

TRANSPORTATION SERVICES

2022

SOUTHERN CALIFORNIA EDISON **Unmanned Aircraft Systems (UAS)** **Flight Operations Manual (FOM)**

Version 1.0



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Safety Policy

This Flight Operations Manual is prepared as a program and operational guide for Southern California Edison (SCE) and Edison International, Inc. employees, contractors and other vendors (collectively as “covered entities”) operating unmanned aircraft on behalf of Southern California Edison and/or Edison International, Inc. The instructions, policies, standards, processes, and procedures described herein define the manner in which company UAS operations shall be conducted. The responsibility and accountability regarding safety is defined herein and assigned to all covered entities operating UAS on behalf of the company.


Safety is always the first priority at Southern California Edison and Edison International, Inc. Flight operations by their nature require an enhanced safety focus in that an additional dimension has been introduced to the common workspace. Consistent with professional aviation operations around the world, UAS operational safety shall be actively pursued through a Safety Management System (SMS). Section 5 of the FOM discusses the SMS in greater detail, but the primary purpose of an SMS is to mitigate operational risks and hazards, with a goal of attaining the lowest practical exposure to risks and their consequences.

All persons operating UAS on behalf of Southern California Edison and/or Edison International, Inc. are subject to the provisions of the Safety Management System established for the company UAS program. Contract operators, vendors, and other third-party entities operating UAS on company behalf may do so under the governance of an SMS established and practiced by their organization, so long as that SMS is consistent with the goals and requirements of the SCE UAS Program’s SMS. All company UAS operators are expected to actively participate in the SMS and supporting programs. Third party operators supporting SCE with UAS flight operations are invited to participate alongside SCE at company-sponsored safety events. In the absence of this, such entities are expected to host their own internal safety events in support of their respective SMS program.

All hazardous events, occurrences, situations and/or activities shall be reported to the SCE Aircraft Operations UAS Program Manager (or assigned delegate thereof) for follow up and investigation. Such events shall be investigated to determine root cause and contributing factors, including but not limited to human, equipment, weather, flight envelope, environmental, and other external factors. The purpose of such investigations shall be to enhance program safety by continuously identifying and mitigating hazards and risks as they become apparent and communicating these findings to the overall community.


SCE maintains a Just Culture in our aviation programs to include Unmanned Operations. The Just Culture (detailed in Sec. 6.2.1) protects responsible individuals reporting hazards described above. Individuals operating with intent to follow company policies, industry best practices and of course the requirements of 14CFR Part 107, may be assured that investigations will be thoroughly conducted and resolved in a non-punitive environment. Willful and/or negligent disregard for regulations, company policies, or established aircraft limitations will not however be tolerated or protected by this clause.

The Unmanned Aircraft Systems Program Manager holds the authority and responsibility for the safe conduct of company unmanned flight operations and the currency of this manual.

DocuSigned by:

 16C3430A933C4F5...
 Director of Transportation Services, Southern California Edison

3/16/2022

Date

DocuSigned by:

 Aviation Officer, Southern California Edison

3/20/2022

Date

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1.0 Introduction

The following processes and procedures serve as the governance for SCE's Unmanned Aircraft Systems (UAS) Operations to provide safe, efficient and lawful support services to meet the unique aviation needs of core utility operations. In accordance with SCE values, safety will be the primary concern of each mission. Whenever an unsafe situation cannot be mitigated, the mission shall be aborted.

1.1 Purpose

The purpose of UAS Operations and this Flight Operations Manual (FOM) is to provide and procure aviation solutions for SCE organization units, consistent with the guiding EIX Corporate Values and Safety Commitments.

1.2 Preface

- 1) This UAS FOM is issued by the authority of the UAS Program Manager under the direction of the Principal Manager for Aircraft Management & Operations in conjunction with the SCE General Operations Manual (GOM). It provides the best available operating instructions for most circumstances, but no manual is a substitute for sound judgment and safety. Above all else, safety shall be the primary concern in each and every operation, regardless of the nature of the mission. Operational necessity may require modification of the procedures contained herein.
- 2) The corporate unmanned aircraft are valuable corporate assets; tangible benefits include enhanced personnel safety, personnel time savings, improved operational flexibility, the carriage of critical sensors as well as innovations yet to be identified. UAS Operations' primary goal is the safe, expeditious data capture, situational awareness, information assimilation as well as potential crew support and construction applications. Every effort will be made to accommodate user organizations in completing their missions for the purpose of improving efficiency and productivity within the realm of safe aircraft operation practices.
- 3) This FOM is not intended to supersede or replace the Federal Aviation Regulations or Federal Aviation Administration (FAA) approved flight and maintenance manuals. The primary purpose of this manual is to improve safety and efficiency by standardizing administrative and operational procedures and management philosophy. All personnel are required to accept and follow the procedures and policies presented in this manual. In the event procedures and policies herein create a conflict with Federal Aviation Regulations or Federal Aviation Administration (FAA) approved manuals, Federal protocols shall have precedence.
- 4) Should a conflict exist between this UAS FOM and the GOM, the GOM shall have governance priority. The conflict shall be brought to the attention of the UAS Program Manager as soon as practical.

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1.3 Applicability

All UAS flight operations shall be conducted in strict compliance with Federal Aviation Regulations and Company policies, standards, procedures and Standard Operating Procedures for UAS. In the event of a variance between the FAR and Company documents, the more conservative policy will be observed. While the FARs provide legal requirements, the Company may elect to use a more restrictive procedure than provided in the FAR.

This manual applies to all unmanned aircraft systems operated by SCE including those operated by vendors supporting SCE operations under contract. Vendors providing demonstrations that are not under contract must comply with the SCE UAS vendor approval process. This FOM serves as the UAS governance document and aims to include roles and responsibilities for entities operating UAS, those governing UAS, site evaluations, mission planning, pre-flight checks, post flight checks.

1.4 UAS Operations Systems of Internal Governance

The following documents comprise the UAS Operations System of Internal Governance:

- SCE UAS Flight Operations Manual (FOM) and included governance documents
- Safety Management Systems Manual (SMS)
- UAS Fleet Management System (in process)
- UAS Third Party Labor (TPL) Acceptance Process

1.5 Distribution

- 1) The controlled document is maintained as electronic format in the [Aircraft Operations Unmanned Aerial Systems SharePoint Site](#). Hard copies of the manual will not be controlled. UAS program documents can be accessed via links to the new UAS site.
- 2) A copy of this manual will be distributed to all SCE UAS operators and OUs operating UAS under charter agreement.

1.6 Revisions

- 1) An annual review of this document will occur and any revisions to this manual will be made as needed to reflect changes in company policies and procedures, and federal, state and local regulations which relate to the safe, efficient, and effective operation of UAS.
- 2) Revisions to this manual will be uploaded to the [Aircraft Operations Unmanned Aerial Systems SharePoint Site](#). Each employee bound by the requirements of this manual is responsible for reading and understanding the current revisions.

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Revision Number	Date of Revision	Date Revision Entered in this Manual	Verified By (Signature)
BASIC ISSUE	March 26, 2019	Basic Issue	SCE Air Operations
Version 1	October 2020		
Initial Publication	January 2022		

2.0 Organization

Aircraft Operations is organized within the Transportation Services Department under Operational Services. Aircraft Operations' purpose is to provide and procure safe and reliable aircraft services to EIX and SCE business areas, which includes facility damage assessment and patrols, electric distribution/ transmission construction and maintenance, mapping/photo and remote sensing missions, snow/water surveys, passenger transportation, and other viable aviation services.

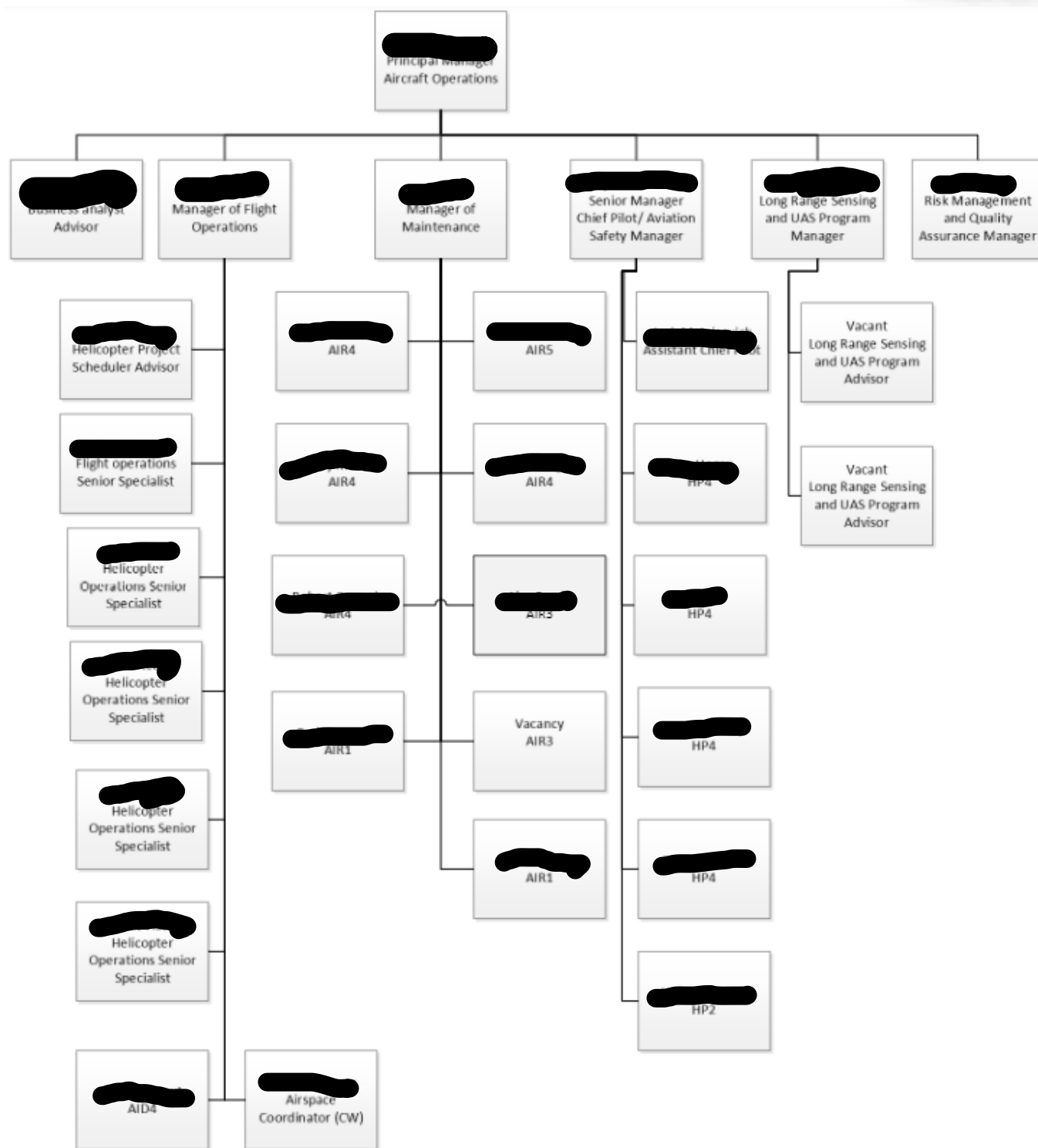
The UAS Program is a function of the Remote Sensing Department within SCE's Aircraft Operations. As such, the Remote Sensing Sr. Manager holds the role and responsibilities of UAS Program Manager.

The Remote Sensing Sr. Manager reports to the Principal Manager of Aircraft Operations to include the role of UAS Program Manager. Due to the aviation role that UAS operators from other SCE business areas have in the organization, they have a matrixed reporting role under the Remote Sensing Division of Aircraft Operations which is empowered as the UAS Model Manager. This structure comprises a program designed to consolidate administration and facilitate UAS operations in multiple business areas across the enterprise. When operating in an aviation role, the flight operations of various entities within the overall organization are conducted under the governance of the UAS Program Manager.

2.1 Organizational Structure

The department organizational structure is shown below:

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2.2 Aircraft Operations Principal Manager

SCE Aircraft Operations is under the general leadership of the Aircraft Operations Principal Manager. The Aircraft Operations Principal Manager is responsible for all aspects of the Air Ops organization and all other members of Aircraft Operations report to this individual.

The Aircraft Operations Principal Manager reports to the Director of Transportation Services, who in turn reports to the Vice President of Operational Services. This chain provides the path by which the Aircraft Operations Principal Manager reports to the Southern California Edison Aviation Officer.

2.3 UAS Program Manager

The UAS Program Manager is responsible for the overall governance, management, safety, and maintenance of all SCE UAS and UAS operations. The UAS Program Manager works closely with the Aviation Safety Officer, manned aviation operations as well as unmanned aircraft operators at SCE to ensure a positive safety culture is maintained. The UAS Program Manager has the following responsibilities in the organization:

- Function in the role of Chief Remote Pilot in Command for the purposes of FAA liaison for SCE.
- Ensure safe, efficient, and compliant execution of all SCE UAS operations.
- Ensure ongoing unmanned operations in compliance with FAA Part 107 and Part 91 rules as well as any Sec. 44807 exemptions and associated Certificates of Authorization (COAs), the accident/incident reporting requirements of FAA Part 107 and NTSB 830 as appropriate.
- Pursue FAA Waivers for UAS operations as necessary and ensure all FAA waivers are current and renewed at the appropriate time.
- Ensure FAA sUAS Pilot Certifications and currency requirements are valid, current, accurately tracked and that pilots are provided adequate notice of approaching re-certification/currency requirements.
- Ensure that all SCE UAS Operators are accurately certified to reflect their rated operational limits, and that all training is properly documented.
- Ensure all SCE Company UAS are legally registered, maintained and insured, and that this information is properly and promptly documented using the SCE UAS Fleet Management System [currently under selection and cyber-review].
- Coordinate with client/chartered Operational Units on selection and development of new aircraft
- Initiate new aircraft by reviewing manuals and developing SOPs
- Author policy and procedures concerning the UAS Flight Operations Manual (this document).
- Conduct proficiency flight checks of UAS crews as well as the procedures and documentation of other SCE business Units participating in the UAS program.

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- Designate UAS Check Airmen in other SCE Operational Units participating in the UAS program.
- Function as a Remote Pilot in Command (RPIC) as required.
- Conduct qualification reviews and audits of UAS-related prospective vendors.
- Conduct periodic operational reviews of UAS-related vendors.
- Serve as the SCE subject matter expert on all issues related to UAS.
- Maintain a current copy of this manual.
- Ensure that each approved Operator has access to this manual and obtains a signed statement from each that they have read and understand its contents.
- Ensure that the FOM is reviewed annually and updated to reflect new technologies and lessons learned. UAS Model Manager shall ensure that all revisions to this manual are distributed and processed properly.

The UAS Program Manager may delegate functions to other personnel but remains responsible for overall management of the organization's UAS flight program.

2.4 Aviation Safety Officer (ASO)

The Aviation Safety Officer (ASO) role may be filled by an individual RPIC operating alone or by an individual designated to oversee a multi-UAS operation. The ASO is responsible for the overall safety of the UAS operation and for completing the ASO checklist which is required for every UAS flight conducted by SCE. Anyone either directly or indirectly involved in UAS flight operations may call for operations to be terminated in accordance with the SCE STOP Principle, only the ASO however is empowered by the Principal Manager for Aircraft Operations through the UAS Program Manager to turn operations back on when deemed to be safe. An ASO is assigned for each SCE UAS operation including vendor operations, or for demonstrations deemed necessary by the UAS Program Manager. In the absence of a formal designation, the RPIC is the default ASO.

Additional discussion on the duties and role of the ASO are found in Sections 8.3 and 8.4.

