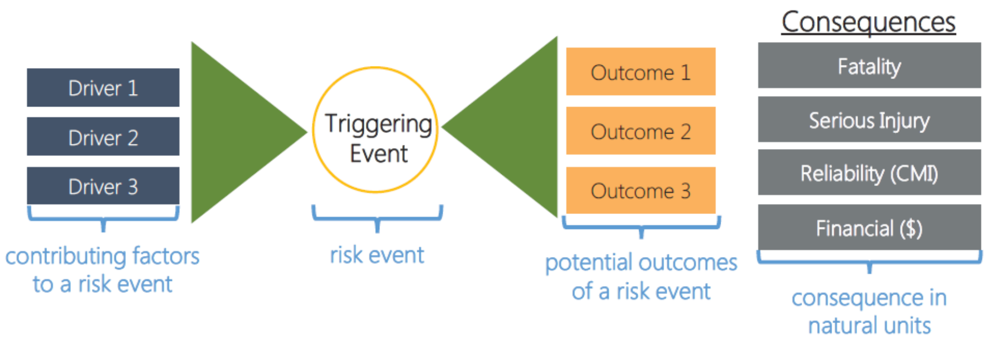
The selection of wildfire and PSPS risk mitigations starts with evaluating or reassessing the particular issue at hand, and the risks that underpin the issue. SCE has invested considerable resources to build its capabilities for identifying the drivers and consequences of wildfire and PSPS risk and examining how that risk is distributed across SCE's High Fire Risk Area (HFRA). The flowchart outlines, in basic terms, general steps embedded in SCE's process for identifying and evaluating wildfire risk:

- Determining drivers (and sub-drivers) and consequences of wildfire risk;
- Quantifying drivers, sub-drivers, consequences, and overall risk as appropriate; and
- Modeling this risk across SCE's HFRA.

Determine drivers (and sub-drivers) and consequences of wildfire risk

As we discussed in detail in Chapter 4 of SCE's 2021 WMP Update, SCE's Wildfire Risk Reduction Model (WRRM) framework leverages the risk bowtie approach to organize drivers, triggering events, and consequences. SCE applies the risk bowtie approach to enable us to consistently and systematically identify threats and characterize sources of risk. The risk bowtie is shown below.

Figure SCE 9.9-2
SCE Risk Bowtie



Quantify drivers, sub-drivers, consequences, and overall risk as appropriate

The outputs of WRRM are used to estimate risk reduction and calculate RSEs in order to help make decisions about wildfire/PSPS mitigation activities and to inform the prioritization of deploying mitigations.

The triggering event at the center of the wildfire bowtie is an ignition in SCE's HFRA. On the left-hand side of the bowtie, historical ignition and fault analysis determined that potential ignitions are primarily driven by equipment failure, contact from objects (such as vegetation or mylar balloons), and wire-to-wire contact (during periods of high winds). SCE leverages machine learning models to estimate the probability of ignition by driver for a given set of assets in HFRA.

The consequences of these ignition events are estimated on the right-hand side of the bowtie, using the Technosylva consequence model (starting in late 2020). The model estimates the potential spread of a fire over a given time, as well as the corresponding impact of a fire in natural units - structures, acres, and population.

The risk bowtie for PSPS risk evaluates the drivers and probabilities of PSPS activations. Here, SCE uses data points such as the historical back-cast of wind and weather conditions in conjunction with PSPS de-energization protocols to estimate the annual frequency and duration of de-energization events. The consequences of these PSPS events are estimated on the right-hand side of the bowtie, based on the potential safety, reliability, and financial impacts to customers.

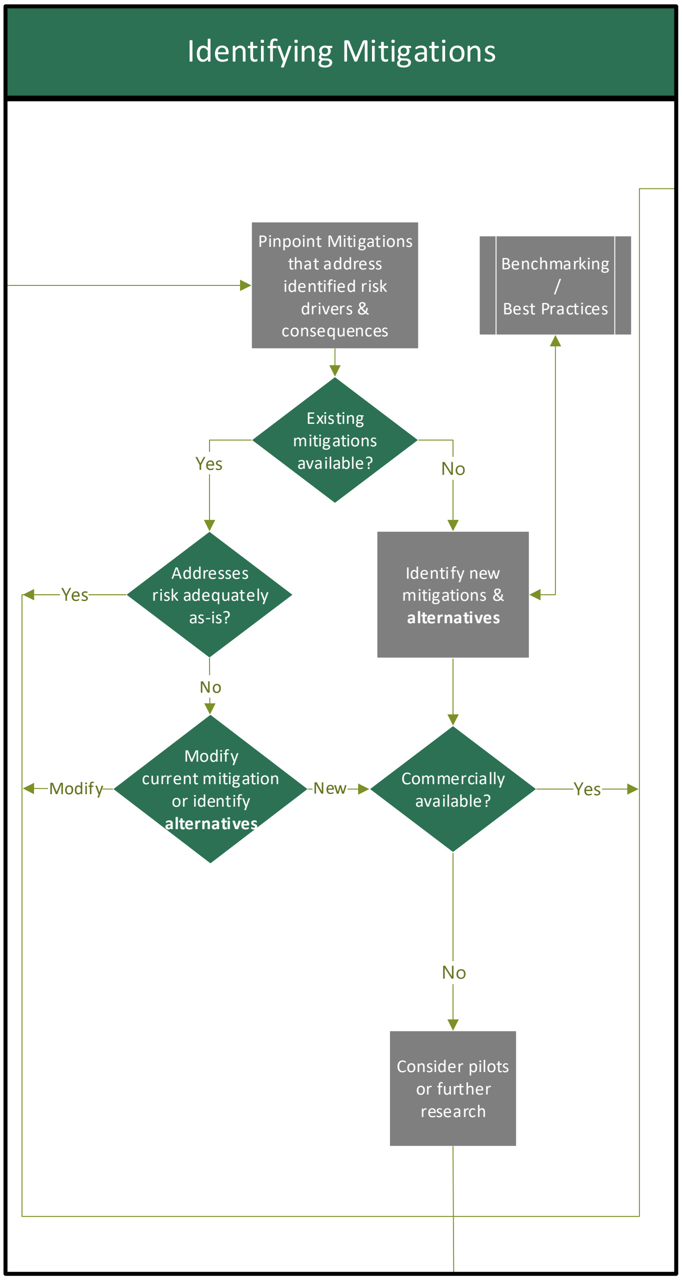
Model this risk across SCE's HFRA

Wildfire and PSPS consequences are then translated into MARS units to calculate RSEs for mitigation activities and compare the relative risk of wildfire ignitions/PSPS events to that of other risk events. The outputs of the various models are aggregated into a unified WRRM output. The output of individual models and/or the entirety of the model output can be used to inform risk-related decision-making.

Through SCE's risk modeling framework, we have developed an improved understanding of the drivers and consequences of wildfire/PSPS risks. In addition, this framework gives visibility to where wildfire/PSPS risk is highest when looking across SCE's HFRA. This information is foundational to identifying, evaluating, and prioritizing mitigation initiatives to address these risks.

2. Identifying Mitigations

Figure SCE 9.9-3



The second step in the process is to identify candidate initiatives to mitigate wildfire/PSPS risk. Here, we focus on potential options to reduce the risks that we evaluated or reassessed, and then prioritized, in the first step. These potential options come in the form of existing, modified, or new initiatives. Mitigation options reduce either the frequency, consequence, or both, of wildfire and/or PSPS risk, resulting in overall risk reduction.

The flowchart outlines certain key steps and decision branches in this process that center around identifying mitigation activities that can address risk drivers and consequences. The flowchart considers these potential options in four general categories, as described below:

- *Existing mitigations that already help to reduce risk*

In some cases, the work that SCE performs to maintain and upgrade its overhead systems in HFRA already provides certain risk reduction benefits. In such cases, these activities would be identified for continued implementation as prudent for purposes of reducing wildfire risk. One example is line clearance activities to reduce the probability of faults or ignitions from vegetation making contact with energized equipment.

- *Existing mitigations that, when modified, can further reduce risk*

In other cases, existing mitigation activities may support wildfire risk reduction, but if appropriately modified, could provide even greater risk reduction benefits. This modification can take several forms:

1. The scope of the activity could be modified. An example is expanding the scope of assets and asset conditions that are evaluated as part of an inspection program.
2. The scale of the activity could be increased to cover a wider area of SCE's HFRA.
3. The frequency of an activity could be modified. An example would be to increase how frequently critical or higher-risk assets or areas are inspected.
4. New technology could be incorporated to make the activity more effective or efficient at identifying and mitigating risk. As an example, incorporating Artificial Intelligence/Machine Learning models to help detect asset defects and identify hazards as part of the Aerial Inspection processes could result in decreased time for problem identification, with increased confidence in risk/issue detection.

- *New mitigations that are commercially ready to deploy to reduce risk*

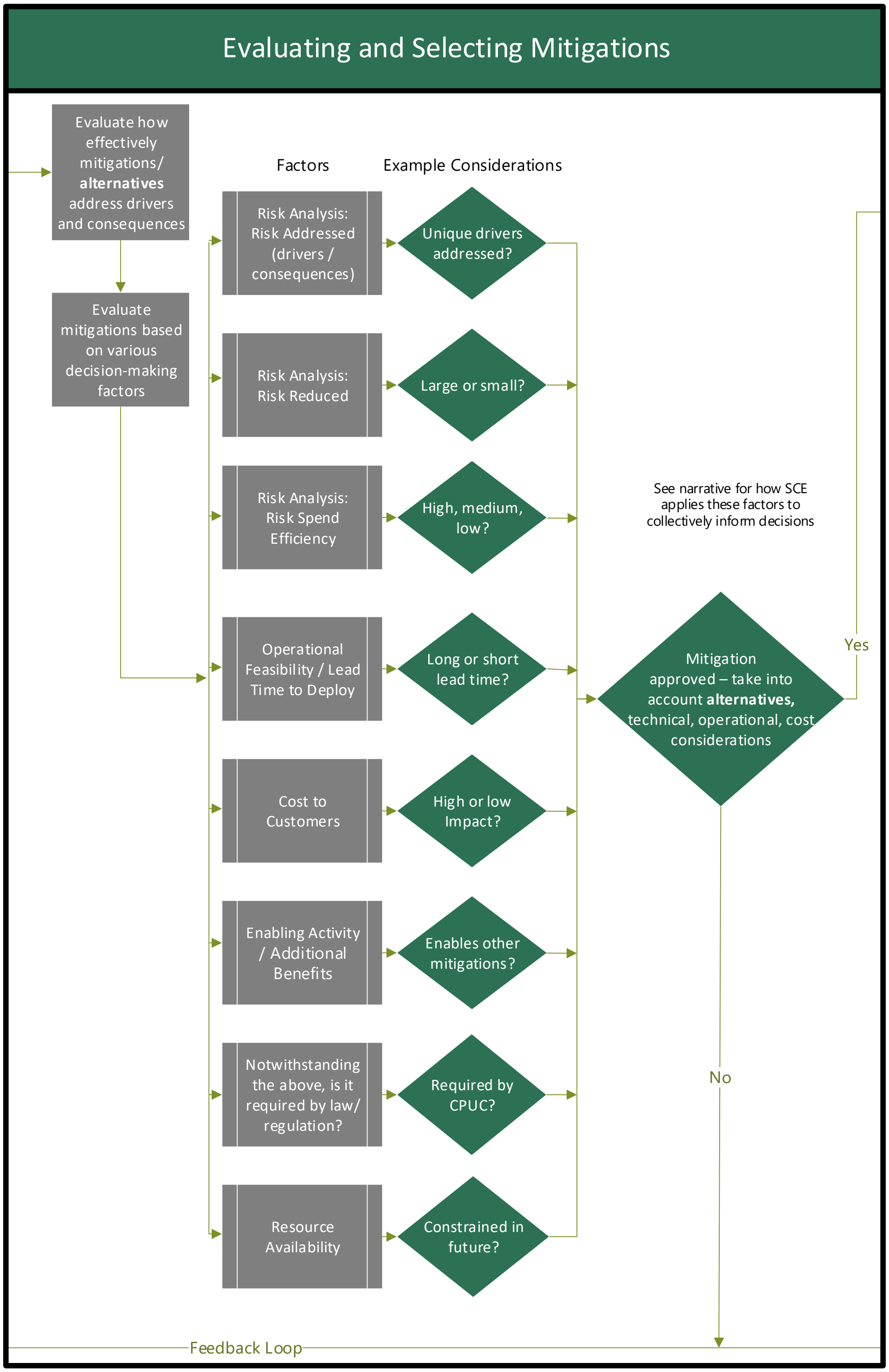
SCE also identifies new risk mitigation options. These new options can be identified through, among other actions, benchmarking with other utilities; studying and adopting emergent best practices; obtaining guidance from engineering and technical industry committees; studying emerging technology demonstrations; and assessing pilot studies that produce successful or otherwise useful results. SCE's portfolio of wildfire mitigation initiatives has benefitted greatly from identifying and adding new initiatives that were not previously deployed in SCE's service territory. Our covered conductor program is an example of one such mitigation.

- *New mitigations that should be piloted and further evaluated for potential future deployment*

In some cases, concepts emerge that have promising wildfire or PSPS risk reduction benefits but are not yet fully studied or evaluated through a reliable pilot or demonstration. Since these options are not commercially ready to be deployed on SCE's system, SCE will typically engage in further consideration of these options through a pilot project, demonstration effort, or smaller-scale field testing or pilot deployment. For example, SCE's Rapid Earth Fault Current Limiting (REFCL) program is piloting a variety of ways to reduce the energy released from ground faults to prevent ignition. Each of SCE's REFCL projects has been found to reduce the energy released in ground faults, and therefore has the potential to reduce public safety risks. However, the REFCL technologies are costly and complex. SCE is exploring multiple approaches because SCE's system is not homogeneous. These technologies require specific configuration, and assessment of the most cost-effective solution will vary across SCE's system.

3. Evaluating and Selecting Mitigations

Figure SCE 9.9-4



After we have identified our options for possible selection, those options must then be prudently evaluated. This usually starts with an estimation of how effective each option can be in reducing the various wildfire and/or PSPS risk drivers and consequences. This analysis is performed by subject matter experts, who utilize engineering data, historical performance data, benchmarking information, research studies, results from demonstrations or field tests, and other sources of information.

SCE is focused on efficiently reducing wildfire and PSPS risk as quickly as reasonably possible, prioritizing mitigations to areas of our system that present the highest risk, and doing so in a manner that appropriately minimizes customer cost and service impacts. Therefore, the selection of wildfire initiatives must necessarily consider several factors in the decision-making process. Such factors include the risk profile for HFRA in SCE's service area, the risk profile of assets that have the potential to cause ignitions, how each activity impacts the frequency and/or impact of wildfires, the potential speed of deployment, costs, RSE scores, resource constraints, material or technology availability and other factors that may relate to a given initiative.

The figure below provides additional details concerning the key factors shown in the flowchart above that are commonly considered as part of SCE's decision-making process when selecting wildfire mitigation initiatives. The figure also illustrates how SCE generally evaluates each factor when making decisions.

Figure SCE 9.9-5

		Features that can dissuade initiative selection	Features that can encourage initiative selection
Critical Factors that drive initiative selection	Risk Analysis - Risk Drivers and Consequences Addressed - Risk Reduced - RSE	Risk drivers and consequences not adequately addressed; Low magnitude of risk reduction; Low RSE	Many risk drivers and consequences addressed or only initiative to address specific risk-driver(s); High magnitude of wildfire and/or PSPS risk reduction; High RSE
	Operational Feasibility / Lead Time to Deployment	Limited or constrained ability to execute; Longer lead time than alternatives	No operational constraints; Shorter lead time than alternatives
Additional Critical Factors that supplement initiative selection decision	Cost to Customers	Higher cost impacts	Lower cost impacts
	Enabling Activity / Add'l Benefits	Does not enable other initiatives; Limited or no non-wildfire benefits (e.g. reliability)	Additional non-wildfire benefits; Necessary for the successful deployment of other initiatives
Overarching Factors that can drive absolute "Go/No-Go" selection decisions themselves	Compliance Requirements / Regulatory Guidance	N/A (Does not factor into selection)	Meet compliance requirements, aligns with regulatory guidance
	Resource Availability	Resource constraints prevent near-term implementation	Resources fully available to plan and execute work

SCE carefully considers each factor both individually and in the aggregate in order to make sound and informed decisions. A given factor may not have a uniform level of importance or impact in all situations. As an example, if an initiative is required pursuant to a regulation, standard, code, or other authority, then meeting and adhering to compliance requirements would naturally be a decisive factor in SCE's ultimate determination. Similarly, if an initiative is under consideration but SCE would be unable to sufficiently staff it with requisite resources, then the "Resource Availability" factor will more heavily influence our decision-making because it may be infeasible to execute the initiative in a timely manner. The influence of resource constraints in assessing a particular potential mitigation can be very different if the resource constraints would simply lead to a short delay in building out the mitigation, versus if the resource constraints could lead to a material inability to complete the mitigation in an acceptable time frame, or fully complete it at all.

Below, SCE describes each decision-making factor in greater detail.

- **Risk Analysis/Factors**: Risk is a primary consideration when selecting mitigation initiatives. Decisions incorporate one or more of the following risk factors:
  - **Risk Drivers and Consequences Addressed:** There are many drivers to wildfire risk (see Tables 7.1 and 7.2 of SCE's Quarterly Data Report submissions for examples). It is necessary to have a portfolio of initiatives that collectively and sufficiently addresses the breadth of risk drivers. In some cases, an initiative such as covered conductor will address numerous risk drivers. In other cases, initiatives may more narrowly – but importantly – address one risk driver that none of the other initiatives address. For example, SCE's Vertical Switches initiative (SH-15) was included in SCE's 2021 WMP Update to address a very specific potential risk driver associated with a specific switch configuration in HFRA that was previously not addressed in our wildfire mitigation plan. In some cases, a mitigation initiative addresses a key driver that is already addressed to some degree by other initiatives, but the configuration is beneficial because the multiple initiatives work together to address the driver better than any single mitigation initiative. For example, though covered conductor addresses vegetation making contact with wires, line clearance and HTMP activities are also necessary to reduce heavy branches or trees from falling into lines that covered conductor may not be able to withstand. Moreover, vegetation management activities can be deployed more rapidly than covered conductor installation, and therefore can help reduce risk across HFRA in advance of covered conductor being installed. Finally, initiatives are also considered based on their ability to mitigate risk consequences. As an example, SCE deploys Community Resource Centers (CRCs) to enable the charging of portable mobile devices and distribute water and snacks. CRCs also provide access to air-conditioned facilities and restrooms, among other services, during a PSPS event. The CRCs do not prevent PSPS events. Instead, they help alleviate the consequences of a PSPS event.
  - **Risk Reduction:** SCE aims to expeditiously reduce as much risk as possible in terms of our electrical lines and equipment being involved in an ignition that can lead to a wildfire. As SCE evaluates wildfire initiatives, the magnitude of risk reduction is a central consideration, with a preference toward those initiatives that can provide higher risk reduction.
  - **Risk Spend Efficiency (RSE):** RSEs help SCE evaluate the relative cost-effectiveness of potential initiatives; this in turn provides insight concerning prudently allocating resources, funding, and efforts to efficiently mitigate wildfire risk. That said, it would not be in the best interest of our customers or the communities we serve if SCE were to carry out a comprehensive wildfire risk mitigation plan based solely on RSEs. An RSE does not take into account certain operational realities, such as resource constraints, compliance issues, or service disruptions. Relying solely on RSEs could lead to significant parts of the system and potentially significant risk issues being left unaddressed. Indeed, the Commission's Safety and Enforcement Division (SED) noted that focusing solely on RSEs in selecting mitigations could be "suboptimal from an aggregate risk portfolio

standpoint."[147] SED acknowledged that "mitigations are usually selected based on the highest risk spend efficiency score unless there may be some identified resource constraints, compliance constraints, or operational constraints that may favor another candidate measure with a lower RSE."[148] SCE agrees with this characterization. An initiative with a relatively higher RSE is generally favorable to one with a relatively lower RSE. However, when an initiative has a relatively lower RSE, it could still be selected if, for example, it is easier to deploy quickly (e.g., critical care battery backup program to medical baseline customers affected by PSPS), addresses a particular risk driver that other mitigations do not (e.g., C-hook replacement and aerial inspections), or reduces overall risk even if it costs more (e.g., targeted undergrounding).

- **Operational Feasibility / Lead Time to Deployment**: An important feature of the selection process is obtaining an early understanding of the feasibility of implementing an initiative, and the time required to plan, design and ultimately deploy the initiative. Since SCE is focused on reducing wildfire risk as quickly as reasonably possible, our preference leans toward initiatives that can be deployed more quickly in order to protect public safety. However, SCE carefully considers certain initiatives that may have longer lead times but that are necessary to provide substantial long-term risk reduction.
- **Cost to Customers**: While the primary focus of our WMP is to aggressively reduce wildfire and PSPS risk for the safety of our customers, cost is a factor in the decision-making process. In addition to RSEs that assess the risk reduction benefits of each initiative against its costs, the total cost associated with any initiative also needs to be considered to account for customer affordability and funding constraints.
- **Enabling Activity / Technology / Additional Benefits**: As noted in SCE's 2021 WMP Update, initiatives can be selected that do not directly reduce wildfire or PSPS risk, but rather *enable* other initiatives to reduce risk, or to do so more efficiently. For example, SCE included our Fuel Sampling initiative (SA-5), where SCE takes semi real-time measurements of vegetation moisture at 15 sites across its service area. SCE's decisions regarding de-energization consider information about the areas that are impacted by wildfire risk, such as fuel conditions. Although models can be used to estimate fuel dryness, results from fuels sampling can be used to assess vegetation dryness in near real-time, help inform models, and serve as an input for fire spread and fire potential calculations. In our decision-making process, SCE will also consider indirect but worthwhile benefits that initiatives may provide. Such indirect benefits may include improved system reliability, faster service restoration, improved communications with customers, etc. While valuable, these secondary benefits may be less influential in the wildfire risk reduction decision-making process compared to the other factors.
- **Compliance Requirement / Regulatory Guidance**: In most circumstances, activities necessary to comply with local, state, or federal laws or regulations will be selected irrespective of other factors. In other words, compliance needs may weigh in favor of selecting the initiative even if other factors seem to weigh against selecting the initiative, particularly if the initiative represents the only prudent or feasible way to comply with the applicable law(s) or regulations(s). In addition, SCE takes into account Commission or other regulatory guidance and decisions when we are selecting wildfire mitigation activities and scope.
- **Resource Availability**: With increasing work to maintain and operate the grid while upgrading it to mitigate safety and resiliency risks, there are increasing constraints associated with specialized

[147] California Public Utilities Commission, Risk and Safety Aspects of Risk Assessment and Mitigation Phase Report of Pacific Gas and Electric Company, Investigation 17-11-003 (March 30, 2018), page 18.
[148] Id.

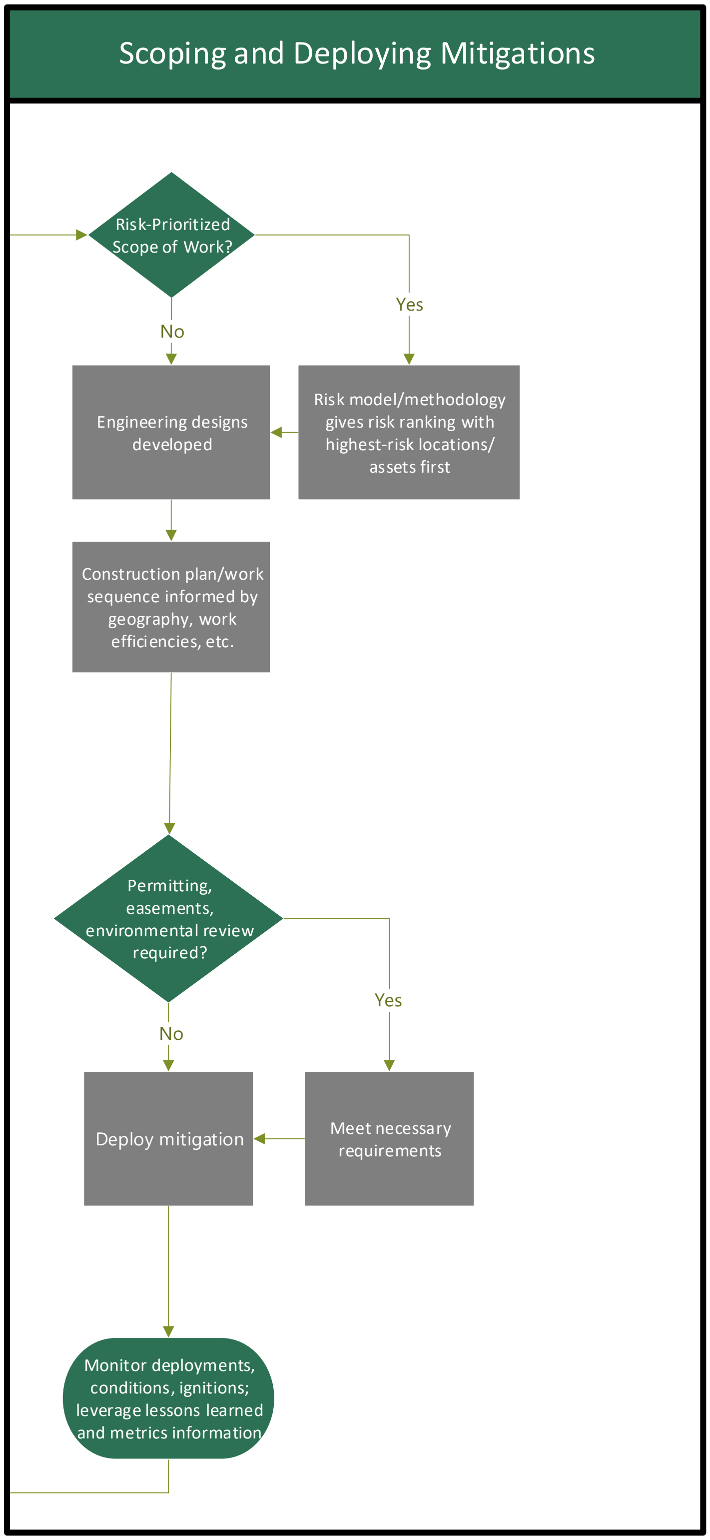
resources such as planners, designers, engineers, field crews, etc. The scope of such resource constraints can be internal, across the state, and even nationwide at times. If requisite resources are not available, the potential initiative could be temporarily deferred or de-scoped.

Mitigation Selection & Approval

In developing the portfolio of activities that constitute our wildfire mitigation plan, we consider the factors discussed above as we decide how much, when, and where to implement each selected mitigation measure. Decisions on selecting initiatives are ultimately made by senior management, through SCE's corporate governance and risk management processes, as discussed above. As part of the risk management process, the factors we outlined earlier help management assess the technical, operational, resource, financial, and regulatory considerations of each wildfire risk mitigation initiative, and of our proposed wildfire mitigation plan overall. Importantly, SCE uses these efforts to evaluate, as a general matter, how sufficiently the overall portfolio of mitigations addresses the drivers and consequences of wildfire and PSPS risk. These factors, such as RSE scores, can aid in this evaluation and further validate and/or focus our decisions on mitigation selection when mitigations are evaluated in aggregate. SCE's responses to Critical Issue SCE-02, Part 2 illustrate how the various factors described above were used in practice to select specific wildfire mitigation activities.

4. Scoping & Deploying Mitigations

Figure SCE 9.9-5



Once mitigations are selected, SCE prioritizes the scope of work, plans and designs the work, and then undertakes the work. This section of the flowchart is germane to how SCE uses risk-informed prioritization to help scope work, and how that scope of work is refined as it advances through the planning, design, and execution process.

SCE's WMP activities predominantly deploy work to SCE's HFRA. However, wildfire and PSPS risk are not uniform across our entire HFRA. Therefore, in most cases, SCE uses risk analysis to prioritize where to allocate resource and funding first. SCE's risk models prioritize deployment to those areas where the initiative will be most effective at reducing the greatest risk. While SCE's risk models have evolved over the last few years, we currently anticipate that all new programs will be evaluated and prioritized using SCE's WRRM where applicable.

For example, when SCE determined that it needed to execute an enhanced inspection program in areas vulnerable to non-wind driven fires in 2020, the circuits within the susceptible areas were prioritized by the ignition consequence estimated in WRRM. Each WMP initiative may be prioritized differently in light of the specific driver(s), sub-driver(s), or consequence(s) that it is designed to address. However, the approach remains the same: prioritize work to reduce wildfire risk as expeditiously as possible.

While the WRRM represents the primary tool used to make risk-prioritized decisions for wildfire initiatives, SCE relies on subject matter expertise and qualitative enterprise-level risk tools to help make risk-informed decisions when quantitative methods are not mature or applicable. The risk bowtie, fault tree analysis, decision trees, failure modes and effects analysis (FMEA), and probabilistic risk assessment (PRA) are some examples of methods that are used.

After work is prioritized, it must be planned, designed, and implemented. The specific steps for grid-related work vary for different types of initiatives. However, the general steps remain as follows: work is planned; it goes through detailed engineering and technical design; it is packaged with other work where applicable to gain work efficiencies and reduce the number of outages to customers; all necessary permitting, environmental assessments and customer approvals as required are obtained; and then assets are inspected, remediated, replaced or installed onto SCE's system or the customer site. The process is different for non-grid work such as customer and technology programs because there are different resources, stakeholders, and requirements involved.

Below, in Part Two (2) of this response, SCE details and explains key aspects of the scoping and deployment process for each of the five examples identified in the Revision Notice.

Summary of SCE's Risk-Informed Decision-Making Framework

SCE has an Enterprise Risk Management (ERM) organization that centralizes oversight and guidance on key and emerging risks across the Company. Specifically, ERM's role is to identify the most critical risks facing the entire enterprise, validate that appropriate mitigation measures have been initiated, monitor the status of the risks and the mitigation measures, and communicate ERM's findings concerning key and emerging risks to SCE's senior management and Board of Directors. Wildfire and PSPS risks are two of the most critical risks utilizing this ERM approach.

ERM works closely with each operating unit (OU) through a "hub-and-spoke" structure to manage risk across the Company. ERM establishes SCE's common risk management framework. ERM also facilitates cross-OU collaboration in developing and maintaining consistent and coherent risk management tools and systems. The OUs provide data, analysis, and guidance on the risks as found within each OU. This helps

ERM prioritize and manage the key risks across the Company. Throughout the year, ERM meets with senior leaders to review and discuss enterprise- and operational-level risks and mitigation plans.

SCE's risk-informed decision-making framework is built on the foundation we described in SCE's Safety Model Assessment Proceeding (SMAP) Application.[149] In the succeeding years, SCE has taken measured and prudent steps to enhance our risk management capabilities. SCE has benefitted from actively participating in the WMP, SMAP, and RAMP processes,[150] and collaborating with the Commission's Wildfire Safety Division, Safety Enforcement Division, the Public Advocates Office, intervenors, and other California utilities in a host of risk-related proceedings and forums. In risk-oriented proceedings, the Commission has repeatedly noted that risk analysis and risk-informed decision-making is an evolving arena.[151] SCE continues to mature our processes to identify, review, and approve new or modified wildfire initiatives in a manner that supports an increasingly consistent assessment framework that helps ensure the proposed wildfire mitigations provide for measurable risk buy-down for purposes of eliminating or reducing wildfire and PSPS risks and can be successfully placed into an executable plan.

[149] A.15-05-002, SCE's Safety Model Assessment Proceeding application, submitted May 2015.
[150] ERM serves as the lead organization for SCE in RAMP, SMAP, and other risk-related proceedings.
[151] *See, e.g.*, D.16-08-018, Finding of Fact 35 ("There is no optimization of portfolio of risk mitigation activities, but this will take several more years of evolving utility models, data collection, and assessments.").

2. SCE SHALL PRESENT THE UPDATED DECISION-MAKING PROCESS BY INCLUDING ONE EXAMPLE OF THE INITIATIVE SELECTION PROCEDURE FOR EACH OF THE FOLLOWING MITIGATION CATEGORIES:

A. SITUATIONAL AWARENESS AND FORECASTING (7.3.2)

For this category, SCE has selected Distribution Fault Anticipation (DFA) (SA-9) as an example.

1. Evaluation (or Reassessment) and Prioritization of Wildfire Risks

Equipment faults represent the primary source of ignitions associated with utility infrastructure. A primary way to prevent faults is to identify leading conditions of fault events (i.e., incipient fault detection) to facilitate actions or repairs to avoid the potential future fault event. This incipient fault condition may also be an actual fault, which has the potential to be repetitive.

SCE estimates that, on an annual basis, it experiences around 650 outages across the HFRA circuits where, following the incidents, conventional circuit patrols were unable to detect the cause or the location of the fault event. DFA technology can help detect incipient faults, thus reducing the probability of ignitions.

For example, circuit patrols may find it difficult to detect instances where a momentary fault from wire-to-wire contact during windy conditions has resulted in minimal damage. This type of fault may re-occur, potentially resulting in more damage and equipment failure that can lead to an ignition. The remote fault data from DFA can be used to help locate these faults or isolate the potential section of circuitry where the fault occurred. Mitigations then can be applied, such as applying line spacers to help avoid further wind-driven fault events at the location.