2.5 Remote Pilot in Command (RPIC)

The RPIC is responsible for the unmanned aircraft under his/her purview, its safe operation and any consequences arising from the operation. RPIC is a *positional* title, providing that individual *positional authority* during the operation. SCE RPIC qualifications will vary based on the type of UAS being operated. The following responsibilities however are common to all cases. SCE RPIC must:

- Be a full-time SCE employee.
- Possess a current Federal Aviation Remote Pilot Certificate (14 CFR 107). RPIC's must maintain certification every 24 calendar months from the date of issuance or previous renewal.

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- Demonstrate proficiency in operating the UAS to the UAS Program Manager or UAS Program Manager's designee for each model in which qualification is sought.
- Ensure appropriate PPE is in proper use by all participants of the operation
- Ensure the RPIC Remote Pilot Certificate, the UAS Registration and pertinent documentation is available for FAA inspection upon demand
- Ensure compliance with 14CFR Part 107, Part 91 (as applicable), SEC. 44807 COAs (as applicable) and any waivers and/or authorization necessary for the operation, as well as any relevant Federal, State, and local regulations, laws and ordinances, and all conditions in this manual.
- Report all abnormal flight incidents to the UAS Program Manager. These may include but are not limited to incidents involving damages less than \$500 to non-SCE property, damage to the aircraft, run-away aircraft, and/or command/control failure.
- Report to the UAS Program Manager and to the FAA (and/or NTSB) within 10 days; any operation that results in serious injury, loss of consciousness, or property damage of at least \$500 to property other than the SCE UAS in operation at the time.
- Conduct a preflight inspection, to include specific aircraft and ground control station checks, to ensure the UAS is in a condition for safe operation.
- Ensure that all required maintenance has been performed and documented.
- Conduct pre-flight (tailboards) for all flight operations, and post-flight briefings as necessary
- Ensure that all necessary flight planning actions have been completed and that all notification requirements have been fulfilled
- Ensure the safety of all persons in the vicinity of the UAS operation. Enhance scope of operations to include VOs (i.e., crowd / traffic control) as necessary
- Reduce the scope of the operation, and if necessary, terminate operations any time a crewmember is determined unable to adequately fulfil the crewmember's responsibilities
- Be knowledgeable of the contents of this manual and abide by the procedures, policies flight standards and conditions contained herein
- Maintain a current copy of this manual on site during UAS operations. Access to an electronic copy is considered compliant.
- Maintain a log of company UAS flight activity specific to the individual
- The RPIC may delegate functions (except for manipulation of flight controls) to other personnel, but retains responsibility for the operation

2.6 Visual Observer

The Visual Observer (VO) is considered an optional crewmember for most operations under 14CFR Part 107. There are specific instances in which at least one VO will be considered necessary under SCE UAS Operations:

- VLOS Flights that traverse more than 500 feet slant range distance from RPIC at any time (may be waived with additional training as specific flight conditions permit out to a hard distance limit from the operator; 1,500 feet for aircraft spanning less than 100cm

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between opposite wing/rotor tips, 3,000 feet for aircraft spanning 100cm or greater between opposite wing/rotor tips)

- Flights in or over congested areas or anytime crowd/traffic control may be required
- Flights in confined areas or areas that restrict movement, preventing the RPIC from adequately assessing the aircraft situation at all times. This includes RPIC locations (e.g., such as a bucket truck) which may restrict free motion or access to aircraft down range.
- Flights in vicinity of tall structures or vegetation, during which a VO may facilitate efficient operation
- Use of VOs to extend or “daisy chain” operations beyond RPIC line of sight is not authorized unless under the provisions of a valid FAA waiver

Any time a VO is utilized as part of the operation, the VO shall be assigned specific responsibilities and demonstrate understanding of these responsibilities. A reliable means of communication between the RPIC and VO shall be established. Some operational methods at SCE may require a VO due to operational complexity. The following responsibilities are assigned to the VO and considered general in all cases. VOs shall:

- Be trained and qualified in accordance with section 10.1.3 of this manual, to include Crew Resource Management (CRM) principles and be familiar with standard CRM terminology and techniques
- Be familiar with the current flight mission and operational specifics
- Understand any upcoming weather elements which may affect flight conditions
- Observe and maintain awareness of local airspace for any aircraft which may become a mission factor
- Maintain situational awareness sufficient to ensure separation of the unmanned air vehicle (UAV) from obstructions, hazards, non-participating people, or any locally restricted or prohibited flight areas.
- Inform RPIC prior to aircraft venturing beyond VO’s limit of situational awareness
- Adhere to instructions from the RPIC
- Support the RPIC and anticipate developing situational changes to ensure all flight operations are conducted in a safe, legal, and effective manner
- Be knowledgeable of the contents of this manual pertaining to VO duties and responsibilities and abide by the procedures, policies and conditions contained herein
- Ensure a current copy of this manual is on site during UAS operations. Access to an electronic copy is considered compliant

2.7 The Model Manager Structure

In a Model Manager program, there is a Master Unit that sets flight policy, procedures, limitations, and establishes flight and flight training standards which are to be maintained throughout the overall organization. This unit is defined as the Model Manager. The Model Manager enforces these standards, policies, procedures, and limitations via periodic audit visits with client organizations. In this manner, the Model Manager establishes and maintains

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governance in the overall flight operations for the organization. It is not however the role of the Model Manager to *manage* the flight operation at the chartered operator level.

For the purposes of SCE, the Model Manager defines an aggregate comprised of the UAS Program Manager and all staff members reporting to that individual. Communications or submissions to the Model Manager may be received by the UAS Program Manager or any direct reports of that individual for further action.

2.7.1 Aircraft Operations Master Unit

For SCE, Aircraft Operations Remote Sensing Division holds the role of the UAS Model Manager and functions as the Master Unit. The program is administered by the UAS Program Manager who may in turn enlist the aid of persons within the Air Ops Remote Sensing Division in the overall program management. Chartered organizations which are served by the Model Manager are identified as the various Organizational Units (OUs) within the company which have demonstrated a benefit to having a localized UAS program. These OUs operate as the “spokes” in a “hub and spoke” structure, while the Master Unit operates as the “hub”.

2.7.2 Chartered Organizational Units (OUs)

Organizational Units (OUs) which have a localized UAS program operate at the discretion of the UAS Program Manager and by authorized charter from Aircraft Operations Remote Sensing Division. The FOM (this document), SOPs which are part of this FOM, and the other program governance elements listed in 2.5 are omni governing across the organization. Individual OUs may have additional SOPs and procedures which pertain to their OU. This is permissible so long as the *overall* governing policies, procedures etc. maintained by the Model Manager are not in any way diminished or negated by additional localized OU governance.

No chartered governing entities shall bleed over to other OUs. Aircraft Operations maintains the over-arching program governance and customizing policy instruments by a chartered OU may only affect operations within that OU.

RPIC candidates shall be identified by the OU and presented to the UAS Program Manager as part 107 candidates. Aircraft Operations will have the sole responsibility of training, qualifying, and certifying candidates to the flight standards required for the skill level demanded by their station within the gaining OU. Once a candidate has attained and demonstrated the skills necessary to safely operate in the manner prescribed by the OU operational profile and has been certified as such by the UAS Program Manager, the candidate shall be added to the roster of certified SCE UAS Operators and returned to the gaining OU. Thus, RPICs are developed who are prepared to apply their new skill set accordingly.

VO candidates may be identified, trained, and qualified by a chartered OU so long as the standards of VO training and qualification specified within this manual are maintained.

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2.7.3 OU UAS Liaison

Each OU with a charter UAS program shall fall under the operational governance of the UAS Model Manager at Aircraft Operations. In this capacity, OUs with a charter UAS program shall maintain a liaison to Aircraft Operations. The role of this person is to act as a conduit between Aircraft Operations and the served OU. The function of this role shall be to facilitate active communication between the OU and the UAS Model Manager, disseminate changes in the FOM, SOPs, flight standards, procedures and other instruments of program governance, urgent flight notices, or other correspondence as may be required. This facilitates a rapid and efficient flow of communication between the Model Manager and served OUs.

Other duties of the UAS Liaison to Aircraft Operations shall be to facilitate periodic program audits, assist with incident investigations, assist with personnel currency and certification tracking and facilitate program enforcement actions.

The UAS Liaison to Aircraft Operations is not anticipated to require more than a 3% to 5% addition to workload. In this capacity, this is anticipated to be a collateral duty held by an individual who is also a UAS operator for the OU. This role establishes a de facto “chief UAS pilot” for the OU’s chartered UAS program. This role is to be considered an elevated authority within the OUs chartered UAS program. Individuals in these roles are expected to lead by example and ensure that the overall UAS Program standards, policies procedures and supporting governing documents are maintained and complied with within their respective OU.

2.7.4 OU UAS Safety Representative

This role is different from the Aviation Safety Officer while being similar to the OU UAS Liaison. The primary exception is that the direct reporting of the role bypasses the UAS Program Manager and has a direct link to the Aircraft Operations Safety Officer. The functions of this role are to assist with incident and safety investigations within the OU and ensure that EH&Synch entries are completed when incidents necessitate. It is expected however that the UAS Program Manager will be consulted regarding recommended changes to UAS operations, policy, flight standards or any other overall governance entities as determined by activities and findings of the OU UAS Safety Representatives, Air Ops Safety Officer, and the SCE Safety agents.

This role is an important tie-in to the Safety Management System (SMS) for UAS operations. It is anticipated that this role will require 3% to 5% additional workload and therefore is intended as collateral duty held by an OU UAS Operator. This role has natural elements of leadership in that the holder of this role is expected to be a champion of UAS safety for the OU and for the SCE UAS Program overall.

Additional duties include facilitating OU participation in periodic UAS Community Safety Forums, Safety Stand-Downs and other Safety promotion events.

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3.0 Policies, Standards and Procedures

There are SCE Corporate policies, standards and procedures which may have an emphasized pertinence to the UAS program. In addition, there are policies and standards internal to Aircraft Operations that apply to all members of the SCE UAS Program while exercising their privileges to operate company UAS. The following policies and standards are always pertinent to the program. This list however is subject to revision outside of this manual. It is up to individual UAS operators to ensure they are familiar with the most current policies, standards and procedures.

- The SCE [Accident Prevention Manual](#)
- [Use of Company Owned, Contract and Chartered Aircraft Policy](#)
- [Classifying and Handling of Company Information Standard](#)
- [Unmanned Aircraft Systems Standard](#)

4.0 Coordination of UAS Operations

UAS operations fall into three basic categories for SCE;

- Operating Unit (OU) level
- Aircraft Operations level
- Contractor / vendor provided

The majority of UAS operations for SCE are anticipated to take place at the OU level by qualified personnel mission focused on the specific needs of the benefitting OU. These are characterized by relatively simple operations which can be provided following a reasonable level of training and realizing significant value add to the OU.

Air Ops UAS operations are better defined as more advanced operations which are beyond the scope of the operator at the OU level. This may include airframe research and development in evaluation and preparation for migration to the OU level, operations requiring more complex aircraft which require a higher skill level for the operator, and/or development of Part 107 waivers for incorporation across the company-wide program.

Contract / vendor operations can be defined as operations that are outside the scope of SCE UAS operations either in terms of sheer volume or specialized capability. In the event of a large-scale emergent response for example, contractors and vendors may be necessary to backfill a large emergent need. In terms of technical capability, specialized operation which may not promise ROI if developed in-house may make better sense as contracted services.

4.1 General Operations

All documents pertaining to the operation and maintenance of SCE's UAS will be stored and maintained on the Aircraft Operations [UAS Portal Page](#)

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- UAS FOM (this document)
- UAS registration and maintenance data
- UAS operators training, FAA certification and recertification, specialized training data and any official correspondence with the FAA regarding operator status
- Part 107 waivers, SEC. 44807 COAs, and other supporting regulatory documents

All SCE UAS may be operated only by SCE employees who hold a current FAA Part 107 certificate and have attained SCE Aircraft Operations authorization as a UAS operator. All authorized SCE UAS operators may only operate aircraft within the airframe and operational limits of the operator's highest level of SCE provided training.

All SCE UAS operators must comply with FAA Part 107, any waivers or authorization issued under Part 107, SEC. 44807 as applicable, and by SCE policies, procedures, this FOM and all SOPs as published. FAA Parts 91 and 135 may become applicable operational regulatory structures for UAS operations at a future date. Evaluation of authorized SCE UAS operators for operations under these parts shall be made on a case by case basis at the appropriate time. As of this writing only Part 107 operations are currently conducted.

The following shall apply to general UAS operations for SCE

- UAS that are 50cm or less in diameter (without props) or wingspan, and 2.5 KG or less max gross weight do not need to have a Visual Observer for non-complex missions. The mission is limited to a 250 foot range without the use of visual observers or advanced RPIC training through Aircraft Operations
- For UAS 50cm or less in diameter, flight distance from the operator using a VO is limited to 500 feet unless the RPIC has undergone advanced RPIC training through Aircraft Operations
- For UAS 50cm or less in diameter, flight distance from the operator using a VO is limited to 1500 feet or the limit of visual acuity for the crewmember nearest the aircraft – whichever is lesser, for an RPIC who has successfully completed the Advanced UAS Operator Course.
- UAS shall not be used for any surveillance activities except as authorized/directed by appropriate SCE authority in accordance with an official SCE *internal* data collection activity
- Operations shall only be conducted during weather and lighting conditions that permit safe UAS operation within limits of the aircraft, operator and any regulations, waivers/authorizations supporting the operation.

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4.2 Organizational Unit Level Operations

4.2.1 Authorizing Charter

All OUs maintaining a UAS operation shall conduct their UAS operations under the overall governance of Aircraft Operations. Each UAS Operation at the OU level shall be authorized by a charter document issued by Aircraft Operations which acts in a similar concept as an FAA Letter of Authorization (LOA), is signed by the gaining OU director and counter signed by the SCE Corporate Aviation Officer. The charter outlines the general agreements by the OU with the UAS Program Manager to always operate within compliance of this FOM and the general SOPs, establishes a liaison to Aircraft Operations for the OU, and establishes an agreement to submit to periodic oversight and periodic program audits by the UAS Program Manager.

A given OU does not have an authorized UAS program until this charter document is executed and issued to the OU of interest. A copy of this charter shall be maintained at Aircraft Operations. Each charter is subject to review on a three-year cycle.

4.2.2 Requirements to Establish an Authorized UAS Charter

Organizational Units pursuing an UAS operation within their organizational structure must satisfy the following criteria:

- A business need for a UAS program shall be identified and approved by the gaining Director for each distinct UAS operational profile sought by the OU
- The OU seeking a UAS charter must designate candidate(s) for the role of Air Ops Liaison
- The OU seeking a UAS charter must designate candidate(s) for the role of UAS Safety Representative
- Aircraft Operations must approve liaison candidates
- OU must nominate UAS Operator candidates for the program.
- OU must establish a plan to sequence candidates through training/qualification provided by Air Ops
- OU must establish a plan to monitor and maintain operator FAA certifications, Biennial Renewals, and operational currency for all operators in their charter

While candidates for UAS Operator need to have a reasonable business benefit to justify SCE sponsored training, there is no hard limit to the number of candidates or eventual operators that an OU may have. There may however be physical limits in that UAS designs are occasionally phased out and discontinued by manufacturers. While Air Ops will strive to train all candidates presented by a given OU, the rate of training and qualification may be limited by external factors outside of Air Ops' control. It should be noted that a small number of candidates may ultimately lack the aptitude to successfully complete the training and qualification regimen. This should never be held against the individual as it is rarely a factor within their control.

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4.2.3 Air Ops Liaison Requirements

The Aircraft Operations UAS Liaison is a required role in order to establish an operational UAS charter within an OU. The additional demand on the individual is intended to be sufficiently mild such that the role may be filled as a duty that is collateral in nature. In some cases, OUs may have a need for distinctly different operational profiles depending on the functions of the departments operating aircraft. Each operation with a distinct profile shall have a designated Air Ops Liaison. Candidates for Air Ops Liaison must hold a Part 107 certificate. Newly established charters may designate a provisional liaison(s) while the individual(s) is(are) attaining a Part 107 certificate(s). Non-certificate holders however may not exercise this role over certificated individuals. This individual may be selected from the UAS operators within the OU and may continue to function as such while fulfilling the liaison role. Persons nominated as Air Ops Liaisons for a chartered OU UAS program must be willing to fulfil the role and meet the following requirements:

- Possess a personal culture of safety, professionalism, and a propensity towards leadership
- Possess the bandwidth and aptitude within their normal duties to facilitate the training/qualification of Part 107 candidates within the OU
- Possess the bandwidth and aptitude within their normal duties to monitor the FAA Certificate / Renewal status and operational currency for UAS operators within the OU
- Nominate candidates as training RPICs to facilitate OU specific program development
- Complete “Train the Trainer” course for flight/procedure instruction, CRM, VO development and Incident Investigation

4.2.4 UAS Safety Representative Requirements

The UAS Safety Representative is a required role in order to establish an operational UAS charter within an OU. The additional demand on the individual is intended to be sufficiently mild such that the role may be filled as a duty that is collateral in nature. Candidates for UAS Safety Representative must hold a Part 107 certificate. Newly established charters may designate a provisional UAS Safety Representative while the individual is attaining a Part 107 certificate. This individual may be selected from the UAS operators within the OU and may continue to function as such while fulfilling the UAS Safety Representative role. A candidate nominated as UAS Safety Representative for a chartered OU UAS program must be willing to fulfil the role and meet the following requirements:

- Possess a personal culture of safety, professionalism, and a propensity towards leadership
- Possess the bandwidth and aptitude within the individual’s normal duties to facilitate the safety promotion activities
- Possess the bandwidth and aptitude within individual’s normal duties to observe two randomly chosen operations per month
- Possess the bandwidth and aptitude within individual’s normal duties to investigate UAS incidents and report on findings to Aircraft Operations Safety Officer

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- Complete training on Safety Management System fundamentals, human factors, causal analysis and aviation investigation techniques provided by Aircraft Operations

4.2.5 Organizational Unit Operations

Responsibility for the day-to-day flight operations of a chartered OU is held at the OU level. Aircraft Operations does not manage these flight operations, nor does Aircraft Operations manage flight characteristics of work methods developed by a given OU, so long as all general operations remain in compliance with this FOM and the General SOPs.

OUs may develop unit-level SOPs to cover operations specific to the OU. The span and scope of such documents are limited to the OU and may not be applied outside of the OU program charter. Additional SOPs developed at the OU level must remain in compliance with the General SOPs that govern the company-wide program and may not circumvent or otherwise disable, in whole or in part, any of the General SOPs or any portion of this FOM.

4.3 Advanced UAS at the Aircraft Operations Level

Requests for Flight Support and Missions

- Requests for flight support and mission requests shall be submitted through the UAS website and directed to the UAS Program Manager or an authorized delegate
- The UAS Program Manager will ensure requests made in a reasonable time window are reviewed and submitted for approval prior to the proposed mission date and time
- The UAS Program Manager will ensure requests are in accordance with the appropriate manager approval matrix

4.4 Contractor / Vendor Operations

4.4.1 General

Prior to use of a contractor, a determination needs to be made that the desired capability and/or capacity is not available within SCE resources. Only UAS vendors from the current list of Approved UAS Vendors are authorized to be contracted. There is a rigorous audit and evaluation process that technically qualifies a contractor for UAS operations of behalf of SCE. The contractor audit process is outlined in Sec. 7.2 of this FOM. Contractors are not authorized to utilize a third-party vendor in their stead, as third-party vendors may not possess SCE technical qualification as a UAS vendor.

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Contractors providing non-aviation services/deliverables for SCE may wish to utilize UAS as an incidental operation. This is defined as a UAS operation conducted by the contractor's employee(s) that facilitates delivery of the product or service sought under contract. Such operators will need to be technically evaluated in the same manner as Contractors who are successfully on the Approved List. Incidental Operators who are successful will be added to the Approved Vendor Operator list with a note pertaining to the limited services offered.

4.4.2 Authorized SCE UAS Vendor Requirements

Southern California Edison requires all UAS vendors to be structured, function and operate as a professional aviation organization. Prospective vendors must first be sponsored by Supply Management upon the request of a manager in the OU pursuing their UAS services. Vendors must meet the following criteria:

- UAS program must operate in accordance with at least one of the following
 - 14CFR Part 107
 - Sec. 44807 COA
 - 14CFR Part 91
 - 14CFR Part 135
- UAS Pilots must
 - Be FAA certified to operate UAS under 14CFR Part 107, 91 and/or 135 as appropriate to the UAS program structure defined in their program documentation
 - Have at least AUVSI TOP Level II certificate (Trusted Operator Program) or industry equivalent
 - Maintain pilot flight logs documenting their UAS experience
- The prospective UAS vendor must possess and maintain the following:
 - Flight Operations Manual or Established SOPs that define operational standards for flight activities commensurate with major utility operations
 - Documented Safety Management System (SMS) comprised of at least the "Four Pillars" of an SMS per AC 120-92B
 - Safety Policy
 - Safety Risk Management
 - Safety Assurance
 - Safety Promotion
 - Formalized (documented) pilot training program
 - Formalized (documented) aircraft maintenance program

4.4.3 Non-SCE UAS Operator Insurance Requirements

UAS contractors and/or sub-contractors are required to carry \$10Million in aviation insurance and provide SCE with a certificate of insurance while operating UAS on behalf of SCE.

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Insurance requirements are detailed in the Master Services Agreement (MSA) which occurs during the contractor onboarding process.

4.4.4 Non-SCE UAS Operator Aircraft Restrictions

UAS that are marketed and manufactured by corporations or other entities associated with nations, governments or other organizations that exhibit a history of adverse cyber-activity/cyber-espionage targeting the United States, its national security interests and/or critical infrastructure are not authorized on property. This includes devices marketed and manufactured by entities based in China, Russia, North Korea, and Iran, as well as other nations, governments and/or organizations known or discovered to engage in such activities (covered entities). Use of such devices is only authorized by issuance of a policy exception for emergency measures on a limited time/limited case basis and may not be used on company assets classified as CEII (Critical Infrastructure).

UAS that are manufactured by corporations or other entities described above but marketed and supplied either 1) domestically (to include Canada) or 2) by corporations or other entities of nations, governments or other organizations that are considered allies of the United States and do not exhibit the activities discussed above may be used on non-CEII assets only. These devices may require review by SCE cyber-security prior to use on company assets.

UAS manufactured and marketed by organizations based within United States that use firmware or software sourced from foreign entities may be used on non-CEII assets only. These devices may require review by SCE cyber-security prior to use on company assets.

UAS manufactured and marketed by organizations based within United States and use domestically sourced (including Canada) firmware and software are not restricted but must adhere to SCE cybersecurity guidelines. These devices may require review by SCE cyber-security prior to use on company assets.

Any UAS operated on behalf of SCE must adhere to SCE Cybersecurity Standards to include 256 bit AES data encryption and network isolation protocols. These standards are detailed in the SCE Cybersecurity Standard.

4.4.5 Contractor/Vendor UAS Scheduling

The UAS support request shall include the following information:

- The contact information of the requesting party
- Mission Priority (standard or emergency)
- The Mission location: closest cross streets, street address, and GPS coordinates (lat/long in decimal degrees) of the center of the flight area
- Radius of the proposed flight area (in feet) from the GPS coordinates
- Maximum proposed altitude of overflight (in feet, above ground level)
- Purpose of mission: assessment/inspection, documentation, mapping, etc.
- Number of flights requested and frequency (approximate values are acceptable)
- Features of interest

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Scheduling and Dispatch

- Requests for normal/routine UAS flight missions and support must be submitted at least 5 days prior to launch date in order for the Program Manager to review, approve or deny the mission based on UAS availability
- Emergent UAS operation to facilitate urgent situations may be approved by Air Ops Dispatch/Airspace Coordinator on a real-time basis prior to launch as detailed in Sec. 8.2 of this manual.
- In general, UAS dispatch will be prioritized based on the following types of missions. Other missions may however be conducted at the discretion and approval of the Program Manager.
 - Emergency Response
 - Public Safety Power Shutoff Inspections and Response
 - Damage/Hazardous Object Assessments
 - Hazard Monitoring and Mapping
 - Construction Monitoring and Mapping
 - Asset/Facility Inspections

5.0 Crewmember Requirements

All SCE UAS RPICs shall maintain certification under FAA Part 107. Only authorized SCE employees with current FAA Part 107 certification are permitted to operate SCE UAS.

Aviation medicals are not required for UAS operations under FAA Part 107, UAS crewmembers however are expected to assess their physical condition and ensure that they are physically able to support any given UAS operation being contemplated. Consideration should also be given to the level of rigor necessary to access the planned flight location.

RPICs are required to maintain currency by piloting a UAS for at least 0.3 hours within the preceding 90 days, to include at least three take-offs and landings. In the event elapsed time between operations exceeds 90 days, currency must be regained while utilizing another current SCE RPIC acting as VO in a setting that does not involve operation within 50 feet of live circuit. RPIC currency shall be tracked in an appropriate operations and fleet management system maintained by Air Ops. OU Air Ops Liaisons shall have appropriate access to facilitate records management.

Crew Duty Day shall be managed by the OU and in accordance with Policy OSDR-315027876-11. For the purposes of flight activity, the following shall be adhered to: Flight activity shall be limited to two hours continuous, not to exceed six hours cumulative in a given work period. After two hours of continuous flight operation a 30-minute break is required prior to resuming flight activity. For the purposes of flight operations, the work period is capped at 14 hours. A

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minimum of 8 hours rest is required between work periods to reset the flight clock. These limits may be waived by the UAS Program Manager or authorized delegate for the purpose of emergency operations as evaluated on a case by case basis.

5.1 Factors Affecting Performance

There are numerous factors that can influence individual performance (e.g., time, weather, workload, health, etc.). All these factors should be continually weighed against mission requirements. Elevated risk requires a reassessment of the mission.

It is very important that RPIC's be able to recognize the signs of fatigue in themselves and their crews. UAS crew members should also be aware that weather conditions, such as extreme heat or cold, may lead to increased fatigue through dehydration or body chill.

Proper management of crew endurance ensures overall aviation safety, mission accomplishment, and crew-member efficiency. There should be constant contact between crew members to ensure the effects of fatigue are noted. If a crew member is unable to perform his/her duties due to fatigue, or other factors, the RPIC shall decide whether the mission must be rescheduled or redesigned to accommodate adjusted crew assignments.

- Fitness and Health – Depending upon the mission, UAS operators may need to hike to remote areas and therefore shall wear the appropriate PPE as well as demonstrate overall health and fitness levels appropriate to the field conditions anticipated.
- All personnel on the UAS mission shall abide by the general SCE Fitness for Duty policies and fitness for duty outlined in the GOM
- Reference, as a self-check, the aviation I'M SAFE safety acronym – Illness, medication, sleep, alcohol, fatigue, emotion/eating

5.2 Working alone or in remote locations

OU personnel remain subject to OU policies and procedures concerning working alone or in remote locations. It is recommended that an AED be included in the equipment list for remote operations.

6.0 Safety

6.1 Safety Management System (SMS) for the Unmanned Aircraft Program

The Unmanned Aircraft Safety Management System (SMS) is based on FAA guidelines set forth in the AC 120-92B Advisory Circular. While a full SMS is beyond the scope of an unmanned operation, AC 120-92B outlines what are known as the “four pillars” of a robust SMS program. The SMS for SCE's Unmanned Aircraft program embraces these four pillars as a means to instill

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a safety culture into all members of the unmanned aircraft community at Southern California Edison. These four pillars are identified as:

- **Safety Policy** – This defines the safety culture and leadership roles that company management and its representatives must maintain in developing and supporting this culture.
- **Safety Risk Assessment** – This defines the concept of acceptable risk, provides for risk controls and tools to identify, evaluate, and mitigate risk. This enhances safety by providing the lowest level of risk exposure available to a given operation.
- **Safety Assurance** – This defines an internal audit structure to evaluate the efficacy of safety policies and procedures, and to make enhancements or changes, as necessary.
- **Safety Promotion** – This is the leadership buy-in to safety and the SMS. It provides for continuous learning, periodic safety stand-downs and invites active participation and contribution from the overall community.

6.2 Safety Policy Abstract

The Safety Policy provided as a foreword to this FOM has governance over all operations of the Unmanned Aircraft Program in its entirety. This includes company personnel while operating company UAS aircraft, whether on company time or not. This also applies to non-company personnel retained as contingent workers, contract operators or other third-party vendors while engaged in UAS flight operations on SCE's behalf.

6.2.1 Just Culture

SCE Aircraft Operations maintains a “Just Culture” in the realm of aviation safety. A Just Culture assumes best intentions of the community members throughout their operations. As such, a Just Culture fosters an environment of learning and continuous improvement across the community by allowing operators and crews to share lessons learned from unintentional violations of policies, procedures, and/or regulations, or from mistakes and mishaps, without fear of retribution or disciplinary action. The caveat is that such occurrences are unintentional, and that policies and procedures designed to prevent such occurrences have otherwise been followed. The further expectation is that operators and crews are willing participants in the movement towards continuous improvement by remaining open, honest, and volunteering pertinent information in the interest of community improvement.

Operators who willfully violate regulations, policies, or procedures, or who willfully depart from established operational safety boundaries are not protected by the Just Culture clause and remain subject to disciplinary actions or consequences which may result.

Aircraft Operations Remote Sensing Dept., Southern California Edison management, and members representing company management and the Unmanned Aircraft Program Manager are all important safety representatives of this program. It is expected that such individuals will uphold this safety policy and lead by example in the unmanned aviation safety space.

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6.3 Risk Assessment

Operators are required to identify, evaluate, and mitigate risks to the general public, themselves, the aircraft, and the mission prior to the first operation of the day in each new location. The overall situation must be continuously monitored for changes in the risk profile and/or new risk elements which may present themselves. This is considered a key component of operational safety and is therefore a mandatory step.

6.4 Safety Assurance and Safety Promotion

Safety Assurance is an audit for efficacy of the SMS methods. As such it will be discussed in section 7.0 “Audits”.

Safety Promotion is the aggregate of programs to foster a positive safety culture throughout the community. The two formal treatments of this are periodic Safety Stand-downs, and the UAS Users’ Forum found in [Teams*]. The UAS Users’ Forum is provided as a location for members of the community to meet and discuss safety topics, best practices, close calls, and discover new techniques that may be shared. Currently this is found at:

<https://teams.microsoft.com/l/channel/19%3a8a402587c5a74877b5468f56e42c7291%40thread.tacv2/General?groupId=1c1cd5f1-2e94-4625-84c8-173604e6890b&tenantId=5b2a8fee-4c95-4bdc-8aae-196f8aacb1b6>

*The UAS Users’ Forum will be moving to different platform once a suitable one is identified. Teams has a 6 month sunset on all posts.

6.5 Safety Committee

The UAS Program Manager shall delegate a member of the Remote Sensing and UAS staff as an active member of the SCE Air Operations Safety Committee. In this role, the UAS Program Manager, through said delegate, represents the aviation department in all matters relating to UAS safety to include (but not limited to):

- Coordination with the Chairman of the Safety committee to ensure all UAS operations are conducted in compliance with overall Company safety requirements.
- Monitor safety issues, provide safety education, investigate incidents and accidents for all UAS operations.
- Provide training to manned aircraft crews to improve awareness of UAS operations and prevention of encounters with UAS (for SCE UAS operations as well as non-participant UAS).

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Members and participants of the SCE UAS Program are expected to engage and participate in the forum-based UAS community hosted on SCE's SharePoint cloud. This resource also provides ongoing safety discussions, best practices and community developed methods (vetted by Air Ops). The UAS community forum is a key component in the SCE UAS Safety Management System (SMS).