Another example can be found in the area of distribution capacitor banks. These are devices on the distribution system used to improve efficiency of power flow and stabilize voltage. However, it is difficult to detect potential problems with these devices, because indicators are not present to inform or predict a pending failure. In such cases, the condition cannot be immediately pinpointed and repaired, nor can the conditions that caused the event be promptly mitigated. This can lead to arcing or equipment failure, which in turn can result in ignitions that involve utility equipment. Many equipment failure events with capacitors pose minimal ignition risks where the equipment contains the energy of the fault event, and the equipment fusing safely clears the fault from the system. However, other failures such as events involving capacitor switches can produce external sparks. DFA provides the capability to detect some of these conditions by reporting capacitor-related arcing, which is a leading indicator (incipient fault detection) for capacitor switch failures.

In terms of risk drivers that DFA addresses, faults are considered equipment/facility failure (EFF). Sub-drivers included within EFF include capacitor banks, wire-to-wire, connection devices, and switches, among others.

2. Identifying Mitigations

Identification of Existing Activities

In terms of existing activities which mitigate risk associated with wire-to-wire contact, SCE primarily relies on the deployment of covered conductor, as well as other initiatives like the long span initiative.

Moreover, as part of its traditional infrastructure replacement program, SCE replaces capacitor banks based on established end-of-life standards, and through breakdown maintenance activities. Accordingly, this existing level of activity was not considered a viable alternative to DFA, since it did not provide the type of proactive monitoring and data-driven analysis that DFA offers.

Modify or Identify New Activities or Alternatives

SCE identified DFA as a potential initiative to address the identified risks. DFA helps SCE detect events relatively early by utilizing intelligent electronic devices that monitor electrical system measurements to recognize current and voltage signatures that are indicative of potential incipient failures. This capability supports timely completion of remedial actions to avoid faults and potentially reduce ignition incidents. Due to its ability to remotely access and retain data for grid events, DFA also enables SCE to collect and analyze large amounts of fault data for potential repairs and/or mitigations. Additionally, DFA technology allows SCE to closely monitor the operation of its distribution capacitor banks, providing prompt alerts when issues are detected. SCE has benchmarked DFA and Early Fault Detection (EFD) (discussed below). SCE leveraged input from the vendor regarding the experiences of other utilities to further understand DFAs capabilities and the type of abnormal events it can recognize. Moreover, SCE continues to have ongoing conversations with a peer utility on the uses of DFA and EFD.

SCE began piloting DFA in 2019 and evaluated the results of 60 units that were deployed in 2020. Based on the pilot findings, SCE is continuing to deploy DFA in HFRA in 2021.

A potential alternative to some of the benefits from the data recorder portion of DFA would require that most of the data regarding faults be manually retrieved by SCE personnel. These personnel would need to visit the substations and other relay sites where relays are configured to capture events, a significant expenditure of personnel time. In any event, this manual process would only be feasible for sites with microprocessor relays because electromechanical relays do not have the capability to collect event data. In addition, microprocessor relays only capture a portion of the data as compared to DFA, and do not have the capabilities for advanced analytics to provide alerts of predictive incipient fault detections.

The advanced analytics with DFA also categorize the data, allowing large amounts of data to be managed effectively. The use of relay data as an alternate would need similar data management capabilities to be developed as employee processes or other automated solutions. As an example of classifications, DFA's algorithms can specify potential conductor-related or capacitor bank issues, among others.

Another alternative activity, that is potentially complementary to DFA, is EFD technology. EFD detects high-frequency radio emissions which can occur from arcing or partial discharge conditions on the electric system. These types of conditions can represent an incipient failure, such as severed strands on a conductor, vegetation contact, or insulator degradation. The technology requires placement of paired sensors on poles approximately every three circuit miles on a distribution voltage line. At higher voltages, sensors can be placed farther apart. However, SCE needs more data to evaluate the effectiveness of EFD in its system. SCE is currently initiating a pilot program to evaluate EFD on our system based on preliminary information gathered from benchmarking with PG&E and Australian utilities. The results of this pilot and a more detailed understanding of EFD technology benefits could inform DFA scope in the future.

SCE has explored other technology options for situational awareness sensors through companies engaged in developmental efforts and with vendors who claim that their products can detect similar conditions as

EFD and DFA products. We have found that such alternatives are not yet commercially ready. SCE will continue to consider these and any other emergent technologies that appear to hold promise.

3. Evaluating & Selecting Mitigation

Decision-Making Factors

Because Capacitor Bank Infrastructure Replacement does not offer a proactive approach, and because manual monitoring would be a partial and labor-intensive solution, and EFD is still an early-stage emerging technology, we concluded that DFA represented the only viable alternative. With DFA, continuous-monitoring sensors lend additional and more effective situational awareness, in a manner that is readily available for scaled deployment.

Figure SCE 9.9-6

Mitigation: Distribution Fault Anticipation(DFA)

	Features that can dissuade selecting the initiative	Features that can encourage selecting an initiative
Risk Analysis - Risk Drivers and Consequences Addressed	Risk drivers and consequences not adequately addressed	Many risk drivers and consequences addressed or only initiative to address specific risk-driver(s)
Risk Analysis - Risk Reduced	Low magnitude of risk reduction	High magnitude of wildfire and/or PSPS risk reduction
Risk Analysis - Risk Spend Efficiency (RSE)	Low RSE	High RSE
Operational Feasibility / Lead Time to Deployment	Limited or constrained ability to execute; Longer lead time than alternatives	No operational constraints; Shorter lead time than alternatives
Cost to Customers	Higher cost impacts	Lower cost impacts
Enabling Activity / Add'l Benefits	Does not enable other initiatives; Limited or no non-wildfire benefits (e.g. reliability)	Additional non-wildfire benefits; Necessary for the successful deployment of other initiatives
Compliance Requirements / Regulatory Guidance	N/A (Does not factor into selection)	Meet compliance requirements, aligns with regulatory guidance
Resource Availability	Resource constraints prevent near-term implementation	Resources fully available to plan and execute work

Decision-Making Factors

Below, SCE provides additional details regarding how the various alternatives were evaluated using the key decision-making factors.

1. Risk Analysis
    a. Risk Drivers / Consequences Addressed

DFA provides situational awareness by identifying issues such as arcing activity and rapidly accessible fault data which can aid in fault locating. These attributes help reduce the risk from both CFO and EFF risk drivers. Importantly for EFF events, DFA targets the Capacitor Bank Failure sub-driver of the risk bowtie. In addition, DFA can potentially identify system anomalies/failures via its ability to assess current and voltage signatures. As discussed above, SCE is still assessing complementary benefits to DFA as well as other potential EFD benefits that could help reduce risk.

    b. Level of Risk Reduction

DFA represents a relatively small amount of the overall WMP portfolio risk reduction amount. The risk assessment is necessarily based on only that portion of fault events that have the leading indicators or incipient conditions that are detectable by DFA and that can be found prior to the conventional fault occurrence. However, most ignition risk aligns with fault events. Thus, avoiding fault events minimizes or helps eliminate the ignition risk. Accordingly, DFA's ability to provide advance alerts on potential impending equipment failures, and provide valuable data when fault events do occur, has prompted SCE to move DFA past the pilot implementation stage and towards small-scale deployment to further realize and evaluate its benefits.

    c. Risk Spend Efficiency

Though the risk reduction is modest, DFA costs are relatively low as well, and SCE determined that DFA has a relatively high RSE. SCE notes, however, that the RSE calculations are based on limited data from recent deployment. As the technology is more widely implemented and more data is gathered, the RSE calculation will be re-evaluated.

SCE did not perform an RSE calculation for EFD, because it is still in pilot phase.

2. Operational Feasibility / Lead Time to Deployment

The lead time needed to deploy DFA is approximately one year for purchasing, planning, and deploying a set of DFA installations. This was deemed to be a reasonable time period relative to other initiative deployment periods. EFD has a potentially longer lead time to deployment, since EFD requires that one sensor pair be deployed every three circuit miles, whereas DFA only requires one device for an entire circuit.

3. Cost to Customers

DFA costs are generally low relative to SCE's portfolio of mitigations. Costs for EFD are expected to be comparable to DFA. Because DFA would avoid the need to send a worker out into the field to manually retrieve data, DFA presents cost avoidance and time-saving opportunities in comparison to the manual process.

4. Enabling Activity / Technology / Additional Benefits

The integrated use of other systems such as smart meters, remote monitored intelligent electronic devices (IEDs), and power system analysis modeling software is expected to further improve benefits derived from the remote data provided by DFA. DFA also provides data collection capabilities that can be integrated into ignition investigations, thereby enhancing opportunities to learn from both close calls and actual events.

Besides detecting incipient failures before they progress to a complete failure, EFD can also help monitor arcing changes to assess the overall health of the electric system. This capability can help inform operational decisions during high-risk conditions. For circuits that transverse both non-HFRA and HFRA, the selection of sites for EFD sensor pairs can be prioritized to cover HFRA circuit sections before non-HFRA circuitry; it is not necessary that an entire circuit be monitored by EFD devices in order to utilize EFD.

5. Compliance Requirement/Regulatory Guidance

Neither DFA nor EFD are driven by compliance requirements or regulatory guidance.

6. Resource Availability

Resource constraints were less influential in the decision-making process since there were only limited concerns regarding the ability to implement DFA through the pilot and program stages. However, as mentioned above, an advantage of DFA is that it obviates the need for SCE to send a worker out to manually retrieve the data in the field.

Mitigation Selection & Approval

After a thorough evaluation of these various decision factors, SCE leadership approved moving forward with DFA to address the identified risk. Aside from having a relatively high RSE, key factors in the selection of DFA include: (a) DFA's ability to target certain risk drivers; (b) its ability to be deployed relatively quickly; (c) its commercial availability; (d) its deployment of automation onto the system to increase fault data collection capabilities and reduce manual efforts; and (e) its potential to improve electric system reliability based on the capabilities outlined above. Initially, SCE approved moving forward with the initial pilot of 60 locations in 2019. SCE then expanded deployment in 2021 to 150 more locations, based on the initial results of the pilot and the need to further refine our understanding of the effectiveness of DFA across SCE's system.

Additionally, SCE continues to pilot EFD, and we remain optimistic that EFD technology will provide additional enhancements to our situational awareness of the grid and will complement DFA in reducing wildfire risk. The initial EFD scope was targeted to existing DFA circuits to permit comparison between the two technology offerings.

4. Scoping & Deploying Mitigation

When considering DFA implementation, SCE first identified distribution lines in HFRA. Prioritization criteria thereafter include: a high number of momentary and sustained outages (as DFA can help identify fault locations and causes), a high number of HFRA circuits within a substation, a high percentage of overhead circuit miles, and available rack equipment space. In 2020, SCE monitored and evaluated reported events for the initial 60 units that we installed in 2019 and early 2020. In 2021, SCE plans to install 150 additional units and continue monitoring the 60 previously installed units.

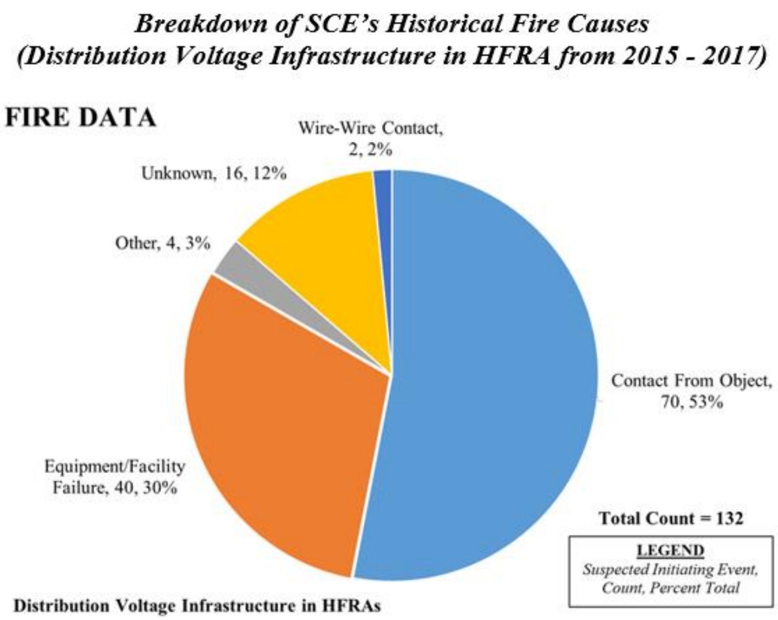
B. GRID DESIGN AND SYSTEM HARDENING (7.3.3)

For this category, SCE has selected Covered Conductor (SH-1) as an example.

1. Evaluation (or Reassessment) and Prioritization of Wildfire/PSPS Risks

In 2018, prior to SCE's deployment of covered conductor, SCE conducted an analysis of historical ignition drivers in SCE's HFRA. The chart below was originally included in SCE's Grid Safety Resiliency Program (GSRP), Section II(C)(2)(a). As the chart shows, over half of SCE's historical ignitions associated with distribution infrastructure in HFRA were caused by foreign objects (e.g. vegetation, metallic balloons, wildlife) contacting electrical facilities. Other drivers identified include equipment/facility failure and wire-to-wire contact. The data indicated that a wildfire mitigation strategy that centers on preventing contact-from-object (CFO) faults can significantly reduce ignition risk.

Figure SCE 9.9-7



2. Identifying Mitigations

Modify or Identify New Activities or Alternatives

SCE identified several potential mitigation measures to address CFO and wire-to-wire contact risk drivers, as well as equipment failure drivers. SCE also identifies and benchmarks these alternatives against SCE's prior practice of replacing bare wire with larger-sized bare wire, for context. In addition, SCE notes here that PSPS is a potential alternative as well. However, because widespread and repeated use of PSPS is not a reasonable or desirable long-term strategy, we do not consider PSPS as a viable alternative in this exercise, which is evaluating primary and long-term alternatives for deployment. SCE further discusses the use of PSPS as a potential alternative to covered conductor going forward, in our response to Critical Issue SCE-03.

1. Undergrounding overhead conductor (Existing): Relocate distribution lines underground.

2. Covered Conductor (Modified): Replace standard "bare" overhead conductor (i.e., exposed electrical wires) with covered conductor to reduce CFO-related and wire-to-wire contact faults (in addition to equipment failure risk drivers).

3. Partial Covered Conductor (New): Replace only one or two phases with new, appropriately-sized covered conductor.

4. Insulated Sleeves/Wraps (New, piloted previously): Retrofit existing bare conductor, if its size and condition are good, with insulated sleeves.

5. Bare Wire (Prior Replacement Standard): Traditionally, SCE would reconductor small wire circuits with larger-sized conductors to reduce conductor failure. Because it had been SCE's practice to remediate overhead conductor with larger-sized bare wire, SCE initially evaluated the effectiveness of bare wire to help benchmark the performance of alternatives. Once the effectiveness of covered conductor was sufficiently studied and determined to provide substantially higher risk mitigation benefits, and with a higher RSE, SCE adopted the use of covered conductor as standard practice within its HFRA. As such, while SCE includes bare wire in this discussion, SCE does not view bare wire as a prudent alternative to covered conductor in mitigating wildfire and PSPS risk.

6. PSPS (Not a reasonable or desirable long-term strategy): PSPS is necessary to protect public safety but is used only under extreme conditions and as a measure of last resort. Theoretically, PSPS is fully effective against all sub-drivers listed above, for the simple reason that a de-energized circuit is not a potential ignition source. However, this effectiveness is only realized during specific times when ignitions are expected to have higher consequence outcomes. This is fundamentally different than other grid hardening mitigations such as covered conductor, which address the identified risk drivers under all operating conditions. Because of this, SCE did not evaluate PSPS as a viable alternative in its initial analysis, though we still utilize PSPS today as a mitigation of last resort when conditions require its use. This is discussed in more detail in SCE's response to Critical Issue SCE-03.

7. Emerging Technologies: SCE continues to explore additional ways to mitigate wildfire risk, including piloting emerging technologies. Because these technologies are in various stages of assessment and deployment, and generally not ready for scalable, system-wide implementation, they are not yet considered as viable alternatives. Please see SCE's response to Critical Issue SCE-03 for more detail.

3. Evaluating and Selecting Mitigation

Next, SCE conducted a comprehensive review of mitigation alternatives and their effectiveness at reducing or eliminating the drivers of faults, with a focus on CFO-related and wire-to-wire contact related faults. Engineers evaluated how faults could be mitigated by each specific mitigation measure, and mitigation effectiveness factors for each mitigation alternative were calculated. Furthermore, the mitigation effectiveness factors were used in combination with unit costs to estimate mitigation-cost ratios. A mitigation-cost ratio was calculated by dividing the mitigation effectiveness factor by the mitigation unit cost. The results of this analysis, as published in the GSRP's Mitigation Effectiveness Comparison Workpaper, are summarized in the table below.[152]

[152] *See* GSRP Workpaper Volume 1 (Mitigation Effectiveness Comparison).

Table SCE 9.9-1
Initial Mitigation-Cost Ratio Analysis[153]

Mitigation Option	Relative Mitigation Effectiveness Factor	Cost per Mile ($ million)	Mitigation-Cost Ratio
Re-conductor – Bare	0.15	0.30	0.50
Re-conductor – Covered	0.60	0.43	1.40
Underground Conversion	1.00	3.00	0.33

Comparing the mitigation cost-ratios provides a meaningful indicator of the relative value of each mitigation. For example, a comparatively higher mitigation-cost ratio indicates greater overall mitigation value (greater overall customer benefit per dollar spent). On the other hand, a comparatively lower mitigation cost ratio indicates lower overall mitigation value for customers (less benefit per dollar spent). While this analysis was performed for SCE's GSRP Application and SCE's risk models have evolved since then, the results here are still directionally applicable and validated by more recent analyses. Risk modeling performed as part of the 2021 WMP Update shows that Undergrounding (SH-2) is estimated to have an RSE in HFRA Tier 2 of 447, while Covered Conductor (SH-1) has an RSE in HFRA Tier 2 of 3,514.

Mitigation effectiveness factors were not calculated for partial covered conductor and insulated sleeves/wraps. The partial installation of covered conductor was rejected because it is less effective at mitigating faults. A partial phase reconductor alternative would, as a practical matter, dilute the effectiveness of covered conductor. Installing covered conductor on one phase does not mitigate many types of contact-related faults such as palm fronds blowing in and contacting all phases of a conductor span. Covering a center phase does not prevent the contact between the outer phases. In addition, covering one phase does not address phase-to-ground contact-related faults. The resource requirements and costs for deploying one-phase installation of covered conductor are comparable to covered conductor deployment on all phases, but the benefits are lower. Insulated sleeves/wraps were found to be technically and operationally infeasible.

[153] In 2018, SCE built a bottoms-up covered conductor unit cost forecast in the GSRP filing, using its Overhead Conductor Program as a basis. Accounting for the differences in material costs for covered conductor as well as the costs of associated upgrades, such as the replacement rate of poles, covered conductor was estimated at approximately an average of $421,000 per circuit mile (2018 $) as stated in SCE's 2021 GRC Track 1 filing. This figure did not include any assumptions about using fire-resistant poles (FRP), which are more expensive than traditional wood poles. The forecast average unit cost with FRP consideration is approximately $456,000 (2018 $).

Figure SCE 9.9-8

Mitigation: Covered Conductor

	Features that can dissuade selecting the initiative	Features that can encourage selecting an initiative
Risk Analysis - Risk Drivers and Consequences Addressed	Risk drivers and consequences not adequately addressed	Many risk drivers and consequences addressed or only initiative to address specific risk-driver(s)
Risk Analysis - Risk Reduced	Low magnitude of risk reduction	High magnitude of wildfire and/or PSPS risk reduction
Risk Analysis - Risk Spend Efficiency (RSE)	Low RSE	High RSE
Operational Feasibility / Lead Time to Deployment	Limited or constrained ability to execute; Longer lead time than alternatives	No operational constraints; Shorter lead time than alternatives
Cost to Customers	Higher cost impacts	Lower cost impacts
Enabling Activity / Add'l Benefits	Does not enable other initiatives; Limited or no non-wildfire benefits (e.g. reliability)	Additional non-wildfire benefits; Necessary for the successful deployment of other initiatives
Compliance Requirements / Regulatory Guidance	N/A (Does not factor into selection)	Meet compliance requirements, aligns with regulatory guidance
Resource Availability	Resource constraints prevent near-term implementation	Resources fully available to plan and execute work

Decision-Making Factors

Below, SCE provides additional details regarding how the various alternatives were evaluated using the key decision-making factors.

1. Risk Analysis

As discussed earlier, SCE conducted a review of mitigation alternatives and their effectiveness at reducing or eliminating faults. The mitigation effectiveness factors for each mitigation alternative were calculated as a result of this analysis.

   a. Covered Conductor: This mitigation activity will address ignition risk due to contact-from-object faults, wire-to-wire contact, and other equipment/facility failure drivers, such as conductor and splice failures. SCE's initial analysis performed for the GSRP in 2018 estimated that covered conductor had a relative mitigation effectiveness factor of ~60%. More recent analysis indicates this to be a conservative estimate.

b. Undergrounding Overhead Conductor: Relocating distribution lines underground will address both contact-from-object and equipment/facility failure drivers. SCE's initial analysis estimated that undergrounding has a relative mitigation effectiveness factor of 100%.

c. Bare Conductor: This activity will only address ignition risk related to equipment/facility failure drivers. Per SCE's analysis, reconductoring with larger bare conductor is estimated to yield a relative mitigation effectiveness factor of 15%.

2. Operational Feasibility / Lead Time to Deployment
   a. Covered Conductor: Prior to submitting the 2018 GSRP Application, SCE gained experience proactively reconductoring portions of certain at-risk circuits with covered conductor to gain critical deployment capabilities and insights. This effort confirmed that though covered conductor required more careful handling than bare conductor so as to not damage the covering, and needs some additional effort to remove the insulation to make connections to equipment or other hardware such as dead-ends, covered conductor installation is similar to putting in bare conductor installation, which had been widely used at SCE. Since then, SCE has gained significant experience in covered conductor installation, and validated that the general lead time for deploying covered conductor (approximately 16 to 22 months) is not higher than reconductoring with bare conductor.

   b. Undergrounding Overhead Conductor: Undergrounding has substantially higher lead time, requiring 36 months on average from scope to construction. Easement and/or environmental issues can add still longer lead times for undergrounding. Thus, undergrounding requires a longer deployment time than covered conductor.

   c. Partial Covered Conductor: Operational lead time and other factors are similar to that of covered conductor installation.

   d. Insulated Sleeves/Wraps: SCE piloted an installation of insulated sleeves over existing bare conductors. We determined that the retrofitting option was technically infeasible and ineffective. One of the major technical issues was that it was not possible to install insulated sleeve over a long span of conductor and maintain the sleeve in an intact condition. The sleeve would shrink or detach over time, creating exposed sections of the bare conductor, and rendering the mitigation ineffective in preventing contact-related faults. Additionally, SCE determined that installation over long spans was very labor-intensive, and at times extremely difficult to execute successfully.

   e. Bare Conductor: Installing bare conductor is a standard practice at SCE, and therefore yields a well-understood lead time to deploy. Generally, the lead time to deploy bare conductor is approximately 16 to 22 months.

3. Cost to Customers
    a. Reconductoring with bare conductor has the lowest cost ($417k/mile), [154] and underground conversion is the highest-cost option ($3.4M).[155] Covered conductor costs fall in between these two options ($456k/mile),[156] but covered conductor costs are only marginally higher than reconductoring with bare conductor.

4. Enabling Activity / Technology / Additional Benefits
    a. Covered conductor provides some additional benefits beyond wildfire and PSPS risk mitigation, including reducing charging current and public safety risks associated with human contact with energized wire. If an energized wire down occurs with covered conductor, human contact with the covering will result in, at most, a very slight and almost imperceptible shock. For instance, tests performed at the National Electric Energy Testing, Research and Applications Center (NEETRAC), Georgia Institute of Technology, demonstrate that human contact with a downed covered conductor would result in current below 1 mA.[157] The effect of this current level is considered "generally not perceptible."[158]

       Additionally, deploying covered conductor should increase reliability, because one of its main functions is to prevent contact-related faults. Via benchmarking with other utilities, we learned that increasing reliability was a key motivation in their deployment of covered conductor. And the results of a survey conducted by SCE indicated that other utilities have experienced reduced contact-related faults after they deployed covered conductor.[159]

5. Compliance Requirement/Regulatory Guidance
    a. Covered conductor and other alternatives considered are not driven by a compliance requirement.

6. Resource Availability

All mitigation options will require essentially the same resources, which includes workforce resources to address scoping, planning, and implementing the mitigation. Availability of resources was more of a factor in determining the scope of covered conductor deployment, as opposed to the decision to undertake the mitigation itself.

[154] See A.19-08-013 Exhibit SCE-02, Vol. 01, Part 1, OH Conductor Rebuilds – Forecast Unit Cost is ~$174k per conductor mile (2018 $). Using a conversion factor of 2.4 to convert that unit cost to circuit miles results in ~$417k per circuit mile.
[155] *See* A.19-08-013 Exhibit SCE-04, Vol. 05A, Targeted Undergrounding.
[156] See A.19-08-013 Exhibit SCE-15, Vol. 05, Covered Conductor – Forecast Unit Cost is ~$456k per circuit mile (2018 $), including incremental costs associated with fire resistant poles.
[157] *See* GSRP Work Paper Volume 1 (NEETRAC Study and Associated SCE Developed Study Summary).
[158] *See* Dept. of Health & Human Services, Centers for Disease Control & Prevention, Electrical Safety, Safety and Health for Electrical Trades Student Manual, (Apr. 2009), at p. 7, available at https://www.cdc.gov/niosh/docs/2009-113/pdfs/2009-113.pdf.
[159] *See* Covered Conductor Compendium.

Mitigation Selection & Approval

SCE's risk analysis showed that implementing covered conductor represents the most prudent mitigation measure. Specifically, while SCE's prior practice of reconductoring with bare conductor would have slightly lower cost, and underground conversion would have greater risk reduction benefit, reconductoring with covered conductor has the greatest *overall* value. The RSE for covered conductor is consistently among the highest of all WMP activities analyzed. This RSE result occurs because covered conductor is effective at mitigating several types of ignition drivers such as contact from object and wire to wire contact, as well as reducing equipment failures associated with older distribution system equipment and hardware, all at a relatively reasonable cost. Importantly, covered conductor is available today to deploy at scale to maximize risk reduction for our customers as quickly as possible. As previously stated, undergrounding cannot be deployed at such scale in the timeframes required, and executing PSPS de-energizations at the frequency and scale that would be required is not a reasonable or practical solution.

There are also additional PSPS-related benefits provided by covered conductor, as well as non-wildfire safety and reliability benefits. For example, based on extensive benchmarking, engineering evaluations, and preliminary results of deployments to date, covered conductor appears to be very effective at mitigating CFO risk (see Critical Issues SCE-03, Section C for further details). Operationally, covered conductor is sited overhead and is thus more readily accessible compared to undergrounded conductor. Thus, covered conductor is easier to maintain and repair compared to undergrounded conductor.

All these criteria were factored in when SCE made covered conductor the cornerstone of its wildfire mitigation plan. Please also see SCE's response to Critical Issue SCE-03 for additional details on SCE's selection of covered conductor as a primary mitigation initiative.

4. Scoping and Deploying Mitigation

SCE's criteria for selecting circuit segments for reconductoring has evolved over time, in line with refinements to SCE's risk models. Beginning in 2019, SCE used the risk scores from the Wildfire Risk Model to prioritize the circuit segments for replacing bare conductor with covered conductor. Besides using risk scores, operational efficiencies in bundling work were also considered when scheduling covered conductor deployment. The underlying POI and consequence score models have undergone several refinements, and SCE continues to incorporate these enhanced risk scores into its deployment strategy to the extent practicable. In late 2020, SCE transitioned from using the Reax ignition consequence model to Technosylva, which resulted in some reprioritization of the circuit segments. To realign covered conductor scope to the improved risk model, conductor segments that had higher risk scores than those using the previous model were identified and placed into the process for 2022 construction.

This was done by ranking all conductor segments using the WRRM with the new Technosylva consequence scores and identifying which of those segments had been previously scoped through prior methods such as using the 2019 WRRM model. Any segments that ranked higher in the WRRM than the previous risk models and were not already scoped for construction were prioritized for 2022 construction. This method will help enable all the highest risk segments identified in our updated risk model to be completed by the end of 2022.

The method just described used the wildfire component of the WRRM only, and did not include the PSPS component described in Chapter 4. This was due to timing for operational purposes, because the PSPS component was not completed in time for the WRRM risk ranking evaluation for 2021 deployment. Covered conductor scope beyond what is currently in-flight will use the updated WRRM model with both wildfire and PSPS components. However, SCE is prioritizing covered conductor installation on circuits that have been frequently impacted by PSPS. As part of its Expedited Grid Hardening Plan, SCE is accelerating approximately 100 miles of covered conductor from future years to construction prior to October of 2021.

In terms of deploying covered conductor, SCE uses the most recent version of its risk model to prioritize circuit segments based on risk. This is used to select the next tranche of circuit segments with the highest calculated risk scores, which will be sent for further job scoping. Once the defined scope is delivered, then planning and design activities commence. After an approved engineering design is completed, the agency permitting processes begins, along with other activities to clear the path for executing the work. These include activities such as environmental review, access review, landowner and city negotiations, defined work hours, and the removal of other constraints. Upon completion of these activities, tentative scheduling is determined. (Generally, progressing from design to construction takes approximately 16 to 22 months, depending on the size and complexity of the work scope). Some of the variables that may slow the completion of work include: site accessibility, weather conditions, emergent events and storm restoration, customer outage restrictions, and agency-driven constraints. While SCE endeavors to deploy work according to the initial risk-prioritized scoping, these operational complexities may cause the eventual ordering of actual installation to differ from initial prioritization.

Construction and design standards for covered conductor were developed prior to deploying it. Developing the construction and design standards involved thoroughly testing as well as benchmarking across various national and international utilities. Testing validated the performance of the covered conductor. Benchmarking allowed SCE to incorporate lessons learned from other utilities into the standards. These activities supported the prudent and successful deployment of covered conductor. Further detailed discussion regarding these activities is found in SCE's response to Critical Issue SCE-03, Part C.

C. ASSET MANAGEMENT AND INSPECTIONS (7.3.4)

For this category, SCE has selected Distribution High Fire Risk-Informed (HFRI) (IN-1.1) inspections as an example. This section describes how the scope and location of Distribution HFRI inspections were selected.

1. Evaluation (or Reassessment) and Prioritization of Wildfire/PSPS Risks

Normal wear and tear and deterioration of overhead structures and assets (such as poles, crossarms, transformers, fuses, conductors, etc.) increases the probability of failures and faults, and the associated risk of ignitions that involve electrical infrastructure. SCE's Distribution Enhanced Overhead Inspections (EOI) program in 2019 validated that the requirements, scope, and frequency of compliance-driven grid patrols and overhead detailed inspections were insufficient for purposes of detecting a large number of potential hazards. Not remediating such potential hazards would increase the risk of wildfire ignition in HFRA.

After inspecting each overhead asset in HFRA as part of HFRI, SCE transitioned to a risk-informed prioritization in 2020 using POI and consequence of ignitions for each asset in scope. While the 2020 scope for inspections was based on the Reax consequence model, the 2021 scope is based on the Technosylva model. SCE also updated its probability of ignition models, which were used to inform our 2021 scoping of work. Both the POI models and Technosylva scoring are discussed in detail in Chapter 4 of SCE's WMP. This risk modeling was used to determine the scope of inspections under this initiative, as described below.

2. Identifying Mitigations

Modify or Identify New Activities or Alternatives

Detailed inspections serve as one method of identifying potential equipment failures or foreign objects that may contact equipment and result in an ignition. The Commission has recognized this principle and determined that periodic detailed inspections are an effective mitigation. Accordingly, GO 165 requires that utilities perform a detailed inspection of their overhead assets at least once every five years. However, there is also a risk that equipment or structure degradation will occur between compliance cycle inspections. Such degradation is often due to natural wear and tear or emergent events such as weather or third party-caused damages.

In addition, GO 165 requirements are based on safety and reliability, not necessarily addressing all potential ignition risks, and could typically be performed using ground inspections. To address ignition risks more comprehensively, additional and more frequent inspections are needed. Moreover, SCE determined aerial inspections could meaningfully supplement ground-based inspections to identify deterioration or unfavorable asset conditions that are not visible from the ground. Since SCE had already made a determination to perform additional inspections going beyond minimum regulatory requirements and to employ aerial inspections, the alternatives for this initiative focused on varying the amount of structures inspected in 2021.

3. Evaluating and Selecting Mitigation

Figure SCE 9.9-9

Mitigation: Distribution High Fire Risk-Informed (HFRI) Inspections

	Features that can dissuade selecting the initiative	Features that can encourage selecting an initiative
Risk Analysis - Risk Drivers and Consequences Addressed	Risk drivers and consequences not adequately addressed	Many risk drivers and consequences addressed or only initiative to address specific risk-driver(s)
Risk Analysis - Risk Reduced	Low magnitude of risk reduction	High magnitude of wildfire and/or PSPS risk reduction
Risk Analysis - Risk Spend Efficiency (RSE)	Low RSE	High RSE
Operational Feasibility / Lead Time to Deployment	Limited or constrained ability to execute; Longer lead time than alternatives	No operational constraints; Shorter lead time than alternatives
Cost to Customers	Higher cost impacts	Lower cost impacts
Enabling Activity / Add'l Benefits	Does not enable other initiatives; Limited or no non-wildfire benefits (e.g. reliability)	Additional non-wildfire benefits; Necessary for the successful deployment of other initiatives
Compliance Requirements / Regulatory Guidance	N/A (Does not factor into selection)	Meet compliance requirements, aligns with regulatory guidance
Resource Availability	Resource constraints prevent near-term implementation	Resources fully available to plan and execute work

Decision-Making Factors

Below, SCE provides additional details regarding how the various alternatives were evaluated using the key decision-making factors.

1. Risk Analysis

   a. Risk Drivers / Consequences Addressed

Distribution HFRI inspections identify a broad set of drivers of wildfire ignitions and faults across Equipment Failure and Contact from Object drivers. For example, HFRI inspections identify certain drivers of Contact from Object such as vegetation and animal nests. The inspections also identify certain drivers of Equipment Failure such as pole deterioration, splice damage and insulator failures. While traditional inspection programs focus on whether an existing asset conforms to broad Commission-defined compliance requirements, HFRI inspections focus in addition on whether an existing asset meets ignition-focused safety criteria that were only recently informed by ignition risk analyses. Furthermore, while traditional inspection programs only require data collection when a remediation was needed, HFRI inspections collect additional asset attribute data (asset type, asset condition, etc.). In this way, HFRI inspections help create a baseline for asset information in HFRA, the results of which can be used to develop and deploy other wildfire mitigation initiatives.

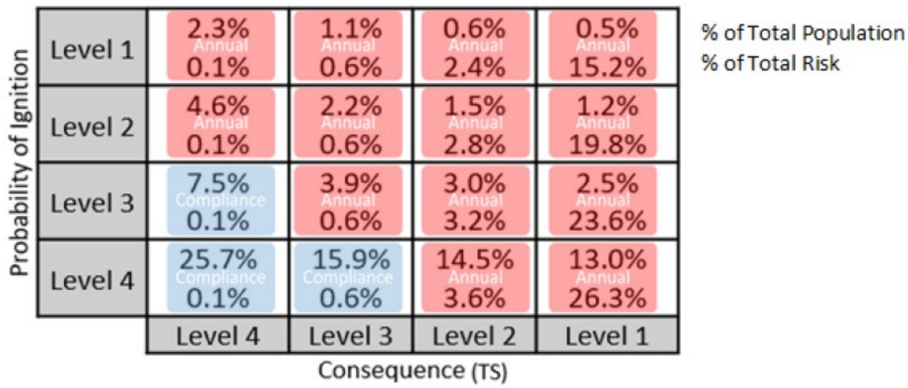
b. Level of risk reduction

As described above, SCE constructed a risk model that provided a risk score for each structure within HFRA. In determining the 2021 inspection scope, SCE created a 4 x 4 matrix to allow for a structure-by-structure evaluation. One dimension of the matrix represented four levels of POI risk and the other dimension represented four levels of consequence, with level one being the highest risk and level four being the lowest risk. Each structure was scored and mapped to a box in the matrix based on its POI and consequence. Next, different inspection scenarios were evaluated. In these scenarios, the inspection frequencies were varied based on the POI and Consequence risk level in the 4x4 matrix. The number of inspections, amount of risk inspected, and the cost were compared for each scenario.

After evaluating the scenarios, SCE selected the scenario shown in Figure SCE 7-4 below. In this scenario, the highest-risk structures (i.e., those mapped to the red boxes) will be inspected in 2021. The structures represent 59% of the total Distribution structures in HFRA. This scenario was chosen because it provides a high level of risk reduction as measured by the sum of the risk of the structures inspected. The total risk inspected for the chosen scenario was 99%. The blue boxes represent assets that pose relatively low risk in terms of probability and consequence of ignition but inspecting and remediating them would substantially increase costs. On the other hand, not inspecting and remediating the assets represented in the red boxes would leave substantial unmitigated risks in SCE's HFRA. In addition, any structures due for a compliance inspection in 2021, regardless of which box they mapped to, are included in 2021 scope.

HFRI inspections result in notifications if remediations are necessary. The notifications are prioritized based on estimated severity and impact, and higher priority notifications are remediated faster. Priority 1 (P1) issues require remediation as soon as the issue is discovered, either by fully remediating the condition, or by temporarily repairing the equipment or structure to allow for follow-up corrective action. Examples of P1 issues include vegetation touching lines, broken crossarms or insulators, burned connectors, or wires laying on crossarms. P1 issues are typically made safe within 24 hours and remediated within 72 hours. Priority 2 (P2) issues are lower risk and therefore may be resolved within 24 months based on the existing safety or reliability condition and location. If the P2 issue is located within HFRA and poses a potential fire risk, remediation work is scheduled to be completed within 12 months. In an extreme fire threat area of Tier 3, the maximum remediation time is within 6 months. Examples of P2 issues include vegetation near lines, deteriorated crossarms or splices, or insufficient pole depth.

Figure SCE 9.9-10
Visualization of Risk Analysis



c. Risk Spend Efficiency

The RSE calculations for Distribution HFRI Inspections (ground and aerial) and corresponding distribution remediations were combined.[160] Inspections by themselves do not reduce risk but are necessary to identify equipment conditions that require remediations; these remediations reduce risks. The relatively high RSE value supported the continued need for this program to proactively identify equipment failures and potentially hazardous conditions before an ignition could occur.

2. Operational Feasibility / Lead Time to Deployment

All of the scope scenarios considered were operationally feasible. Inspection scope requires a relatively short lead time as compared to other mitigation activities, and therefore risk on the system is identified relatively quickly. Pursuant to GO 95 Rule 18, remediation of identified wildfire risks must be completed within twelve months or earlier, depending on priority level and HFRA Tier in which the structure is located. Therefore, the most pressing risks are remediated relatively quickly. Typically, SCE strives to determine inspection scope in Q4 of the year preceding the inspection plan to allow adequate time for the detailed inspection plans to be developed for the following year.

3. Cost to Customers

The costs to inspect and then remediate the corresponding findings from the inspections were one of the factors examined in the decision-making process. However, prioritization was necessarily given to the risk reduction benefits achieved by performing more inspections and accompanying remediations.

[160] Please see SCE's response to Critical Issue SCE-01 for RSE scores separated for Distribution Ground and Distribution Aerial Inspections and Remediations.

4. Enabling Activity / Technology / Additional Benefits

Though HFRI inspections are not undertaken to enable other wildfire mitigation activities, they do assist in identifying and remediating Priority 1 and Priority 2 conditions, thereby enhancing safety and reliability of the grid beyond wildfire risk mitigation.

Further, the detailed asset data captured from HFRI inspections provides additional asset health and inventory information. This information is used to update and enhance the predictive accuracy of wildfire risk models (probability of ignition models) as well as expand risk models to cover assets not previously covered (e.g., cross-arms).

5. Compliance Requirement/Regulatory Guidance

As noted above, there is a compliance requirement to perform detailed inspections throughout SCE's service territory; HFRI encompasses these compliance requirements. However, more frequent discretionary inspections are prudent to reduce the risk of ignitions. Therefore, SCE considered various scenarios for HFRI inspections that went beyond compliance requirements.

6. Resource Availability

When evaluating various levels of risk-informed inspections and the corresponding remediations, SCE considered execution feasibility to help ensure that sufficient qualified resources would be available to support the alternatives considered. Across the alternatives considered, there were no prohibitive concerns with having the requisite resources to perform the work.

Mitigation Selection and Approval

The inspection scope options were reviewed by SCE's Leadership Team. After considering the key factors discussed above, with specific consideration to the risk reduction and costs associated with different inspection options, SCE selected the option set forth in our WMP. This allows for maximizing risk reduction by inspecting and remediating structures that account for the vast majority of risk associated with structures in HFRA.

4. Scoping & Deploying Mitigation

As described above, the structures selected for inspection are prioritized by risk. Once the total inspection scope is determined, execution groups develop an implementation plan that is operationally efficient and takes into account weather and other constraints when performing inspections in different environments across our service territory. The HFRI inspections begin in January and target completion of all inspections before fire season starts. Remediations are prioritized based on the High-Fire Threat District and the severity of the condition.

Inspection and remediation progress are tracked against the plan to help ensure timely completion. SCE also monitors its inspections and remediations to identify process improvements and software enhancements to improve the quality and efficiency. Lastly, the inspection "find rates" are also tracked, and help inform planning for the following year.

D. VEGETATION MANAGEMENT AND INSPECTIONS (7.3.5)

For this category, SCE has selected the Hazard Tree Mitigation Program (HTMP) (VM-1) as an example.

1. Evaluation (or Reassessment) and Prioritization of Wildfire/PSPS Risks

Historically, SCE's Tree Caused Circuit Interruption (TCCI) data has identified a significant number of faults in SCE's HFRA caused by trees "falling in" or branches / fronds "blowing in" to SCE lines and equipment. These trees were typically outside of the compliance clearance zone. Some visually healthy trees that were far enough from SCE lines and equipment to meet clearance requirements still pose a threat of falling during high wind conditions and striking SCE facilities, depending on condition of the tree and other site-specific factors. Branches or fronds getting dislodged from trees near electrical facilities also have a higher probability of blowing into the lines and equipment and causing faults that can potentially initiate an ignition.

2. Identifying Mitigations

Modify or Identify New Activities or Alternatives

As discussed in SCEs 2021 General Rate Case,[161] SCE's Vegetation Management organization performs field reviews and tracks TCCIs to determine the cause of vegetation failures and if the interruption resulted from vegetation within the GO 95 Rule 35-mandated clearance area (CPUC compliance zone). This data shows that approximately 90 percent of TCCIs originate outside the CPUC compliance zone, resulting from trees that fall over, break off and blow into lines, or palm fronds that fly into SCE facilities. Therefore, removing live trees and vegetation within the Utility Strike Zone (USZ) that pose a threat to SCE facilities is critical to lowering the risk of these vegetation-related faults and ignitions.

HTMP entails detailed inspection and evaluation of living trees that pose risks despite trimming and pruning, and appropriate mitigations, up to the level of removing these trees. Detailed inspections for HTMP involve a two-level assessment process. A Level 1 visual assessment is performed to determine if the tree is within the USZ and has the capability to strike SCE facilities if it fails. If a tree meets these criteria, a Level 2 assessment of the tree is conducted using SCE's tree risk calculator.

In the third quarter of 2020, an independent study was performed by an external firm specializing in distribution engineering and arboriculture to evaluate the effectiveness of SCE's tree risk calculator for identifying and mitigating hazard trees. The report concluded that SCE's HTMP and the tree risk calculator provide an effective and necessary approach to identifying and assessing trees that may be a potential hazard to electrical facilities and pose a risk of wildfire ignition.

A potential alternative is Covered Conductor installation. Covered conductor would address *some* of the risk associated with fall-ins or blow-ins, but it would not address *all* of the risks that HTMP would address – for example, it would not address the risk of a heavy branch or tree falling into the lines and breaking the conductor/bringing it or other electrical facilities down. Therefore, while covered conductor does not represent a true alternative to HTMP, we include covered conductor as a consideration in framing the decision to select HTMP, because both mitigations address some of the same risks. Moreover, HTMP and covered conductor serve to *complement* each other in their abilities to reduce wildfire risk.

Another potential alternative is Undergrounding of Overhead Lines.

[161] A.19-08-013. Exhibit SCE-02, Volume 6.

3. Evaluating & Selecting Mitigation

Figure SCE 9.9-11

	Mitigation: Hazard Tree Mitigation Program (HTMP) Features that can dissuade selecting the initiative	Features that can encourage selecting an initiative
Risk Analysis - Risk Drivers and Consequences Addressed	Risk drivers and consequences not adequately addressed	Many risk drivers and consequences addressed or only initiative to address specific risk-driver(s)
Risk Analysis - Risk Reduced	Low magnitude of risk reduction	High magnitude of wildfire and/or PSPS risk reduction
Risk Analysis - Risk Spend Efficiency (RSE)	Low RSE	High RSE
Operational Feasibility / Lead Time to Deployment	Limited or constrained ability to execute; Longer lead time than alternatives	No operational constraints; Shorter lead time than alternatives
Cost to Customers	Higher cost impacts	Lower cost impacts
Enabling Activity / Add'l Benefits	Does not enable other initiatives; Limited or no non-wildfire benefits (e.g. reliability)	Additional non-wildfire benefits; Necessary for the successful deployment of other initiatives
Compliance Requirements / Regulatory Guidance	N/A (Does not factor into selection)	Meet compliance requirements, aligns with regulatory guidance
Resource Availability	Resource constraints prevent near-term implementation	Resources fully available to plan and execute work

Decision-Making Factors

Below, SCE provides additional details regarding how the various alternatives were evaluated using the key decision-making factors.

1. Risk Analysis
    a. HTMP: This activity implements permanent risk reduction solutions for contact from high-risk trees when removal is prescribed. The RSE score for HTMP is relatively moderate (1,602).

    b. Covered Conductor: While covered conductor can prevent some vegetation blow-in faults, it cannot prevent a fault in cases where a tree or tree limb falls against a line with enough force to break the pole/conductor. In these instances, Covered Conductor is considered a complementary mitigating activity to HTMP. Accordingly, while covered conductor has a high RSE (4,192 in Tier 3) and delivers a large amount of risk reduction, it does not sufficiently reduce the risk associated with this specific sub-driver.

   c. Undergrounding of Overhead Lines: While undergrounding would prevent faults or ignitions associated with any vegetation fall-in or blow-in, the RSE (347 in Tier 3) is relatively low.

2. Operational Feasibility and Lead Time to Deployment
   a. HTMP: HTMP work has a relatively short lead-time to deployment. Mitigations are typically performed within 180 days following the initial hazard tree assessment, contingent on having the site access and authority to perform the mitigation. Lead time for tree mitigation can be affected by coordination with State and Federal agencies and compliance with applicable environmental laws.

   b. Covered Conductor: Covered conductor deployment takes significantly longer than HTMP. It can typically take 16-22 months from performing initial scoping to completing the installation of the covered conductor.

   c. Undergrounding of Overhead Lines: Undergrounding is not always operationally feasible due to topography and other considerations. Moreover, of all the alternatives, it requires the greatest lead time to implement. Thus, it takes longer to mitigate the risk with undergrounding.

3. Cost to Customers
   a. HTMP costs are moderate relative to SCE's portfolio of mitigations. In terms of ability to mitigate fall-in risk, HTMP and undergrounding represent the two mitigations that show the most promise. However, when considering system-wide application, undergrounding is cost-prohibitive, whereas HTMP is not.

4. Enabling Activity / Technology / Additional Benefits
   a. None of these solutions are considered enabling activities.

5. Compliance Requirement
   a. None of the considered mitigations are driven by a compliance requirement.

6. Resource Availability
   a. HTMP: The availability of workforce (International Society of Arboriculture (ISA) Certified Arborists) influences the scope and pace of tree assessments. To date, this has not proven to be a significant barrier in selecting this mitigation.

   b. Covered Conductor: While resources are already being dedicated to covered conductor projects, designing a covered conductor program to specifically mitigate the sub-driver of TCCIs would likely require additional planning, prioritization, and additional resources.

c. Undergrounding of Overhead Line: Will require resources inclusive of the scoping, planning, and construction workforce.

Mitigation Selection & Approval

After a thorough evaluation of these various decision factors, SCE leadership approved moving forward with HTMP to address the identified risk. As previously discussed, while covered conductor can prevent contact from object faults, it cannot prevent a fault in cases where a tree falls against a line with enough force to break the pole/conductor. Accordingly, it is not a complete alternative to HTMP.

In general, undergrounding of overhead conductor provides the greatest wildfire mitigation effectiveness compared to other alternatives. However, undergrounding is significantly more difficult to deploy at the scale required to sufficiently address the fall-in risk across HFRA. It is also much more operationally complex to deploy and is not always feasible depending on local terrain and site conditions. Finally, the time required to deploy undergrounding is significantly longer than the time required to deploy HTMP. Thus, HTMP addresses and mitigates risks more rapidly than undergrounding.

4. Scoping & Deploying Mitigation

SCE uses a Tree Risk Assessment Calculator to determine whether removal of a tree is necessary or if other remediations would suffice (such as, for example, aggressive trimming, topping, or branch removal). For trees in HFRA that are within the strike zone of overhead facilities, ISA Certified arborists perform detailed assessments and classify tree hazards based on tree characteristics (e.g., deteriorated trunk, roots or limbs, dead palm fronds, etc.) and site characteristics (e.g., soil condition, previous fire damage, high wind areas, etc.).

The Tree Risk Calculator assigns a risk score based on the individual tree's "likelihood of failure" and an "Impact Strike Score." The likelihood-of-failure determination takes tree height, site conditions, tree lean, and tree defects into account. The Impact Strike Score determination incorporates factors such as line voltage impact, fire impact, and likelihood of impact. Each of these factors requires detailed evaluation. Each tree is assigned a risk score ranging from 0 to 100 using a tree risk calculator. ISA-certified arborists can apply professional judgment as appropriate in adjusting these risk scores when it is warranted in addition to providing mitigation options. Trees that score 50 or more are typically mitigated, since they are considered more vulnerable to falling or have branches or leaves that are more vulnerable to dislodging and striking nearby electrical facilities.

Additionally, SCE considers risk in determining areas to prioritize for tree assessment. The strategy is designed to first target assessment and mitigation of trees that have a higher likelihood of striking SCE's equipment. In prioritizing HTMP tree assessment and mitigation work, SCE utilizes a methodology that first considers areas posing the highest risk to public safety and property damage. It does so by evaluating factors such as fire threat area tier, fuel loading surrounding SCE's facilities, permit and environmental considerations, and population density. Those highest-consequence areas are then considered against other factors such as tree density immediately adjacent to lines, known vegetation issues, deployment of other wildfire mitigations, and scheduling efficiency.[162]

[162] A.19-08-013. Exhibit SCE-02, Volume 6.

E. GRID OPERATIONS AND PROTOCOLS (7.3.6)

For this category, SCE has selected Customer Care Programs (PSPS-2) as an example, with a specific focus on Community Resource Centers (CRC) and Community Crew Vehicles (CCV).

1. Evaluation (or Reassessment) and Prioritization of Wildfire/PSPS Risks

While Public Safety Power Shutoff (PSPS) is an effective mitigation against ignitions during periods of high fire risk and typically has significantly lower public safety risks compared to wildfire risks, it also introduces hardships for our customers and communities. Some examples include customers' inability to charge communication devices and medical equipment, lack of power to pump well-water, or absence of access to de-energization information (including event duration). These risks may affect customers' ability to manage the impacts of a PSPS de-energization, absent the customer having the tools or back-ups to tolerate such impacts.

To enhance customer resilience, SCE considered mitigations that may address the following needs associated with proactive de-energizations:

- heating and cooling needs
- power needs for medical/healthcare devices
- backup power needs for essential services
- device charging needs
- information needs
- well water pumping needs
- comfort needs (restrooms, water)
- Smart Meter for alerts
- meter mounted adaptors
- bulk water delivery

2. Identifying Mitigations

Identification of Existing Activities
Customer resilience with regard to PSPS impacts depends on a combination of the level of individual preparedness (e.g., having a back-up generator) and practical support that SCE and others can offer to help reduce customer impacts from PSPS. For SCE, this support includes CRCs and CCVs.

SCE began deploying CCVs in early 2019 to enable the charging of portable mobile devices, provide information about PSPS events, distribute water and snacks, and assist customers in connection with account services such as updating their contact information and enrolling in outage alert notification. In late 2019, SCE opened CRCs at various locations. The brick-and-mortar nature of CRCs enhanced the services already provided by CCVs by allowing customers to be served indoors and providing access to restrooms.

In response to the COVID-19 pandemic, SCE packaged information, services, and resources into customer resiliency kits that could be distributed to customers with minimal contact. A customer resiliency kit includes a reusable tote bag, emergency LED lightbulb or flashlight, pre-charged phone battery, personal protective equipment (e.g., masks, hand sanitizers, etc.), a bottle of water, and snacks. These customer resiliency kits, along with ice or ice vouchers, are distributed at both CRC and CCV locations.

SCE uses mobile CCVs to reach impacted communities that do not have a CRC location in their community, or to supplement CRCs as needed to support impacted communities. SCE has designed and outfitted eight cargo transit vans and box trucks as CCVs with the required equipment and technology that enable SCE staff to transport and distribute water, snacks, portable charging devices, lights, and other amenities to communities potentially impacted by a PSPS de-energization event.

The purpose of CRCs and CCVs is to assist customers by providing certain temporary stop-gap resources to help mitigate the impact of a PSPS event. They also provide customers with guidance on how to be more prepared for future PSPS events. However, CRCs and CCVs do not directly address all customer impacts from PSPS de-energizations. Therefore, SCE explored and implemented new or alternative solutions identified below.

Modify or Identify New Activities or Alternatives

Beyond the existing CRC and CCV activities already in place, SCE identified several other alternatives that could aid in reducing the impacts of PSPS:

- Resilient CRCs: Existing CRCs in remote communities impacted by PSPS events receive the installation of switching infrastructure and deployment of a temporary generator to the CRC during PSPS events if they meet eligibility criteria.
- Cooling Centers: Provides customers relief from summer heat events in approximately 250 locations through cities and counties; serves as an alternative or supplement to CRCs.
- Critical Care Backup Battery (CCBB): Provides eligible customers who are enrolled in SCE's Medical Baseline program, CARE or FERA, and reside in a HFRA with a free portable backup battery to enable temporary power to their medical equipment during a PSPS de-energization event.
- Customer Resiliency Equipment Incentive (CREI): This pilot fully funds the installation cost of a microgrid control system at two customer sites (a retrofit and new build).
- Resiliency Zones: Provides in-front or behind-the-meter temporary generation during PSPS events to support impacted communities being able to continue to access or obtain essential services such as food, fuel, medicine, and other public safety services in remote communities.
- Residential Portable Power Station: Provides a financial rebate to customers to purchase a portable battery to power small devices and appliances.
- Portable Generator Rebates: Provides financial rebates toward the purchase of a portable generator to customers that are dependent on electricity to pump water.
- Bulk Water: Provides delivery of water via water tenders to rural locations that depend on pumping to access water for home and/or livestock needs.
- Meter-Mounted Adaptor: Provides installation of a meter-mounted adaptor to quickly connect a portable generator to a customer electrical panel.
- Smart Meter Alerts: Would utilize smart meters communication capabilities to convey an alert about a PSPS event.

3. Evaluating and Selecting Mitigation

Figure SCE 9.9-12

Mitigation: Customer Care Programs

	Features that can dissuade selecting the initiative	Features that can encourage selecting an initiative
Risk Analysis - Risk Drivers and Consequences Addressed	Risk drivers and consequences not adequately addressed	Many risk drivers and consequences addressed or only initiative to address specific risk-driver(s)
Risk Analysis - Risk Reduced	Low magnitude of risk reduction	High magnitude of wildfire and/or PSPS risk reduction
Risk Analysis - Risk Spend Efficiency (RSE)	Low RSE	High RSE
Operational Feasibility / Lead Time to Deployment	Limited or constrained ability to execute; Longer lead time than alternatives	No operational constraints; Shorter lead time than alternatives
Cost to Customers	Higher cost impacts	Lower cost impacts
Enabling Activity / Add'l Benefits	Does not enable other initiatives; Limited or no non-wildfire benefits (e.g. reliability)	Additional non-wildfire benefits; Necessary for the successful deployment of other initiatives
Compliance Requirements / Regulatory Guidance	N/A (Does not factor into selection)	Meet compliance requirements, aligns with regulatory guidance
Resource Availability	Resource constraints prevent near-term implementation	Resources fully available to plan and execute work

Decision-Making Factors

Below, SCE provides additional details regarding how the various alternatives were evaluated using the key decision-making factors.

1. Risk Analysis
   a) The RSE for providing CRCs and CRVs is relatively low (188). However, as mentioned previously, RSE is just one factor considered in selecting activities.

b) CCBB does not reduce wildfire risk or consequence but does reduce the consequence of PSPS. The RSE for this initiative is relatively low (22), but necessary to support a subset of customers with specific safety needs.

c) Other alternatives addressing PSPS risk were described above.

2. Operational Feasibility / Lead Time to Deployment
   a. CRCs: Regulations/policies and availability of compliant spaces govern the ability to deploy CRCs. For example, the facility needs to be compliant with certain restrictions on hours of operation, with American Disabilities Act (ADA) provisions, and with egress and ingress requirements. We site CRCs based on a combination of factors, including a forecast of highly impacted circuits and feedback from stakeholder groups, including local government and various community-based organizations. Because PSPS represents a measure of last resort and is determined based on actual weather conditions, the time available to deploy a CRC for a PSPS event can be short. SCE currently has a portfolio of 60 contracted CRCs that allows us to promptly set up CRCs. SCE stands up pop-up CRCs in consultation with the local government if there is not already a pre-contracted CRC in the impacted community.

   b. CCVs – CCVs can be quickly activated to serve customers and can be set up in open areas without a standing facility and/or in remote areas. CCVs are especially useful in limiting indoor interactions in light of the COVID-19 pandemic.

   c. Cooling Centers – Deployment is dependent on several factors, such as contractual obligations, policy restrictions, geographic location, and the partnership with cities and counties.

   d. Resiliency Zones – The time required to complete the installation of switching infrastructure at an essential site depends on the identification of sites, and customer agreement to participate in the Pilot. Total time to complete a project is between six and eight months. This time period includes site evaluation, permitting, ordering of materials, etc.

   e. CCBB – Participation pivots on the customer's level of interest in enrolling in the program. Once enrolled, customers are assessed for a battery, and work with the program contractor to schedule an appointment to deploy the backup battery.

   f. Portable power stations / generator – implementation time depends on customer uptake / participation.

   g. Water Tenders – timing depends on contracts with water tender companies.

   h. Meter-Mounted Adaptors – depends on the time to market product to customers and sign up customers to participate, as well as procure the necessary equipment.

   i. Smart Meter Alerts – depends on the time required to procure equipment and develop software or coding for messaging capabilities (dependent on message type/content). Longer lead time is implicated here.
3. Cost to Customers

a. The costs of the various options considered are relatively low in relation to SCE's overall wildfire mitigation portfolio. Individual initiatives discussed can vary from <$1M (portable power stations and portable generator rebates) to ~$12M (CCBB).
    a. CCBB: ~$12M
    b. CREI: $200K
    c. Resiliency Zones: ~$3M
    d. Resilient CRCs: ~$1M
    e. Portable power stations and portable generator rebates: $400K
    f. CRC/CCVs: $1M
    g. Water Tenders, Smart Meter alerts – costs were not calculated (see mitigation approval section below)
    h. Meter-Mounted Adaptors: $150K (to pilot)

4. Enabling Activity / Technology / Additional Benefits
    a. The identified options are not enabling activities.

5. Compliance Requirement / Regulatory Guidance
    a. CRCs: SCE is required to have CRCs available to customers pursuant to Phase 2 of the PSPS OIR.[163]

    b. Rebates, Cooling Centers (not required for PSPS), CCVs, CREI, Resiliency Zones, Bulk Water, Meter-Mounted Adaptors, and Smart Meter Alerts: These options are not driven by compliance requirements.

    c. Battery Backup: Senate Bill (SB) 167 authorizes electrical corporations to deploy backup electrical resources or provide financial assistance for backup electrical resources to customers that receive medical baseline allowances and that also meet specified requirements. While this is not a compliance requirement, stakeholders have strongly encouraged SCE to offer this option to the targeted audience.

6. Resource Availability
    a. None of the alternatives considered have experienced resource constraints to date. The preparation work to ensure their availability is done beforehand (e.g., CRCs) or they are currently limited scale pilots (e.g., CREI).

Mitigation Selection & Approval

In evaluating the risks and mitigation options, and the various decision factors discussed above, SCE determined that continuing its CRC and CCV efforts was prudent. Not only are CRCs required, but they serve as a valuable mechanism to support and reduce the impacts to those impacted by PSPS events. Further, SCE looked at the unique needs of customers and particular circumstances that could be best addressed through a portfolio of customer-focused initiatives.

[163] Decision (D.) 20-05-051 Adopting Phase 2 Updated and Additional Guidelines for De-energization of Electric Facilities to Mitigate Wildfire Risk, issued June 5, 2020.

Initiative recommendations may come from an external community request, or from an internal recommendation. SCE reviews program recommendations to prioritize and implement the highest-priority items. For example, the well water generator program was developed in response to feedback from communities in Acton and Agua Dulce that de-energization results in a loss of their ability to move water. After gathering feedback, conducting an assessment, and developing the program requirements, SCE has now successfully implemented the pilot program.

Some alternatives posed significant challenges and were therefore ruled out. A suggestion was received to activate more cooling centers. However, SCE does not have direct contracts with cooling centers which are administered by cities and counties. Moreover, the locations of the available cooling centers do not match the locations of anticipated PSPS events and CRCs.

Water Tenders were not implemented due to community feedback and the limited resources (vendors) available to provide services. The Meter-Mounted Adaptor alternative was delayed and not implemented based on safety concerns that surfaced in connection with lab tests. Smart Meter alerts were not implemented due to concerns regarding multiple notification/alerts occurring from different sources, potentially resulting in customer confusion.

Given the above-mentioned considerations, SCE decided to proceed with adding the following programs in addition to its CRC/CCV offerings:

- Critical Care Backup Battery (CCBB)
- Customer Resiliency Equipment Incentive (CREI)
- Resiliency Zones
- Residential Portable Power Station / Portable Generator Rebates
- Resilient CRCs

Collectively, these programs comprise the portfolio of Customer Care Programs (PSPS-2) discussed in SCE's 2021 WMP Update. Resiliency Zone and Residential Portable Power Station/Portable Generator Rebates were implemented as pilots in 2020.

4. Scoping & Deploying Mitigation

CRCs are activated and CCVs are dispatched to communities that are impacted by a PSPS de-energization event. When contracting with sites to host CRCs, SCE targets communities using the following factors: (1) circuit locations impacted during the prior wildfire seasons; (2) circuits likely to be impacted by PSPS events in the coming year (this analysis considers Access and Functional Needs and other customer groups); (3) population density; (4) special needs within the community; and (5) feedback from internal and external stakeholder groups such as local government and various community-based organizations.

SCE first prioritized securing locations to serve as CRCs. This was followed by outreach to CRC site/building owners with whom SCE has existing contracts in remote communities. We performed this outreach to discuss resiliency needs (for Resilient CRCs) in the form of a transfer switch installation and temporary mobile backup generator provided by SCE. Looking ahead to the next two to four years, SCE will adjust CRC needs and locations based on: (a) grid hardening completed; (b) reduced need to rely on PSPS; and (c) feedback from customers and community stakeholder groups. For all other mitigations within the Customer Care Program, SCE scopes and deploys as follows:

- CCBB targets CARE/FERA customers who are enrolled in the Medical Baseline program in HFRAs in 2021.

- Community Resiliency Equipment Incentive (CREI) was deployed as a pilot based on community outreach and taking into account whether the site had a resiliency strategy, including solar and/or battery.

- Resiliency Zones were deployed based on identifying seven rural communities with essential service needs, followed by community outreach for site selection and participation.

- Resilient CRCs target sites are rural CRCs within HFRAs that are subject to frequent PSPS.

- Resiliency rebates are offered for both Portable Power Stations and Portable Generators. A portable power station rebate is currently available for all SCE customers. The portable generator rebate targets (a) CARE/FERA customers in HFRA that depend on water pumping for access to water ($500 rebate); and (b) all other customers in HFRA that depend on water pumping ($300 rebate).

9.10 SCE-03: Inadequate Justification for Extensive Utilization of Covered Conductors

WSD's Critical Issue Explanation: *SCE fails to provide adequate justification to support its selection of covered conductors in the mitigation initiative selection process. SCE does not provide RSE estimates for alternative mitigation initiatives, precluding a meaningful comparison between initiatives and resulting in a lack of evidence to support SCE's selection of covered conductors. Additionally, SCE attempts to justify its plan for extensive, expedited covered conductor installation with the unsupported assertion that covered conductor installation is the sole mitigation alternative that will allow SCE to increase wind speed thresholds for Public Safety Power Shutoffs (PSPS). SCE fails justify this assertion and fails to commit to PSPS reductions post-covered conductor installation.*[164]

SCE's Wildfire Covered Conductor Program (WCCP) deployment is SCE's primary wildfire risk mitigation program developed after detailed risk analysis and benchmarking across other utilities, both in the United States and abroad. Before providing our responses to the four specific questions regarding covered conductor required by the revision notice, we provide some additional background on why SCE selected covered conductor – through the Wildfire Covered Conductor Program (WCCP) – as its hallmark wildfire risk mitigation tool. We also further explain how SCE's proposed scope is appropriate and necessarily to aggressively buy down wildfire risk for customers across SCE's HFRA.

Background on Selection and Scope of the Covered Conductor Program as SCE's Principal Risk Mitigation Tool

a. SCE's Covered Conductor Program is the most practical solution to comprehensively reduce wildfire risk in a timely manner across the HFRA

Historical analysis of ignitions shows that faults associated with overhead conductor are the leading cause of ignitions associated with utility infrastructure. Over the last five years, the ignition frequency from Contact from Object (CFO),[165] conductor failure[166] and Wire-to-Wire contact in SCE's service area have averaged ~70%[167] of the total overall relevant ignitions in SCE's HFRA service area. Therefore, reducing the probability of faults associated with overhead conductor due to contact with vegetation, other objects such as flying debris, or adjacent conductors was deemed to be the highest priority in combating wildfire risks. Installing insulated conductors is one of the very few ways to substantially reduce the probability of faults associated with overhead conductor from such drivers. Of the 38 other activities included in SCE's 2021 WMP update, as explained at length in SCE's 2021 GRC Track 1 testimony, and further evaluated in SCE's response to Revision SCE-02, there are only two practical like-for-like alternatives to covered conductor that provide the same or more risk reduction benefits: repeated use of PSPS or widespread undergrounding.[168] The former is not a desirable primary long-term strategy and the latter is financially

[164] Revision Notice, p. 8. (Internal citations omitted)
[165] Contact from Object risk sub-drivers: Animal, Balloons, Vegetation, Vehicle, and Unspecified.
[166] Conductor failure includes, conductor failure, splice failures, jumper failures and connector failures.
[167] Calculation from SCE reportable events in High Fire Areas 2015 - 2020
[168] In SCE's 2021 WMP Update Revision 1 in response to directives SCE-02 and SCE-03, SCE also discussed additional potential "alternatives" to covered conductor, *e.g.*, replacing bare wire with bare wire, partial covered conductor. SCE evaluates these alternatives in response to Critical Issue SCE-02.

prohibitive, requires long planning and execution horizons, and in many cases is infeasible from a practical perspective. The table below summarizes the factors considered in evaluating alternatives and demonstrates why covered conductor was selected as SCE's preferred alternative for broad deployment.