6.6 Personnel Safety

All UAS crewmembers, whether company internal or contracted operators are responsible for ensuring the highest level of safety during UAS operations to protect themselves, fellow employees supporting UAS missions, observers/bystanders and the general public. The ASO shall ensure all crewmembers abide by the following minimum safety requirements for all SCE UAS operations including those conducted by vendors:

- Establish a safety perimeter around the launch and recover zone. In congested areas this may require marking by cones and/or other means. The size of the safety perimeter shall be adjusted based on the specific UAS operation but never less than 15 feet.
 - Only UAS crewmembers are permitted in the safety perimeter during UAS operations and when a UAS is energized. Non-qualified persons may be escorted into the perimeter when the UAS is not energized.
 - All personnel that enter the safety perimeter shall have the appropriate PPE to include as a minimum: eyewear sufficient to withstand impact from a motor-driven propeller on the aircraft being operated, a high-visibility shirt and/or a reflective vest. ANSI rated safety glasses and a hard hat are required anytime aircraft over 2.5 kg will be operated.
- UAS crewmembers shall wear thick gloves when handling non-plastic propellers, leaking batteries, and energized UAS over 2.5 kg – especially when arming and disarming.

NOTE:

A propeller/rotor may potentially start spinning at any time the aircraft is energized. One must treat it accordingly. This is especially true when arming/disarming a system or when changing flight modes.

- Adhere to fire prevention procedures to include:
 - No Smoking.
 - Compliance with Bulletin 22 directives
 - Fire control equipment shall be on hand; ABC fire extinguisher with current inspection tag and at least 5 lbs capacity as a minimum. Other equipment such as a shovel may be considered as well depending on work site.

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- All battery charging conducted in a suitable fire-safe location away from combustible materials. All batteries not in use shall be stored in appropriate containers. (“In use” refers to batteries either physically connected, recently connected, undergoing charge, or intended for connection during a mission)
- Generators, fuel, and other combustible items shall be positioned in a manner that minimizes the possibility of fire

6.7 Minimum Approach Distance in Vicinity of Energized Infrastructure / EMF

SCE electrical infrastructure involves high voltage components as a consequence of SCE’s core business. There are no electrically active portions of our electrical infrastructure that operate below a high voltage level. High voltage current has a byproduct component known as an electromagnetic force, or EMF as it is commonly referred to in the industry. EMF is proportional to the change in electric current, and as SCE transmits and distributes generated electrical energy at 60Hz – that is, electrical current reverses direction 120 times per second. This affects a continuous state of change. The resulting EMF field can be quite robust, depending on the voltage level of the circuit in question.

EMF is generated in a field that is perpendicular to the electrical conductor that generates it, with a right-hand or “clockwise” orientation. As it cuts through any other conductor that transits this field, a corresponding voltage is introduced into that conductor. When a path to any ground exists (any voltage differential may be seen a “ground” by this induced voltage) a corresponding current will flow through the intruding conductor. The closer said conductor is to the EMF source, the stronger the effect as an inverse-square relationship.

In the case of UAS, the many wires and semiconductors present within the vehicle provide numerous opportunities for such induced voltages and currents. The presence of amplifiers within the onboard circuits exacerbates the effect of induced voltages. This may be sufficient to interrupt command/control features of the UAS. In most cases the magnetic compass is the first casualty of this effect, often rendering a UAS unable to find “home” or any other fly-to points which may be programmed. This also renders the aircraft unable to accurately interpret directional command and control signals from the Ground Control Station.

To avoid this situation, SCE UAS Operators shall operate UAS no closer to high voltage infrastructure than has been established as a Minimum Approach Distance (MAD) for the voltage level in question as determined for the model of aircraft being operated. Under no circumstances will any UAS be operated closer than 5 feet from energized conductor or components (10 feet for 110KV and above).

SCE Aircraft Operations shall coordinate with Transmission Engineering to establish known MAD values for each model of UAS as part of the evaluation for acceptance onto the list of approved SCE UAS models. Please see Appendix F for known MAD distances by aircraft.

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6.8 Battery Safety

Lithium-ion (Li-ion) batteries are the most common UAS power supply. The most common variant for UAS is the lithium polymer battery, abbreviated variously as LiPo, LIP, Li-poly, etc. It is a rechargeable battery of lithium-ion technology in a pouch format, which makes them lighter but not rigid. As a result, they are often manufactured into a rigid exo-structure. Li-ion batteries are rechargeable.

Li-ion batteries - Li-Po in particular, can pose a safety hazard; unlike other rechargeable batteries, Li-Po batteries require a computer-controlled charging environment in order to remain thermally stable during the charge process. Li-Po batteries also pose a particular sensitivity to aging.

In general, Li-Po batteries shall only be charged via authorized charging systems and shall be stored and transported inside of approved containers. LiPo batteries with a total energy capacity greater than 6000 mAh are subject to the Li-Po battery handling SOP.

Expendable batteries shall be handled in accordance with SCE [hazardous waste] policy.

7.0 Program Audits

7.1 Internal

Internal Audits take two forms. Aircraft Operations UAS Program audits will be conducted at the discretion of the UAS Program Manager to ensure compliance with this FOM and all applicable policies, standards, and procedures. These audits typically take place at the OU UAS operation under inspection with a significant focus on program documentation, along with a field evaluation of typical operations. The Internal UAS Audit form [appendix n+..] shall be used to score and document an internal OU UAS program audit. This audit is patterned on ISBAO standards but addresses only aspects appropriate SCE's UAS Program.

The field operational audit will involve a random selection of a flight crew to observe in a normal field operation. For the purposes of fairness and uniformity of evaluations, only an exercise deemed a *normal operation* shall be audited and scored.

Impromptu field audits may be made at any time by qualified Aircraft Operations representatives and/or UAS qualified members of SCE Safety. These audits are intended to be less formal with an emphasis on operational safety and compliance in the field setting. These audits are generally referred to in company documentation as *Safety Observations*.

7.2 External

The focus of Aircraft Operations regarding third-party aviation operators is to ensure that prospective and current third-party operators meet SCE safety and effectiveness standards from

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an aviation perspective in order to be an authorized aviation vendor. The aviation qualification procedure however is not all inclusive of every company requirement that burdens a third-party entity wishing to hold a contract with SCE. The overall vendor relationship with SCE is maintained with the SCE Supply Management. Aircraft Operations only assesses the efficacy of third-party aviation programs, safety and associated deliverables. Additional responsibility ensuring third-party compliance with SCE policies, procedures and standards may fall upon Aircraft Operations in the event that Aircraft Operations is the holder of a third-party contract. These responsibilities however are generally described in the language of a vendor contract.

Third-party UAS operators are vendors or contractors who utilize UAS to procure/develop their contracted deliverables for SCE. Some may provide UAS services as their primary business model while others may provide unrelated services for which UAS facilitate an amplified product. Any provider is held to the same standards regardless of the business model under which UAS services are rendered. All third-party UAS service providers are subject to an initial audit to qualify as a vendor, as well as periodic audits on a three-year schedule to maintain their Authorized UAS Vendor status.

Audits of third-party vendor/contractor UAS programs shall be conducted to follow components of the ISBAO Aviation Audit Standard. UAS operations do not need to have all the features of a manned aviation program, so only those which are applicable are subject to audit. UAS vendor candidates must satisfactorily demonstrate at least minimum standards discussed in Sec. 4.4 of this FOM. Vendors accepted onto the Authorized UAS Vendor List as of the publication of this FOM have been audited and meet the requirements stated in Sec. 4.4. As such they are grandfathered until their next periodic audit. Beginning with FY2022, an audit of a prospective or current vendor's operation by shall be conducted by authorized and qualified Aircraft Operations representatives following the structure specified herein. This audit shall examine a vendor's operation, programs, and actual flight activity.

The UAS Vendor Audit/evaluation is conducted in two parts. The first is an initial administrative evaluation to determine whether a prospective vendor possesses an established program which fosters a culture of operational safety and professional excellence. The second or follow-on portion of the evaluation procedure examines the actual operational methods and behaviors of a prospective UAS vendor to determine the degree to which their operation adheres to their program as documented.

Prospective vendors wishing to initialize the vendor evaluation process must first be sponsored by a manager in the OU pursuing their UAS services. Prospective vendors, as well as authorized vendors wishing to renew their SCE authorized status must meet the minimum standards listed in Sec. 4.4, and provide:

- A) A Current Company Structure
- B) Company Records
 - a. Part 107 / Part 91 / Part 135 / Sec. 44807 COA certificates as applicable
 - b. FAA registrations for all aircraft proposed for operation on SCE behalf
 - c. Certificates of Airworthiness where applicable

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- d. FAA authorizations/waivers generated for unmanned operations under the above regulations
- e. Pilot/operator logs
- f. Pilot/operator AUVSI TOP Level II (Trusted Operator Program) certificates, certificates of an equivalent industry program, or equivalent experience demonstrated in pilot logs
- g. Training records
- h. Aircraft maintenance records
- i. Accident/incident records
 - i. FAA records
 - ii. NTSB records
- C) Insurance Certificate(s) indicating a minimum of \$10M liability coverage
- D) Operational Governance Documents
 - a. Flight Operations Manual / General Operations Manual / Standard Operating Procedures
 - b. Policies / Standards
 - c. Safety Management System (SMS) facilitating the “four pillars” into their operations
 - i. Safety Policy
 - ii. Safety Risk Assessment
 - iii. Safety Assurance
 - iv. Safety Promotion
 - d. Emergency Response Procedures Manual (may be incorporated into FOM)
 - e. Aircraft checklists
 - f. Pilot/operator training manual
- E) Fitness for Duty Policy
- F) PPE requirements for field operators
- G) Pilot competency checks
- H) Aircraft maintenance program / battery procedures
- I) Crew Resource Management (CRM) program
- J) Company Culture and Communication
- K) Documented 4 most recent safety meetings

If the above evidence provided is not deemed acceptable by the UAS Program Manager, the prospective vendor will be provided one opportunity to remedy any deficient documents, programs, SOPs and/or experience deficiencies. Should a prospective vendor ultimately fail to meet the minimum acceptable administrative criteria then the prospective vendor will be disqualified from further consideration.

Upon receipt of acceptable qualifying evidence, the UAS Program Manager will schedule an operational evaluation event with the prospective UAS. At this meeting the prospective vendor will be required to present the following:

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- Current Part 107 sUAS Pilot Certificate(s) for each individual who will be acting in the role of RPIC
- Current FAA Registration documents, Airworthiness Certificates (when required) and Weight/Balance Data (when required) for all UAVs on display or intended for flight during this evaluation
- All Certificates of Authorization, Waivers and/or other documents which may be required to facilitate the evaluation flight operations
- Pilot logs for all UAS operators who will be operating UAS or acting as RPIC during the evaluation
- Aircraft maintenance records and logs for all aircraft intended for flight during the evaluation.

Upon acceptance of the above documentation, a demonstration of the proposed flight operations will be performed. The UAS Program Manager (and/or official delegate(s) thereof) shall observe and document the following:

- Operational setup for appropriate safety margins from common pedestrian spaces and potential third-party damages
- Appropriate use of VOs
- Appropriate and clear crew assignments
- Concise conveyance of duties and expectations
- Acceptable CRM practices
- Appropriate and thorough safety brief
- Positive control of takeoff/landing zone and associated flight areas
- Positive control of bystanders with appropriate operational safety margins
- Sound Aeronautical Decision Making
- Data collection processes and procedures in accordance with SCE Cybersecurity Policy
- Appropriate post operational debrief
- Reasonable demobilization from site to include minimized environmental impact
- Timely product delivery possessing a level of quality consistent with defined SOW parameters

The flight evaluation and audit portion shall be graded in accordance with the Flight Evaluation and Audit form provided in Appendix n.

Upon successful completion of the evaluation and audit process, continuing authorized SCE UAS vendors will be recertified for continued service while a given prospective vendor shall be forwarded to Procurement as a conditionally qualified UAS Operator. Acceptance as an Authorized UAS Vendor will be pending any remaining procurement processes which may include Master Services Agreements, Change Orders and other contractual criteria not covered by this FOM.

Impromptu field audits may be made at any time by qualified Aircraft Operations representatives and/or UAS qualified members of SCE Safety. These audits are intended to be less formal with

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an emphasis on operational safety and compliance in the field setting. These audits are generally referred to in company documentation as Safety Observations.

8.0 Normal Operations

8.1 Use of UAS

SCE UAS crews are permitted to operate only those UAS owned by and registered to SCE. In no instance, shall SCE employees be permitted to use personally owned UAS or other UAS not owned by SCE to conduct operations for SCE. Authorized vendors under contract to SCE are authorized to use only UAS owned by and registered to their respective company. All UAS in use on behalf of SCE shall be in compliance with the SCE Cybersecurity Standard.

Only payloads or devices approved by the Original Equipment Manufacturer “OEM” or the UAS Program Manager are permitted to be carried on SCE UAS. Third party devices must be approved by the UAS Program Manager prior to inclusion on SCE registered aircraft.

8.2 Scheduling of Operations

All planned flight activity within SCE shall be coordinated through the Aircraft Operations Airspace Coordinator. This includes UAS Operations. The purpose of the SCE Airspace Coordinator is to ensure safety of flight by preventing airspace conflicts within the SCE territory. SCE flight activity has increased significantly in the past few years and this trend is expected to continue for the foreseeable future. Airspace is assigned to necessary operations on a priority basis depending on company need, permit timing, mission complexity and other factors.

UAS missions that are planned shall be communicated to the SCE Airspace Coordinator by 1 PM the previous day. The SCE Airspace Coordinator then publishes the planned and coordinated operations that same day by 5 PM for the following day. Planned UAS operations must be included on that plan for authorization to commence.

Unplanned UAS Operations are permitted if they are emergent in nature and necessary to restore, establish or maintain safety to the general public, or service to components of the electrical grid. Prior to operations, reasonable attempts shall be made to reach the UAS Airspace Coordinator or the Aircraft Operations Dispatcher (in that order) for just-in-time clearance. If these individuals cannot be reached, then UAS Operators shall conduct a thorough check of the local airspace prior to commencing flight operations. A report of the operation may need to be made to Air Ops after the fact which includes the name of the UAS operator, time, location, and duration of the operation along with the circumstances requiring a UAS flight.

SCE Aircraft Operations Airspace Coordinator: 626-302-1885

SCE Air Ops Dispatcher: 909-974-4676

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8.3 Protection of Privacy

SCE is dedicated to the responsible use of unmanned systems. The capabilities of unmanned aircraft have the potential to violate privacy of vendor individuals. All use of unmanned aircraft on behalf of SCE, whether internally or by authorized vendors, shall be subject to the SCE Data Privacy Policy.

8.3.1 Authorized Use and Secure Data Handling

Imaging systems aboard SCE aircraft are solely intended for authorized business purposes. All captured imagery from SCE remote sensing methods, to include unmanned aircraft registered to SCE or its authorized vendors conducting operations on behalf of SCE is the property of Southern California Edison. All imagery captured by remote sensing methods (which includes unmanned aircraft) by either internal sources or authorized vendors shall be handled as Confidential information. Such data may only be used to inform and/or develop official SCE knowledge bases. Capture, transmission and storage of remote sensing data shall be made in accordance with the Standard for Classifying and Handling Company Information and Cybersecurity Standard.

Company owned imagery, or imagery collected by third party operators on behalf of Southern California Edison or Edison International, Inc., may be authorized by SCE management for public disclosure. Unauthorized use of imagery captured using SCE remote sensing methods is a violation of this FOM and may constitute a violation of SCE's Privacy Policy. Except in life safety circumstances (Imminent Hazard), Law enforcement requests for SCE data must be processed through SCE Law Dept. for submission of requested data. Please see the SCE Data Privacy Policy for further information.