Table SCE 9.10-1
Weighing Covered Conductor Alternatives

Alternatives Considered	Pros	Cons
Undergrounding	• Addresses most risk drivers associated with overhead conductor failure	• Significantly more expensive than covered conductor on an average ($3.4 million/ mi)[169] • Significantly lower RSE compared to covered conductor (347 vs. 4,192) • Substantial portion of SCE's over 9,600 circuit miles of overhead conductor in HFRA are in terrain that is not conducive to undergrounding (e.g. rocky, close to the ocean, etc.) • Longer lead times to deploy due to permitting and resource needs meaning will take much longer to mitigate wildfire risks
Covered Conductor Deployment	• Highly effective at mitigating risk drivers (~64%) • Highest RSE of all SCE WMP activities • Lower costs than undergrounding ($456k per mile on an average[170]) • Can be deployed much faster than undergrounding to mitigate wildfire risks • Has much longer useful life (~45 years) than temporary PSPS events	• Does not fully address all drivers of overhead conductor-related ignition risks (e.g., tree fall-ins, car-hit-pole, certain snow or ice conditions)
Other Alternatives	• See Critical Issue SCE-02 for more details on previously-considered alternatives (e.g., partial covered conductor and insulated sleeves) • See Part C of this response for an evaluation of emerging alternative technologies	
PSPS	• Can be targeted based on near term forecasts or actual conditions and deployed immediately as a mitigation of last resort	• Causes customer hardships and not a sustainable long-term solution • Not used under all operating conditions; used only as a measure of last resort

Covered conductor is also cost effective in comparison to other wildfire mitigation programs and initiatives. However, while RSEs are an important consideration in selecting risk mitigation programs and prioritizing deployment, they are not the only consideration. For example, resource availability to perform the necessary work in a timely manner is an important operational consideration. The same engineers, planners, and field crews who would perform much of the wildfire mitigation work have historically performed other important work on our system. SCE has reallocated a significant amount of these resources to address public safety risks associated with wildfires, while simultaneously maintaining similar

[169] A.19-08-013 SCE-04 Volume 5A (2018 constant dollars)
[170] A.19-08-013 SCE-15 Volume 5 (2018 constant dollars)

resources to serve the foundational needs of the electric system (e.g., restoration of service, storm, infrastructure replacement, new service connections, load growth). Nevertheless, constraints on hiring, onboarding and training resources are important factors in selecting wildfire mitigation activities and pace. SCE developed a comprehensive and balanced mitigation plan with activities that will collectively reduce the greatest amount of risk in the shortest amount of time, considering RSEs as well as various regulatory, operational, resource, and cost constraints.[171]

It should also be noted that SCE's pilot initiatives are not realistic alternatives to covered conductor deployment, but instead are promising, potentially complementary risk mitigation tools. SCE continues to pursue those pilot initiatives as appropriate, and as previously encouraged by the Commission and WSD.[172] But those efforts should be viewed as in addition to – not in lieu of – continued implementation of SCE's most important wildfire mitigation and public safety initiative, *i.e.*, WCCP. This is covered in more detail in SCE's response to question "c".

The WCCP is one of the most important activities in SCE's WMP, however, it was not undertaken to completely eliminate wildfire risks in SCE's HFRA. When fully deployed, WCCP can mitigate approximately 60% of the total risk of wildfires associated with utility equipment, and complements SCE's various other WMP initiatives, including high fire risk informed inspections, line clearing and the Hazard Tree Mitigation Program (HTMP). SCE will continue to surgically and sparingly use the Commission-approved tool of PSPS only when necessary as a measure of last resort to protect public safety, especially as grid hardening measures such as WCCP is ongoing.

b. The Scope of SCE's Covered Conductor Program is Necessary and Appropriate to Mitigate Risk to Customers and Communities

While SCE prioritizes covered conductor deployment in the riskiest areas of its system, SCE also proposed a total scope of covered conductor deployment to address locations that have high wildfire risk, and to not shortsightedly focus on the limited areas that have the highest relative risk.

Following the devastating wildfires of 2017 and 2018, the Legislature enacted SB 901, which required the utilities to develop and implement comprehensive WMPs. Pursuant to that statute, each utility "shall construct, maintain, and operate its electrical lines and equipment in a manner that will *minimize* the risk of catastrophic wildfire posed by those electrical lines and equipment."[173] In order to achieve this risk reduction, a utility's wildfire mitigation programs must be designed "to ensure its system will achieve the *highest* level of safety, reliability, and resiliency, and to ensure that its system is prepared for a major event, including hardening and modernizing its infrastructure with improved engineering, system design, standards, equipment, and facilities …."[174]

As discussed below, SCE has selected its covered conductor scope based on actual or absolute (as opposed to relative) risk each circuit mile is expected to mitigate. Risk from overhead conductor is not uniformly distributed across SCE's HFRA. Many locations pose significantly higher relative risk compared to others, and some locations pose extraordinarily high relative risks. Therefore, risk reduction and RSE of covered conductor deployment for these locations are significantly higher than others. When the overhead

[171] *See* 2021 GRC Exhibit SCE-15, Vol. 05, p. 20.

[172] *See* D.19-05-038 (approving SCE's 2019 WMP) at p. 33: "We also support SCE's proposal to investigate the alternative technologies it lists …."

[173] Cal. Pub. Util. Code Section 8386(a) (emphasis added).

[174] Cal. Pub. Util. Code Section 8386(c)(13) (emphasis added).

conductor circuit segments in SCE's HFRA are ranked by risk or RSE, it might appear as though the marginal (or *relative*) risk reduction diminishes towards the right-hand side of the relative risk curve for covered conductor deployment. However, such a graph does not capture the actual (or *absolute*) risk being reduced with every addition mile of covered conductor deployment. The RSEs for locations with lower relative risks are undoubtedly lower than for locations with higher relative risk, but the objective of the WMPs are not only to address the highest risk assets or locations, but rather to address all locations that pose high wildfire risks. Focusing only on relative risk to define overall scope would not be sufficient or acceptable as customers residing in locations with *relatively* lower risk still face significant *absolute* risk. The table below (reproduction of a table included in SCE's GRC testimony) summarizes the relative risk ranking of circuit miles and the corresponding absolute risk impacts covered conductor deployment will be mitigating.

Table SCE 9.10-2
Average Wildfire Consequence Along the Relative Risk Buydown Curve[175]

Tranches of Cumulative Miles on Risk Curve	Average Reax Score for Tranche[176]	Average Wildfire Consequence per Mile for Tranche[177]
0-1,250	6,849	272 structures and 33,036 acres
1,251-2,500	1,291	107 structures and 16,830 acres
2,501-3,750	371	69 structures and 8,617 acres
3,751-5,000	104	42 structures and 4,102 acres
5,001-6,250	24	23 structures and 1,597 acres
6,251-7,500	3	9 structures and 334 acres
7,501+	0	1 structure and 23 acres

This data clearly demonstrates that ignitions associated with points along the far right-hand side of the risk curve could lead to destructive wildfires, and consequences can be further exacerbated depending on actual weather and fuel conditions and third-party fire-fighting abilities to effectively contain resulting wildfires.[178] There are a significant number of homes and businesses that could be impacted by potential wildfires starting much further along the risk curve. For example, an ignition on the 3,000th rank circuit mile could impact 69 structures and 8,617 acres on an average. An ignition on the 6,000th rank circuit mile could impact 23 structures and 1,597 acres on an average. These are clearly important risks that SCE took into account in determining its proposed covered conductor scope. The table also shows the mathematical result of SCE's then-current risk estimation, where locations that could on an average have

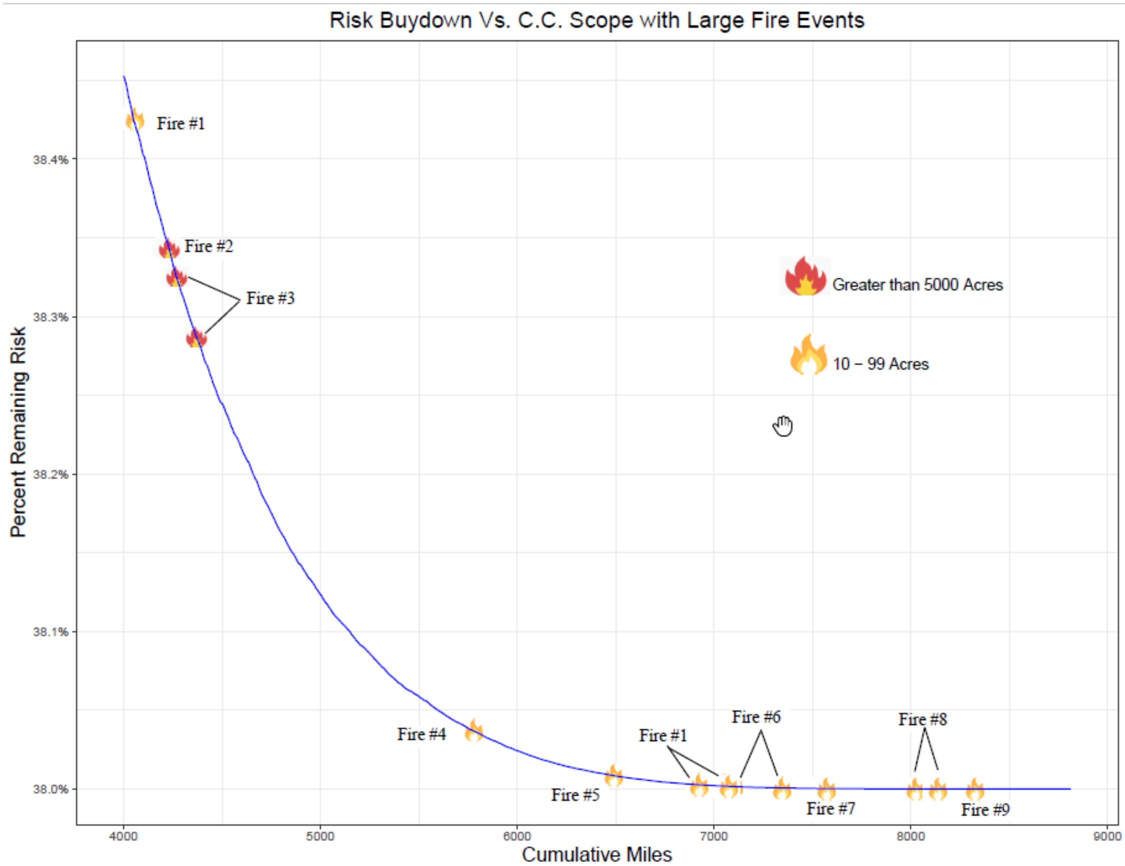
[175] See Exhibit SCE-15, Vol. 05, p. 22, Table II-7 in A.19-08-013.
[176] Rounded to nearest whole number. Reax values are derived from current DOTS 2.0 risk-prioritization model.
[177] Rounded to nearest whole numbers. Consequence data from original methodology used to populate illustrative risk buydown curve shown in SCE's direct testimony and TURN's testimony in the GRC. SCE has also "mapped" the consequence data to current DOTS 2.0 model.
[178] *See* Exhibit SCE-15, Vol. 05, p. 21 in A.19-08-013.

consequences that are ~11 times higher in terms of structures destroyed or ~21 times higher in terms of acres burned, have risk scores that are ~285 higher, illustrating that using relative risk reduction in this context has its limitations for defining scope. SCE's risk modeling has been updated since the GRC testimony was submitted, but the concepts remain unchanged and valid.

In fact, actual – not theoretical – destructive wildfires recently have occurred in SCE's service area on circuit-segments located in areas much further down the risk buydown curve that would remain uncovered under a more limited deployment scenario.[179] This is unsurprising: Almost every mile of prospective covered conductor installation will occur in areas the Commission has already deemed inherently dangerous by designating them as Tier 3 and Tier 2 HFTD. The figure below (reproduced from SCE's 2021 GRC testimony) shows large historical reportable ignitions which have occurred since 2014 on the updated risk curve (X-axis scale adjusted to start at 4,000th highest risk circuit mile). There have been two recent ignitions greater than 5,000 acres which occurred up to the 4,500 mile-mark and several fires occurred in locations that are ranked much lower risk. Given adverse weather and fuel conditions, constrained firefighting capability, increasing population in wildland urban interface and worsening effects of climate change, any of these fires could have significant safety, reliability and financial impact on our customers. In other words, while the relative modeled risk reduction does decrease beyond 2,110 miles, there is substantial *actual* risk – not just modeled risk – proven to have occurred beyond 2,110 miles.

[179] *See* Exhibit SCE-15, Vol. 05, pp. 24-25 in A.19-08-013.

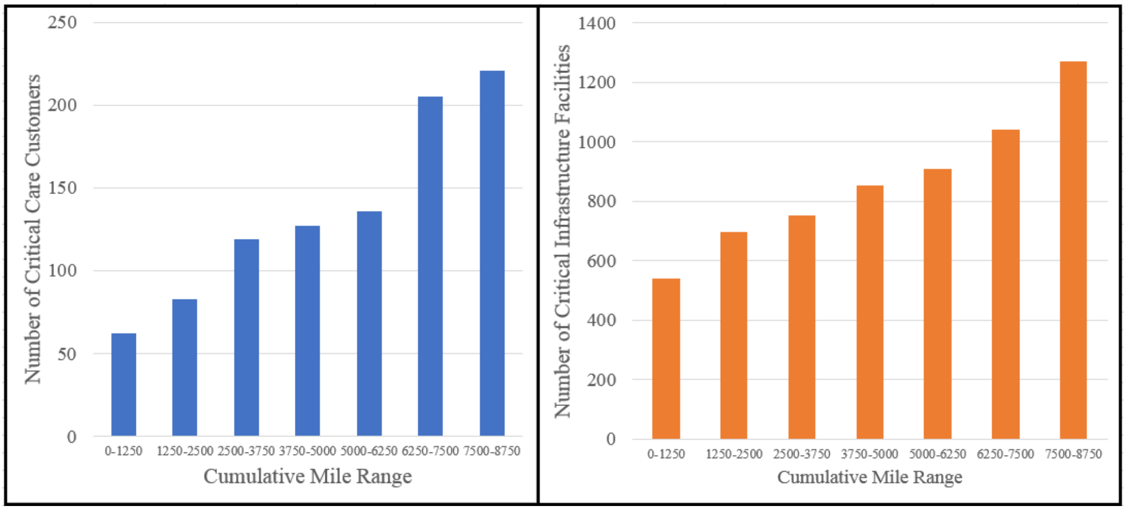
Figure SCE 9.10-1
Overlay of Historical Large Fire Events
on SCE's Relative Risk Buydown Curve[180]



Further, the locations that have lower relative risk serve some of SCE's most vulnerable residential customers and essential services facilities in areas throughout the risk curve.[181] The figure below from SCE's 2021 GRC rebuttal testimony shows the number of Critical Care customers[182] and Critical Infrastructure facilities by cumulative circuit miles on the risk curve. A much more limited deployment scope would leave out hundreds of critical care customers and thousands of critical infrastructure facilities from wildfire risk mitigation activities.[183]

[180] *See* Exhibit SCE-15, Vol. 05E3, p. 25E, Figure II-3 in A.19-08-013; *see also* Exhibit TURN-78 in A.19-08-013.
[181] These residential customers are classified as critical care customers, which means they depend on the use of life-supporting medical devices for their survival and cannot tolerate loss of electricity sources for two or more hours. *See* D.19-05-042 for the definition of "critical facilities, "which are facilities and infrastructure that are essential to the public safety and that require additional assistance and advance planning to ensure resiliency during de-energization events.
[182]Customers who are enrolled in SCE's medical baseline program and whose physician has indicated that medical equipment is used for life support purposes (i.e., customer cannot be without life support equipment for at least two hours) are identified upon enrollment as Critical Care customers.
[183] *See* Exhibit SCE-15, Vol. 05, pp. 22-23 in A.19-08-013.

Figure SCE 9.10-2
Histograms of the Number of Critical Care Customers (Left) and Critical Infrastructures Facilities (Right) Along the Relative Risk Buydown Curve[184]



Moreover, the statement that "SCE's current covered conductor installation plan also fails to address the riskiest circuit segments identified, with only 581 miles of highest risk circuits in the 1,883 miles of planned covered conductor projects"[185] is both inaccurate and irrelevant. It is inaccurate because that figure is derived from SCE's planned *2021 deployment only* (as calculated at the time of SCE's response to a data request – SCE's current 2021 plan for those circuits is 694 miles).[186] It is irrelevant because it is derived from Cal Advocates' list of SCE's 71 "riskiest" circuits – not circuit segments. SCE appropriately prioritizes covered conductor deployment on the most relatively risky circuit segments, and different segments of overall circuits often have markedly different relative risk scores.

With that background explanation and context, below SCE directly responds to the four revision requests set forth in Critical Issue SCE-03.

[184] *See* Exhibit SCE-15, Vol. 05, p. 24, Figure II-2 in A.19-08-013.
[185] Revision Notice, p. 8.
[186] It is also worth noting that we deployed an additional 733 miles of covered conductor circuit miles on the Cal Advocates-selected circuits prior to 2021 and have currently scoped an additional 465 miles of covered conductor circuit miles on the Cal Advocates-selected circuits post-2021.

Responses to Four Critical Issues

1. USING THE RSE ESTIMATES PROVIDED IN SCE-01 AND SCE-02 ABOVE, SCE SHALL FULLY AND ADEQUATELY DEMONSTRATE WHY IT HAS SELECTED COVERED CONDUCTORS OVER ALTERNATIVE INITIATIVES IN ITS DECISION-MAKING PROCESS. IN PARTICULAR, SCE SHALL DEMONSTRATE:

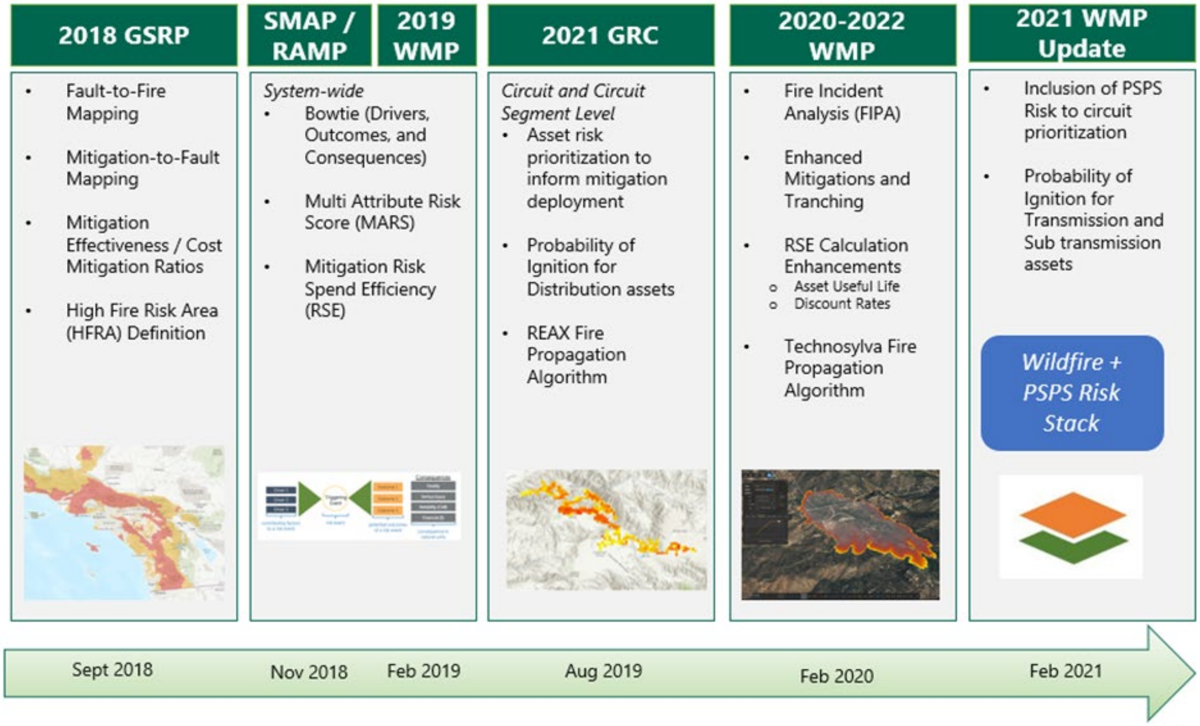
A. HOW THE LOCATION OF COVERED CONDUCTOR INSTALLATION IS FOCUSED ON ITS HIGHEST WILDFIRE RISK CIRCUIT SEGMENTS

The Commission has defined levels of risk in its development of the CPUC Fire-Threat Map after careful consideration and analysis.[187] This map identifies areas designated as Tier 3 – areas with extreme wildfire risk; and Tier 2 – areas with elevated wildfire risk. SCE's risk analysis helped determine the assets that posed the highest risks (overhead conductors) and the most cost-effective solution at an enterprise level (covered conductor). SCE's WCCP forecast is for deploying covered conductor almost exclusively within these "extreme" and "elevated" risk areas.[188] In other words, the Commission has already decided that the areas SCE will protect with covered conductor are inherently risky. When prioritizing the location of covered conductor installation within these inherently risky areas, SCE uses the most accurate risk model available at that time supplemented with operational factors for efficiency.

SCE selects circuit segments using risk analysis results in conjunction with factors such as bundling work by location to improve efficiency and reduce customer outages (pulling forward scope that would have been eventually covered) and swapping higher rank circuit segments with lower rank circuit segments if the former requires longer permitting timelines. In some instances, the scope is extended beyond risk prioritized segments for ease of constructability or to reduce PSPS scope. For example, SCE may choose to extend the reconductor to an existing dead-end to avoid installing a guy wire on private property or reconductor up to an automated device. If a particular bare wire segment has been recently replaced as part of a different capital program, SCE may choose not to deploy covered conductor on the relatively new segments.

[187] *See* D.17-12-024.
[188] In August 2019, SCE filed a Petition for Modification (PFM) of D.17-12-024, in which SCE proposed to officially add approximately 1% of SCE's non-CPUC-designated high fire risk area (HFRA) to the CPUC High Fire Threat District (HFTD) map. This area was considered to have a relatively higher potential for a fire to propagate than other non-CPUC HFRA. SCE's PFM was granted in material part by the Commission in D.20-12-030. SCE's amended GRC testimony, Exhibit SCE-04, Vol. 05A (submitted on November 22, 2019), reflected the areas that SCE filed in its PFM. *See also* July 5, 2019 AL 4030-E. *See* Section II.B.1.c)(3) for operational realities that may also require covered conductor outside of SCE's HFRA.

Figure SCE 9.10-3
Evolution of SCE's Wildfire (and PSPS) Risk Modeling



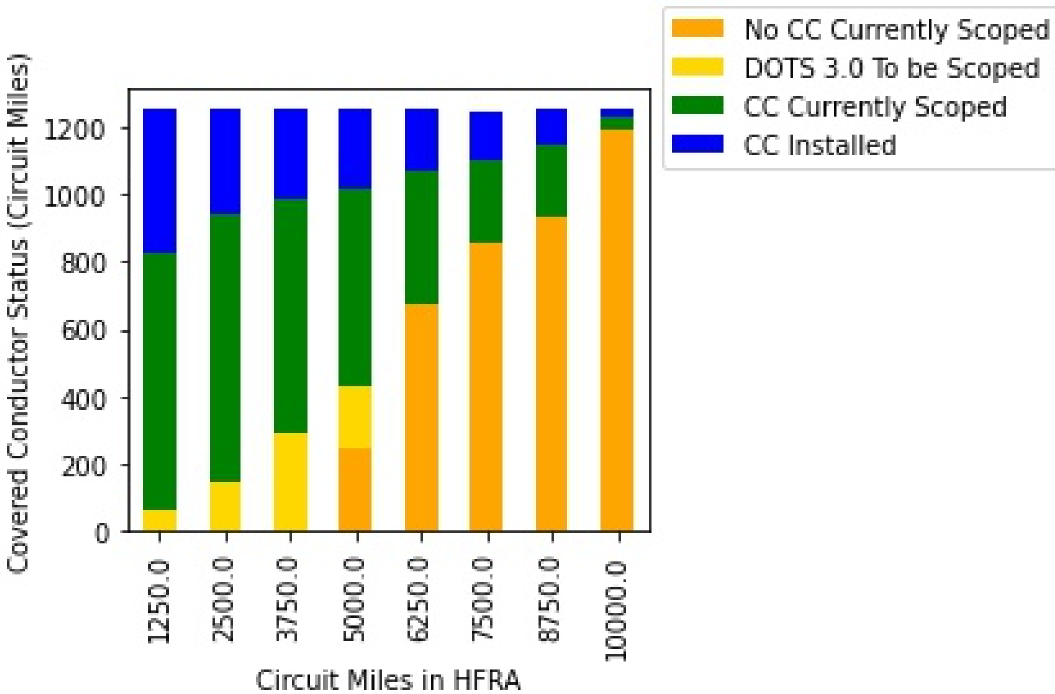
In addition, as shown in the figure above, SCE has continued to refine its risk models. As SCE's risk modeling capability progressed, SCE considered it prudent to transition covered conductor deployment prioritization using the latest risk analysis results to the extent practicable. If design or construction has ensued for a particular segment, SCE completes the work even if a newer risk model scores the segment at a lower priority as it would be impractical or infeasible to pull the scope back. Moreover, deploying covered conductor on a lower ranked circuit still reduces overall risk, albeit by a relatively smaller amount. On the other hand, higher ranked segments cannot be immediately included in covered conductor deployment scope as the general lead time to construction including designing, permitting and schedule can take approximately 16 to 22 months, and lower ranked circuits may be used to continue mitigating overall risk.

Therefore, due to operational considerations and transition between risk models, even when using a specific risk priority ranking, circuit segments actually completed will not exactly match the latest mathematical risk ranking. This means that current WMP scope may include circuits identified as higher priority via previous generation risk prioritization methodology, but lower priority based on the latest risk methodology.

The plot below shows the covered conductor status in circuit miles (installed, scoped, or not scoped) in 1,250 HFRA circuit segment miles tranches. These 1,250 HFRA circuit miles tranches are grouped and ordered based on risk, with the highest risk segments grouped first. As illustrated, the circuit-segments with the highest risk for the first 2,500 circuit miles have been mostly either installed or scoped. Additionally, a significant amount of covered conductor is installed or scoped through the first 3,750 conductor miles. There is a small amount of covered conductor installed at relatively lower risk segments that were identified by previous scoping methodology, including scoping based on circuit-level risk –

which can include relatively lower risk circuit segments. There are also circuit segments scoped in the last two tranches that will be either removed or reprioritized depending on where the scopes are in the execution cycle. The following plot is based on DOTS 3.0, SCE's latest risk model. However, current scoped and constructed circuits are based on previous iterations of SCE's Wildfire Risk Models (note that SCE has continuously enhanced its risk models over the years). Therefore, newly identified relatively higher-risk segments are not yet scoped; this is highlighted in yellow "DOTS 3.0 To be Scoped" in the plot below in the first three tranches.

Figure SCE 9.10-4
Covered Conductor Scope Status Relative to Circuit Mile Risk Tranches in HFRA



B. HOW THE LOCATION OF COVERED CONDUCTOR INSTALLATION IS FOCUSED ON CIRCUITS THAT ARE SUBJECT TO FREQUENT PSPS EVENTS

Overall wildfire risk reduction continues to be the primary criterion for prioritizing where covered conductor is installed. However, recent experience has demonstrated that risk ranking of circuit segments using wildfire risk scores does not always perfectly coincide with risk ranking of circuit segments by PSPS impacts. Therefore, SCE has implemented an Expedited Grid Hardening Plan to accelerate covered conductor installation in selected locations most frequently impacted by recent PSPS events. This plan is central to our PSPS Action Plan efforts, which are fur

ther detailed in response to Critical Issue SCE-04 and within Chapter 8 of SCE's WMP.

The Expedited Grid Hardening Plan is focused on SCE's 72 "Frequently Impacted Circuits" (FICs), which have experienced four or more PSPS de-energization counts from 2019-2021. SCE has developed customized recommendations for each of these 72 circuits and placed particular emphasis on the feasibility of accelerating deployment of grid hardening options including covered conductor installation. Specifically, the plan includes the installation of approximately 700 miles of covered conductor on these 72 circuits. Approximately 85% of these miles were already planned for 2021 installation irrespective of PSPS benefits because of their high wildfire risk and, as part of the Expedited Grid Hardening Plan, SCE is targeting completion prior to October 2021. The remaining 15% of these miles were anticipated for installation in later years and, as part of the Expedited Grid Hardening Plan, SCE has accelerated these miles to 2021 and is similarly targeting completion prior to October. In both instances, SCE is merely "pulling forward" covered conductor scope that would have been completed even in the absence of any PSPS overlay.

C. THE EFFECTIVENESS OF COVERED CONDUCTORS BOTH IN-FIELD AND LONG-TERM IN COMPARISON TO OTHER ALTERNATIVE INITIATIVES

SCE selected covered conductor as a wildfire risk mitigation measure after careful and extensive research and evaluation. Since it has only been a little over two years since broad deployment in SCE's service area, it is too early to have a final post-deployment effectiveness evaluation. However, we are confident of the effectiveness of covered conductor in preventing faults associated with contact with foreign objects or wire to wire contact from occurring and avoiding ignitions at the site of the fault and potential failure of upstream conductor based on the rigorous testing, extensive evaluation of engineering and technical performance, and comprehensive benchmarking efforts performed to determine its viability and benefits.

Benchmarking

SCE has benchmarked with the following utilities regarding covered conductor: S. Korea (Korea Electric Power Company – KEPCO), Australia (Ausnet), Massachusetts (National Grid, Groveland Light, Holyoke, Middleton), New Hampshire (Eversource, Liberty Utilities), New York (Con Edison, Orange and Rockland Utilities), Washington (Seattle City Light, Puget Sound Energy), and Colorado (United Power).[189] Covered conductor has been successfully deployed in other countries. For example, following the devastating bushfires in Australia, the 2009 Victorian Bushfires Royal Commission issued a report listing a variety of recommendations, among which were installing covered conductor and removing trees outside of the clearance zone that could come into contact with an electrical power line.[190] The implementation of such multiple mitigations has resulted in marked improvements in bushfire risk performance.[191]

Through benchmarking, SCE found that covered conductor deployment in various utilities was meant to either mitigate ignitions, increase reliability, and/or increase public safety. In the Northeastern United States, where forested areas make up a significant portion of the terrain, utilities deployed covered conductor to prevent faults caused by vegetation contact. KEPCO, on the other hand, started deploying covered conductor in the late 1970s to increase public safety. Presently, KEPCO's distribution system is 100% covered conductor. Ausnet, an Australian utility, deployed covered conductor for wildfire mitigation. Ausnet has provided examples where covered conductor was successful in preventing potential ignition, such as when a storm blew a cypress tree onto an overhead covered conductor line.

SCE also learned how to mitigate past issues that these utilities encountered. For example, after learning that lightning protection was a key component to preventing covered conductor failure, SCE ensured that its covered conductor standards incorporated increased lightning protection. Additionally, SCE learned that using porcelain insulators with covered conductor could result in covering damage. Therefore, SCE designed its covered conductor standards to require exclusively polymer insulators. In New England, where some utilities have installed covered conductor in 80% of their distribution system, utilities indicated that covered conductor looked and performed the same as bare wire after more than 50 years of service.

[189] *See* R.18-10-007 Data Request MGRA-SCE-003 (attached hereto as Appendix A, p. A13).
[190] *See* http://royalcommission.vic.gov.au/finaldocuments/summary/PF/VBRC_Summary_PF.pdf at p. 29.
[191] *See, e.g.,* Bryant, Phil, Ausnet Services, "Meeting our bushfire safety obligations" dated June 15, 2018, p. 36, available at https://www.ausnetservices.com.au/-/media/Files/AusNet/About-Us/Determining-Revenues/Distribution-Network/Customer-Forum/Weeks-3-and-4/Bushfire-safety-obligations.ashx?la=en.

Design Standards and Testing

While SCE had never issued a large-scale deployment of covered conductor for wildfire mitigation before 2018, covered conductor was not new to SCE. Prior to SCE's targeted deployment of covered conductor in high fire risk areas (HFRA), SCE utilized an older version of covered conductor in heavily forested areas to prevent faults from vegetation contact.

Prior to selection of covered conductor for broad deployment in HFRA, SCE updated its covered conductor specifications from the ones that were previously used and performed engineering analysis and supported testing on covered conductor to evaluate its effectiveness for mitigating incidental contact with a variety of objects, as detailed in the GSRP workpaper, "Engineering Analysis on the Impacts of Contact from Objects on Bare vs. Covered Conductors."[192] During this test, SCE simulated and empirically tested various objects making contact with the covered conductor. Specifically, cases tested include vegetation contact, wildlife contact, metallic balloon contact, and conductor-to-conductor contact. Both simulation and empirical testing validated the ability of covered conductor to withstand contact from various objects without a high fault current or arcing. The empirical results showed that using covered conductors eliminated sparking, limited energy to less than one watt and reduced current into an object to much less than one milliamps (mA). Putting this into perspective, a typical cell phone charges at 3 to 4 watts, while a charger left unplugged without a phone consumes 1 to 2 watts, meaning that the highest power calculated is in the low-end range of a cell phone charger unplugged from a phone. Overall, the simulation and test demonstrated that the use of covered conductors can prevent phase-to-phase and phase-to-ground faults and mitigate ignition risk from associated arcing or sparking.[193]

SCE further required qualification testing by manufacturers to assess the longevity and performance of covered conductor. These tests included ultraviolet (UV) exposure, track resistance performance, and maximum dielectric constant measurements. All tests conformed to established industry standards.[194] UV testing accurately predicts, on an accelerated basis, the effect of sunlight. The test is meant to induce property changes associated with end of use conditions. Track resistance testing evaluates the tracking and erosion resistance of the covering. Tracking is the process of electrical discharges creating a partially conducting path on the surface of the covering. This process leads to erosion on the covering. Lastly, the covered conductor is required to meet a maximum dielectric constant per industry standards. Dielectric constant is a quantity measuring the ability of a substance to store electrical energy in an electric field. The purpose of the test is to ensure that the insulation strength of the covering is acceptable, and the covered conductor will perform as designed in terms of preventing contact-related faults.

Effectiveness Analysis Post Deployment

Beyond the research, evaluation and analysis conducted by SCE before deciding to pursue covered conductor as a key cornerstone of its wildfire mitigation portfolio, SCE has also begun analyzing early data associated with its rollout. Since 2018, SCE has documented known contact-related events with covered conductor. In one instance, a tree fell on covered conductor lines, making contact with all three phases. In another case, energized covered conductor lines fell into adjacent trees after a vehicle struck a pole, as

[192] *See* GSRP Work Paper Vol. 1 (An Engineering Analysis on the Impacts of Contact from Objects (CFO) on Bare vs. Covered Conductors.

[193] *See* R. Bravo, E. Pham, A. Luy, J. Rorabaugh and E. Hutchinson, "12kV Covered Conductor Testing," 2020 IEEE/PES Transmission and Distribution Conference and Exposition (T&D), 2020, pp. 1-5, doi: 10.1109/TD39804.2020.9300013.

[194] *See* Insulated Cable Engineers Association, Inc., *Standard for Tree Wire and Messenger Supported Spacer Cable*, ANSI/ICEA S-12-733 (2016).

shown in Figure SCE 9.10-5. These did not result in faults, wires down, or ignitions because covered conductor was deployed. A fault would have occurred if this were bare wire, which could result in possible ignition, as experienced in previous events. To date, no CPUC-reportable ignitions resulting from contact from object, wire-to-wire, or wires down have been reported on circuit segments where covered conductor has been deployed.

Figure SCE 9.10-5
Covered Conductor Contact with Vegetation After Car-Hit-Pole
Ojai, California – July 24, 2020

The table below summarizes data from five circuits that both experienced CPUC-reportable ignition events from 2016 to 2020 and subsequently had covered conductor installed. Since covered conductor deployment in these circuits, no ignition associated with the risk drivers covered conductor is designed to prevent, namely contact from object, wire-to-wire contact, and equipment failure have occurred.[195] Though the data is limited, the early outcomes are promising and validate SCE's benchmarking and testing results.

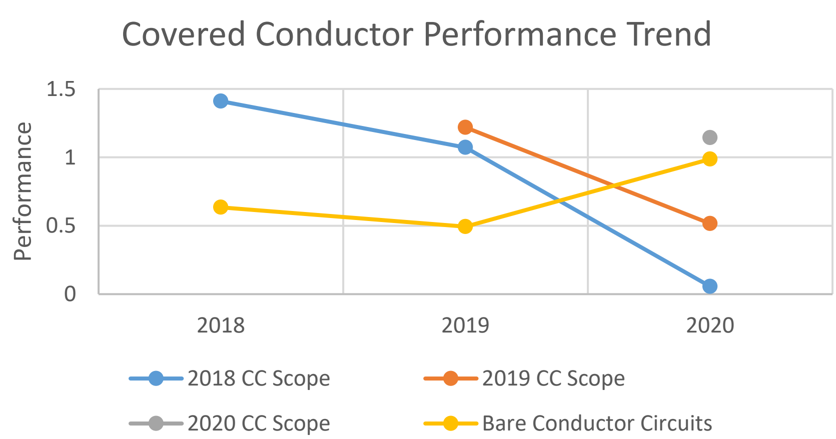
[195] After covered conductor installation, a non-CPUC-reportable minor ignition associated with the Jordan circuit occurred due to improper construction installation that was subsequently corrected.

Table SCE 9.10-3
Pre/Post Covered Conductor Installation Ignition Tracking

Circuit	# of Months Pre-CC (Dating Back to 1/1/16)	# of Months Post-CC (upto 12/31/20)	# of Ignitions Pre-CC (Dating Back to 1/1/16)	# of Ignitions Post-CC (upto 12/31/20)	# of Ignitions per Month Pre-CC (Dating Back to 1/1/16)	# of Ignitions per Month (Post-CC to 12/31/20)
BUCKHORN	44.8	15.2	1	0	0.022	0
CARVER	47.1	12.9	1	0	0.021	0
HUGHES LAKE	112.6	7.4	2	0	0.036	0
JORDAN	54.6	5.4	1	0	0.018	0
THACHER	59.2	0.8	1	0	0.017	0
Sum	318.3	41.7	6	0	0.114	0 [196]

SCE also compared the performance for bare wire and covered conductor as summarized in the figure below. Comparing ratio of number of outages in a given year to the 10-year historical average number of outages from 2007-2017 shows that while the ratio has increased for bare wire circuit segments, it has improved significantly for the circuit segments where covered conductors was installed. Please note that this ratio was higher for covered conductor in the year of deployment as covered conductor scope included circuit segments that had high risk scores and each subsequent year has a lower starting point as the higher risk segments have been mitigated.

Figure SCE 9.10-6
Covered Conductor Outage Performance Compared to Bare Conductor[197]



Alternatives Analysis

SCE evaluated covered conductor against insulated sleeves, leaving the wire bare, only installing partial covered conductor on some phases, along with undergrounding. In the case of deploying insulated sleeves, SCE concluded that the product was very labor intensive and difficult to install. It also tends to shrink over time, thus leaving portions of the bare wire exposed increasing ignition risk. Bare wire and undergrounding were also evaluated[198] but covered conductor has the greatest mitigation to cost ratio, i.e., it has the greatest overall customer benefit per dollar spent as compared to bare wire and underground conversion. Additionally, partial covered conductor was evaluated under two scenarios: 1) only the centered phase was covered and 2) only the two other phases were covered. These options did

[196] SCE notes that this preliminary data is not normalized for factors such as weather and exogenous events.
[197] Note that all of the covered conductor outage data is associated with HFRA and the vast majority of the bare circuit data is associated with HFRA.
[198] Mitigation Effectiveness Comparison – Amended Supporting Section IV(B)(1)(c) of the GSRP.

not provide the full benefit of fully covered conductor systems, and provided only minimal potential cost savings, because the relative cost of the covered conductor versus bare wire is not significant.

Compared to viable alternatives with significant risk reduction benefits, specifically undergrounding and PSPS, covered conductor has proven to be more cost-effective (versus the former) with less societal impacts (versus the latter) as described in more detail in Table SCE 9.10-1 earlier in this response.

Table 9.10-4 shown below provides a summary of the efficacy of various alternatives versus covered conductor across the various ignition drivers, with the Harvey Balls ranging from fully shaded meaning greater than 75% effectiveness to un-shaded meaning no effectiveness against the drivers. Though undergrounding provides the best ignition mitigation measures, it is the highest cost option to deploy and requires the most amount of time to plan and construct. Covered conductor, on the other hand, provides substantial ignition mitigation measures across the various drivers, and can be deployed much more cost effectively and with greater speed.

SCE made the decision to pursue covered conductor only after extensive evaluation and deliberation with technical experts, alternatives analysis and testing. As TURN recently acknowledged, "if targeted properly, covered conductor can be an important and extremely effective wildfire risk mitigation tool."[199]

Note that the mitigation effectiveness of the various drivers is not additive. Doing so does not account for potentially overlapping benefits between alternative mitigation activities and deployment limitations. For this reason, SCE's selection of mitigations takes potential overlap into consideration.

[199] *See* Exhibit TURN-02, p. 8 in A.18-09-002, the GSRP proceeding.

Table SCE 9.10-4
Comparison of Covered Conductor and Alternatives Mitigation Effectiveness

Driver	Sub-Driver	Covered Conductor	Insulated Sleeves	Partial Covered Conductor (Center Phase)	Partial Covered Conductor (Out Phases)	Bare Conductor	UG
Contact From Object	Veg. Contact	◕	◕	◔	◑	○	●
	Animal Contact	●	●	◑	◕	○	●
	Balloon Contact	●	●	◑	◕	○	●
	Car Hit Pole	◕	◕	◔	◑	○	●
	Other Contact	●	●	◑	◕	○	●
	Unknown Contact	●	●	◑	◕	○	○
Wire-to-wire contact	Wire-to-wire Contact/Contamination	●	●	◑	◕	○	●
Contamination	Contamination	○	○	○	○	○	●
Utility Work	Utility Work/Operation	○	○	○	○	○	●
Vandalism	Vandalism/Theft	○	○	○	○	○	●
Equipment Facility Failure	Connector Damage/Failure	●	○	●	●	●	○
	Splice Damage/Failure	●	○	●	●	●	○
	Crossarm Damage/Failure	◕	○	◕	◕	◕	●
	Lightning Arrester Damage/Failure	○	○	○	○	○	●
	Other Damage/Failure	○	○	○	○	○	●
	Capacitor Bank Damage/Failure	○	○	○	○	○	●
	Conductor Damage/Failure	●	○	●	●	●	●
	Fuse Damage/Failure	○	○	○	○	○	●
	Switch Damage/Failure	○	○	○	○	○	●
	Pole Damage/Failure	○	○	○	○	○	●
	Insulator Damage/Failure	●	○	●	●	●	●
	Voltage Regultor Damage/Failure	○	○	○	○	○	●
	Recloser Damage/Failure	○	○	○	○	○	●
	Anchor/Guy Damage/Failure	○	○	○	○	○	●
	Sectionalizer Damage/Failure	○	○	○	○	○	●
	Connection Device Damage/Failure	○	○	○	○	○	●
	Transformer Damage/Failure	○	○	○	○	○	●

Other alternative technologies and mitigations such as replacing fuses, installing fast curve, and RAR/RCS as well as newer technologies SCE is exploring including Rapid Earth Fault Current Limiter (REFCL) technologies, Distribution Open Phase Detection (D-OPD), Early Fault Detection (EFD) and Distributed Fault Anticipation (DFA) can act to complement covered conductor to help further reduce ignition risks that remain with application of covered conductor alone. Some of these technologies have conceptual potential to mitigate certain wildfire risks but are still under development and evaluation for practical applications in SCE's distribution system. Others are expected to reduce ignition risk for sections of circuits where covered conductors have not been deployed and equipment/poles have not been hardened. In addition, various technologies will complement each other to reduce the risk of various ignition sources, types of faults and complexity of system configuration. These alternative technologies, which are in varying stages of demonstration and deployment, are summarized briefly below and described in greater detail in Section 7.1.4.

- **Fuse Replacements and Fast Curve Installations:** These mitigations are intended to reduce fault energy, and primarily provide benefit once a fault has occurred as opposed to covered conductor which targets fault prevention. These mitigations can be rapidly deployed across the existing system and are considered directly transferable to covered conductor systems to help reduce fault energy should a fault occur.

- **REFCL:** The REFCL program is piloting ways to reduce energy released from ground faults to the point that ignition is unlikely. SCE's 2021 projects include a Ground Fault Neutralizer, the resonant grounding of a substation, monitoring of one overhead REFCL isolation transformer application, and completing the installation of one pad-mounted REFCL isolation transformer.

- **D-OPD:** D-OPD may be paired with bare or covered conductors, and primarily focuses on reducing wire down related ignition risk. This pilot targets wire separation events to help de-energize conductors while as they fall towards to the ground, thus earth. In concept a de-energized wire falling to the ground level has a reducing ignition risk. focuses

- **EFD:** Early Fault Detection, as the name implies, offers capabilities for early detection of events that may cause or exacerbate fault conditions. This new situational awareness technology is still being developed by the supplier with further enhancements expected to aid in additional practical applications of the equipment. The pilot helps to capture not only operational data on the EFD system alone, but also aids in understanding the collective and complimentary aspects EFD may offer such as when coupled with DFA or how the system may influence other programs such as infrared scanning. EFD may provide benefits in monitoring conductor systems as well as various equipment failures which can lead to ignition risks.

- **DFA:** DFA technology incorporates electrical system measurements to alert on the potential for pending equipment failures by continually monitoring circuits to detect and assist with locating and categorizing electrical events such as incipient and traditional faults. SCE piloted implementations in 2019 and 2020 and is moving towards small-scale deployment of units in 2021 to further realize and evaluate benefits of DFA.

Table 9.10-5 compares covered conductor with other potential mitigations SCE is exploring. Except for REFCL, all potential pilot mitigations show some limited effectiveness against the various ignition risk drivers. REFCL could potentially provide great benefit on the mitigation of ignition drivers, however, as stated earlier is still an on-going limited pilot and not ready for systemwide deployment. In addition, newer technologies such as REFCL are showing promise, however, SCE is still evaluating results of the pilot to determine the ability to deploy at scale across SCE's service area. At least for the next several years, covered conductor is the only scalable and implementable large-scale solution.

Table SCE 9.10-5
Comparison of Covered Conductor and Alternative Technologies Mitigation Effectiveness

Driver	Sub-driver	Covered Conductor	Fuses Replace	Fast Curve	RAR/RCS	DFA	EFD	REFCL*	OPD
Contact From Object	Veg. Contact	◕	◔	◔	○	◔	◔	◕	◔
	Animal Contact	●	◔	◔	○	○	◔	●	◔
	Balloon Contact	●	◔	◔	○	○	○	◕	◔
	Car Hit Pole	◕	◔	◔	○	○	○	◔	◔
	Other Contact	●	◔	◔	○	○	○	◕	○
	Unknown Contact	●	◔	◔	○	◔	◔	◕	○
Wire-to-wire Contact	Wire-to-wire Contact	●	◔	◔	○	◔	○	○	○
Contamination	Contamination	○	◔	◔	○	○	◔	◑	○
Utility Work	Utility work/Operation	○	○	○	○	○	○	◔	○
Vandalism	Vandalism	○	○	○	○	○	○	◔	○
Equipment Facility Failure	Connector Damage/Failure	●	◔	◔	○	◔	◔	◕	◔
	Splice Damage/Failure	●	◔	◔	○	◔	◔	◕	◑
	Crossarm Damage/Failure	◕	◔	◔	○	○	○	◑	○
	Insulator Damage/Failure	●	◔	◔	○	◔	◔	◕	○
	Lightning Arrester Damage/Failure	○	○	○	○	○	○	◕	○
	Tap Damage/Failure	○	○	○	○	○	○	◕	○
	Tie Wire Damage/Failure	○	◔	◔	○	○	◔	◕	○
	Other Damage/Failure	○	◔	◔	○	○	○	◕	○
	Capacitor Damage/Failure	○	○	○	○	◑	○	◔	○
	Conductor Damage/Failure	●	◔	◔	◔	◔	◔	◕	◔
	Fuse Damage/Failure	○	○	○	○	○	○	○	○
	Switch Damage/Failure	○	◔	◔	◔	◔	◔	○	◑
	Pole Damage/Failure	○	◔	◔	○	○	○	◔	○
	Voltage Regulator Damage/Failure	○	○	◔	○	○	◔	◕	○
	Recloser Damage/Failure	○	○	◔	○	○	○	◔	○
	Anchor/Guy Damage/Failure	○	◔	◔	○	○	○	◔	○
	Sectionalizer Damage/Failure	○	○	◔	○	○	◔	○	○
	Connection Device Damage/Failure	○	◔	◔	◔	◔	◔	◕	○

** REFCL effectiveness assessment is preliminary*

SCE has not included PSPS in the above tables because as a wildfire mitigation, PSPS is necessary to protect public safety but is used only under extreme conditions and as a measure of last resort. Theoretically, PSPS is fully effective against all sub-drivers listed above, for the simple reason that a de-energized circuit is not a potential ignition source. However, this effectiveness is only realized during specific times when ignitions are expected to have higher consequence outcomes. This is fundamentally different than other grid hardening mitigations such as covered conductor, which address the identified risk drivers under all operating conditions.

D. HOW COVERED CONDUCTOR INSTALLATION COMPARES TO OTHER INITIATIVES IN ITS POTENTIAL TO REDUCE THE NUMBER AND/OR LENGTH OF PSPS EVENTS

To be clear: SCE is not "attempt[ing] to justify its plan for extensive, expedited covered conductor installation" on the basis that it "will allow SCE to increase wind speed thresholds for Public Safety Power Shutoffs (PSPS)."[200] SCE's covered conductor program scope is primarily and fundamentally targeted at ignition-risk reduction, and though wildfire-risk locations tend to overlap with locations with high PSPS risk, they are not identical. As part of SCE's Expedited Grid Hardening Plan, SCE has identified targeted locations where the expediting of covered conductor installation already (or anticipated to be) scoped for ignition-risk reduction reasons from future months and years would provide nearer-term PSPS reduction benefits in addition to the anticipated wildfire-risk reduction benefits. Thus, SCE's plans for covered conductor as a means of reducing the need for PSPS is not increasing the *scope* of covered conductor work, but instead simply a means of further refinement of the *timing* and *sequencing* of covered conductor installation that would ultimately have been completed irrespective of anticipated PSPS-reduction benefits.

SCE's Expedited Grid Hardening Plan relies on covered conductor in combination with multiple mitigation measures to collectively reduce the scope and frequency of PSPS. In addition to covered conductor, the Expedited Grid Hardening Plan also includes: circuit segment exceptions; installation of new automated switches, relocation of existing automated switches, or automation of existing non-automated switches; installation of additional weather stations; use of updated switching and load rolling plans; and use of temporary generators. Collectively, the measures in SCE's Expedited Grid Hardening Plan contribute to SCE's expectation of 30% reduction in PSPS scope, 25% reduction in PSPS frequency, and 50% reduction in PSPS duration[201] based on PSPS protocol improvements and grid hardening efforts, assuming the same weather and fuel conditions as 2020.

Deployment of covered conductor over an entire isolatable circuit segment has a clear and positive influence on the number of PSPS events, the number of customers impacted by PSPS events, and the duration of PSPS events. This is because covered conductor allows for increased PSPS thresholds, which can eliminate some events (i.e., events where wind speed breaches the bare conductor threshold but not the covered conductor threshold) and reduce the duration of the events that still remain necessary (i.e., limited to shorter time periods during events where wind speed breaches the covered conductor threshold).

What is known as "circuit segment exceptions" can achieve similar benefits, in particular cases where bare conductor might pose a low risk for wildfire ignition or fire spread, despite being located in a high fire risk area as designated by the CPUC. For example, a portion of a circuit traversing a recent burn scar may be a candidate for such a circuit segment exception.

Increased installation of automated switches generally reduces the number of customers impacted by PSPS events that do occur. Automated switches can also reduce the duration of PSPS events. This is because automated switches allow for remote switch operation – as opposed to manual on-site operation – for load restoration purposes. Updated switching and load rolling plans generally do not reduce the number of PSPS events but can reduce the number of customers impacted by PSPS events. The benefits

[200] Revision Notice, p. 8.
[201] SCE's 2021 WMP Update, Table SCE 8-2

of both automation and switching/load rolling are further enabled through installation of weather stations, which can increase situational awareness and support PSPS-related switching decisions.

The use of temporary generators generally does not reduce the number of PSPS events but can reduce the duration of PSPS events experienced by specific customers who can be served by the temporary generator during a PSPS event. A table summarizing the comparison between the mitigation measures included in SCE's Expedited Grid Hardening Plan in terms of impacts on PSPS event frequency and duration is provided below.

Table SCE 9.10-6
Comparison of Expedited Grid Hardening Mitigation Measures

Mitigation	Reduce PSPS event frequency?	Reduce number of customers impacted by PSPS events?	Reduce PSPS event duration?	Notes
Covered Conductor	**Yes** When wind does not exceed covered conductor thresholds, events may be avoided	**Yes** When events are avoided, fewer customers may be impacted	**Yes** When wind still does exceed covered conductor thresholds, events may be shorter in duration	These benefits are achieved when a PSPS isolatable segment is fully addressed via covered conductor, exception, or a combination of both
Circuit Segment Exceptions	**Yes** When weather and environmental factors are consistent with the conditions for identified exception, events may be avoided	**Yes** When events are avoided, fewer customers may be impacted	**Yes** When weather and environmental factors are inconsistent with the conditions for identified exception, events may be shorter in duration	
Automated switches	**No** Automation does not inherently eliminate PSPS events (but may reduce the resulting impacts)	**Yes** With greater ability for circuit segmentation, fewer customers may be impacted	**Yes** With ability for remote operation, faster switching may reduce the duration of some events	These benefits are further enabled by installation of weather stations
Updated switching and load rolling plans	**No** Switching and load rolling does not inherently eliminate PSPS events (but may reduce the resulting impacts)	**Yes** With switching and load rolling plans updated to reflect most recent circuit conditions, fewer customers may be impacted	**No** Switching and load rolling does not inherently make PSPS events shorter in duration	
Temporary Generators	**No** Use of temporary generators does not inherently eliminate PSPS events (but may reduce their impacts)	**No** Customers served by temporary generators will still experience brief outages during PSPS events (associated with generator startup and switching)	**Yes** Customers served by temporary generators may see significantly shorter PSPS event durations	Temporary generators are not allowed to operate "in parallel" with the existing system prior to PSPS events for safety reasons
Undergrounding	**Yes** When circuits are fully underground, events will be avoided	**Yes** When events are avoided, fewer customers may be impacted	**Yes** When circuits are fully underground, events will be avoided	Underground segments may still be subject to PSPS depending on the presence of overhead circuitry elsewhere on the same circuit

9.11 PSPS CORRECTIVE ACTION PLAN

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE

STATE OF CALIFORNIA

Order Instituting Rulemaking to Examine Electric Utility De-Energization of Power Lines in Dangerous Conditions.	Rulemaking 18-12-005

SOUTHERN CALIFORNIA EDISON COMPANY'S (U 338-E) CORRECTIVE ACTION PLAN

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Dated: **February 12, 2021**

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE

STATE OF CALIFORNIA

Order Instituting Rulemaking to Examine Electric Utility De-Energization of Power Lines in Dangerous Conditions.	Rulemaking 18-12-005

SOUTHERN CALIFORNIA EDISON COMPANY'S (U 338-E) CORRECTIVE ACTION PLAN

In compliance with President Marybel Batjer's letter issued January 19, 2021, in R.18-12-005, Southern California Edison Company (SCE) hereby submits its corrective action plan related to the Public Safety Power Shutoff program (Attachment 1 hereto).

Respectfully submitted,

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February 12, 2021

Attachment 1

Southern California Edison Company's Corrective Action Plan

SOUTHERN CALIFORNIA EDISON COMPANY’S (U 338-E)

CORRECTIVE ACTION PLAN

SOUTHERN CALIFORNIA EDISON COMPANY'S (U 338-E) CORRECTIVE ACTION PLAN

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Provide quantitative analysis of all factors that SCE utilizes when considering de-energization	Section III.A
Identify and document the authorities of Senior Officer in Charge, or equivalent position, and how all elements of the utility emergency operations are clearly aligned under the command of this position	Section III.A
Identify and document all executives with the title of Vice President, or equivalent, and above, with responsibilities in making the decision to call a PSPS event	Section III.A
Identify and document all Board members and Board committees with PSPS decision-making oversight	Section III.A
2. Execution of the Notification Process	
Reduce the significant variance between the number of advance customer notifications sent out and the actual number of customers de-energized in a PSPS event	Section III.B
Research and document the root cause of any instance in which SCE's notification process failed to notify customers in advance of a PSPS event and implement appropriate corrective actions. If the notification deficiency was due to the weather, establish processes to fully demonstrate the rapidity of the change in weather conditions that led to a de-energization without being able to notify customers in advance. If due to other reasons, such as internal processes, database or vendor issues, SCE should immediately act upon those issues to address the problem	Sections III.C, VI
Improve SCE's Incident Management Team's processes and protocols to ensure notifications follow the timing interval guidelines and include estimated start date, time and duration of the de-energization event, and the estimated time of power restoration.	Section III.C
Develop a communication and notification strategy in anticipation of the disruption of the traditional communication channels. In doing this, SCE shall coordinate with public safety partners to use in-language public alert system and public radio broadcasts in de-energization impacted areas in situations where internet, cellular, or landline-based communication services are limited	Section III.C
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Establish a more effective and efficient communication structure with counties and the State; Conduct after action reviews with counties and state agencies to better understand their information needs; Improve SCE's	Section III.D

internal process to ensure timely and accurate information is submitted to CSWC; Take a proactive approach for prompt resolution of problems and establish a timeline to resolve problems during the communication with local and State government agencies.	
Separate the Operational Briefings from State Executive Briefings to ensure each call serves its own purpose.	Section III.D
Coordinate with counties, tribal governments, and Cal OES to develop and validate a list of public safety partners, including local government agencies and critical facilities	Section III.D
Develop a process to ensure public safety partners have the opportunity to adequately engage for each PSPS event. SCE should develop metrics and seek feedback from these organizations after each event to evaluate the effectiveness of the engagement, and to identify specific actions to be taken to address such feedback	Section III.D
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I.

INTRODUCTION

In recent years, California has experienced an unprecedented number of catastrophic wildfires.[1] The 2020 wildfire season, specifically, was the largest recorded in California's history as nearly 10,000 wildfires burned over 4.2 million acres, more than four percent of the state's land.[2] During extreme weather conditions, high winds can create ignition risk, due to such issues as broken cross arms or vegetation or other objects blowing into powerlines. Such fires can then spread rapidly given the high winds and extremely dry conditions. SCE is implementing a robust infrastructure program, as described in its most recent Wildfire Mitigation Plan (WMP), submitted on February 5, 2021, to mitigate the risk of wildfires associated with electric facilities and protect the safety of our communities. SCE's infrastructure program is aimed at hardening the grid to reduce wildfire risks (*i.e.*, reducing the number of ignitions) and enhancing system resiliency (*i.e.*, reducing electrical infrastructure damage and improving power restoration time during and after a fire event). Despite the significant progress already made in hardening our grid, much work remains to be done. Proactive de-energization of power lines to reduce the risk of catastrophic wildfires, referred to as Public Safety Power Shutoffs (PSPS), is still a necessary measure of last resort appropriately employed to protect public safety under extreme fire-risk weather conditions.

SCE, however, expects PSPS events to become less frequent as it implements its wildfire mitigation initiatives described in SCE's WMP. The fundamental objectives of SCE's PSPS actions are to protect public safety while striving to keep the power on for as many customers as possible; communicate clearly and accurately before, during, and after events; and minimize the impact of de-energizations through customer programs.

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1 *See* CAL FIRE's historical top 20 largest and top 20 most destructive fires, *available at* https://www.fire.ca.gov/stats-events/.

2 *See* CAL FIRE summary of the 2020 fire season, *available at* https://www.fire.ca.gov/incidents/2020/.

By all accounts, 2020 was an extreme weather and fire season. In fact, five of the six largest wildfires in California's history took place last year and the average rainfall totals across Central and Southern California remained 50 percent to 75 percent below normal. Weather and dry fuel conditions in 2020 necessitated PSPS de-energization events to avoid even more fires than what California already experienced. SCE acknowledges that many customers were affected by PSPS on multiple occasions, including holidays—some of whom were trying to work and attend classes from home due to the COVID-19 pandemic. SCE understands the hardships that PSPS events cause our customers and communities, and we have consistently been improving the program. The feedback we received from stakeholders after the PSPS events in 2020, as well as reflected in President Batjer's January 19, 2021 letter and during the CPUC's public meeting on January 26, 2021, has crystallized and reinforced the areas where we must and will improve. SCE has heard the clear message from customers, regulators, government officials, and public safety partners: we must do more to reduce the need for PSPS; perform coordination, communication, de-energization, and re-energization protocols more effectively when PSPS is necessary; share our wildfire mitigation and PSPS-related plans in a clear and useful manner; and support our customers—especially Medical Baseline customers and customers with access and functional needs (AFN)—with more resiliency options.

The sections below describe SCE's plans for corrective actions and improvements to the PSPS program (Corrective Action Plan). In its Corrective Action Plan, SCE describes concrete activities it is undertaking to reduce the frequency, scope, and impact of PSPS during the 2021 fire season. These activities address the issues raised in President Batjer's January 19 letter and during the January 26 Commission meeting as well as the concerns raised by our customers and public safety partners. SCE's Corrective Action Plan proposes five categories of corrective actions:

- reduce the use of PSPS,
- execute PSPS events more effectively with transparency into the decision-making process,

- mitigate the impacts of PSPS events,
- keep partners and customers clearly and consistently informed, and
- enhance and improve post-event reporting.

SCE will submit biweekly updates on progress toward completing the Corrective Action Plan and will provide regular and as-requested updates to CPUC staff about progress toward the corrective actions.

Under similar weather conditions as those experienced in 2020, these activities collectively should reduce: (1) the number of circuits and circuit segments de-energized during PSPS events, (2) the duration of PSPS outages during events, (3) the number of customers de-energized during PSPS events, (4) the proportion of customers who were de-energized but did not receive PSPS notifications, and (5) the proportion of customers who received PSPS notifications but were not de-energized. We are prioritizing our efforts to implement these improvements in the communities that have been most heavily impacted by PSPS since 2019.

In addition, SCE will improve customer and stakeholder communication, including enhancing our coordination with emergency managers and public safety partners, before, during, and after PSPS events. SCE attempts to use every means of communication, in some cases employing them repeatedly, because different people absorb information in different ways and conveying information about PSPS events is essential. Nonetheless, we commit to continuously improve our approach to make it most useful for customers and public safety partners.

To assure that these steps benefit customers and other stakeholders, we will measure their effectiveness using surveys. SCE will share this information with the Commission through an appropriate bi-weekly report or meeting before the start of the 2021 traditional fire season. SCE will also measure actual improvements during and after the 2021 fire season and share the results in SCE's 2022 WMP Update.

Some of SCE's proposed corrective actions are in addition to or modifications of the PSPS-related activities outlined in SCE's 2021 WMP, submitted on February 5, 2021, and SCE will capture them in the WMP Change Orders Report process. For example, significant improvements in the efficiency and accuracy of the notification process may require incremental investments in technologies to integrate data sets across PSPS operations and automate customer and stakeholder notifications. Similarly, corrective actions that involve providing data analytics, establishing and monitoring performance measures, and creating enhanced visibility and traceability of decisions will also require incremental investments in technologies and related resources. The incremental work is also expected to require additional resources, and SCE is re-evaluating resource allocation amongst the actions included in this plan and the WMP to assess and address potential execution risks. SCE will record and seek cost recovery of any incremental costs associated with these proposed actions in the same manner as the costs of other wildfire risk mitigation-related activities and programs set forth in the WMP.

II.
CORRECTIVE ACTION 1: REDUCE THE USE OF PSPS

PSPS is a necessary wildfire risk mitigation measure to protect public safety under extreme conditions that SCE uses as a last resort. However, because some communities, including but not limited to Acton, Agua Dulce, Chatsworth, and Simi Valley, were frequently impacted by PSPS events, SCE is taking proactive steps prior to the peak 2021 wildfire season to decrease the use of PSPS in these communities. Once the grid hardening and circuit exception measures below are implemented, the communities historically most impacted by PSPS events will see a reduction in the number of events, the duration of events, and the number of customers that experience these events, assuming the same weather conditions as 2020. SCE will develop metrics to reflect each reduction and report these to the Commission in its bi-weekly reports.

A. Expedited Grid Hardening

SCE will reduce the use of PSPS through expedited grid hardening activities on our most impacted circuits. As discussed in SCE's WMP, SCE continues to deploy covered conductor and other grid hardening measures to reduce the potential for wildfires. While SCE has used sophisticated wildfire risk models to prioritize its grid hardening deployment, the risk ranking of circuit segments using wildfire risk scores does not necessarily coincide with risk ranking of circuit segments accounting for PSPS. SCE's PSPS experience in the last two years has highlighted opportunities to adjust our approach by including PSPS history as an additional criterion, thus accelerating grid hardening deployment to bring quicker relief to those areas with high wildfire risks where PSPS events have been more frequent. Specifically, SCE will expedite grid hardening activities prior to peak wildfire season in 2021 to benefit the communities most frequently and severely impacted by PSPS events.

Examples of grid hardening activities that potentially can be expedited to reduce the use of PSPS are listed below.

- Installation of covered conductor: Covered conductor is the most effective mitigation against wildfires and protects the grid from a number of issues commonly seen in high-wind conditions, such as blown-in debris, line slapping, and downed wires. SCE relies on lower PSPS de-energization thresholds in the absence of covered conductor. Therefore, fully completing the installation of covered conductor within an isolatable circuit segment enables SCE to raise de-energization thresholds, reducing frequency and duration of PSPS on that segment.[3]
- Installation of new automated sectionalizing devices (*e.g.*, switches), relocation of existing devices, or automation of existing non-automated devices: PSPS de-energizations occur at the isolatable circuit segment level, which are defined as portions of a circuit between automated sectionalizing devices. Increasing the number of sectionalizing devices can allow SCE to be more targeted in its PSPS actions. For example, if there is a high wind event at the end of a circuit but the same conditions do not exist at the beginning of the circuit, a sectionalizing device in the

[3] Note that while SCE will also review the possibility of expedited underground conversion on a case-by-case basis, SCE anticipates that it is unlikely underground conversion activities can be completed prior to the peak 2021 fire season.

middle of the circuit allows SCE to de-energize only the affected portion of the circuit. In this example, the PSPS event will still occur, but the additional sectionalizing devices would make it possible to reduce the number of customers impacted.