8.3.2 Data Minimization

The general public has a right to an expectation of privacy within their personal, non-public spaces, such as the interior of a bedroom, bathroom, dressing room, swimming pool, or any other area in which the occupant has a reasonable expectation of privacy. Operators shall not utilize SCE equipment to intentionally invade the privacy of individuals. Incidental capture of the likeness of third-party individuals during official authorized use of SCE imaging systems or vendor owned imaging systems operating on behalf of SCE (to include unmanned aircraft) shall be considered unintentional and not constitute a violation of this FOM or the SCE Cybersecurity Standard. Such incidental captures are to be avoided when feasible. In any case, captured imagery is considered SCE property and classified as Confidential information.

As a post-flight directive, images suspected of violating a person's reasonable expectation of privacy shall be reported to the chartered OU management. Sufficient information (e.g., filename, date/time stamp) shall be provided to assist management with locating such images. Subject to record retention requirements and where technically feasible, such images shall be deleted or anonymized/de-identified in post-production. Chartered OU management shall also

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instruct operators to permanently delete such image files from all source data capture media, e.g., SD-cards, once such image files have been copied to a permanent repository.

8.3.3 Data Access

Data captured by remote sensing methods shall be limited to those who need to know as demonstrated by a business justification. Operating Units (OUs) with UAS charters are responsible for designing and implementing controls to limit access to remote sensing data captured during their operations.

8.3.4 Data Labelling

Remote sensing data shall be labelled Confidential information where technically feasible in accordance with the Standard for Classifying and Handling Company Information.

8.4 Preflight Duties

Successful flight operations begin with a well-trained and prepared crew operating an airworthy and properly maintained UAS. Thorough preflight planning promotes the greatest assurance of a safe and successful operation.

The ASO for a given SCE UAS operation shall ensure that the following preflight duties are completed.

- Pre mission planning
 - Site selection/survey
 - Site access, customer contact as necessary
 - Terrain and obstacle considerations
 - Proximity to airports to include heliports
 - Weather conditions and forecasts
 - Obtain airspace authorizations*
 - NOTAMs (Notices to Airmen)
 - Temporary Flight Restrictions (TFRs)
 - Existing applicable NOTAMs
 - Filing UAS NOTAMs
- Preflight Inspection of UAS

*Airspace authorizations that are obtained by LAANC applications are the responsibility of the ASO. Authorizations requiring a written waiver have greater complexity and shall be obtained by Aircraft Operations on the ASO's behalf.

RPICs shall, prior to the first mission of the day and following any minor aircraft incidents, conduct a detailed preflight inspection of the UAS to ensure the system is airworthy. FAA Part 107 operations do not currently require a certificate of airworthiness. The FAA considers the RPIC's preflight inspection as fulfilling the airworthiness requirement.

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For the purpose of this FOM, a *minor aircraft incident* is defined as an unintended aircraft occurrence that is not self-induced by the aircraft or flight system, and results in no injuries to persons, no damage to property, and following which the aircraft retains an airworthy condition.

8.5 Role of the Aviation Safety Officer (ASO)

An ASO will be assigned for all SCE UAS operations. For single-crewmember operations, the RPIC shall also function as the ASO. To enhance safety oversight, a separate crewmember not assigned/operating as an RPIC shall be designated as the ASO for complex UAS operations including (but not limited to) Beyond Visual Line of Sight (BVLOS), multi-UAS operations, and other operations declared by the UAS Model Manager. In all cases, the designated ASO is responsible for the overall safety of the UAS operations. In accordance with the SCE Accident Prevention Manual (APM) and all aviation conventions, any person may declare a stop to operations in the event an unsafe condition is observed or discovered. When the STOP Principle is applied during SCE UAS operations, only the ASO has authority to declare UAS operations may continue following resolution of the condition(s) which necessitated the stop.

8.6 Voice Communications

For VLOS operations, communications between the ASO, RPIC and VO may be conducted directly by word of mouth or by an approved intercom/communication system approved by the UAS Model Manager. When approved, BVLOS operations may require radio or phone communications in the event of greater distances between crew members. Phone applications may be used if approved in advance by Cybersecurity, the UAS Model Manager. Communication methods must be briefed as part of the ASO brief, and ensuring sufficient cellular coverage and app access is available for all crewmembers.

If communication with any crewmember is lost during flight operations, the ASO shall make a determination whether the mission may continue with an alternate means of risk mitigation. In all cases, the safety of people on the ground and manned aircraft will be prioritized.

8.7 Use of Checklists

Checklists are included in the appendices of this FOM. The checklists included meet the minimum checklist requirements for SCE UAS Operations. UAS Operators are allowed to create and use their own checklists, so long as these are equivalent or greater in scope to the sample checklists provided in this FOM.

At a minimum, RPIC/ASOs shall use the IMSAFE checklist to determine personal airworthiness and that of crews associated with the operation, as well as airspace and local UAS restrictions (the ASO Checklist described in Sec. 8.7.1). For basic, low-risk operations a “checklist flow” may be substituted for the aircraft preflight. For advanced operations involving more complex

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operational profiles, a written checklist shall be followed. In these situations, a “challenge/response” format often enhances effectiveness.

A checklist flow is a non-documented physical procedure in which an operator physically begins the checks at the same specific location each time. The continued check then follows the same path around the aircraft and/or flight control surfaces, checking the same specific components for airworthiness in precisely the same manner each time. This method is especially useful during flight for in-situ mission configurations, particularly as mission parameters dynamically evolve. A checklist flow may be reinforced by a scan of the documented checklist to ensure all critical items are covered. This method has been shown to be at least as effective as following the printed checklist but is often preferred during actual mission execution as it is less invasive on the operator’s flight focus.

8.7.1 ASO Checklist

The ASO checklist shall be used for all SCE UAS operations. Items determined out of compliance with the ASO checklist shall be resolved/mitigated prior to conducting UAS operations.

8.7.2 UAS Operations/Preflight Checklist

SCE UAS crews shall use the operations checklists provided by the OEM of the UAS or Aircraft Operations and/or authorized delegates of Aircraft Operations. A general UAS pre-flight checklist is provided in Attachment D for operations in the event an airframe-specific checklist has not been developed. This also describes the checklist flow described in Sec. 8.7.

8.7.3 Maintenance Checklists

To be determined/described by OEM/fleet management system

8.8 Flight Operations

All SCE UAS flight operations shall be conducted in compliance with either Part 107, Part 91 or Part 135 of the FAA Federal Aviation Regulations, or under a Sec. 44807 Certificate of Authorization (COA). Airspace authorizations which may be obtained via LAANC or other “just in time” electronic submittal/retrieval methods shall be obtained as necessary by authorized SCE UAS operators using a company device. This is considered a normal and routine function of company wide UAS flight operations. Each UAS Operator is responsible for understanding when airspace authorizations are required and obtaining the LAANC authorization when it is available.

Advanced airspace authorizations, access into TFRs, COAs, Special Government Interest (SGI) and Part 107 waivers and/or any other regulatory override instruments shall be negotiated and obtained on behalf of SCE only by qualified Aircraft Operations personnel. Such instruments are

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typically identified as a hard-copy certificate or Letter of Authorization (LOA) issued by the FAA to an individual who is then responsible for the actions of personnel operating under the provisions and limitations of said instrument.

Only qualified SCE UAS operators are authorized to manipulate the flight controls of an energized SCE unmanned aircraft system except under training conditions that have been officially established through the Aircraft Operations Unmanned Aircraft Program. In addition, only qualified SCE UAS operators are authorized to handle energized UAS except in the event of an emergency.

All company UAS operations and UAS operations conducted by authorized vendors on behalf of SCE shall be in compliance with this FOM.

8.8.1 Visual Line of Sight Defined

For the purposes of SCE UAS Flight Operations, Visual Line of Sight (VLOS) is defined as a distance from the RPIC that shall not exceed:

- 1,500 feet slant range for aircraft spanning less than 100cm between opposite wing/rotor tips or
- 3,000 feet slant range for aircraft spanning 100cm or greater between opposite wing/rotor tips

Dependent on future UAS acquisitions, this restriction may be waived by the UAS Model Manager on a case-by-case basis if compliance with 14CFR Part 107.31 can be demonstrated.

Under no circumstances shall a RPIC operating on behalf of SCE under 14CFR Part 107 exceed a slant range distance that interferes with 14CFR Part 107.31 compliance unless operating under the authority of an official FAA Beyond Visual Line of Sight (BVLOS) waiver obtained by SCE Aircraft Operations (please see Sec. 8.10.3).

8.8.2 Flight Operations During Daylight Hours

FAA Part 107.29 defines daylight operations (including civil twilight) as the period between 30 minutes prior to official sunrise to the period that ends 30 minutes after official sunset. During the periods of civil twilight (30 minutes before sunrise and 30 minutes after sunset), the AV must have an anti-collision light that is visible for at least 3 statute miles.

8.8.3 Flight Operations at Night

Night operations require extra diligence and attention to safety. All SCE UAS operations at night shall be conducted in accordance with 14 CFR 107.29 by authorized SCE UAS Operators who have renewed their UAS certificate after 01 April 2021. The following conditions are stipulated

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by the FAA for safe UAS operations at night and shall strictly followed during SCE UAS operations at night:

- All night operations require a VO to support the RPIC in seeing and avoiding other aircraft, people on the ground, ground-based structures and obstacles, and maintaining general situational awareness.
- RPIC and VO are required to have been trained in the unique conditions of night flying including:
 - o Recognizing and overcoming visual illusions caused by darkness.
 - o Understanding physiological conditions/limitations that may degrade night vision.
 - o How to protect night vision and what to do in the event of a loss of night vision
- All UAS operated at night must have:
 - o Fully operational position lighting to determine the orientation of the AV.
 - o Anti-collision/strobe lighting mounted on the AV to provide visibility to both the ground crew, manned aircraft and other UAS operators. Multiple strobes will be used where the strobe light could be masked by AV components or payloads.

8.8.4 Flight Time and Logs

Currently, the FAA has not defined flight time for UAS. Most UAS manufactured today automatically log flight time as the period of time that the motors are running. The period of time motors are running while the aircraft is not in flight is expected to be negligible. In the event that an aircraft does not automatically log its time, SCE UAS crews will use the definition for manned aircraft flight time which states that flight commences when an aircraft moves under its own power for the purpose of flight and ends when the aircraft comes to rest after landing.

RPICs are required to complete flight logs within 24 hours after every UAS flight by using flight log forms and/or methods provided by The SCE UAS Model Manager. Crews are required to report issues encountered on the UAS and payloads and are encouraged to provide as much detail as possible.

8.8.5 Post Flight Duties

At the conclusion of daily flight activities, SCE UAS crews are required to complete the following:

- 1) Conduct a thorough post-flight inspection to identify issues with equipment. Issues must be documented immediately if it will affect the next mission.
- 2) Conduct a post-flight debriefing to provide two-way feedback to other crew members and the customer.
- 3) Enter flight logs and issues within 24 hours of postflight inspection.

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8.9 Operating Procedures for Specific Areas

This section reserved for future use

8.10 Enhanced Operations

8.10.1 Semi-Automated Flight

Some UAS provide for the option to program specific flight routes and maneuvers prior to flight and execute/repeat a programmed flight at any time on demand. Such capabilities often arrive as a built-in feature of the aircraft from the OEM. This feature has already demonstrated significant value-add for certain flight environments and UAS applications at SCE. Like any automated flight system however, there are caveats which may escape the attention of the novice operator.

No SCE UAS Operator shall program/execute automated flight plans without first demonstrating to the UAS Program coordinator or an authorized delegate a demonstrated ability to:

- 1) Recognize and counter terrain variances in the programming
- 2) Establish proper altitude and positional offsets from infrastructure and obstacles
- 3) Recognize/react correctly to programming or execution errors
- 4) Suspend/terminate a flight program in a timely manner when the aircraft is not behaving as intended

UAS Operators who successfully demonstrate these skills are authorized to program and utilize automated flight profiles with appropriately equipped SCE UAS.

8.10.2 Fully Automated Flight

This section reserved for future use

8.10.3 Flight Beyond Visual Line of Sight (BVLOS)

This section reserved for future use

8.10.4 Flight Operations Under FAA Waiver and/or Authorization

8.10.4a Operations Under Part 107 Waivers/Authorizations

14CFR Part 107 governs commercial UAS operations in the U.S. and requires that UAS operated under this part are limited to less than 55 lbs (25 kg) and 87 knots (100 mph) airspeed. Many of the rules established in Part 107 are eligible to be waived if the operator can demonstrate what is known as an alternate means of compliance. In the event that certain regulations significantly

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degrade or prevent the efficient use of UAS for SCE, a waiver for relief from the affecting regulation may be pursued and obtained.

When such actions become necessary, SCE Aircraft Operations shall be the sole point of contact with the FAA and pursue waivers and authorizations on behalf of SCE. Upon issuance of waivers/authorizations, only RPICs and specific aircraft by serial number who are listed in the text of the waiver/authorization are authorized to operate under its authority.

Part 107 waivers generally require 90 days and up to 180 days to acquire. More complex waivers may require even greater lead time. Waivers attained in this manner are normally valid for all affected operations for two years from the date of the waiver.

Authorizations on the other hand are generally to allow operation within otherwise restricted or prohibited airspace. These are usually more rapid but still require fairly significant time to attain. The lifespan of an Airspace Authorization varies depending on need of the applying entity and the nature of the airspace restriction in question.

8.10.4b Special Government Interest Waivers (SGIs)

Under some circumstances, entities which exhibit a demonstrated contribution to the well-being of the general public are afforded the option to attain waivers and authorizations on a more emergent basis. These are called Special Government Interest (SGI) Waivers or Authorizations. On paper they appear just like a normal waiver/authorization document, except that they generally expire at the end of the period of need. SGIs however may be obtained at an enormously accelerated speed over traditional waivers and authorizations. They generally take minutes or hours to turn around and are intended to provide rapid access to authorized operations meeting an urgent need to enhance or restore public order. SGIs are issued solely by the FAA Special Operations Office.

SGIs are not available to the general public. They are a tool reserved for entities such as first responders, Government agencies and entities which operate the fabric of our social infrastructure. As a major electric utility, SCE qualifies as eligible for SGI waivers/authorizations.

When SGI waivers/authorizations become necessary, SCE Aircraft Operations shall be the sole point of contact with the FAA and pursue SGI waivers and authorizations on behalf of SCE. Upon issuance of waivers/authorizations, only RPICs and specific aircraft by serial number who are listed in the text of the waiver/authorization are authorized to operate under its authority.

9.0 Emergency Procedures

Emergency procedures are specific to each UAS type as designed by the manufacturer. It is the responsibility of the SCE or SCE Vendor's flight crew to be proficient with the aircraft operational manual provided by the vendor before any flight operations are conducted. The RPIC

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should always be prepared to execute an emergency procedure in instances where there is a lost link, loss of GPS, or there are other aircraft or obstructions in the flight path. The RPIC should brief the flight crew before the start of the flight operations about emergency procedures and have a mission abort site for landing in the case of an emergency. After the UAS has safely landed, it should be documented for maintenance purposes.

Contingencies

It is the responsibility of the RPIC to ensure that there are contingency plans written into the work plan for each job. These should include some of the following plans.

- Alternate route planning
- Alternate Altitudes in case of other aircraft in the area.
- Alternate landing areas
- Ensure that the RTH setting places the UAS in a safe location and follows a safe path during execution

General UAS Emergencies

A list of the most common emergency situations includes, but is not limited to:

- Loss of Datalink communications
- Loss of GPS signal
- Autopilot Software error/failure
- Loss of Engine power
- Return to Home (RTH) does not work
- Unintended contact with a wire, pole, or other object
- Unmitigated intrusion of another aircraft within 500 feet of the UAS mission airspace

The SCE UAS has failsafe options in case of failures or emergency situations. These include using methods of stabilization and an automated Return to Home (RTH) or Return to Land (RTL). These fail-safe mechanisms are tested during training and should be tested during currency flights as well. Flying without designed fail-safe mechanisms in place is not authorized. Failsafe features do not replace sound piloting or Aerial Decision Making (ADM).

In the event of a lost link or fly away, the RPIC shall evaluate the airspace affected and immediately contact the Air Route Traffic Control Center (ARTCC) for the affected region with details of the flight such as; location, direction of flight and approximate altitude, speed and flight time remaining (remaining battery life). If operating within controlled airspace, be prepared to contact the airspace controlling authority as well should you be directed to do so by ARTCC.

In the event of an emergency the RPIC should be prepared to submit a written statement on any FAA regulatory deviations upon the request of the Administrator (FAA) as outlined in Part

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107.21. An SCE internal EHSynch report shall be filed regardless of whether the FAA requests a statement.

Notifications

- Notify 911/Emergency services
- Notify SCE Air Ops of emergency
- Notify the SCE Program Manager of the emergency as soon as practical
- See Attachment E: Accident/Incident Checklist

First Aid

First aid should be rendered to any injured personnel

Provide first aid to injured people.

Caution all personnel in the immediate area to remain clear and upwind of aircraft due to possible hazardous smoke or fumes from batteries.

Company Policy for Personnel Injury

SCE personnel need to follow their specific organizations policy for personnel injury and fill out a EHSynch report so the Corporate safety knows of the incident.

Contractors shall abide by the Health and Safety Handbook for Contractors.

9.1 Immediate Procedures to Follow if Involved in a UAS Aviation Accident or Incident Resulting in Serious Injury or Death

- 1) Only move an injured person if their life is in immediate danger where they are.
- 2) Provide what emergency medical care you are trained to administer.
- 3) Notify the Scheduler/Dispatcher immediately or as soon as practical. If unable, then contact the UAS Program Manager. If it is a weekend or holiday, contact the Edison Security Operations Center (ESOC) and ask to be connected with the Aircraft Operations Coordinator. Be prepared to provide the following information:
 - a. Identification of the UAS.
 - b. Time, date, and possible cause of the accident, if known.
 - c. Location of the accident, including distance from nearest town.
 - d. Names of injured, if any, and extent of injury.

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- e. Telephone or address where UAS Pilot can be reached.
 - f. Any other pertinent information.
- 4) Protect the scene/wreckage from further damage.
 - 5) Prevent the removal or disturbance of any wreckage or payload.
 - 6) Give no statements to anyone, including the Federal Aviation Administration, unless/until cleared to do so by Company Management.
 - 7) *Note: Do not speculate on the cause of the accident. Do not talk to the press.*
 - 8) If you are not injured, are under no medication or do not need immediate medical care, cooperate with the NTSB investigators.
 - 9) When practical, a full written statement shall be completed by all personnel involved. The intent is to record all details as close in time to the occurrence as possible.

9.1.1 Notification of Accident/Incident Involving a Company UAS

- 1) The Pilot-in-Command will report any major accident involving Company aircraft by the most expeditious means to:

Aircraft Operations	909-974-4676
	PAX 11676
	AirOps@sce.com
	Company Radio

- 2) The Aircraft Operations Principal Manager or UAS Program Manager, or his/her designee, will notify the following as necessary:

Director of Transportation Services	626-302-9434
	PAX 29434
Grid Control Center	626-308-6717
	PAX 46717
Claims Department Representative on duty	800-621-8516
	PAX 26911
SCE Watch Office	626-812-4286

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PAX 44286

National Transportation Safety Board 310-380-5660
Western Regional Office, Gardena

Federal Aviation Administration 951-276-6701
Flight Standards District Office #8
6961 Flight Road, Riverside, CA 92504

9.2 Accident/Incident Reporting

The Accident/Incident Checklist included in Appendix D shall be used by the ASO or other crewmember when an accident or incident occurs. Both the FAA and NTSB have separate requirements for reporting Accidents and incidents. The FAAs' requirements are provided in FAA Part 107.9 while the National Transportation Safety Board's (NTSB) requirements fall under 49 CFR §830.5.

- **FAA Part 107.9**

- Requires that an accident be reported within 10 calendar days of the operation and states the requirements for reporting an accident that occurs during the operation of a small UAS (sUAS) that involves at least:
 - Serious injury to any person or any loss of consciousness; or
 - Damage to any property, other than the small, unmanned aircraft, unless one of the following conditions is satisfied:
 - The cost of repair (including materials and labor) does not exceed \$500; or
 - The fair market value of the property does not exceed \$500 in the event of total loss.

- **NTSB**

- The NTSB accident/incident reporting requirements depend on a number of factors and the classification of the accident or incident as described in 49 CFR §830.5.

The UAS Program Manager shall assist SCE UAS Operators with the FAA/NTSB process in the event reporting becomes necessary. If the accident/incident does not reach the level of the above criteria, then handle the occurrence through your OU Air Ops Liaison and UAS Safety Representative.

9.2.1 Accident/Incident Definitions

For the purposes of the SCE UAS Program;

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An Accident is any occurrence while the UAS is energized for flight that results in collision with another vehicle in motion (including another UAS), and/or inflicts bodily injury requiring medical attention (to include field first aid) or causing human death.

An Incident is any occurrence while the UAS is energized for flight that results in Federal regulatory violation(s), forced landing due to battery/fuel exhaustion, physical damage to the aircraft rendering it non-airworthy, aircraft interference with persons not part of the mission crew, and/or external interference with controlled flight occurs. This may include collision with fixed objects, damage to property, failure of flight control components or surfaces, electromagnetic interference, or physical interference with the operation by a third party. Incidents shall not involve physical injury or human death. In such cases the incident enters the realm of “accident”.

The above incidents are considered “major” and are reportable in EHSynch as well as any FAA or NTSB reporting requirements which may occur. The following incidents are considered “minor” and not EHSynch reportable, but operators are encouraged to share lessons learned with the community none the less:

- Forced landing due to battery fault
- Low altitude/low airspeed crash resulting in no structural compromise
- Zero damage/zero injury cessation of flight due to operator error

9.3 Required Written Reports and Statements

1) Company reporting requirements:

- a) Crew members and Company employees shall write a statement of facts, conditions, and circumstances relating to the accident as they perceived; copies to Claims for approval and forwarding to NTSB.
- b) In the case of an incident or accident employees will follow the Safety Incident Management Standard (SCE-EHS-Safety-ST-1)
- c) SCE Form ED-46C, *Damage Report* shall be submitted as soon as practical.
- d) Third party witnesses wishing to submit statements may forward them to the UAS Model Manager in a sealed envelope. Names and contact information of witnesses shall be collected by the ASO prior to departure from the scene. This data shall be handled as Confidential in accordance with the Standard for Classifying and Handling Company Information.

2) NTSB Form 6120.1 Pilot/Operator Accident Report; completed copy to Claims Department for approval with instructions for forwarding to NTSB.

- a) Within ten (10) days after an accident for which notification is required.

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b) As required by NTSB for an incident.

9.4 Loss of Aircraft/Equipment

Regardless of the nature of loss, anytime an SCE unmanned aircraft is missing or has become unrecoverable, the aircraft loss shall be immediately reported to SCE Aircraft Operations and ESOC. The report shall include the company's aircraft identification (e.g., Anafi TH0017), FAA registration number, aircraft serial number, and the individual who has responsibility for the aircraft.

The preferred delivery of this report is via phone contact to ESOC with email follow-up to the UAS Model Manager. Upon receipt of this notification, the UAS Program Manager or authorized delegate shall notify the FAA and cancel the aircraft registration immediately. In the event of a non-incident loss (an aircraft discovered missing) FAA notification may be delayed 24 hours to allow responsible parties additional time to discover a misplaced aircraft.

In the event that a mobile device coupled to the aircraft as part of its Ground Control Station is also missing (theft of an entire kit, for example), the UAS Program Manager shall notify ESOC and report the loss. This report shall coincide with the FAA registration cancellation.

De-registration of aircraft is generally a one-way event that is non-reversible. Re-registration in the event an aircraft is once again located has a minimal, inconsequential cost in terms of cash outlay, but may require administrative activity that rivals the economic benefits of taking such action. It is the intent of the UAS Program in general to avoid this situation when practical.

9.4.1 Incident Related Loss

In the event that an internal flight incident results in the loss of the aircraft from which recovery is unsafe or impossible, recovery of the aircraft shall not be attempted. The actions described in Sec. 9.0 and 9.1, as applicable, shall be immediately initiated by the RPIC/ASO.

If safe to do so, the RPIC or a qualified designee from the flight crew shall remain on scene and monitor the aircraft until it can be positively determined that power/fuel cells aboard are no longer ignition hazards. Should ignition occur, RPIC/ASO shall immediately call 911, and crew shall evacuate to a safe location if necessary. Further emergency contacts may be made once all personnel have achieved a safe situation.

Further actions described in Sec. 9.2 and 9.3 shall be taken if applicable.

The RPIC and ASO in command of the incident mission shall also be identified in the reporting listed above in Sec. 9.4.

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9.4.2 Non-Incident Related Loss

In the event an SCE unmanned aircraft is discovered to be missing and the discovery does not involve an active flight mission, the aircraft shall be reported as missing to the UAS Model Manager within 24 hours following the guidance in Sec. 9.4 above. This report shall also include the device ID of any company-issued mobile device which may be coupled to the aircraft and also missing as part of an entire kit.

In addition to these actions, the identified custodian of the missing aircraft shall, in appropriate circumstances, file a police report with the local law enforcement agency having jurisdiction in the locality where the loss occurred. The police report number shall be included in the body of information reported to the UAS Model Manager. The police report shall include the serial number and FAA registration number of the missing aircraft to facilitate closure in the event law enforcement recovers the aircraft.

In the event of an aircraft loss due to non-flight related damage, the aircraft (including all kit components) shall be returned to Aircraft Operations care of the UAS Program Manager for disposition.

9.5 Incident/Accident Investigation

The UAS Program Manager shall affect a complete investigation of all incidents and/or accidents involving Unmanned Aircraft operated on behalf of SCE. The purpose of the investigation shall be to determine root causes, human factors, environmental contributors, aircraft factors, maintenance issues, contributing management factors, adherence to regulation and/or policy, and any other probable causes leading up to the incident/accident under investigation.

Pursuant to the philosophy of a just culture organization, investigations shall launch under the assumption that individuals involved have operated with intent to comply with all regulations, policies, standards, and procedures governing the incident operation. This philosophy shall be maintained unless and until recovered/discovered evidence clearly indicates an unexplained willful departure from governing statutes. The primary outcome of an investigation is intended to enhance the overall safety and reliability of the UAS program and serve as a learning opportunity for the UAS community. The UAS Model Manager shall maintain a zero-bias policy until all facts and evidence have been established and fully explored.

The OU management, the OU Air Ops Liaison, and the OU UAS Safety Representative shall ensure incident/accident ASOs, RPICs and crews complete the steps and documents outlined in 9.2 and 9.3 along with the Accident/Incident checklist in Appendix D. Written reports and statements from the incident crew shall be forwarded to the UAS Model Manager along with all scene photographs/video, and any other physical evidence generated by the occurrence or derived during subsequent efforts to ascertain information.

The OU management, the OU Air Ops Liaison, and the OU UAS Safety Representative shall ensure SCE internal incident/accident aircraft, Ground Control Station equipment, UAS flight data and onboard recording media are returned to the UAS Model Manager to facilitate investigation. Aircraft and equipment belonging to external operators acting on behalf of SCE

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are not required to surrender equipment but are required to forward unedited and unabridged copies of all flight data and media generated during the incident operation. This data may be forwarded as electronic files via email or any other conventional media transfer protocols.

10.0 Training and Evaluation

Commercial UAS operation in the U.S. requires certification by the FAA for each individual partaking in this activity. The FAA barrier to success is relatively low, requiring that one need only to pass a written examination. Prior to qualification as a UAS operator on behalf of SCE, the company requires that all employees undergo specific training to ensure operational safety and operational success. Managers and supervisors are responsible for identifying and nominating candidates for the program, ensuring candidates complete training and are afforded adequate opportunity to take the FAA Small Unmanned Aircraft Remote Pilot exam. In addition, candidates must complete Aircraft Operations initial flight training. In many cases, additional flight training to the advanced skill level is often required for full qualification in one's occupational duties involving UAS operation.

OUs with a chartered UAS program shall identify unit trainers knowledgeable and sufficiently skilled to develop and train OU operators in UAS work methods specific to the OU. These individuals shall have a dotted-line report to their OU Air Ops Liaison and complete a Train the Trainer course from Aircraft Operations and be qualified prior to providing any aviation related instruction. No person who has not been appropriately qualified by the UAS Model Manager shall provide aviation instruction on behalf of SCE for SCE employees.

The UAS Model Manager shall be identified as the general qualification authority on all UAS operation throughout SCE. In this capacity, the UAS Model Manager is the single reference for training, qualification, and operational standards for UAS operation on behalf of the Southern California Edison Company and Edison International, Inc. OUs with a chartered UAS program shall submit newly identified work methods to the UAS Model Manager for authorization/approval prior to commencing such activity across the respective OU. A limited level of experimental activity by appropriately advanced and qualified operators is permitted within the OU for the purpose of work method development prior to submission to the UAS Model Manager for authorization/approval.

The UAS Model Manager shall always be available for consultation/partnership with chartered OUs in the development of new UAS work methods. The mission of the UAS Model Manager includes facilitating success for chartered OUs in the execution of their respective UAS programs.

10.1 FAA Part 107 Remote Pilot Certificate & Training Requirements

RPICs are required to pass an FAA knowledge test and possess an FAA Part 107 Remote Pilot Certificate before being authorized to pilot SCE UAS. ASOs, RPICs, and Visual Observer must complete an initial training program to ensure proper use and operation of the equipment in day and nighttime environments. Classroom training will include the topics of Crew Resource

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Management (CRM), equipment updates/changes, operational procedures/considerations, and night/physiology training. RPICs are required to demonstrate pilot proficiency and knowledge of SCE operational procedures, proper calibration, and performance of the equipment. RPICs are required to be evaluated on new equipment before operating it themselves.

10.1.1 General Training Requirements for RPICs, ASOs and Visual Observers:

- Manager e-mail approval confirming the business justification to attend SCE's UAS classroom training in order to operate and/or support SCE UAS drone flight operations
- Enroll and complete the SCE UAS classroom training
- Successfully pass the FAA's knowledge test

10.1.2 Additional Training Requirements for RPICs:

- Manager e-mail approval confirming the business justification to obtain a FAA Part 107 Remote Pilot Certificate in order to operate a SCE UAS drone
- Obtain Remote Pilot Certificate from the FAA and/or renew your certificate in compliance with FAA rules
 - It is strongly recommended that the RPIC take the certification test within three weeks of completing the SCE UAS classroom training but no later than three months for a higher success rate. Manager exception approval is required to enable the RPIC to take the certification test beyond three months after completing the SCE UAS classroom training.
 - If an RPIC already has a Remote Pilot Certificate, proof of certification must be provided.
- Once the RPIC has completed the classroom training and/or obtained the Remote Pilot Certificate, then the RPIC will be required to successfully complete SCE's flight proficiency training, which includes practicing flying UAS drones with certified coaches that specialize in SCE's standards outlined within this manual.
- Additional classroom instruction shall focus on Crew Resource Management (CRM) to provide a sound basis for operations requiring assistance from qualified individuals to maintain operational safety during more complex operations.
- To ensure continued proficiency with the equipment, RPICs are required to participate in periodic recurrent classroom and flight training as defined by the UAS Model Manager.