SCE plans to reduce the use of PSPS by expediting grid hardening activities on its most frequently impacted PSPS circuits. SCE identifies circuits for expedited grid hardening review based on the following circuit-specific characteristics:

- Circuit-level de-energization counts due to PSPS events from 2019-2021
- Number of customers impacted by these PSPS events, and
- Number of AFN customers and Critical Infrastructure customers impacted by these PSPS events.

Each circuit identified for expedited grid hardening is evaluated by a cross-functional team of subject matter experts, including operations personnel, risk management professionals, engineers, fire scientists, customer service personnel and construction project managers. The team reviews circuit segment-specific details, such as historical PSPS events, status of planned grid hardening projects, switching capabilities, weather station locations, and other relevant considerations. The team considers a wide variety of circuit-hardening options for the potential to reduce the use of PSPS on the given circuit segment. This segment-by-segment review yields customized recommendations for each circuit, with particular emphasis placed on the feasibility of accelerating the deployments of grid hardening options.

SCE is presently reviewing its list of circuit segments for expedited grid hardening. Once this list is finalized, these circuits will undergo in-depth review for expedited hardening opportunities to address both PSPS impacts and wildfire risks according to the projected milestones shown below. Final plans for expedited grid hardening will include an assessment of execution challenges such as availability of materials, labor resources, planned outage impacts, and environmental requirements. Feasibility of construction will depend on the resolution of these challenges. Timelines for the expedited grid hardening plan are provided below.

Corrective Action #	Description/Deliverables	Milestone/Deadline
1.A Expedited Grid Hardening	• Identify Circuits potentially in scope for Expedited Hardening	Feb. 19, 2021
	• Complete Circuit Segment Reviews for Identified Circuits	Mar. 15, 2021
	• Finalize Circuit Mitigation Plans	Apr. 15, 2021
	• Complete Construction per Plans	Sept. 1, 2021
	• Complete Post-Construction Activities	Oct. 1, 2021

B. Circuit Segment Exceptions

SCE's plan to reduce the use of PSPS also involves determining additional "circuit segment exceptions" using updated information. SCE removes circuit segments from PSPS protocols in situations where persistent or prevalent wildfire risk associated with these segments are temporarily abated or no longer exist. While the potential for reducing PSPS based on circuit exceptions is much more limited than grid hardening activities, the exception process does not require installation or replacement of assets and, therefore, analysis and application of this option can typically be performed quicker than grid hardening activities when the latest information supports such exceptions.

The circuit exception review process begins when SCE personnel identify a line segment which—despite being located in a high fire risk area (HFRA) as designated by the Commission—might currently pose a very low risk for wildfire ignition or fire spread. For example, a portion of a circuit found to be traversing over a recent burn scar may be a candidate for circuit exception. Circuit segments can be identified as candidates for exception review as SCE begins preparing detailed designs for grid hardening activities, or through specific feedback received from field personnel. This process requires current and local knowledge of changing conditions to inform the circuit review process.

Identified circuit segments are reviewed by SCE's PSPS operations, fire science, and risk management experts evaluating the circuit segment's unique characteristics (*e.g.*, construction type, outage history) and location characteristics (*e.g.*, fuel quantity, fuel type, fuel dryness, fuel age, history of fires in the area) to determine if that circuit segment can be exempt from PSPS monitoring and de-energization due to low wildfire risk. Through this circuit exception review process, SCE was able to reduce customer impacts on 22 circuits in 2020. To further reduce the use of PSPS, SCE is expeditiously collecting and reviewing the latest circuit information and conducting detailed analysis for exception requests currently in queue according to the projected milestones shown below.

Corrective Action #	Description/Deliverables	Milestone/Deadline
1.B Circuit Segment Exceptions	• Circuit Segment Exception Analysis for Exception Requests in Queue as of Feb. 12, 2021, Complete	Mar. 31, 2021
	• Circuit Segment Exception Approval and Implementation for Exception Requests in Queue as of Feb. 12, 2021	Jun. 1, 2021

III.

CORRECTIVE ACTION 2: EXECUTE PSPS EVENTS EFFECTIVELY WITH TRANSPARENCY OF THE DECISION-MAKING PROCESS

SCE commits to sharing more information with the Commission, other agency partners, and public about its PSPS decision-making process and the factors SCE considers in making de-energization decisions to protect public safety. SCE will also effectively and consistently engage with our stakeholders to assure the information we provide is comprehensive, clear, and responsive to the feedback we receive from our customers, regulators, and public safety partners. SCE will provide the metrics demonstrating its success in achieving these goals by sharing the feedback it receives with the Commission on a regular basis.

In this section, we also address the concerns expressed about SCE's PSPS notifications. Improved weather and fuels forecasting will reduce the number of customers de-energized without prior notification and reduce the variance between customers notified and those de-energized. We will conduct a detailed analysis to identify shortcomings and will use customer feedback to identify areas for improvement in content and cadence. Following these forecasting improvements and analyses to establish baselines, SCE will develop metrics to measure improvement and will report these to the CPUC.

A. Clearly Articulate Decision-Making Process for Each Event

SCE is committed to providing greater clarity and transparency on the qualitative and quantitative factors, such as environmental conditions (*e.g.*, wind and fuel), circuit characteristics and public safety impacts, that it considers when making de-energization decisions to increase customer and public safety partner understanding.

SCE's de-energization decisions are complex and made on a circuit-by-circuit basis, often on a sub-circuit level, only when current conditions in the immediate area warrant action.[4] De-energization wind speed triggers are unique to each circuit and are dynamic based on evolving environmental and circuit-specific characteristics. Factors that SCE considers when setting de-energization triggers include wind speed, Fire Potential Index (FPI), ignition consequence modeling, circuit conditions, length of conductor, and other technical characteristics for the applicable circuit. SCE's Incident Management Team (IMT) takes characteristics such as a higher FPI, multiple historical outages and outstanding maintenance items into account when determining if wind speed thresholds for recommending de-energization should be modified.

Execution of de-energization protocols is managed by the IMT in alignment with nationally recognized Incident Command System principles. The IMT considers the following factors, while exercising its discretion:

- National Weather Service alerts or warnings for counties where SCE circuits in HFRA are located

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[4] See section 8.1.3 of the 2021 WMP for a description of the utility's protocols and thresholds for PSPS implementation.

- Ongoing assessments from SCE's in-house meteorologists informed by high resolution weather models, data from SCE weather stations (*e.g.*, wind speeds, humidity levels, and temperature), and publicly available weather stations
- FPI, an internal tool that utilizes both modeled weather and fuel conditions
- Real-time situational awareness information obtained from weather station data and field observers, whenever possible, positioned locally in HFRA circuits identified as at risk for extreme fire weather conditions
- Specific concerns from state and local fire authorities, emergency management personnel, and law enforcement regarding public safety issues
- Expected impact of de-energizing circuits on essential services such as public safety agencies, water pumps, traffic controls, medical facilities, etc.
- Circuit maintenance conditions, length of conductor, and other technical characteristics for the applicable circuit

In addition to the above factors, which are monitored by SCE's IMT, at least one qualified Live Field Observer (LFO) is stationed at every circuit in scope, at least two hours before the start of the event when possible. The purpose of this LFO is to monitor a circuit for any possible signs of failure or prevailing environmental conditions, such as potential damage from wind gusts, airborne vegetation, or flying debris. SCE also deploys field resources to pre-patrol each circuit that is forecasted to be in scope for PSPS de-energization consideration. The pre-patrol requires qualified personnel to visually inspect the entire length of the overhead circuit that traverses HFRA to verify if the circuit can withstand incoming weather and to provide additional up-to-date intelligence on field conditions to SCE's IMT. If maintenance concerns are discovered on a circuit in scope, repairs are expedited (if possible) before the impending wind event. Where possible, every circuit that is in scope for the upcoming event has a pre-patrol performed, unless it was already patrolled within the last seven days. While the SCE Incident Commander takes recommendations from LFOs, members of the IMT and external public safety partners, each decision to de-energize a circuit (or segment thereof) during a PSPS event must be ultimately authorized by the Incident Commander.

The decision to de-energize during a PSPS event involves the consideration of many dynamic and complex quantitative and qualitative factors that are difficult to communicate, particularly in real time during events. We accept, however, that we must make our decisions understandable to our customers and stakeholders and will improve our transparency as proposed below.

1. Increased Transparency

In 2021, SCE will enhance the transparency of its PSPS decision-making process by developing clear, understandable, and accessible materials to share with customers and public safety partners about its PSPS decision making process. As part of this effort, SCE will explain its activation thresholds, de-energization thresholds, and the quantitative and qualitative analysis that warrant de-energizing a circuit or portion of a circuit. Detailed information will be included in PSPS post-event reports to clearly explain why each PSPS event was necessary to protect public safety. SCE will identify the Incident Commanders that have decision-making authority in each PSPS event and fully demonstrate, when applicable, the rapidity of the change in weather conditions that led to a de-energization without being able to notify customers in advance.

To ensure newly developed materials reach customers and stakeholders, SCE will use a multi-pronged outreach approach that will include adding and updating factsheets and other materials to sce.com and sharing materials in presentations at community and at other public meetings. We will engage with non-profits, community-based organizations (CBOs), the AFN community, and with emergency management agencies, state, county, local and tribal governments, as well as meetings with the Commission, Cal OES and CAL FIRE. We will be responsive to the feedback received to improve our processes and the information we provide.

Corrective Action #	Description/Deliverables	Milestone/ Deadline
2.A.1 Increased Transparency	• Develop clear and user-friendly external-facing materials to educate and inform customers, public safety partners and other stakeholders on SCE's decision-making process, including all factors that SCE utilizes when considering de-energization.	Apr. 1, 2021
	• Provide and explain the quantitative and qualitative factors that SCE utilizes when considering de-energization, in update reports and in public and stakeholder outreach. Factors include activation and notification thresholds, de-energization thresholds (including impact from grid hardening), environmental conditions (wind speed, fire potential index, rapidly changing weather), circuit characteristics and input from emergency management and first responder agencies. Demonstrate why the thresholds are set at levels selected.	Apr. 1, 2021
	• Share materials on sce.com/psps and via external outreach and engagement efforts, including meetings with communities, local, state and tribal government, emergency management and public safety agencies and critical infrastructure providers.	May 1, 2021
	• Increase transparency in post-event reporting by including a more detailed description of the factors that SCE used when deciding to de-energize each circuit, or circuit segment.	Apr. – Dec. 2021 Post-Event Reports

2. Identify Senior Officer(s) In Charge During PSPS Events

SCE follows principles of the National Incident Management System and components of the Standardized Emergency Management System during PSPS events. This includes using an Incident Management Team structure to execute PSPS events, assigning an Incident Commander responsible for all de-energization decision-making and coordinating at the Operational Area level during PSPS events. SCE's Incident Management Team (IMT) and emergency response structure for all emergency events, including PSPS, are governed by the Crisis Management Council (CMC) framework. The CMC is SCE's senior executive governance body responsible for providing strategic direction during emergencies. The CMC's primary responsibilities are to provide policy-level oversight of on-going operations, assign executives to internal task forces, assign executives to represent SCE with local, state, and federal jurisdictions, communicate with SCE's Board of Directors, interact with senior local, state, and federal government officials, request declaration of a National Response Event for Mutual Assistance, approve expenditures that exceed normal limits and perform other corporate-level duties necessitated by an emergency event. Tactical decision-making is delegated to Incident Commanders.

The CMC is comprised of SCE's and Edison International's senior-most executives. The CMC may bring in executives from various SCE's operational units to provide subject matter expertise on an as-needed basis. When the CMC is not activated, it is represented by the Officer-in-Charge (OIC). The OIC is responsible for monitoring on-going events and, when necessary, making decisions on behalf of the CMC. Most CMC members rotate monthly to assume the role of the OIC.

3. Identify and Document all Executives with PSPS Decision-Making Authority

PSPS de-energization and re-energization decisions are made by executives (director or higher), who serve as Incident Commander during the PSPS events. These executives are trained in the Incident Command System as well as PSPS operations and are rostered into the PSPS IMT. The assigned Incident Commander is responsible for all de-energization and re-energization decisions made during any PSPS event.

4. Identify and Document all Board Members and Committees with PSPS Decision-Making Oversight

The Safety and Operations Committee (SOC) of the SCE Board is responsible for the oversight of SCE's public safety, wildfire operations and risk mitigation including PSPS, business resiliency and emergency response functions. As such, SOC's oversight includes continuous improvement of operations, and responsiveness to stakeholders, customers, local governments, emergency response agencies, and other critical infrastructure providers. This committee also oversees safety, wildfire and operational performance metrics. This oversight role is outlined in the SOC charter available on the sce.com website. Biographies of SOC directors are also available on the sce.com website.[5] The SOC has standing agenda topics on public safety and wildfire safety, including PSPS operations.

The SOC reviews SCE's WMPs and receives regular progress updates on WMP implementation. All members of the SCE Board have visited SCE's Emergency Operations Center (EOC) for a demonstration of the personnel, technologies and resources used to manage PSPS events. The SOC is also briefed on aspects of PSPS operations such as meteorology, Fire Potential Index (FPI), circuit monitoring, segmentation, and use of technology such as cameras, weather stations, and grid control system.

Corrective Action #	Description/Deliverables	Milestone/ Deadline
2.A.2-4 Identify Senior Officer, Executives, and Board Members and Committees with PSPS Decision-Making Authority	• Identify and document the authorities of Senior Officer in Charge, or equivalent position, and how all elements of the utility emergency operations are clearly aligned under this incident command system	Feb. 12, 2021
	• Identify and document all executives with the title of Vice President, or equivalent, and above, with responsibilities in making the decision to call a PSPS event	Feb. 12, 2021
	• Identify and document all Board members and Board committees with PSPS decision-making oversight.	Feb. 12, 2021

B. Improve Weather and Fuels Forecasting Accuracy

SCE uses forecasts of weather and fuels information from its customized in-house atmospheric modeling to identify upcoming weather events in which circuits may be in scope for potential de-energization to protect public safety during critical fire-risk weather. SCE's in-house modeling identifies utility-related hazards, and produces detailed forecasts of wind speed,

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[5] https://www.sce.com/about-us/who-we-are/governance

relative humidity, vegetation moisture, and other information for every 1.25 square miles, making it the preferred source for PSPS weather information.

Due to the complexity of terrain and the localized nature of weather conditions in SCE's service area, all atmospheric modeling, independent of source, encounters challenges in accurately portraying details of weather events, and must be continually refined to improve accuracy. For SCE in the context of PSPS, this means that atmospheric and fire spread modeling predictions must be continually updated to minimize impacts to SCE customers.

Improved in-house forecasting capabilities will reduce the number of customers de-energized without prior notification. These enhanced capabilities will also address the variance between the customers who are notified of potential de-energization and the customers who are actually de-energized due to onset of increased fire danger conditions. President Batjer identified this "significant variance in number of customers initially notified versus the number actually de-energized" in her letter. This variance reflects the difference between SCE's long-range weather forecasting at the circuit level, which is the basis of initial (*e.g.*, 72-hour, 48-hour and 24-hour) customer notifications, and de-energization decisions, which are based on real-time conditions at the circuit-segment level.

Targeted real-time decision-making at the circuit segment level allows SCE to de-energize as few customers as possible, based on actual weather conditions and as a last resort; however, it is the main source of the variance between initial notifications and actual de-energizations. Enhanced forecasting should reduce this inherent variance due to emergent variables, such as weather. SCE will continue to reduce PSPS impacts to individual customers during events by using real-time weather information rather than forecasting to make de-energization decisions, and by de-energizing only necessary segments of circuits, rather than entire circuits, even when all customers on a circuit may have initially been in scope for potential de-energization and received notifications to that effect.

Improved in-house forecasting capabilities will reduce the variance between the customers who are notified of potential de-energization and the customers who are actually de-energized due to onset of increased fire danger conditions, as well as the number of customers de-energized without prior notification.

SCE is making improvements to its in-house modeling in the following ways:

- Accelerating previously planned modeling enhancements: This includes the use of machine learning technology (Artificial Intelligence) to help improve estimations of wind speeds at specific locations where PSPS has occurred most frequently in prior wildfire seasons. In addition, SCE is acquiring additional weather model data from other sources to alleviate dependency on a single source for weather modeling information. Both efforts will increase precision in notifications and will help to identify the scope and duration of de-energizations more accurately.
- Increase resolution of weather and fire potential predictions: SCE will acquire more computing power, which will enable SCE to make wholescale systematic changes to all its in-house modeling. This will include doubling the forecast resolution from 2km to 1km , which will allow for more precise weather and fuels forecasts and will address some of SCE's inherent challenges in capturing details in the timing and magnitude of predicted fire weather events. These improvements will collectively help to more precisely identify the scope of where, when, and how long potential de-energizations may occur, reducing the number of "short notice" and missed notifications.
- Utilize fire spread predictions for PSPS: SCE will evaluate its capability to estimate how large fires may grow and what their subsequent impact on nearby communities may be. Following evaluation, SCE will incorporate these estimations as another factor to inform decisions to de-energize portions of the grid during extreme weather events that lead to destructive wildfires. This will help to clarify the PSPS footprint to reflect true fire weather conditions more accurately.

Corrective Action #	Description/Deliverables	Milestone/Deadline
2.B Improve Weather and Fuels Forecasting Accuracy	• Acquire additional data and use machine learning technology	May 1, 2021
	• Increase the resolution of SCE's in-house weather modeling	Sept. 1, 2021
	• Use fire spread predictions to help with de-energization decisions	Nov. 1, 2021

C. <u>Improve Customer Notifications</u>

As outlined in President Batjer's letter, "advanced and accurate notifications are vital for customers, critical facilities and public safety partners to prepare for a de-energization." SCE is committed to improving the clarity, cadence, and accuracy of notifications to better meet customers' needs, and to evaluate and improve the effectiveness of our notification delivery systems.

SCE is performing an end-to-end analysis of in-event notification (imminent de-energization, de-energization, imminent re-energization, and re-energization) gaps experienced in 2020 and using these results to develop process and technical solutions to continue improving notification accuracy. Missed initial (72-hour, 48-hour and 24-hour) notifications will be addressed through improvements in weather forecasting.

SCE will conduct independent customer research to understand how to best address the customer pain points with SCE communications both before, during, and after each PSPS event that have been identified through customer and community feedback. At the conclusion of the research process, we will update the language and cadence of our notifications to provide greater clarity for all customers who are impacted by PSPS.

1. <u>Improve In-Event Notification Accuracy</u>

SCE will assess and improve its accuracy and adherence to timing interval guidelines for notifications that are sent after the onset of extreme weather by performing an end-to-end assessment of the process gaps that have led to some instances of missed or inaccurate notifications, and making integrated process improvements based on the findings of the analysis. Documentation for weather-related notification deficiencies, as requested in President Batjer's letter, will be provided in post-event reporting.

In 2020, both SCE's practice of de-energizing at the circuit-segment level, which reduced customer impacts, and the use of processes that were manually driven, slowed the notification process and resulted in missed or conflicting notifications. The root-cause analysis will help SCE better coordinate the handoff between operational and notification teams by integrating operational (grid) and customer (notification and communications) workflows.

SCE will also complete design and initiate development of a broad technical solution to increase automation. This system will integrate PSPS, customer and field data, further reducing the need for manual operations. This will also reduce data conflicts and improve efficiency. The automated system should provide significant improvements to accuracy and timeliness, as well as improved overall situational awareness.

SCE recognizes the schedule outlined below is aggressive, especially when considering technical complexity and key dependencies.

- Key dependencies include soliciting customer/stakeholder feedback, updates to provide more granular weather forecasts, and the need for coordinating and engaging with the Commission for some potential changes to notification requirements.
- Technical complexities include challenges associated with integrating disparate data sets across multiple SCE systems, working with systems vendors on changes, executing complete/rigorous testing, and performing detailed training on new processes and tools.

SCE will use its bi-weekly reporting to keep the Commission informed on progress and adjust deadlines based on new information discovered through its design and analysis activities. SCE will prioritize changes that can be quickly implemented with minimal risk to effective PSPS operations.

Corrective Action #	Description/Deliverables	Milestone/Deadline
2.C.1 Improving In-Event Notification Accuracy	• Act upon vendor issues: Validate resolution of vendor issue for telephone notification errors	Feb. 19, 2021
	• Simplify telephone language preferences: Change telephone messaging for customers to "Press 1 for English," in alignment with most common phone menus	Feb. 19, 2021
	• Perform end-to-end analysis of 2020 notification failures to inform short- and long-range technical solutions	Mar. 31, 2021
	• Complete design and initiate development and implementation for prioritized 2021 improvements including process change map and digital tools to better integrate the notification process with PSPS operations (in advance of more advanced long-range efforts)	May 1, 2021
	• Implement prioritized initial updated processes and digital tools	Jun. 1, 2021
	• Provide training and job-aids for PSPS team members on new processes/tools	Jun. 1, 2021
	• Complete design for an automated system to fully integrate PSPS data sets and processes, improve customer data accuracy, and reduce manual notification actions	Dec. 1, 2021

2. Reduce Notification Redundancy and Improve Clarity

SCE has initiated a re-evaluation of the PSPS notification experience, analyzing the cadence, content, language and delivery methods to more closely align with customer expectations.

In 2020, SCE notified customers each time their status changed (*i.e.*, when their circuits were dropped or added from the pre-event monitored circuit list) and provided twice-daily updates. This led to customers' status sometimes changing more than once a day. Customer feedback indicates that these multiple updates created confusion and the perception of "over-notification." Other issues that were reported included unclear language, missing information, and providing worst-case, rather than realistic, estimated restoration times, significantly overstating how long most customers should plan on being without power.

SCE will continue to engage with customers[6] to clarify how much information customers want, how frequently they want it, and the best way to message the notification content for clarity and transparency. The process will map current-state customer notification experience to understand where we are falling short from the customer perspective, through both direct customer research and work with third-party communication experts.

Additional input will come from community meetings, critical infrastructure workshops and work with the PSPS Working Groups and Advisory Board.

SCE will also meet with CPUC staff to discuss how to best interpret the regulatory requirements to meet customer needs. Results will inform a re-design of the notification content and process including:

- Frequency and cadence of notifications
- Information and level of detail to be provided
- Approach to language and communications

At the end of this research process, SCE will determine the appropriate cadence, and content, for pre-event and in-event notifications. Revised notifications will include estimated start date, time and duration of the de-energization event, and the estimated time of power restoration. A high-level workplan for this activity is provided below.

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[6] SCE will also work with its public safety partners and critical infrastructure providers to develop notice content that better addresses their needs. See discussion in Sections II.C and IV.D.

Corrective Action #	Description/Deliverables	Milestone/Deadline
2.C.2 Reduce Notification Redundancy and Improve Clarity	• Complete mapping of current customer experience from first notification through event all-clear, including the cadence, content, language, and delivery methods	Mar. 15, 2021
	• Complete mapping of customer experience improvements •	May 1, 2021
	• Complete customer research to collect input from customers on future state PSPS notification experience	May 1, 2021
	• Complete outreach to critical infrastructure customers to incorporate feedback into public safety notification cadence	May 1, 2021
	• Codify new notification cadence for customers in scope to reduce out-of-event notification churn, and address imminent notification guidelines	Jun. 1, 2021
	• Complete re-design of the notification content and process and launch new messages	Jun. 1, 2021
	• Measure customer satisfaction for de-energized customers following each PSPS event and summarize at the end of the 2021 fire season	Each PSPS Event
	• Measure customer sentiment of all HFRA customers	Sept. 15, 2021 Dec. 31, 2021

3. <u>Address Preferred Channels</u>

SCE provides notifications through many channels in order to better ensure that all customers are receiving notifications. This means that customers and other stakeholders, including public safety partners and local and tribal governments, received multiple notifications that in some cases appeared to provide conflicting information. One known source of this confusion has been account holders subscribing to ZIP code alerts in addition to, or instead of, SCE customer alerts. ZIP code alerts have been made available to reach transient populations who do not have premise-level accounts, to allow them access to PSPS status within an area of interest. However, ZIP code alerts cover multiple circuits, and customers who sign up for ZIP code alerts instead of premise-level alerts receive separate notifications for all circuits within a single ZIP code. This can lead to account-holding customers receiving conflicting notifications that may not be relevant to them.

To reduce this notification duplication and potential for conflicting information, SCE will:

- Perform data analytics on customer notification channel subscriptions to identify customers who can be moved from ZIP code alerts to premise-level alerts, and
- Identify and employ proactive measures to enroll customers into customer alert channels, while directing non-account holders into a different notification option that will reduce the potential for confusion.

Corrective Action #	Description/Deliverables	Milestone/Deadline
2.C.3 Address Preferred Channels	• Provide opt-out support to move customers from ZIP code alerts to premise-level alerts	Jun. 1, 2021

4. Consider Use of Public Radio Broadcast Where Appropriate

Customers in certain remote locations with poor cellphone access have difficulty communicating during power outages. To improve their ability to receive emergency messages, SCE will coordinate with County Offices of Emergency Management to identify remote locations that could require the use of the use of Emergency Radio Broadcasts during PSPS events, and develop messaging for these areas where appropriate.

Corrective Action #	Description/Deliverables	Milestone/Deadline
2.C.4 Consider Use of Public Radio Broadcast, Where Appropriate	• Work with County Offices of Emergency Management to identify remote locations that could require the use of Emergency Radio Broadcasts during PSPS events	Mar. – Dec. 2021
	• Develop appropriate messaging for use in Emergency Broadcast Systems where appropriate during PSPS events	Jun. 30, 2021

D. Improve Engagement with Local and State Emergency Management, First Responder Agencies and Other Public Safety Partners

SCE fosters strong relationships with Emergency Management at the local and State level to effectively coordinate and manage emergency events, including PSPS events. While foundationally strong, these relationships have been strained through the frequency and magnitude of PSPS events during the 2020 fire season. In order to rebuild trust and continue to strengthen these relationships, SCE will complete the following corrective actions to improve engagement, ensure timely and accurate data sharing, proactively and quickly address issues, and simplify information shared with local and State Emergency Management, first responders and public safety partners during PSPS events. SCE will also establish engagement metrics, perform surveys and in-person (or virtual) after-action reviews after PSPS events and share the results of these surveys with partners and the Commission to measure improvement.

1. **Develop and implement a process for public safety partners to adequately engage during PSPS events that includes improvement metrics.**

While regular engagement with State and local public safety partners regarding PSPS protocols and their implementation has been ongoing since the advent of SCE's formalized PSPS program in 2018, new requirements have emerged and we have a better appreciation of expectations from our partners. There are opportunities to increase understanding of PSPS processes and, more importantly, create agreed-upon success metrics for PSPS events and solicit feedback from public safety partners ahead of the 2021 fire season to make further improvements. This year, SCE plans to again meet with public safety partners at the local and State level and solicit input on existing engagement structures during PSPS events. These meetings will allow SCE to identify needed improvements to existing communications, suggest and make improvements, and review improvements with the Working Groups and Advisory Board created in 2020 to solicit feedback on updated PSPS protocols.

To demonstrate progress towards these goals, SCE will work with public safety partners at the State and local level to create appropriate metrics that measure this improvement. As previously mentioned, SCE will also request feedback through electronic surveys and in-person (or virtual) after-action reviews with public safety partners after PSPS events. SCE will include the results of these engagement surveys in post-event reports to share our progress toward more effective engagement.

Corrective Action #	Description/Deliverables	Milestone/Deadline
2.D.1 Develop and implement a process for public safety partners to adequately engage during PSPS events that includes improvement metrics	• Conduct discussions with Cal OES and county OEM Directors to solicit input on optimal structure for in-event communication structure and develop metrics to measure progress	Mar. 31, 2021
	• Document input during partner discussions and agree to and assign timeframe for implementation ahead of the 2021 fire season	Apr. 30, 2021
	• Implement any identified improvements to existing communications structure	May 31, 2021
	• Consistently use Working Groups/Advisory Board to review results, share improvements, and identify further corrective actions to update IMT protocols and procedures	Jun. 15, 2021, and quarterly thereafter
	• Perform after-action reviews with impacted county and state agencies after each PSPS event to better understand their information needs	Each PSPS Event
	• Send out engagement surveys to State, county. and critical infrastructure partners after every PSPS event to evaluate our effectiveness and identify any potential areas of improvement	Each PSPS Event
	• Include results of engagement surveys in post-event reports	Each PSPS Event

2. <u>Improve internal processes for timely and accurate information submission to California State Warning Center (CSWC).</u>

SCE has begun an initial series of meetings with California State Warning Center (CSWC) to align SCE's processes and procedures with CSWC's needs. SCE will meet regularly with CSWC ahead of the 2021 fire season to identify any additional corrective actions that will increase the ability to submit timely, accurate in-event reporting of de-energization specifics to Cal OES as they require.

Corrective Action #	Description/Deliverables	Milestone/Deadline
2.D.2 Improve internal processes to ensure timely and accurate information is submitted to California State Warning Center (CSWC)	• Meet every month with CSWC ahead of the 2021 fire season to discuss forms, procedures and IOU differences in operations, implement existing corrective actions and identify any potential additional corrective actions	Monthly until at least May, 2021
	• Confirm SCE's role in implementing the CSWC Standard Operations Guide (SOG)	Feb. 4, 2021
	• Validate existing separation of State/County calls	Feb. 4, 2021
	• Create job aids for Deputy Planning Section Chief role to include responsibility for essential elements of information and Cal OES notification form	Mar. 31, 2021
	• Clarify invitee/information expectation for each stakeholder call (State/County)	Mar. 31, 2021
	• Validate invitee lists for State briefing calls to ensure accurate contact information	Mar. 31, 2021

3. <u>Coordinate with counties, tribal governments, and Cal OES to develop and validate a list of public safety partners, including local government agencies and critical facilities.</u>

In 2018, SCE managed a comprehensive effort to collaborate with counties, tribal governments and Cal OES to develop contact lists for PSPS events. SCE has continued to update these lists as additional partners have been identified during PSPS events. However, a comprehensive effort is again required to verify SCE has both the right public safety partners as well as the correct contact information to reach those partners during events. To accomplish this, SCE will once again contact all public safety partners, including local government agencies and critical facilities, to validate proper contacts and contact information. SCE will utilize an annual update strategy to identify additional public safety partners as applicable and update contact information for engagement in PSPS events. SCE will also evaluate if it is possible to manage future contact updates through the Public Safety Partner portal and implement, if feasible.

Corrective Action #	Description/Deliverables	Milestone/ Deadline
2.D.3 Coordinate with counties, tribal governments, and Cal OES to develop and validate a list of public safety partners, including local government agencies and critical facilities	• Engage Tribal contacts for any additional coordination opportunities	Mar. 31, 2021
	• Validate all Cal OES Regional Administrators are invited to daily in event operational briefings	Mar. 31, 2021
	• Work with Cal OES to define and include additional public safety partners in State and County calls as applicable	Mar. 31, 2021

4. <u>Proactively and promptly resolve problems during PSPS events with local and State public safety partners.</u>

Given the number of late-2020 PSPS events, SCE was unable to provide the level of support expected to properly interface with public safety partners at the State and local level and provide prompt resolution of issues. To provide better support and minimize further communication challenges, SCE will dedicate situational awareness staff to provide information to public safety partners and promptly resolve issues during events in the 2021 fire season and beyond. This single point of contact during events will enhance information sharing and increase SCE's ability to quickly resolve public safety partner issues that arise.

Corrective Action #	Description/Deliverables	Milestone/ Deadline
2.D.4 Take a proactive approach for prompt resolution of problems and establish a timeline to resolve problems during the communication with local and State public safety partners.	• Onboard and train new employees dedicated to information gathering and reporting to CSWC in PSPS events	Mar. 31, 2021
	• Provide dedicated in-event contact to CSWC for in-event communication, coordination and prompt resolution of issues	Each PSPS Event

E. Provide Clearer Event Status Via SCE's Website

SCE will improve its outage look-up features to make it easier for customers to find the status of any type of event that may impact their electrical service. This will address the current inconvenience when customers have to check up to three different pages (PSPS Events, Maintenance/Repair Outages, and CAISO Rotating Outages), which leads to confusion when customers attempt to determine the cause and expected duration of an outage during PSPS events that coincide with other service interruptions.

In SCE's revised website, customers will be able to simply enter an SCE service address and the website will display the status of any current or planned interruptions to their electrical service including estimated restoration time(s). In the first phase, SCE will implement a simple search-based service interruption look-up tool to expedite delivery in time for the beginning of the 2021 fire season. Phase 2 will expand the capability and scope to consolidate the various map-based displays of service interruptions into a single solution to improve the experience for website visitors who need or prefer to see the information in a visual, area-wide format. In Phase 2, SCE will also incorporate additional detail into the map-based display to improve customer understanding of active PSPS event conditions. Further, the website will better reflect realistic expected restoration times for each event.

The enhancements described above depend on access to data and the quality of that data. SCE has initiated several initiatives described in its 2021 WMP to improve data governance and integrate data into a central repository. SCE will use its bi-weekly reporting to keep the Commission informed on impacts from these dependencies and adjust deliverables and dates, if necessary, based on new information discovered through its design and analysis activities. SCE will ensure that any information displayed to customers is accurate and supports the goal of providing clearer information and reducing confusion.