10.1.3 Additional Training Requirements for VOs:

- Technical Qualification as SCE RPIC satisfies the knowledge requirements to hold a VO role for another SCE RPIC
- In the absence of SCE RPIC status, individuals shall demonstrate the following knowledge to attain Technical Qualification as a VO
 - Completion of the CRM classroom module

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- Basic Part 107 knowledge of 14CFR Part 107.15, .17, .27, .29, .31, .33, .37, and .39, common emergency procedures and reporting requirements
- The above may be administered by qualified individuals at the OU level so long as training and evaluation are in accordance with this manual

10.1.4 Additional Training Requirements for UAS Unit Trainers:

Unit Trainers are individuals who have demonstrated the knowledge, operational aptitude, professional aviation safety attitude, as well as the aptitude and patience to train others in specific UAS related operational functions. These individuals are nominated by their respective OUs and qualified by the UAS Model Manager. Unit Trainers shall operate only within their respective OU charters unless written authorization has been provided by the UAS Model Manager to assist other OUs. Unit Trainers shall be objective in the training and evaluation of their clients, adhering to established quantitative pass/fail criteria.

UAS Unit Trainers shall be SCE Technically Qualified UAS Operators (RPIC). In addition to current, unrestricted status as SCE Technically Qualified UAS Operators, UAS Unit Trainers shall be trained and demonstrate proficiency in:

- Key elements from the FAA Fundamentals of Instruction
- Completion of the CRM Facilitator classroom module
- Safety Management System Fundamentals
- Flight Instruction and Flight Performance Evaluation Fundamentals
- Flight training record keeping and forwarding to Air Ops

Qualified Unit Trainers are authorized to train and qualify VOs at the OU level, evaluate

10.2 Qualification

Qualification flights shall take place with no less than five miles visibility, no less than 1,000 foot cloud ceilings, and no greater than 7 knots wind. The evaluation flights shall take place at the Daggett Training Facility unless conditions require a change in venue. Live circuits shall not be used for flight training or evaluation. Aircraft impact with any object during an evaluation flight is a mandatory fail.

10.2.1 Basic Flight

The basic flight evaluation for qualification requires a candidate UAS operator to demonstrate:

Correct preflight procedure – flight planning

IMSAFE

Risk Analysis

Local weather observation/forecast

Aeronautical Decision Making (ADM) – Go/No Go decision

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Airspace Check

Correct preflight procedure – aircraft

Registration

Prop(s)

Aircraft structure

Camera and gimbal condition

Ground Control Unit / Device (if req'd)

Battery condition

Connected battery for security and proper installation

Signal check between aircraft / ground control unit

Actual Flight – Multi-rotor

Take-off

- Smooth and in control

Performs control check

- 10 feet above head for safety

Flight pattern 1: Cones at 25 feet away

- Fly to each cone randomly assigned, at 6 feet above tops. Stop within a 3-foot box above cone. Do this with aircraft facing forward (relation to operator), thence with the aircraft facing operator, thence with the aircraft facing left and again facing right.

Flight pattern 2: Cones at 25 feet away

- Fly to each cone randomly assigned, at 25 feet above tops. Stop within a 3-foot box above cone. Do this with aircraft facing forward (relation to operator), thence with the aircraft facing operator, thence with the aircraft facing left and again facing right.

Flight pattern 3: Cones at 25 feet away

- Fly to each cone randomly assigned, at 25 feet above tops. Stop within a 3-foot box above cone. Do this with aircraft facing forward (relation to operator), thence with the aircraft facing operator, thence with the aircraft facing left and again facing right.

Flight pattern 3: Cones at 100 feet away

- Fly to each cone randomly assigned, at 25 feet above tops. Stop within a 5-foot box above cone. Do this with aircraft facing forward (relation to operator), thence with the aircraft facing operator, thence with the aircraft facing left and again facing right.

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Emergency Procedure: Battery Failure	- Simulated imminent battery failure. Guides aircraft on descent all the way to safe point on ground. Keeps trying to control even if aircraft is not responding.
Emergency Procedure: Lost Link	- Simulated Lost Link. Keeps trying to control even if aircraft is not responding. Executes RTH. Travels (walks) to aircraft position until aircraft responds/lands.
Emergency Procedure: Fly-Away	- Simulated aircraft fly-away. Keeps trying to control even if aircraft is not responding. Calls out: Last known position, time, last known battery level (estimated flight time remaining), and direction of travel. Has appropriate ARTCC phone number on hand. Simulated contact with ARTCC (phone).

10.2.2 Advanced Flight

The Advanced Flight evaluation for qualification requires a candidate UAS operator to demonstrate all the capabilities in Basic Flight, plus the following:

Pre-Flight Brief

Brief Items in “Correct preflight procedure – flight planning” from 10.1.1, with a VO crew.

Assign Crew Positions	- Each crewmember understands assignments. Each crewmember understands mission and is clear on concept of operation. Each crewmember is appropriately assigned.
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Rudimentary Inspection Maneuvers

Inside 360 Left	- Revolve the aircraft clockwise around a point keeping the camera focused on the point in the center. The aircraft must maintain a 15 foot radius from the center point ± 5 feet, and must maintain an altitude of 15 feet above the center point ± 5 feet. Center point must remain in camera view for the full 360. This maneuver is executed by feathering cyclic left with a simultaneous yaw to the right. There is no time limit but the maneuver must be completed in a single flight.
Inside 360 Right	- Revolve the aircraft counter-clockwise around a point keeping the camera focused on the point in the center. The aircraft must maintain a 15-foot radius from the center point ± 5 feet, and must maintain an altitude of 15 feet above the center point ± 5 feet. Center point must remain in camera view for the full 360. This maneuver is executed by feathering cyclic right with a simultaneous

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yaw to the left. There is no time limit, but the maneuver must be completed in a single flight.

Practical Inspection Maneuvers

Utility Pole at 100 Feet

- Capture still images: 360⁰ images of components atop the upper-most crossarm of a utility pole located 100 feet away. Images must be made from 15 feet distance \pm 5 feet and 10 feet above \pm 3 feet. End components must be imaged from 10 feet \pm 3 feet below as well. There is no time limit, but all imagery must be captured during one flight.

Transmission Tower at 300 Feet

- Use VOs from the pre-flight segment. Capture still images: both sides of all dead-end insulators on a tower 300 feet away (slant range). Images must be made from 35 feet distance \pm 10 feet and 30 feet above \pm 10 feet. End components must be imaged from 30 feet \pm 10 feet below as well. There is no time limit, but all imagery must be captured during no more than two flights.

Demonstrates good Crew Resource Management:

Clear communication, maintains professional demeanor, accepts /acts upon crew input, maintains/enforces sterile cockpit and mission focus.

10.3 UAS Operator FAA Currency

Authorized SCE UAS Operators shall maintain a current status for their FAA Part 107 Small Unmanned Aircraft Certificates. Operators shall provide a copy of their Certificate of Completion as evidence of qualifying recurrency training to the SCE UAS Program Manager. SCE UAS Operators holding Part 107 sUAS Remote Pilot Certificates which are within 15 days of expiration shall be required to complete FAA approved recurrency training prior to exercising flight privileges with SCE unmanned aircraft. It should be noted that the FAA requires recurrent training to occur *within* 24 calendar months of the previous training but does not require that 24 calendar months elapse prior to seeking a recurrent status. Each time a certificate holder successfully completes recurrency training the 24 calendar month clock is reset. Operators are welcome and even encouraged to revisit recurrency training more often if desired.

Recurrency is presently provided via the FAA Safety Team (FAAST)

10.4 UAS Operational Currency

10.4.1 General Currency

In order to remain current for operation of unmanned aircraft for the purpose of UAS operation on behalf of SCE, a UAS Operator (SCE internal or authorized vendor) shall have, within the preceding 90 days, logged a minimum of:

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- Three take-off / landing evolutions. For the purpose of this definition, a take-off shall include any combination of flight control manipulation and/or physical operation which results in intended, stable and controlled flight of the UAS while the aircraft is energized and under its own power. In addition, a landing shall include any combination of flight control manipulation and/or physical operation which results in intended, stable and controlled cessation of flight during which flight is terminated at an intended location under full control.
- One flight evolution at the required skill level of the Qualified SCE UAS Operator's highest skill rating (i.e., an operator rated at the Advanced Flight level for the purpose of flight in close proximity to SCE infrastructure shall have logged at least one flight evolution at the advanced level within the preceding 90 days). A flight evolution is defined as one take-off as described above, a subsequent flight operation requiring the appropriate skill level, terminating with a landing as described above.

Currency at an operator's highest rating level implies currency at lower levels. Currency at a lower level however only authorizes continued operation at that lower level.

10.4.2 Restoring Currency

A UAS Operator for whom currency has lapsed may restore:

- Basic flight currency by logging three take-off/landings while operating in a location appropriate for UAS practice flight. During at least one of the take-off/landing evolutions, at least 0.3 hours of general navigation (maneuvering over open ground) is required.
- Advanced flight currency by logging three take-off/landings, during at least one of which 0.3 hours of operation at the advanced flight level is performed. During the advanced flight operation, a fellow UAS operator who is qualified and current in advanced UAS flight shall act as VO on behalf of the operator who is restoring currency.

10.5 UAS Operational Proficiency

Qualified SCE UAS Operators who exhibit a propensity for operational difficulty or degradation of personal performance may become subject to a UAS proficiency check. Air Ops Liaisons and OU management who observe/are made aware of adverse characteristics in a UAS operator within their charter UAS program shall document and forward pertinent information to the UAS Model Manager for disposition.

Contract/vendor UAS operators who exhibit evidence of diminished capability to operate UAS shall be removed from participating in UAS operations on behalf of SCE until the conditions facilitating operational deficiency have been mitigated or corrected.

A UAS Proficiency check at face value consists of repeating the flight demonstration (flight check) that was initially required to attain qualification. The proficiency flight check shall be performed at the flight skill level commensurate to one's assigned role. The check flight description and passing criteria are discussed in Sec. 10.1.1 and 10.1.2. During this evaluation, additional attention shall be given to the following:

- IMSAFE check on the candidate

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- Risk analysis / risk mitigation skills
- Aeronautical Decision Making (ADM) factors
- Operator confidence
- Condition of assigned equipment
- Use of checklists
- General demeanor

Conditions which indicate potential candidacy for re-evaluation include but are not limited to:

- Returning to UAS operations following one year or more of non-operation
- Three operator-related aircraft incidents within a 90-day period
- One aircraft incident causing serious injury or requiring FAA/NTSB reporting
- Propensity for operational difficulty
- Suspension/disciplinary action for willful safety violations

10.6 Suspension/Removal from UAS Program

10.6.1 UAS Operators

Qualified UAS Operators who are found to willfully disregard the provisions of this FOM, the SOPs, and company policies, standards and procedures that pertain to UAS operation may be suspended from the UAS Program by the UAS Program Manager or the Aircraft Operations Principal Manager. UAS Operators who are found to willfully violate SOPs internal to their chartered OU may be suspended or removed from their OU UAS operation by either the OU Air Ops Liaison or OU management. In such cases, the UAS Program Manager may review the overall flight status of the individual since status in the program is reliant on a recognized business need within the OU.

Qualified UAS Operators under proficiency check review who are unable to satisfactorily demonstrate or regain required proficiency may be removed from the UAS Program by the UAS Program Manager or the Aircraft Operations Principal Manager. In the event the candidate fails an UAS proficiency check as described in Sec. 10.5 due to difficulty with technical skills, the individual's qualified UAS operator status shall be suspended pending completion of a practice period which shall encapsulate no fewer than 15 working days excluding vacation and holidays, during which a minimum of 5 practice hours shall be logged. At the end of this period the individual shall be re-evaluated for re-instatement.

If the candidate fails an UAS proficiency check due to behavioral / EAP related factors regardless of technical ability, the individual's qualified UAS operator status shall be suspended pending discussion with OU management and evidence of correction/mitigation of underlying conditions.

The UAS Program Manager may determine that removal from the program has become an option in extreme or repeat cases. This shall not occur until a discussion with UAS operator's OU management has taken place.

Evaluators shall disregard all personal biases and base determinations solely on the quantitative performance criteria listed in Sec. 10.1.1 and 10.1.2 as appropriate, as well as reported operational difficulties listed in Sec. 10.5 under "Conditions which indicate potential candidacy for re-evaluation". All UAS Operations shall be performed in compliance with the [Fitness for Duty Policy](#).

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All records and results from these proceedings are Company Confidential and shall be disclosed to/discussed with only the individual under examination and direct reporting management with a specific need to know.

10.6.2 Chartered UAS Operations

OUs with chartered UAS operations that demonstrate a continued culture of non-compliance with this FOM or its SOPs may be subject to suspension or revocation of their charter. In such cases it is highly likely that a systemic condition exists at the management level which requires correction in order to resume/re-establish a charter UAS program.

Conditions indicative that suspension/revocation may be necessary are generally present in the aggregate of the OU's UAS operators and include but are not limited to:

- Poor safety performance
- Repeated FAA violations
- Repeated violations of this FOM
- Repeated violations of company policy, standards, or procedures pertaining to UAS operations
- Two consecutive failures of program audits performed by Air Ops
- Multiple UAS incidents over a relatively short time / spike in occurrences

The recovery from the suspension / revocation condition shall be dependent on the nature of the cause. Only extreme cases would likely go straight to revocation. The steps toward full revocation of a program are graduated and intended to provide an OU opportunity to reverse the course and partner with Air Ops in that effort:

- Suspension of charter pending a 4-hour safety standdown with Aircraft Operations that has the affected manager(s), Air Ops Liaison(s), the OU UAS Safety Representative and all UAS operators in attendance.
- Suspension of charter pending replacement of the Air Ops Liaison, the OU UAS Safety Representative or both.
- Revocation of charter pending Aircraft Operations special audit, full remediation of chartered program if necessary, and review with OU leadership at the VP level.

It is the intent of Aircraft Operations and the UAS Program Model Manager to assist troubled charter operations in repairing/restoring their programs. Charter UAS Operations who are thoughtfully cooperating with Aircraft Operations in this effort demonstrate good faith in restoring the aviation culture necessary to operate on behalf of SCE.

11.0 Logging Flight Time and UAS Aircraft Maintenance

11.1 Documentation of Flight Logs and Maintenance Logs

Flight logs will be filled out for each flight and should contain the information: listed in the Documentation Section of this part.

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Maintenance Logs shall be kept current at all times. The SCE UAS Model Manager shall maintain a log for each UAS registered to SCE. Minor field maintenance items such as propeller changes may be entered in the UAS Operator's Log in the "remarks" column.

11.2 Use of fleet management tools

Fleet management software is pending identification and procurement. This section is currently TBD.

11.3 Documentation

Periodic maintenance performed by the UAS Model Manager shall be documented in the aircraft's maintenance log. Aircraft maintenance logs are stored and maintained by the UAS Model Manager.

Minor field maintenance actions that may be performed by the RPIC shall be documented in the RPIC's log prior to close of business for the day of occurrence.

After each day of operation, the RPIC will complete a log entry documenting each UAS operation.

All UAS flight logs shall include the following information:

- Date (e.g. 12/03, dd/mm)
- Aircraft Make/Model
- Aircraft FAA ID
- Takeoff Location
- Landing Location (if different from take off)
- Flight Duration
- Number of Mission Landings
- Aircraft Type
- Mission Type
- Authorizations Required
- Quantity of Batteries Used
- Any Remarks or Notes
 - Visual Observer Name(s) (if present - enter in Remarks column)

All Documentation pertaining to the maintenance of SCE's UAS shall be stored and maintained in the SCE UAS Program Database (software/cloud-based solution currently in selection stages). This data may expand to include RPIC activity logs as available software features become available.

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12.0 Reporting

12.1 Operational Reports due to Air Ops Department

Company-owned and contract UAS drones will be scheduled through Aircraft Operations for airspace clearance purposes. Provide the scheduler/dispatcher with the operator name, date, time, location and operational area at least 24 hours before the flight operation using the following information:

SCE Airspace Coordinator 909-951-6505 [REDACTED]@sce.com

Aircraft Operations 909-974-4676 PAX 11676 AirOps@sce.com

Emergent operations needing to occur in real time may be authorized into SCE airspace on a real-time basis by contacting the SCE airspace coordinator or the Aircraft Operations Scheduler/Dispatcher for clearance immediately prior to flight. This method is not intended and shall not be used for planned, scheduled, and routine operations characterized as premeditated in nature.