Corrective Action #	Description/Deliverables	Milestone/ Deadline
2.E Provide Clearer Event Status on SCE's Website	• Conduct initial digital experience benchmarking with PG&E	Feb. 2, 2021
	• Initiate scoping/estimation process	Feb. 5, 2021
	• Initiate Procurement activities	Feb. 15, 2021
	• Complete scoping/estimation process	Feb. 26, 2021
	• Complete procurement activities	Mar. 12, 2021
	• Initiate Phase 1 Development	Mar. 15, 2021
	• Initiate Phase 2 Development	May 10, 2021
	• Complete Phase 1 development (including testing)	May 31, 2021
	• Launch Phase 1 - new sce.com service interruption lookup capability and revisions to sce.com/psps landing page	Jun. 1, 2021
	• Complete Phase 2 development (including testing)	Sept. 10, 2021
	• Launch Phase 2 - new sce.com service interruption map and revisions to sce.com/psps landing page	Sept. 13, 2021

IV.

CORRECTIVE ACTION 3: MITIGATE IMPACTS OF PSPS

SCE understands that PSPS events have a meaningful impact on our communities and public safety partners. The section below reflects the steps SCE will take to mitigate the impacts to our communities and public safety partners. The effectiveness of these steps will be measured by increasing enrollment in customer programs that provide resiliency and back-up power, and providing additional support to our most vulnerable customers, including by expanding the Critical Care Back-up Battery program to all eligible Medical Baseline customers and verifying delivery of PSPS notifications to all impacted Medical Baseline customers.

A. Increase Participation in Back-Up Power Programs and Incentives

SCE offers customers multiple back-up power programs and incentives to support their resiliency planning and to mitigate the impacts of PSPS, especially for our most vulnerable customers.

Critical Care Back-up Battery (CCBB) Program:

In July 2020, SCE launched the CCBB program to support our most vulnerable customers, a subset of Medical Baseline customers who are designated as "Critical Care,"[7] enrolled in CARE or FERA and live in a HFRA. More than 700 batteries were delivered to participating customers in the first six months of the program out of the initial 2,500 target population.

In 2021, SCE is expanding the CCBB program to include all eligible Medical Baseline customers (not just Critical Care customers) that are enrolled in CARE or FERA and reside in HFRA. Progress in 2021 will not be impeded by the initial delays experienced in 2020, as inventory is no longer a constraint and SCE is expanding its marketing efforts. To increase battery deployments to eligible customers, SCE will outreach to all eligible customers (approximately 12,000). SCE assumes that approximately 30 percent of total eligible customers will choose to enroll this year. SCE will continue marketing and outreach efforts to reach as many eligible customers as possible. SCE will expand marketing and outreach using direct mail, phone calls, email, and digital channels (sce.com, social media, etc.) and will work with CBOs and other agencies to increase awareness about the CCBB program. By expanding the eligible customer population, SCE will increase back-up batteries deployed to vulnerable customers in HFRA that may not otherwise have the resources to procure necessary resiliency equipment.

By the end of February 2021, SCE will expand the following marketing and outreach activities:

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[7] Critical Care customers are those who rely on medical equipment to sustain life and cannot be without electricity for at least two hours.

- Send direct mailers and email communications to all eligible customers including those that did not commit to participate in the CCBB program in 2020
- Battery deployment vendors begin outbound calling efforts to assess customer medical devices and enroll customers in the program
- Identify and conduct outreach to newly eligible customers every month

By the end of April 2021, SCE will finalize and launch the following new activities:

- Develop social media posts to market the program through SCE's social channels
- Deploy targeted posts on platforms such as Nextdoor or similar other social media platforms
- Engage with CBOs, local and tribal governments, and other agencies to help educate customers in PSPS impacted areas about the CCBB program
- Provide CBOs with training and program collateral to help educate customers about the program
- Launch in-person visits and other methods to engage customers who are nonresponsive or have not agreed to participate in the program

Based on program metrics tracking, SCE may consider onboarding additional battery deployment vendors to increase enrollments and deployments in 2021.

SCE also provides rebates for portable back-up power available on SCE's Online Marketplace to meet the needs of those that may depend on electricity to pump water or to power small appliances, such as routers and modems, as well as charging devices, such as laptops and cell phones:

- <u>Well Water Rebates</u> (for portable generators): In July 2020, SCE launched a rebate pilot targeting customers in HFRA that depend on electricity to pump water to their home or property. This pilot was designed to address water pumping needs and will assess customer interest and barriers to participation. SCE designed the pilot to improve resiliency through portable back-up generators with rebate amounts of $300 for non-CARE/FERA customers and $500 for customers enrolled in CARE/FERA, limited to one rebate per SCE service account. Based on customer feedback, we discovered customers required larger generators to power their pumps and, as a result, we enhanced the product list to include larger portable generators. SCE will continue to market this offering starting in Q1 2021, including education on how to safely connect and use generators.

- Residential Power Station Rebate: In 2020, SCE implemented a portable power station resiliency pilot available to residential customers. The pilot tested customer interest and barriers to investing in resiliency in the form of a clean (battery) portable power station. Using the existing SCE Marketplace website, SCE set the rebate amount to $50 per portable power station, with a limit of five rebates per SCE service account. SCE will promote the offering through marketing, outreach and awareness campaigns starting in Q1 2021, including education on how to safely connect and use batteries. SCE will pursue co-funding of rebate opportunities with third parties to increase resiliency.

Customers can also apply for SCE's Self-Generation Incentive Program (SGIP), which is a statewide program that provides eligible customers with financial incentives to install new qualifying technologies to meet all, or a portion of, the electric energy needs of a home or facility. To improve resiliency and better prepare our vulnerable customers for outages, including PSPS, SGIP offers incentives for the installation of self-generating energy storage systems designed to offset the customer's energy use and work as a back-up battery to provide power when an outage occurs. The eligibility requirements to qualify for these incentives differ between residential and non-residential customers and are outlined in the SGIP handbook.[8] In 2021, SCE will market SGIP to customers by focusing on the Equity Resiliency Incentive, which launched in 2020. The Equity Resiliency Incentive provides a $1.00 per Wh incentive towards the cost of an energy storage system to eligible customers residing in HFRAs (Tiers 2 and 3) or

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[8] Self Generation Incentive Handbook Program *available at* https://www.selfgenca.com/documents/handbook/2020

those who have experienced two or more PSPS events, as well as other eligibility criteria as outlined in the SGIP handbook.[9] SCE's marketing will also include communicating that eligible residential customers can receive 50 percent of the Equity Resiliency Incentive upfront.

Corrective Action #	Description/Deliverables	Milestone/Deadline
3.A Increase Participation and Incentives for Back-Up Power	• Expand the CCBB program to all eligible Medical Baseline customers (CARE/FERA & HFRA) and increase outreach activities to increase enrollment o Offer CCBB program to the expanded customer set through marketing o Track and optimize enrollment progress in 2021 on a bi-weekly basis o Establish additional partners (CBOs, contractors)	Feb. 28, 2021 Apr. 30, 2021
	• Continue and expand marketing and outreach for all back-up power solutions (CCBB, online marketplace rebates) including ~300,000 eligible customers for the Self-Generation Equity Resiliency Incentive Program (whole-house battery solution) featuring the 50 percent upfront incentive payment enhancement	Throughout 2021

B. Increase Community Resiliency

Microgrids and resiliency zones can potentially mitigate PSPS impacts by enabling some customers to remain energized when they otherwise would not be. SCE is pursuing microgrid and resiliency zone opportunities in a variety of formats. SCE is working with customers interested in behind-the-meter (BTM) single-customer microgrids. SCE is also exploring opportunities for front-of-the-meter (FTM) microgrids that utilize utility distribution infrastructure to serve multiple customers.

BTM Microgrids at Customer Sites

SCE's 2021 General Rate Case included a request to provide an incentive to defray part of the installation costs of a microgrid control system for customers willing to increase resiliency

[9] *See generally* D.19-09-027.

within HFRAs. This program will target non-residential customers who already have solar generation and power storage capabilities, or will be adding such capabilities to their sites, and are willing to island and redirect the energy in the storage battery to a designated building on site for use during PSPS or other emergencies. These facilities are required to be open to the public during PSPS events or other emergencies. Most customers that may be able to participate in this program are larger entities such as schools, local government facilities, and potentially large retailers.

In 2019, SCE initiated a pilot to fund two sites with microgrid controllers. One site has existing solar generation and power storage capability (retrofit pilot); the second site has solar generation and is in the process of adding power storage capabilities to their existing solar system (new build pilot). Installation of the retrofit pilot at San Jacinto High School in the San Jacinto Unified School District was completed in August 2020, and SCE entered an agreement with Kordyak Elementary in the City of Fontana within the Rialto Unified School District for a microgrid targeted for 2021.

FTM Microgrids at Multiple Customer Sites

SCE is developing longer-term efforts in microgrids that will serve multiple customers. Through 2020, SCE explored potentially viable microgrid deployment opportunities to provide power during PSPS events by examining portions of our system that experience frequent PSPS outages, serve critical facilities or AFN customers, and have land availability. SCE identified and is pursuing an opportunity in Simi Valley to form a microgrid to reduce PSPS impacts for a community of greater than 200 customers, both residential and commercial, including low-income, critical care, and Medical Baseline customers. The PSPS Microgrid Pilot will be built with clean generation/storage technology and is slated to be operational ahead of peak 2022 wildfire season. Its planning and execution will help SCE advance its capabilities in this nascent area and, correspondingly, inform SCE's contributions to the ongoing Microgrid Order Instituting Rulemaking (OIR).[10]

In 2021, SCE will work with the joint IOUs to develop a Microgrid Incentive Program (MIP) as required by the Microgrid OIR Track 2 Decision.[11] Details of the program remain to be developed, and we expect the program to represent an opportunity for communities interested in implementing FTM microgrids to propose their projects and, if the proposal is eligible, receive technical and financial assistance for its implementation. Proposed projects are expected to be operational in 2023.

Temporary Back-up Power

Temporary back-up power under certain conditions may be used to safely power subsets of customers who would otherwise be affected by a PSPS event. In late 2020, SCE took delivery of a novel mobile battery energy storage system (MBESS), which will function as a zero-emission alternative to a mobile diesel generator. In preliminary deployments, SCE will operate the MBESS in conjunction with diesel generators to reduce net emissions. SCE will also identify potential opportunities for standalone MBESS operation. With 0.7MW/2.9MWh power energy capacity, the MBESS can support multiple customers during a typical PSPS event, depending on targeted customer load profiles and event duration. The preliminary deployment site, in Simi Valley, has been impacted by past PSPS events and includes 121 total customers (113 residential and eight commercial). This site was well-suited for the preliminary deployment based on load profile, available space for equipment, and prior work preparing for temporary diesel generator implementation. The system is expected to be ready for deployment in time for peak 2021 wildfire season. Potential additional deployment sites have been identified in Ventura and San Bernardino counties. Expansion of MBESS deployment to other sites for the 2021 fire

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[10] R.19-09-009, Order Instituting Rulemaking Regarding Microgrids Pursuant to Senate Bill 1339, issued 9/19/2019.

[11] D.21-01-018, Decision Adopting Rates, Tariffs, and Rules Facilitating the Commercialization of Microgrids Pursuant to Senate Bill 1339 and Resiliency Strategies, issued 1/21/2021.

season will be evaluated based upon factors such as effectiveness in mitigating customer minutes of interruption and avoided emissions.

Resiliency Zones Pilot

In early 2020, SCE conducted an analysis of circuits impacted by 2019 PSPS events. SCE used the results of the analysis to identify remote communities to initiate the development of a pilot in 2020 to provide essential service sites (*e.g.*, grocery stores, gas stations) in these remote communities with temporary, mobile back-up power. Participating county and community leaders will identify essential sites and SCE will upgrade customer equipment to enable connection to temporary generators deployed by SCE during PSPS events. To date, SCE has secured customer participant agreements for four sites: three in Agua Dulce and one in Cabazon. The three sites in Agua Dulce include a gas station/mini market, three businesses connected to one panel (hardware store, restaurant, and gift shop), and a pump house that supplies water to those three businesses. The site in Cabazon is a gas station. In 2021, SCE will continue engaging with county and community leaders to identify additional essential service sites in these communities for Resiliency Zones.

Community Resource Centers (CRCs)

In 2020, SCE had fifty-six CRCs and eight Community Crew Vehicles (CCVs) available for deployment during PSPS events, with the primary focus of reducing customer impact due to de-energization. In 2021, SCE will provide certain Community Resource Centers (CRC) in remote locations with a transfer switch and back-up power connection so they can continue to provide service to the community if the CRC site is impacted by a PSPS event. To date, SCE has signed customer agreements with three CRCs (Acton Community Center, James A. Venable Community Center (aka Family Service Association) in the city of Cabazon, and Stallion Springs Community Center in the city of Stallion Springs) to receive temporary back-up power if the CRCs are de-energized during PSPS events.

SCE will evaluate the need to expand beyond the current 56 CRC sites under contract by evaluating a refreshed view of locational needs. SCE will consider 2019-2020 event history, as well as grid hardening efforts. We will continue discussions with tribal communities to increase their participation with designated CRC sites. In addition to CRCs, SCE has a fleet of CCVs that are deployed to locations where CRCs are not available. The CCVs provide similar services to the CRCs. During PSPS events, SCE will deploy trained staff to the CRCs/CCVs in the area of impact to provide information and services to our customers, including education and awareness on PSPS and related program information such as Medical Baseline, CARE/FERA discounts, resiliency rebates, resiliency items such as phone chargers, and amenities such as mobile device charging, snacks, water, and ice. SCE will continue to evaluate customer survey feedback from customer visits to SCE's CRCs and CCVs to make improvements.

Corrective Action #	Description/Deliverables	Milestone/Deadline
3.B Increase Community Resiliency: Microgrids and Resiliency Zones	• Construct four Resiliency Zone sites (three in Agua Dulce and one in Cabazon) with back-up power transfer switches and secure additional community Resiliency Zone site commitments	• Mar. 31, 2021: complete one site • May 31, 2021: complete three sites • Jun. 30, 2021: secure additional commitments
	• Identify up to 15 CRC locations to enable a transfer switch for back-up power	• Jun. 30, 2021: secure customer commitments
	• Complete BTM microgrid enablement for a school in Fontana (Rialto USD) as part of SCE's Community Resiliency Pilot	• Sept. 30, 2021: customer secures materials • Dec. 31, 2021: developer completes construction

C. Address Community Safety

SCE will continue to work with local and tribal governments to help identify community challenges due to the loss of power and develop resiliency plans for PSPS events and other outages. Understanding the community challenges will help address issues SCE has heard from our customers about the need for community resiliency plans for traffic signals, water supply, and telecommunication needs during emergency situations. Additionally, SCE will work with local and tribal governments to support their applications for third-party grant funding for resiliency opportunities. SCE's support may include technical assistance and other assistance as required for the grant. SCE will partner with these stakeholders and the Working Groups, Advisory Board, and other parties to identify and evaluate potential solutions. SCE will also review opportunities to improve the timeliness and content of notifications to help them prepare for potential outages as discussed in Section 2.C of this document.

SCE will document feedback received in these and other meetings for potential changes and improvements to SCE's PSPS processes and procedures. Input and recommendations will be documented and reviewed. SCE will incorporate changes where possible and will keep the stakeholders informed on the status of their feedback.

Corrective Action #	Description/Deliverables	Milestone/Deadline
3.C Address Community Safety and Expand CRC/CCV	• Send WMP and PSPS updates to key stakeholders and ask them to identify community safety needs	Mar. 31, 2021
	• Request meetings with local and tribal governments and critical infrastructure customers	Mar. 31, 2021
	• Assess feedback and incorporate feedback into other action items as appropriate.	Oct. 1, 2021

V.

CORRECTIVE ACTION 4: KEEP PARTNERS AND CUSTOMERS INFORMED

SCE understands that our partners and customers need to be informed about PSPS events, including how to prepare for these events and, especially for our AFN population, enroll in programs intended to support them during such events. In the section below, SCE will demonstrate success through measurably increased program enrollment, stakeholder feedback, and increased outreach in advance of the PSPS events.

A. Education and Awareness Before PSPS Events

1. Education on wildfire, PSPS, hardening, and resiliency

Based on feedback received, SCE recognizes the need to increase customer understanding regarding PSPS processes and decision-making. SCE also needs to increase education about available customer programs, rebates and services that can help customers prepare for PSPS events as well as assist them during an outage.

a) SCE's 2021 PSPS Marketing Campaign:

Past efforts include direct mail, social media, videos, emails, and other advertisements focused on increasing customer awareness around what PSPS events are, how notifications work and where to locate materials online to get information about PSPS events and sign-up for notifications. SCE will continue to provide that information.

In 2021, SCE will direct customers to newly developed, clear and concise information explaining why customers are in scope and being notified regarding PSPS, including the factors that lead to de-energizations and improvements on the grid that will ultimately reduce the need for PSPS.[12] SCE will also provide information about and increase enrollment in customer programs and services that support customer resiliency. In addition to the overall marketing campaign, SCE will continue targeted marketing efforts to its AFN customers (see section 4.B).

SCE's outreach effort will include the PSPS Newsletter mailed to all five million SCE customers with targeted PSPS information and a focus on customers in HFRA. That effort will be augmented with an advertising and marketing campaign that includes radio, digital (videos, banners, connected TV, radio), social media, and search ads.

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[12] SCE's wildfire and PSPS related webpages, available in all prevalent languages, include: Wildfire Safety primary landing page (sce.com/wildfire), Wildfire Mitigation Efforts page (sce.com/mitigation), PSPS page (sce.com/psps), PSPS Alerts page (sce.com/pspsalerts), Fire Weather page (sce.com/fireweather), Community Meetings page, (sce.com/wildfiresafetymeetings) and Customer Resources and Support page (sce.com/customerresources).

SCE will continue using SCE's customer-facing Energized by Edison website to complement these materials, creating content that aids customers in understanding PSPS and encourages customer participation in rebates and other customer programs. SCE will continue to outreach using the Energized website monthly digital newsletter to leverage this content and encourage partners to amplify its message.

Further customer education and outreach efforts will include active outreach to local and regional media outlets, with an emphasis on getting customer programs information to communities that face the highest risk of wildfire.

SCE leverages the results of its various customer surveys to determine opportunities to strengthen messaging, communication channels, and prioritization of customers who may need additional or targeted outreach.

SCE's ongoing marketing campaign, which includes radio, digital, social media, search ads and direct customer mailings, seeks to educate customers and the public on PSPS, including the conditions that trigger a PSPS, how to prepare for a PSPS, what SCE has done and continues to do to mitigate the risk of wildfires, and how to prepare for emergencies including signing up for alerts. In 2021, SCE will create new ads to improve customer awareness of the available programs and services for customers impacted by a PSPS outage, directing them to customer resources and programs. SCE will measure impressions, with a 2021 campaign-wide goal of one billion impressions, as well as measuring click-through rates for these ads.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.A.1.a Marketing Campaign	• Create new ads and expand the marketing campaign to increase awareness of programs and services and help increase customer participation	Apr. 30, 2021

b) <u>2021 PSPS Newsletters Mailed to All Customers:</u>

In April and May 2021, SCE will direct mail PSPS newsletters to all SCE customers, with content adjusted for customers in HFRA. The newsletter sent to customers in HFRA will focus on PSPS, including SCE's decision-making factors for PSPS as well as information regarding available customer programs and rebates. Customers in non-HFRA will receive materials focused on emergency preparedness that will also include an overview of PSPS. Both versions will provide an update on SCE's wildfire mitigation efforts, helpful emergency preparedness websites and ways to sign up for alerts and customer support programs.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.A.1.b PSPS Newsletters	• Newsletter content completed	Mar. 31, 2021
	• Newsletters printed	Apr. 15, 2021
	• Newsletter mailings complete to HFRA customers	Apr. 30, 2021
	• Newsletter mailings complete to non-HFRA customers	Apr. 30, 2021

c) Energized Stories and Monthly Wildfire Digital Newsletter:

SCE shares stories about its wildfire mitigation and PSPS efforts on Energized by Edison. In 2020, wildfire mitigation content on Energized by Edison accounted for 21 percent of total content. This averages two to three content pieces each month. Energized by Edison is available on energized.edison.com and in 2020 had roughly 1.5 million unique visitors. The platform is regularly distributed to media and shared with members of our Consumer Advisory and Government Advisory panels.

In addition to topics including wildfire mitigation activities, emergency preparedness and inspections, content will be expanded to feature programs such as the Critical Care Back-up Battery program and encourage participation in other customer care programs, such as Medical Baseline. SCE also uses its Monthly Wildfire Digital Newsletter to outreach to partner agencies and governments to amplify and share this content on their respective platforms and on social media.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.A.1.c Energized Stories & Digital Newsletter	• Publish two to three stories monthly related to wildfire mitigation and customer programs	Jan. – Dec. 2021
	• Use Monthly Wildfire Digital newsletter to outreach to partner agencies, governments and community organizations	Mar., Jul., Sept., Dec. 2021

d) **<u>Media Outreach</u>**:

As part of its customer outreach efforts, SCE directly contacts local and regional media outlets to leverage Energized by Edison external stories for earned media coverage. These activities have provided information to help customers prepare for PSPS or other emergencies through the coverage achieved.

In 2021, SCE will continue these outreach efforts to media publication in HFRA with a new emphasis on customer programs and rebates to drive customer participation. SCE will also conduct outreach to other media outlets that have covered PSPS issues.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.A.1.d Media Outreach	• Identify and verify media outlet contact information (HFRA and Non-HFRA)	Apr. 1, 2021
	• Outreach with customer program focus and follow-up to HFRA media outlets	May 15, 2021
	• Outreach and follow-up to non-HFRA media	Jun. 30, 2021

2. **<u>Clearly communicate specific circuit information about hardening investments in communities and how those are reducing PSPS need</u>**

As mentioned previously, it is our commitment to reduce the use of PSPS over time with increased grid hardening and improved operations, including changing de-energization thresholds where appropriate, and reducing the number of customers de-energized due to wildfire risk. This effort includes expanding circuit-specific grid hardening and PSPS mitigation plans, particularly for frequently impacted circuits and communicating this information clearly and concisely to customers that were most impacted in 2020. Information about SCE's wildfire mitigation and grid hardening efforts is available on sce.com/mitigation.

Corrective Action #	Description/Deliverables	Milestone/ Deadline
4.A.2 Specific information about grid hardening investments in communities and how those are reducing PSPS need	• Publish 2021 WMP Update fact sheet with comprehensive overview of SCE's grid hardening efforts, progress-to-date and 2021 plans on sce.com	Feb. 5, 2021
	• Publish quarterly progress report on grid hardening on sce.com	Feb. – Dec. 2021
	• Identify and publish information on the circuits most impacted by PSPS in 2020	Mar. 1, 2021
	• Explain on sce.com the work being conducted in 2021 in most impacted communities	Apr. – Sept. 2021
	• Mail letters and conduct outreach to customers on these circuits as progress is made in their area	Apr. – Sept. 2021

B. Reaching Vulnerable Customers to Update Contact Information and Increase Enrollment in Programs and Services

SCE recognizes the importance of reaching vulnerable populations when de-energization events occur and is committed to doing so in advance and during events. SCE also acknowledges that not all customer impacts are the same and that those customers who rely on power for medical devices, medications, mobility or other vulnerabilities may require additional support through tailored customer care programs.

Specifically, SCE currently tracks the following indicators of a customer's AFN status, and SCE will continue marketing to increase enrollment in relevant programs, which will in turn increase enrollment in SCE's AFN tracking, as well as partnering with statewide organizations and agency partners to enhance its ability to identify vulnerable customers:

- Customers enrolled in the following programs:
    - California Alternate Rates for Energy Program (CARE)
    - Family Electric Rate Assistance (FERA)
    - Medical Baseline (including Critical Care)
- Customers who receive their utility bill in an alternate format:

- Braille
- Large Font Bill

- Customers who self-identify as having a person with a vulnerability (such as a disability) in the home and could require an in-person visit prior to disconnection if not otherwise reachable
- Customers who have stated a language preference as other than English

SCE remains committed to understanding the unique needs of its AFN customers and finding opportunities to help enhance outreach, education, and resiliency support in advance, during and following emergency situations such as PSPS events. In 2021, SCE will partner with statewide organizations and trusted agency partners that serve vulnerable populations to enhance its capabilities in identifying AFN customers. SCE is currently working with State Council on Developmental Disabilities (SCDD), Cal OES and the joint utilities on proposals for leveraging In-Home Support Services (IHSS) and the Regional Center programs for identification of vulnerable populations. These organizations serve approximately one-million customers across the State of California and it is believed that those served represent the most vulnerable of the AFN populations. These partnerships will directly serve to enhance SCE's capabilities for identifying vulnerable populations and help get eligible customers enrolled in meaningful programs offered by SCE. SCE will also continue relying on customers self-certification and intend to enhance outreach, awareness and education with its customers as mentioned in other sections within this CAP.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.B Identifying vulnerable populations	• Partner with SCDD, Cal OES (AFN), CFILC and the joint utilities to broaden utility awareness of vulnerable customers enrolled in programs with IHSS and statewide Regional Centers	June 2021

1. Expand marketing and outreach efforts to reach vulnerable customers, including Medical Baseline enrollment

In prior years, SCE has focused efforts during de-energization events on customers that are most medically vulnerable by leveraging information from its Medical Baseline program and taking additional cautionary measures for those designated as Critical Care (customers dependent on a medical device that cannot be without power for at least two hours to sustain life). SCE will continue to focus on identifying, communicating with, and supporting its most vulnerable customers. In 2021, SCE will increase marketing, education, and outreach to enroll vulnerable populations into appropriate programs and services, such as SCE's Medical Baseline program.

SCE's marketing campaign seeks to educate customers and the public on PSPS, including the conditions that trigger a PSPS, how to prepare for a PSPS, what SCE has done and continues to do to mitigate the risk of wildfires, and how to prepare for emergencies. In 2021, SCE plans to continue to run advertisements in English and other languages using a variety of channels, including digital banners, digital video, connected TV, social media, digital audio and broadcast radio as described above in section IV.A.

In addition to this overall marketing campaign, SCE will continue to promote meaningful and relevant programs that offer benefits, incentives, and services to its AFN customers. SCE promotes these programs throughout the year using campaigns dedicated to individual programs. Communications that include highlights about available programs are sent to customers to raise awareness and direct them to channels, such as sce.com and SCE's contact center, where they can learn more about the programs. In 2021, SCE will more than triple the dedicated marketing budget[13] to increase Medical Baseline program enrollments and will continue to cross-promote Medical Baseline with other campaigns as mentioned above.

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[13] SCE's 2020 budget dedicated solely to marketing Medical Baseline was $75,000.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.B.1 Reaching vulnerable customers to update contact information and increase enrollment in programs, services, delivery notifications	• Launch expanded marketing and outreach efforts to reach vulnerable customers, including Medical Baseline enrollment	Mar. 31, 2021

2. Researching the Needs of Vulnerable Populations

To help address the needs, identify the right solutions and support efforts to aid vulnerable populations, SCE conducts its own research studies, gathers direct and meaningful feedback from members of the community and partners with trusted stakeholders such as CBOs, independent living centers (ILCs), the Statewide AFN Advisory Council, 2-1-1 Interface, Working Groups, Advisory Board, and public agencies that represent the AFN population to better understand and address gaps where they exist with our vulnerable customers.

In 2021, SCE will launch a new research study for our AFN customers that will help us further understand the varying needs and impacts of this diverse and vulnerable population when PSPS events unfold providing insights through practices such as surveys and or focus groups. Further, this research study will help to influence customer care plans and future programs that will address the gaps in resiliency capabilities for AFN customers so that as PSPS events unfold, this population will have emergency plans in place that enable them to remain resilient through these events. Data gathered from this study will enhance and inform the strategies for greater integration with the vulnerable population and customer programs offered by SCE for the needs of our vulnerable populations.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.B.2 Identifying vulnerable populations	• Define research objectives and scope to gather qualitative feedback on the customer experience and improve our efforts to help vulnerable customers	Mar. 2021
	• Initiate research with customers	Apr. 2021
	• Complete AFN Research study with conclusions and recommendations	Jul. 2021

3. Enhance the Online Experience

In addition to further identifying and understanding the needs of vulnerable populations, SCE will enhance the online experience by creating a dedicated web page where customers can self-certify as vulnerable, enroll in programs, and update contact information. Additionally, SCE will enable the ability for customers to provide e-signatures for their Medical Baseline applications.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.B.3 Enhance the online experience	• Enable e-signatures for Medical Baseline applications	Apr. 2021
	• Enable customers to self-certify as vulnerable, enroll in programs, and update contact information via sce.com	Jul. 2021

4. Delivery of PSPS Alerts and Notifications to Vulnerable Populations

Identifying Medical Baseline and AFN customers and notifying them of PSPS events is critical to helping ensure the safety and wellbeing of some of the State's most vulnerable residents. Historically, SCE has focused on the most vulnerable customers (those who cannot be without electricity for life sustaining devices for at least two hours, *i.e.*, Critical Care customers) for verification of delivery for alerts and notifications. In 2021, SCE will expand capabilities to apply similar treatment for all Medical Baseline customers and those who self-certify as needing an in-person visit prior to disconnection. This includes ensuring positive delivery to customers and, in cases when SCE cannot verify a positive delivery, SCE will escalate contact attempts up to an in-person visit at the customer's premise, if necessary.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.B.4 Ensure delivery of PSPS alerts & notifications to vulnerable populations	• Expand verification of notification deliveries to Medical Baseline customers and those who certify as needing an in-person visit prior to disconnection, in addition to existing Critical Care customers	Jul. 2021

5. AFN Community Partnerships

SCE will continue engaging with diverse community stakeholders to conduct outreach and raise awareness about PSPS, promote resiliency preparedness for when PSPS events unfold and gain insights on the varying and unique needs of the AFN populations. SCE remains committed to supporting its relationships with statewide and local CBOs and trusted agency partners throughout its service area and continues to expand those relationships outward to other trusted agencies that support AFN customers. SCE's 2021 Access and Functional Needs Plan filed on February 1, 2021, provides a comprehensive listing of community and partnership activity. In 2021, SCE will continue engaging existing partnerships, including within the Statewide AFN Advisory Council, and expand partnerships.

a) Statewide AFN Advisory Council:

SCE is committed to understanding the unique and diverse needs of its AFN customer populations and co-funds the Statewide AFN Advisory Council in partnership with the other California IOUs. The AFN Advisory Council meets at least monthly and is comprised of a diverse group of recognized CBO leaders that support the AFN population as well as members and advocates from within the AFN community. The Statewide AFN Council serves as an appropriate foundation for successfully serving its AFN customers. The AFN Council opens the dialogue to discuss unique needs of this most vulnerable population and to develop a holistic strategy to better serve AFN customers. The board of the AFN Council is comprised of IOUs, state leaders (*e.g.*, Cal OES, CPUC), and statewide CBO leaders who support the AFN population. In 2021, SCE remains committed to building upon the expertise within the AFN Advisory Council and further opportunities to serve its AFN populations.

b) <u>State Agency Partners:</u>

SCE's AFN Plan describes its approach to identifying AFN populations as well as customer care plans. Information is provided to state agencies through manual methods during PSPS events. In 2021, SCE will include the needs of the AFN population into the Public Safety Partner Portal referenced in Section IV.D, providing information on SCE's AFN vulnerability criteria and framework.

c) <u>In-Home Supportive Services (IHSS) Partnerships</u>:

In 2021, SCE will launch its partnership with IHSS to provide training to in-home health workers and other social service staff about the programs that SCE provides that are meaningful and helpful to their clients. The training program will be virtual with a series of events made available on an estimated quarterly basis. The Deputy Director of IHSS and SCE will launch the first quarterly training program by end of Q2 2021 and coordinate additional quarterly trainings throughout 2021. The training will consist of in-depth overview of helpful programs that SCE offers its customers with emphasis on the Medical Baseline program. Additionally, IHSS will coordinate the distribution of collateral and attendees for the sessions using their resource information databases. SCE and IHSS will evaluate the effectiveness of the training programs and look for opportunities throughout the year to improve this partnership, where possible.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.B.5 AFN Community Partnerships	• Continue engagement of existing partnerships including within the Statewide AFN Advisory Council	Jan. – Dec. 2021
	• Launch training of county healthcare workers on Medical Baseline with IHSS	Mar. 31 2021

C. Comprehensive Stakeholder and Community Engagement Plans, Including Townhall Meetings for Impacted Communities

SCE understands that its stakeholders and customers have many questions and concerns regarding PSPS. SCE has engaged and will continue to engage government, business, and community stakeholders, public safety partners, and the public to increase awareness about SCE's wildfire mitigation work, PSPS, customer programs and resources; identify collaboration opportunities; and solicit feedback on possible improvements to these programs. SCE will host public meetings for communities that have been impacted by PSPS as well as participate in government, business, and community forums to educate customers and communities on SCE's WMP and help them prepare for wildfire and PSPS. The stakeholder and community engagement activities will help support and obtain feedback for the other actions listed in this plan.

SCE will document feedback received in these and other meetings for potential changes and improvements to SCE's PSPS processes and procedures. Input and recommendations will be documented and reviewed. SCE will incorporate changes where possible and will keep the stakeholders informed on the status of their feedback.

1. Community Meetings

SCE acknowledges and understands that communities need help understanding what actions SCE is taking to reduce the frequency of PSPS events in their communities. SCE will continue to build upon its community engagement efforts over the past three years. In 2020, SCE held virtual community meetings for customers in high risk fire areas, including communities that were impacted by multiple PSPS events in late 2019: Tehachapi/Lake Isabella, Santa Paula/Fillmore, Acton/Agua Dulce, Chatsworth, Santa Clarita, Cabazon, and Mammoth Lakes/Mono and Inyo counties. SCE also held two virtual meetings open to all communities that were not targeted to a specific area.

By March 31, 2021, SCE will host three virtual community meetings for communities that have been impacted by PSPS events in late 2020 and early 2021. During these meetings, SCE will present and solicit feedback on its Corrective Action Plan. Specifically, SCE will discuss the steps it is taking to address concerns raised by stakeholders and customers regarding recent PSPS events, the mitigations to reduce PSPS events, and customer care programs and resources. SCE will also share how it will keep customers informed about wildfire mitigation activities and other issues discussed in this plan.

During the second quarter of 2021, SCE will host the remaining community meetings for customers in high risk fire areas and for specific communities impacted by multiple recent PSPS events. SCE will address customer questions and concerns about recent PSPS events. SCE will provide information on grid hardening and mitigation activities in communities that have been frequently impacted by PSPS and explain how that work will reduce future PSPS events in those communities. SCE acknowledges that customers also want to understand the factors SCE uses in implementing PSPS, so SCE will provide more detailed information about the decision-making process for monitoring and de-energizing circuits. SCE also understands the impact PSPS events have on customers and will provide detailed information on the various customer care programs (*e.g.*, battery back-up programs, Self-Generation Incentive Program, generator rebate for well water customers) and measures to help customers prepare for outages, including PSPS events. SCE will also encourage customers to sign up for PSPS/outage notifications and other programs, including Medical Baseline. Customers will have the opportunity to ask questions to SCE representatives during the meetings. SCE will send a survey to meeting attendees to solicit feedback on the meetings.

The loss of telecommunications during PSPS events is a concern for many customers, so SCE will invite telecommunication companies serving the impacted areas to participate in the community meetings to share their resiliency plans with customers. SCE will also invite local emergency officials to discuss emergency preparedness tips and explain how customers can access tools and programs provided by local and tribal governments.

Given the COVID-19 pandemic and current stay-at-home orders, SCE plans to hold these meetings virtually, but will re-assess if conditions change. Meetings will be recorded and posted on SCE's website.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.C.1 Community Meetings	Educate customers and communities on SCE's wildfire mitigation work (including community-specific grid hardening activities), PSPS decision-making factors, available customer programs and resources; obtain feedback	• Mar. – Jun. 2021

2. Local and Tribal Government Engagement

SCE understands the importance of educating and partnering with local and tribal governments on SCE's WMP. SCE coordinates closely with the communities it serves and has designated representatives who interface regularly with local and tribal governments.

As SCE has done on an annual basis, SCE will send information on its WMP and PSPS protocols to local and tribal governments in high risk fire areas by March 31, 2021. The material provided will include:

- Updates on changes and improvements to PSPS protocols
- Information on the circuits in the jurisdiction that could be impacted by PSPS
- Information of how to access GIS maps of PSPS circuits
- Description of decision-making factors used to determine the implementation of PSPS
- Information on the grid hardening activities the company is doing in the local area and the impact that will have to reduce the use of PSPS

- Description of SCE's PSPS notification process and ongoing improvements to improve timeliness and accuracy
- Request to verify and update governmental and tribal contact information
- Request for assistance in promoting the enrollment of SCE's PSPS/outage notifications, SCE's Medical Baseline and SCE's customer programs aimed at building customer resiliency for emergencies, including PSPS
- Request to verify or identify additional critical facilities within the jurisdiction's boundaries
- Request for recommendations on how to identify and contact vulnerable populations, including community-based organizations that may be helpful
- Request to help identify additional locations for Community Resource Centers and Community Crew Vehicles
- Solicit input on the SCE Public Safety Partner Portal
- Reminder to assess additional back-up power needs and to test currently available capabilities
- Request input on topics to share or focus on during community meetings

After sending the information, SCE representatives will request to meet with all local and tribal governments in HFRA to review the material provided and solicit input on how SCE can improve its information-sharing, collaboration, and partnership.

SCE has designated representatives for the 13 Native American tribes in SCE's service area. As mentioned above, SCE's representatives regularly engage and coordinate with tribal governments, including during PSPS events. In addition to the individual meetings with tribal governments, SCE will engage the Southern California Tribal Emergency Management Group and will also host a workshop for tribal governments to discuss PSPS and address concerns they may have.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.C.2 Local and Tribal Government Engagement	• Send WMP and PSPS updates to key stakeholders and ask them to identify community safety needs	Mar. 31, 2021
	• Request meetings with local and tribal governments and critical infrastructure customers	Mar. 31, 2021
	• Assess feedback and incorporate feedback into other action items as appropriate.	Oct. 1, 2021

3. County Operational Area Engagement

SCE relies on the partnerships with local and tribal government public safety and emergency management personnel for effective coordination and response to emergency events, including PSPS. As part of ensuring an engagement process that meets the needs of SCE's partners, SCE plans to meet individually with each county Office of Emergency Management ahead of the 2021 fire season. As a follow-up to those initial conversations, SCE will also request to attend and present at existing Operational Area meetings these agencies host to share information on PSPS protocols. These meetings are attended by cities, towns, tribes, and other public safety partners in each county and are an excellent forum for sharing PSPS processes and procedures and soliciting feedback from our agency partners. SCE will use this feedback to improve its PSPS program, strengthen existing relationships, and build new ones.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.C.3 County Operational Area Meetings	Solicit public safety partner feedback through Operational Area meetings	Mar. – Dec. 2021
	Incorporate feedback from Operational Area meetings into PSPS Protocols	May and Dec. 2021

4. Local and Tribal Government Planning Meetings

As required by California Public Utilities Code 768.6, SCE will host two meetings for local and tribal government emergency planning officials by March 31, 2021. These meetings provide SCE an opportunity to review and solicit feedback on its emergency planning activities and to coordinate with local and tribal governments. Information on SCE's PSPS plans will also be reviewed in these meetings.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.C.4 Local and Tribal Government Planning Meetings	Review and receive input on SCE's Emergency Plan, including PSPS	Apr. 2021

5. Local/Tribal Government Resiliency Workshops

As required by the CPUC's Microgrid OIR Track 1 Decision,[14] SCE will hold workshops semiannually starting in 2021 for all local and tribal governments to provide information to assist them in their own resiliency planning efforts and preparing for PSPS. Topics will include PSPS, weather forecasting, microgrids, SCE's electric grid and infrastructure resiliency plans, and reliability. Community choice aggregators and organizations serving AFN and vulnerable populations will also be invited to the workshops.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.C.5 Local/Tribal Government Resiliency Workshops	Provide information to assist local and tribal governments in their own resiliency planning efforts and preparing for PSPS	Apr. 30 and Sept. 30, 2021

6. PSPS Working Groups and Advisory Board

As required by the CPUC's PSPS OIR Phase 2 Decision,[15] SCE hosts PSPS Working Groups and Advisory Board meetings quarterly to expand the opportunities available to share lessons learned between SCE and impacted communities on PSPS protocols and to develop best practices on PSPS. SCE will continue to host PSPS Working Group and Advisory Board meetings quarterly in 2021 and will leverage feedback from these forums to improve PSPS and address stakeholder concerns.

[14] D.20-06-017.
[15] *See* D.20-05-051, p. 90.

Subjects typically addressed by the Working Groups include: CRCs, communication strategies, information sharing including soliciting information of SCE's Public Safety Portal, identification of critical facilities, strategies for supporting AFN people/communities, and resiliency plans. SCE used the existing Cal OES regions to establish three Working Groups to represent stakeholders from the entire SCE service area, including small multi-jurisdictional electric utilities, community choice aggregators (CCAs), publicly owned electric utilities, communications and water service providers, CPUC staff, tribal and local government entities, public safety partners, representatives of AFN and other vulnerable communities.

The PSPS Advisory Board leverages lessons learned from Working Group sessions to make recommendations on potential improvements to SCE's PSPS program. The Advisory Board includes participants from public safety partners, communications and water service providers, local and tribal government officials, business groups, non-profits, representatives of AFN and vulnerable people/communities, and academic organizations.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.C.6 PSPS Working Groups/Advisory Board	Share lessons learned and help develop best practices around PSPS	• Quarterly in 2021

7. Critical Infrastructure Customer / Public Safety Partner Engagement

SCE understands the need to improve the partnership with public safety partners and critical infrastructure customers to ensure they are aware of the impact PSPS may have on their operations.

Specifically, SCE will:

- Continue to provide detailed information on which of their facilities are subject to PSPS, including circuit names
- Review SCE's PSPS notification process and ongoing improvements to timeliness and accuracy of information

- Provide awareness of and visibility into the decision-making factors used to determine the implementation of PSPS
- Provide historical circuit impacts to critical infrastructure customers located in areas that require back-up resiliency plans to ensure they can properly prepare
- Continue to identify and verify all accounts in the critical infrastructure category
- Ensure that critical infrastructure accounts are correctly identified so that they receive the early notifications
- Continue to verify and update contact information
- Continue to provide information and training for access and use of the Representational State Transfer (REST) Service, and GIS maps of PSPS circuits
- Continue to provide load profiles for customers so they can identify back-up power/resiliency requirements
- Solicit input on the SCE Public Safety Partner Portal

SCE will continue to host PSPS resiliency workshops designed for public safety partners and critical infrastructure customers in emergency services, government facilities, healthcare and public health, energy, chemical and transportation sectors, as well as community choice aggregators. SCE has responded to customer feedback by incorporating discussion on customer resiliency and highlights of lessons learned from PSPS events. Topics discussed during these workshops will include:

- Updates on SCE's grid hardening efforts and education on available customer tools and resources
- Review of SCE's PSPS process and communication protocols
- Share technical issues encountered by customers (*e.g.*, ensuring connection of back-up power is compatible, confirming critical equipment is connected to back-up power sources)
- Review opportunities for mutual aid
- Obtain an understanding of customer issues and concerns

SCE values customer feedback stemming from PSPS events and, as a result of such feedback, will provide demonstrations of the GIS tools available to customers, including SCE's REST service, and a review of customer back-up generation requirements. These workshops will occur in the second quarter of 2021. SCE will also improve notifications sent to these customers as detailed in section II.C of this document.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.C.7 Critical Infrastructure Customer / Public Safety Partner Engagement	Educate Critical Infrastructure customers and Public Safety Partners on SCE's wildfire mitigation work, PSPS protocols, and customer resiliency plans; receive input and identify collaboration opportunities	Mar. – Dec. 2021

8. CBO Engagement

Throughout 2021, SCE will continue to partner with CBOs, such as Fire Safe Councils, Independent Living Centers, 211 Operators, and emergency preparedness groups, to educate their members and share information on SCE's wildfire mitigation work, PSPS, customer care programs, and emergency preparedness resources. SCE will seek regular feedback from CBOs to inform continuous improvements on outreach, communications, and program adoption. SCE will also seek assistance to promote customer programs such as Medical Baseline, Self-Generation Incentive Program, and other programs to support customer resiliency.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.C.8 Community-Based Organization Engagement	Engage with Community-Based Organizations to educate their members and help share information on SCE's wildfire mitigation work, PSPS, customer care programs, and emergency preparedness resources	Throughout 2021

9. Power Talks

SCE hosts Power Talks, which are sessions to help educate business and residential customers prepare for all types of electrical outages, including sharing PSPS protocols, notification process and resiliency efforts. SCE plans to hold these sessions virtually across SCE's service area starting in March 2021.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.C.9 Power Talks	Educate business and residential customers on SCE's outage types, including PSPS protocols, notification process, and resiliency efforts	Mar. – Dec. 2021

D. Keeping Public Safety Partners and Critical Infrastructure Customers Informed During Events

Currently, local and tribal government officials, public safety partners, and critical infrastructure managers can access outage and period of concern boundaries for HFRA circuits in the SCE service area for planning purposes through SCE's Representational State Transfer (REST) Service. SCE will create a new Public Safety Partner Portal to improve situational awareness during PSPS events for first responders and operators of critical facilities and communications systems. Features and content of the Portal will include the same real-time PSPS information publicly available on sce.com and through SCE's PSPS REST service and will, subject to appropriate confidentiality measures, expand upon that information to enable better coordination of event response between SCE and public safety partners.

Proposed information available via the Portal:

- **Planning Information**
    - PSPS planning maps
      (GIS layers, KMZ, Shapefile, PDF, File Geodatabase, GeoJSON, Feature Collection)
    - Circuit map
    - Summary of potentially impacted customers, including critical customers and medical baseline customers
    - PSPS Policies & Procedures
    - PSPS Sample Notifications
- **Event Information**
    - Event-specific information and maps
      (GIS layers, KMZ, Shapefile, PDF, File Geodatabase, GeoJSON, Feature Collection)
    - PSPS Outage and Restoration areas
    - List of all affected customers

- Situation Reports

SCE's estimates below are based on its best available information for data integration and stakeholder requirements. SCE will use its bi-weekly reporting to keep the Commission informed on progress and adjust deadlines, if necessary, based on new information discovered and new requirements identified through its design and analysis activities. SCE will prioritize activities to provide stakeholders accurate and useful information to keep them informed throughout a PSPS event.

Corrective Action #	Description/Deliverables	Milestone/Deadline
4.D Keeping public safety partners informed during events	• Conduct initial benchmarking with PG&E Portal team	Feb. 2, 2021
	• Initiate scoping/estimation process with SCE IT	Feb. 5, 2021
	• Initiate Procurement activities	Feb. 15, 2021
	• Complete scoping/estimation process with SCE IT	Feb. 26, 2021
	• Complete procurement activities	Mar. 12, 2021
	• Initiate Phase 1 Development	Mar. 15, 2021
	• Initiate Phase 2 Development	May 10, 2021
	• Complete Phase 2 development (including testing)	May 31, 2021
	• Launch Phase 1 Public Safety Partner Portal	Jun. 1, 2021
	• Complete Phase 2 development (including testing)	Sept. 10, 2021
	• Launch Phase 2 Public Safety Partner Portal	Sept. 13, 2021

VI.

CORRECTIVE ACTION 5: ENHANCE AND IMPROVE POST-EVENT REPORTING

To provide more transparent post-event reports that adequately, accurately, and simply state the circumstances and criteria SCE used to determine the need for a PSPS event, SCE has begun reviewing and improving its current post-event report format based on feedback it has received from its customers, public safety partners, and the Commission on late-2020 PSPS events. Ahead of the 2021 fire season, SCE will coordinate with the Commission staff to confirm that changes to the content and structure of post-event reports aligns with Commission expectations, perform a gap analysis for any information that needs to be expanded, such as demonstrating rapidity of weather change, where appropriate, and continue to make substantive improvements to the post-event report content, template and attachments. These discussions will address all concerns raised by the Commission, including the appropriate way to report multiple periods of concern that occur back-to-back. SCE's post-event report submitted on February 4, 2021, demonstrates SCE's initial improvements and SCE's continuous improvements will be measured by Commission staff confirmation that SCE's 2021 reports meet its expectations and provide all necessary data in a manner that is useful to the Commission and other stakeholders.

Corrective Actions	Description/Deliverables	Milestone/Deadline
5.A. Enhance post-event reporting to align with Commission expectations	• Review all comments on SCE's 2020 and January 2021 post-event reports	Feb. 28, 2021
	• Consult Commission staff on process for reporting multiple consecutive periods of concern and type of complaint information required	Feb. 28, 2021
	• Perform a gap analysis to identify additional information that should be included in reports from the Corrective Action Plan and needed template improvements	Apr. 30, 2021
	• Complete reporting template improvements and review with Commission staff	May 31, 2021

APPENDIX A:
MASTER TABLE OF CORRECTIVE ACTIONS AND MILESTONES

Corrective Action #	Description/Deliverables	Milestone/Deadline
1.A Expedited Grid Hardening	• Identify Circuits potentially in scope for Expedited Hardening	Feb. 19, 2021
	• Complete Circuit Segment Reviews for Identified Circuits	Mar. 15, 2021
	• Finalize Circuit Mitigation Plans	Apr. 15, 2021
	• Complete Construction per Plans	Sept. 1, 2021
	• Complete Post-Construction Activities	Oct. 1, 2021
1.B Circuit Segment Exceptions	• Circuit Segment Exception Analysis for Exception Requests in Queue as of Feb. 12, 2021, Complete	Mar. 31, 2021
	• Circuit Segment Exception Approval and Implementation for Exception Requests in Queue as of Feb. 12, 2021	Jun. 1, 2021
2.A.1 Increased Transparency	• Develop clear and user-friendly external-facing materials to educate and inform customers, public safety partners and other stakeholders on SCE's decision-making process, including all factors that SCE utilizes when considering de-energization.	Apr. 1, 2021
	• Provide and explain the quantitative and qualitative factors that SCE utilizes when considering de-energization, in update reports and in public and stakeholder outreach. Factors include activation and notification thresholds, de-energization thresholds (including impact from grid hardening), environmental conditions (wind speed, fire potential index, rapidly changing weather), circuit characteristics and input from emergency management and first responder agencies. Demonstrate why the thresholds are set at levels selected.	Apr. 1, 2021
	• Share materials on sce.com/psps and via external outreach and engagement efforts, including meetings with communities, local, state and tribal government, emergency management and public safety agencies and critical infrastructure providers.	May 1, 2021
	• Increase transparency in post-event reporting by including a more detailed description of the factors that SCE used when deciding to de-energize each circuit, or circuit segment.	Apr. – Dec. 2021 Post-Event Reports
2.A.2-4 Identify Senior Officer, Executives, and Board Members and Committees	• Identify and document the authorities of Senior Officer in Charge, or equivalent position, and how all elements of the utility emergency operations are clearly aligned under this incident command system	Feb. 12, 2021

with PSPS Decision-Making Authority	• Identify and document all executives with the title of Vice President, or equivalent, and above, with responsibilities in making the decision to call a PSPS event	Feb. 12, 2021
	• Identify and document all Board members and Board committees with PSPS decision-making oversight.	Feb. 12, 2021
2.B Improve Weather and Fuels Forecasting Accuracy	• Acquire additional data and use machine learning technology	May 1, 2021
	• Increase the resolution of SCE's in-house weather modeling	Sept. 1, 2021
	• Use fire spread predictions to help with de-energization decisions	Nov. 1, 2021
2.C.1 Improving In-Event Notification Accuracy	• Act upon vendor issues: Validate resolution of vendor issue for telephone notification errors	Feb. 19, 2021
	• Simplify telephone language preferences: Change telephone messaging for customers to "Press 1 for English," in alignment with most common phone menus	Feb. 19, 2021
	• Perform end-to-end analysis of 2020 notification failures to inform short- and long-range technical solutions	Mar. 31, 2021
	• Complete design and initiate development and implementation for prioritized 2021 improvements including process change map and digital tools to better integrate the notification process with PSPS operations (in advance of more advanced long-range efforts)	May 1, 2021
	• Implement prioritized initial updated processes and digital tools	Jun. 1, 2021
	• Provide training and job-aids for PSPS team members on new processes/tools	Jun. 1, 2021
	• Complete design for an automated system to fully integrate PSPS data sets and processes, improve customer data accuracy, and reduce manual notification actions	Dec. 1, 2021
2.C.2 Reduce Notification Redundancy and Improve Clarity	• Complete mapping of current customer experience from first notification through event all-clear, including the cadence, content, language, and delivery methods	Mar. 15, 2021
	• Complete mapping of customer experience improvements	May 1, 2021
	• Complete customer research to collect input from customers on future state PSPS notification experience	May 1, 2021
	• Complete outreach to critical infrastructure customers to incorporate feedback into public safety notification cadence	May 1, 2021

	• Codify new notification cadence for customers in scope to reduce out-of-event notification churn, and address imminent notification guidelines	Jun. 1, 2021
	• Complete re-design of the notification content and process and launch new messages	Jun. 1, 2021
	• Measure customer satisfaction for de-energized customers following each PSPS event and summarize at the end of the 2021 fire season	Each PSPS Event
	• Measure customer sentiment of all HFRA customers.	Sept. 15, 2021 Dec. 31, 2021
2.C.3 Address Preferred Channels	• Provide opt-out support to move customers from ZIP code alerts to premise-level alerts	June 1, 2021
2.C.4 Consider Use of Public Radio Broadcast, Where Appropriate	• Work with County Offices of Emergency Management to identify remote locations that could require the use of Emergency Radio Broadcasts during PSPS events	March – December 2021
	• Develop appropriate messaging for use in Emergency Broadcast Systems where appropriate during PSPS events	June 30, 2021
2.D.1 Develop and implement a process for public safety partners to adequately engage during PSPS events that includes improvement metrics	• Conduct discussions with Cal OES and county OEM Directors to solicit input on optimal structure for in-event communication structure and develop metrics to measure progress	3/31/21
	• Document input during partner discussions and agree to and assign timeframe for implementation ahead of the 2021 fire season	4/30/21
	• Implement any identified improvements to existing communications structure	5/31/21
	• Consistently use Working Groups/Advisory Board to review results, share improvements, and identify further corrective actions to update IMT protocols and procedures	6/15/21 and quarterly thereafter
	• Perform after-action reviews with impacted county and state agencies after each PSPS event to better understand their information needs	Each PSPS Event
	• Send out engagement surveys to State, county. and critical infrastructure partners after every PSPS event to evaluate effectiveness and identify any potential areas of improvement	Each PSPS Event
	• Include results of engagement surveys in post-event reports	Each PSPS Event
2.D.2	• Meet every month with CSWC ahead of the 2021 fire season to discuss forms, procedures and IOU differences in operations,	Monthly until at least May, 2021

Improve internal processes to ensure timely and accurate information is submitted to California State Warning Center (CSWC)	implement existing corrective actions and identify any potential additional corrective actions	
	• Confirm SCE's role in implementing the CSWC Standard Operations Guide (SOG)	Feb. 4, 2021
	• Validate existing separation of State/County calls	Feb. 4, 2021
	• Create job aids for Deputy Planning Section Chief role to include responsibility for essential elements of information and Cal OES notification form	Mar. 31, 2021
	• Clarify invitee/information expectation for each stakeholder call (State/County)	Mar. 31, 2021
	• Validate invitee lists for State briefing calls to ensure accurate contact information	Mar. 31, 2021
2.D.3 Coordinate with counties, tribal governments, and Cal OES to develop and validate a list of public safety partners, including local government agencies and critical facilities	• Engage Tribal contacts for any additional coordination opportunities	Mar. 31, 2021
	• Validate all Cal OES Regional Administrators are invited to daily in event operational briefings	Mar. 31, 2021
	• Work with Cal OES to define and include additional public safety partners in State and County calls as applicable	Mar. 31, 2021
2.D.4 Take a proactive approach for prompt resolution of problems and establish a timeline to resolve problems during the communication with local and State public safety partners.	• Onboard and train new employees dedicated to information gathering and reporting to CSWC in PSPS events	Mar. 31, 2021
	• Provide dedicated in-event contact to CSWC for in-event communication, coordination and prompt resolution of issues	Each PSPS Event
2.E Provide Clearer Event Status on SCE's Website	• Conduct initial digital experience benchmarking with PG&E	Feb. 2, 2021
	• Initiate scoping/estimation process	Feb. 5, 2021
	• Initiate Procurement activities	Feb. 15, 2021
	• Complete scoping/estimation process	Feb. 26, 2021

	• Complete procurement activities	Mar. 12, 2021
	• Initiate Phase 1 Development	Mar. 15, 2021
	• Initiate Phase 2 Development	May 10, 2021
	• Complete Phase 1 development (including testing)	May 31, 2021
	• Launch Phase 1 - new sce.com service interruption lookup capability and revisions to sce.com/psps landing page	Jun. 1, 2021
	• Complete Phase 2 development (including testing)	Sept. 10, 2021
	• Launch Phase 2 - new sce.com service interruption map and revisions to sce.com/psps landing page	Sept. 13, 2021
3.A Increase Participation and Incentives for Back-Up Power	• Expand the CCBB program to all eligible Medical Baseline customers (CARE/FERA & HFRA) and increase outreach activities to increase enrollment o Offer CCBB program to the expanded customer set through marketing o Track and optimize enrollment progress in 2021 on a bi-weekly basis o Establish additional partners (CBOs, contractors)	Feb. 28, 2021 Apr. 30, 2021
	• Continue and expand marketing and outreach for all back-up power solutions (CCBB, online marketplace rebates) including ~300,000 eligible customers for the Self-Generation Equity Resiliency Incentive Program (whole-house battery solution) featuring the 50 percent upfront incentive payment enhancement	Throughout 2021
3.B Increase Community Resiliency: Microgrids and Resiliency Zones	• Construct four Resiliency Zone sites (three in Agua Dulce and one in Cabazon) with back-up power transfer switches and secure additional community Resiliency Zone site commitments	• Mar. 31, 2021: complete one site • May 31, 2021: complete three sites • Jun. 30, 2021: secure additional commitments
	• Identify up to 15 CRC locations to enable a transfer switch for back-up power	• Jun. 30, 2021: secure customer commitments
	• Complete BTM microgrid enablement for a school in Fontana (Rialto USD) as part of SCE's Community Resiliency Pilot	• Sept. 30, 2021: customer secures materials • Dec. 31, 2021: developer completes construction

3.C Address Community Safety and Expand CRC/CCV	• Send WMP and PSPS updates to key stakeholders and ask them to identify community safety needs	Mar. 31, 2021
	• Request meetings with local and tribal governments and critical infrastructure customers	Mar. 31, 2021
	• Assess feedback and incorporate feedback into other action items as appropriate.	Oct. 1, 2021
4.A.1.a Marketing Campaign	• Create new ads and expand the marketing campaign to increase awareness of programs and services and help increase customer participation	Apr. 30, 2021
4.A.1.b PSPS Newsletters	• Newsletter content completed	Mar. 31, 2021
	• Newsletters printed	Apr. 15, 2021
	• Newsletter mailings complete to HFRA customers	Apr. 30, 2021
	• Newsletter mailings complete to non-HFRA customers	Apr. 30, 2021
4.A.1.c Energized Stories & Digital Newsletter	• Publish two to three stories monthly related to wildfire mitigation and customer programs	Jan. – Dec. 2021
	• Use Monthly Wildfire Digital newsletter to outreach to partner agencies, governments and community organizations	Mar., Jul., Sept., Dec. 2021
4.A.1.d Media Outreach	• Identify and verify media outlet contact information (HFRA and Non-HFRA)	Apr. 1, 2021
	• Outreach with customer program focus and follow-up to HFRA media outlets	May 15, 2021
	• Outreach and follow-up to non-HFRA media	Jun. 30, 2021
4.A.2 Specific information about grid hardening investments in communities and how those are reducing PSPS need	• Publish 2021 WMP Update fact sheet with comprehensive overview of SCE's grid hardening efforts, progress-to-date and 2021 plans on sce.com	Feb. 5, 2021
	• Publish quarterly progress report on grid hardening on sce.com	Feb. – Dec. 2021
	• Identify and publish information on the circuits most impacted by PSPS in 2020	Mar. 1, 2021
	• Explain on sce.com the work being conducted in 2021 in most impacted communities	Apr. – Sept. 2021
	• Mail letters and conduct outreach to customers on these circuits as progress is made in their area	Apr. – Sept. 2021
4.B	• Partner with SCDD, Cal OES (AFN), CFILC and the joint utilities to broaden utility awareness of vulnerable customers	Launch by March 31, 2021

Identifying vulnerable populations	enrolled in programs with IHSS and statewide Regional Centers	
4.B.1 Reaching vulnerable customers to update contact information and increase enrollment in programs, services, delivery notifications	• Launch expanded marketing and outreach efforts to reach vulnerable customers, including Medical Baseline enrollment	Mar. 31, 2021
4.B.2 Identifying vulnerable populations	• Define research objectives and scope to gather qualitative feedback on the customer experience and improve our efforts to help vulnerable customers	Mar. 2021
	• Initiate research with customers	Apr. 2021
	• Complete AFN Research study with conclusions and recommendations	Jul. 2021
4.B.3 Enhance the online experience	• Enable e-signatures for Medical Baseline applications	Apr. 2021
	• Enable customers to self-certify as vulnerable, enroll in programs, and update contact information via sce.com	Jul. 2021
4.B.4 Ensure delivery of PSPS alerts & notifications to vulnerable populations	• Expand verification of notification deliveries to Medical Baseline customers and those who certify as needing an in-person visit prior to disconnection, in addition to existing Critical Care customers	Jul. 2021
4.B.5 AFN Community Partnerships	• Continue engagement of existing partnerships including within the Statewide AFN Advisory Council	Jan. – Dec. 2021
	• Launch training of county healthcare workers on Medical Baseline with IHSS	Mar. 31 2021
4.C.1 Community Meetings	• Educate customers and communities on SCE's wildfire mitigation work (including community-specific grid hardening activities), PSPS decision-making factors, available customer programs and resources; obtain feedback	Mar. – Jun. 2021
4.C.2 Local and Tribal Government Engagement	• Send WMP and PSPS updates to key stakeholders and ask them to identify community safety needs	Mar. 31, 2021
	• Request meetings with local and tribal governments and critical infrastructure customers	Mar. 31, 2021
	• Assess feedback and incorporate feedback into other action items as appropriate.	Oct. 1, 2021

4.C.3 County Operational Area Meetings	• Solicit public safety partner feedback through Operational Area meetings	Mar. – Dec. 2021
	• Incorporate feedback from Operational Area meetings into PSPS Protocols	May and Dec. 2021
4.C.4 Local and Tribal Government Planning Meetings	• Review and receive input on SCE's Emergency Plan, including PSPS	Apr. 2021
4.C.5 Local/Tribal Government Resiliency Workshops	• Provide information to assist local and tribal governments in their own resiliency planning efforts and preparing for PSPS	Apr. 30 and Sept. 30, 2021
4.C.6 PSPS Working Groups/Advisory Board	• Share lessons learned and help develop best practices around PSPS	Quarterly in 2021
4.C.7 Critical Infrastructure Customer / Public Safety Partner Engagement	• Educate Critical Infrastructure customers and Public Safety Partners on SCE's wildfire mitigation work, PSPS protocols, and customer resiliency plans; receive input and identify collaboration opportunities	Mar. – Dec. 2021
4.C.8 Community-Based Organization Engagement	• Engage with Community-Based Organizations to educate their members and help share information on SCE's wildfire mitigation work, PSPS, customer care programs, and emergency preparedness resources	Throughout 2021
4.C.9 Power Talks	• Educate business and residential customers on SCE's outage types, including PSPS protocols, notification process, and resiliency efforts	Mar. – Dec. 2021
4.D Keeping public safety partners informed during events	• Conduct initial benchmarking with PG&E Portal team	Feb. 2, 2021
	• Initiate scoping/estimation process with SCE IT	Feb. 5, 2021
	• Initiate Procurement activities	Feb. 15, 2021
	• Complete scoping/estimation process with SCE IT	Feb. 26, 2021
	• Complete procurement activities	Mar. 12, 2021
	• Initiate Phase 1 Development	Mar. 15, 2021
	• Initiate Phase 2 Development	May 10, 2021
	• Complete Phase 2 development (including testing)	May 31, 2021

	• Launch Phase 1 Public Safety Partner Portal	Jun. 1, 2021
	• Complete Phase 2 development (including testing)	Sept. 10, 2021
	• Launch Phase 2 Public Safety Partner Portal	Sept. 13, 2021
5.A. Enhance post-event reporting to align with Commission expectations	• Review all comments on SCE's 2020 and January 2021 post-event reports	Feb. 28, 2021
	• Consult Commission staff on process for reporting multiple consecutive periods of concern and type of complaint information required	Feb. 28, 2021
	• Perform a gap analysis to identify additional information that should be included in reports from the Corrective Action Plan and needed template improvements	Apr. 30, 2021
	• Complete reporting template improvements and review with Commission staff	May 31, 2021

Appendix B

CMC, PSPS IC, and Board SOC Rosters

Crisis Management Council – 2021 Roster	
Name	**Title**
Pedro Pizarro	President and CEO of Edison International
Adam Umanoff	EVP and General Counsel of Edison International
Maria Rigatti	EVP and CFO of Edison International
Kevin Payne	President & CEO of Southern California Edison
Steven Powell	EVP of Operations
Todd Inlander	CIO & SVP of Information Technology
Jacqueline Trapp	SVP of Human Resources
Caroline Choi	SVP of Corporate Affairs
Carla Peterman	SVP of Strategy & Regulatory Affairs
Drew Murphy	SVP of Strategy & Corporate Development
Beth Foley	VP of Corporate Communications
Phillip Herrington	SVP of Transmission & Distribution
Jill Anderson	SVP of Customer Service

PSPS Incident Commanders – 2021 Roster	
Name	**Title**
Adebola Ayorinde	Director, NW Construction and Maintenance
Vik Trehan	Director, Design Engineering & Work Management
Anthony Edeson	Director, Grid Operations
James Cherrie	Director, Substation Construction and Maintenance
Robert Sholler	Director, Central Field Services
Dana Cabbell	Director, Integrated System Strategy
Russ Ragsdale	Director, Asset and Engineering Strategy
Dana Bullock	Director, Transmission
William Chiu	Managing Director, System and Asset Strategy
Terry Ohanian	Director, Southeast DC&M
Dean Yarbrough	Director, SCE Safety
Jose Goizueta	Director, Advanced Analytics and Process Improvement

SCE Board of Directors' Safety and Operations Committee – 2021 Roster	
Name	**Title**
Timothy T. O'Toole	Chairperson
Jeanne M. Beliveau-Dunn	Member
Carey A. Smith	Member
Linda G. Stuntz	Member
Peter J. Taylor	Member
Keith Trent	Member