12.2 Fleet Management Reporting

Aircraft Operations shall manage UAS drone operations, track operational history, maintenance history and maintain operator data specific to the certification, qualification, currency of and competency for UAS operation. This data may be reported to competent authority upon request.

Chartered OUs shall ensure RPIC Flight Logs are forwarded to the SCE UAS Model Manager on a monthly basis. Online document update protocols that provide the SCE UAS Model Manager access shall be considered a compliant reporting method.

13.0 Management Structure and Contact Information

13.1 Aircraft Operations

Aircraft Operations
Southern California Edison
Chino Airport
7000 Merrill Avenue, Bldg. A-290
Chino, CA 91710
(909) 974-4676

13.2 Aircraft Operations Principal Manager

[REDACTED]
Aircraft Operations
Southern California Edison
Chino Airport
7000 Merrill Avenue, Bldg. A-290

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Chino, CA 91710
[REDACTED]

13.3 Management Reporting Structure

DIRECTOR OF TRANSPORTATION SERVICES
[REDACTED]

2244 Walnut Grove Avenue
Rosemead, CA 91770
[REDACTED]

AVIATION OFFICER

[REDACTED], VP Operational Services
2244 Walnut Grove Avenue
Rosemead, CA 91770
[REDACTED]

Edison Security Operations Center (ESOC)
626-815-5611

13.4 Aircraft Operations Internal Management Structure

REMOTE SENSING / UNMANNED AIRCRAFT PROGRAM MANAGER
[REDACTED]

Aircraft Operations
Southern California Edison
Chino Airport
7000 Merrill Avenue, Bldg. A-290
Chino, CA 91710
[REDACTED]

SCHEDULER/DISPATCHER
[REDACTED]

Aircraft Operations
Southern California Edison
Chino Airport
7000 Merrill Avenue, Bldg. A-290
Chino, CA 91710
[REDACTED]

SCE AIRSPACE COORDINATOR
[REDACTED]

Aircraft Operations
Southern California Edison
Chino Airport

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7000 Merrill Avenue, Bldg. A-290
Chino, CA 91710

[REDACTED]

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APPENDIX A – Abbreviations and Glossary of Terms

Abbreviations

AGL	Above Ground Level
AIM	Aeronautical Information Manual
AV	Air Vehicle
ASO	Aviation Safety Officer
ASOS	Automated Surface Observing System
AWOS	Automated Weather Observing System
ATC	Air Traffic Control
BLOS	Beyond Line of Sight (communication link)
BVLOS	Beyond Visual Line of Sight
C2	Command and Control
C3	Command, Control, and Communications
COA	Certification of Waiver or Authorization
CFR	Code of Federal Regulations
CG	Center of Gravity
DDL	Digital Datalink
DUAT	Direct User Access Terminal (for FAA weather)
EO/IR	Electro-Optic/Infrared
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations (part of Title 14 of the CFR)
FLIR	Forward Looking Infrared Radiometer
FMV	Full Motion Video
FOM	Field Operations Manual
GHz	Gigahertz
GOM	General Operating Manual
GPS	Global Positioning System
HD	High Definition
IMC	Instrument Meteorological Conditions
ISR	Intelligence, Surveillance, and Reconnaissance
KTS	Knots
LiPo	Lithium Polymer (battery)
LRU	Line Replaceable Unit
MEL	Minimum Equipment List
MHz	Megahertz
MPH	Miles Per Hour
MSL	Mean Sea Level
MTBF	Mean Time Between Failure
MTBR	Mean Time Between Replacement
NAS	National Airspace System
NOTAM	Notice to Airmen

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OEM	Original Equipment Manufacturer
PIC	Pilot in Command
PPE	Personal Protective Equipment
PS	Payload Specialist
R/C	Remote Control
RPIC	Remote Pilot in Command
RSSI	Received Signal Strength Indicator
RTL/RTH	Return to Launch, Return to Home (similar terms)
SE	Support Equipment
SMS	Safety Management System
sUAS	Small UAS (less than 5 pounds)
TFR	Temporary Flight Restriction
UAS	Unmanned Aircraft System
VMC	Visual Meteorological Conditions
VO	Visual Observer
VLOS	Visual Line of Sight

Glossary of Terms

14CFR Part 91	Commonly referred to as Part 91: The body of Federal Aviation Regulations that defines aircraft operation conducted solely in pursuit of interests to the owner/operator of the aircraft. 14CFR Part 91 operations require an appropriate airmen certification issued under 14CFR Part 61 or 14CFR Part 141.
14CFR Part 135	Commonly referred to as Part 135: The body of Federal Aviation Regulations that defines aircraft operation conducted for hire in pursuit of interests to a third party paying for services, particularly during carriage of third-party cargo or equipment. 14CFR Part 135 operations require an appropriate airmen certification issued under 14CFR Part 61 or 14CFR Part 141.
Authorization	1) Authority to conduct activities, assume titles/positions, or operate outside of normal established controls. Authority is understood to have been granted by a competent source to an entity that is partaking in activities which are regulated or governed by a government or organization. 2) Pertaining to FAA action, similar to a waiver except an authorization in location-based, such as an Airspace Authorization or authority to operate in otherwise controlled airspace.

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Confined Area	An operational area that is physically bounded in a manner that requires enhanced skills while manipulating the controls of an aircraft, and/or requires mitigations to be in place in order to prevent inadvertent and adverse interaction with surrounding obstacles.
Congested Area	An aircraft operational area that requires mitigating factors in place to assure adequate operational separation from the non-participating public.
Incidental Operator/	
Incidental Operation	A vendor providing products and/or services to SCE that are not in themselves related to aviation operations, but do require aviation operations to develop or produce the desired deliverables defined in their contract. Such aviation operations are therefore incidental to the services for which they are contracted, but are subject to Air Ops governance none-the-less.
Positional Authority	Having enhanced authority over a location or operation that is assumed in real time by virtue of one's position in the operation. This refers to specialized skills and knowledge possessed by an individual that uniquely qualifies that individual to exercise local authority to ensure the safety of crewmembers and members of the non-participating public. Positional authority supersedes traditional rank structures or other positions of authority until the situation assigning positional authority ceases.
Sec. 44807	Section 44807: A special section of Chapter 14 Code of Federal Regulations defining authority to operate unmanned aircraft that fall outside the physical limits defined by 14CFR Part 107.
Waiver	Similar to Authority; A waiver is <i>activity</i> based. A documented grant of relief from the confines of specific FAA regulation(s) to allow an enhanced aviation activity. Waivers are processed from an initial application made by an individual who has proposed an <i>alternate means of compliance</i> found acceptable to the FAA that will adequately mitigate the hazards that the waived regulation(s) is/are intended to avoid.

Attachment B: Pack-up Kit Checklist (PUK)

APPENDIX B – Standard and Supplementary Equipment Lists

Standard Equipment for SCE UAS Operations:

Company Cellphone

UAS Launch/Recovery Pad

UAS

UAS Support Kit (model specific)

UAS Mobile Device (if required)

PPE as Necessary

Additional Equipment for HFRA/Bulletin 322 Operations:

First Aid Kit

5lb ABC Fire Extinguisher

Shovel

5 Gal Water Backpack

Company Radio (as req'd)

Sufficient Ground Clearance Vehicle (if off-road)

Additional Equipment for Isolated Locations/Personnel:

First Aid Kit

AED

Satellite Phone / Rockstar

2 gal Drinking Water per Person

Field Survival Pack

Attachment C: RPIC / Aviation Safety Officer (ASO) Checklist

APPENDIX C - Checklists

MISSION PREPARATION:

1. Operational Risk Management (ORM)
 - a. Risk matrix Perform
 - b. Excessive risk Mitigate
 - c. Mission Go/No Go Assess/Elevate as nec.
 - d. Verify
 - i. Notifications complete (NOTAM, Property Owner, LAANC, Others as req'd)
 - ii. Maintenance Logs Checked/Reviewed
 - iii. Current and forecast weather
 - iv. NOTAMS and GPS RAIM checked
 - v. Crew: IMSAFE
2. Crew Coordination and Resource Management
 - a. Visual Observers (VO) Sufficient
 - b. Mission Assignments Briefed / Understood
 - c. Sterile cockpit Briefed / Set
 - d. Cellphones Silenced
 - e. Crowd / Traffic Control Assigned / In Position
3. Communications Plan
 - a. Crew Communications Established / Checked
 - b. Local Authorities Comms Established / Checked (as nec.)
 - c. Reg. ARTCC Ph. Number On Standby
4. Navigation and Flight Planning
 - a. Flight Plan/Mission/Contingencies Briefed
 - b. Handoff Procedures Briefed / Understood (as req'd)
 - c. Divert Termination Plan Briefed
 - d. Operational Hazards Discussed / Mitigated
5. Emergency Procedures Briefed:
 - a. Mission Abort
 - b. UAV loss of control
 - c. Lost Link
 - d. Fly-away contingency – Contact ARTCC: Aircraft position, heading, Remaining Flight Time
 - e. Crew Lost Comms
 - f. Inadvertent IMC / Loss of Visual Contact with UAV
 - g. Crew emergencies (illness or injury)
6. GCS and UAS Preflight Inspections complete, FAA registration visible on AV
7. Safety equipment
 - a. Safety Zone established (cones and vests)
 - b. Fire extinguisher near GCS
 - c. PPE (glasses, gloves, hats, sunscreen, bug spray, etc. as required)
8. Payload Checklist Complete
 - a. Recording/Reporting
 - b. LTE/Bluetooth configured
 - c. Data Cards installed and Sensors turned on

POSTFLIGHT:

1. Recording/Reporting requirements
 - a. Flight data captured/backed-up
 - b. Operations debrief to include Safety and Lessons learned
2. Maintenance issues documented in Fleet Management Software

Attachment D: General UAS checklist**(for cases where OEM does not provide a checklist)****PRE-FLIGHT**

WEATHER CHECKED
 AIRSPACE CHECKED
 UAV FORECAST APP CHECKED
 TRANSMITTER BATTERY CHARGED
 AIR VEHICLE BATTERY CHARGED
 MOB. DEVICE BATTERY CHARGED
 AIR VEHICLE INSPECTED/AIRWORTHY
 LANDING GEAR EXTENDED/SECURE
 PROPS INSPECT & SECURE
 MOTORS SPIN FREELY & SECURE
 GIMBAL SECURE
 CAMERA SPINS FREELY
 MEDIA MEMORY INSTALLED
 BATTERY SECURE
 POWER (TRANSMITTER THEN AV) ON
 FIRMWARE (Transmitter & AV) REVIEW
 GEO-FENCE/RTH REVIEW
 GPS SIGNAL ESTABLISH
 MIN. SAFE ALT SET
 LOST LINK FAILSAFE RTH
 COMPASS CALIBRATION COMPLETED
 CAMERA (IF REQ'D) OPS CHECK

BEFORE TAKEOFF

RADIO LINKS VERIFY
 FLIGHT MODE MANUAL
 AIRSPACE CLEAR
 LZ CLEAR

TAKE OFF

MOTORS IDLE
 HOVER 10M ALT MIN/AS REQ'D
 TAKEOFF TIME RECORD
 PITCH, ROLL, YAW CHECK, CORRECT
 LANDING GEAR AS REQUIRED

LANDING

APPROACH BRIEF
 FLIGHT MODE LED MANUAL
 LANDING GEAR DOWN
 LZ CLEAR
 TOUCH DOWN MOTORS TO IDLE

AFTER LANDING

MOTORS OFF
 LAND TIME RECORD
 AV POWER OFF
 TRANSMITTER OFF
 BATTERY REMOVE
 BATTERY VOLTAGE RECORD

AFTER LAST FLIGHT ON LOCATION

AIRCRAFT/TxMITTER STOW
 LZ BASE CLEAN/TIDY
 FLIGHT LOG COMPLETE

**EMERGENCY CHECKLISTS
LOST LINK**

ANTENNA ORIENTATION VERIFY
 ANTENNA CONNECTIONS VERIFY
 CONTROL INPUTS CONTINUE
 C2 LINK MONITOR

LINK RESTORED

CONTROL RESTORED VERIFY
 MISSION SUSPEND/RTB/TROUBLESHOOT

LINK NOT RESTORED

LOST LINK RECOVERY LOC. RECORD
 AIRCRAFT RECOVER

FLY AWAY

CONTROL MODE MANUAL
 CONTROL INPUTS CONTINUE
 HEADING/DIRECTION NOTE
 ARTCC CONTACT/REPORT

GPS LOSS

CONTROL MODE MANUAL
 WIND DRIFT NOTE/MANAGE
 MISSION RTB IF NECESSARY

PROPULSION FAILURE

CONTROL MODE MANUAL
 CONTROL INPUTS CONTINUE
 POWER REGULATE DESCENT
 LANDING AREA "CLEAR!"

Attachment E: Accident/Incident Checklist (check for Air Ops standard)**APPENDIX D – Accident/Incident Checklists**

1	Notify 911/Emergency Services	
2	Secure area to limit further injuries and property damage. Shut off power to UAS.	
3	Provide first aid to injured people. Caution all personnel to remain clear and upwind of aircraft due to possible hazardous smoke or fumes.	
4	Direct all public inquiries to Public Affairs	
5	UAS Identification and Registration number	
6	Owning Organization	
7	Date of event	
8	Time of event (Local)	
9	Launch time (Local)	
10	Address/Location of event	
11	Crew list (ASO, RPIC, VO, and others)	
12	Was fire involved?	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>
13	If fire involved, was the UAS on fire in flight?	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>
14	Cloud Coverage	
15	Temperature	
16	Wind Speed/direction	
17	Other weather observations/notes	
18	Lighting	Night <input type="checkbox"/> Dawn <input type="checkbox"/> Day <input type="checkbox"/> Dusk <input type="checkbox"/>
19	Description of injuries	
20	Description of UAS/Equipment damage	
21	Description of Government/State property damage	
22	Description of commercial/private property damage	

Attachment E: Accident/Incident Checklist (check for Air Ops standard)

23	Take photos of scene, equipment, and damage, prior to moving anything	
24	Secure and label all data from UAS (log files, photo/video files)	
25	Was media present? If so, who?	
26	Description of mishap (mission, launch, enroute, landing, etc.)	
27	Flight Mode at Time of Loss	
28	Commanded Altitude	
29	UAS Altitude above Ground	
30	UAS Heading (Degrees Magnetic)	
31	Last Known UAS Location	
32	Loss of Link Indication?	
33	Previous Problems/Maintenance Issues That May Have Contributed to the Loss	
34	Flight Recorded/Taped	Yes <input type="checkbox"/> No <input type="checkbox"/>
35	Actions Taken upon/after Loss (searches, use of resources, etc.)	

Attachment E: Accident/Incident Checklist (check for Air Ops standard)

36	Witnesses Name and Role (i.e., SCE employee, Visual Observer, UAS Team, bystander, etc.)	
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Attachment F: Rules for Specific Operating Areas

APPENDIX E – Environmental Restrictions for UAS Operation

TBD

Current discussions with ESD may add this section.

Attachment F: Rules for Specific Operating Areas**APPENDIX F – Known Minimum Approach Distances****Parrot Anafi Work/Thermal**

Transmission Line Type	Minimum Approach Distance (Feet)*
525 kV Double Circuit	35
525 kV Single Circuit	25
230 kV Double Circuit	15
230 kV Single Circuit	15
200 kV to 33 kV	15
16 kV	10
12kV and Below	5

APPENDIX G – Standard Operating Procedures

Reserved for future development

Certificate Of Completion

Envelope Id: 790A211AB3FC4101AE552AC4F2E11E28
 Subject: Please DocuSign: SCE UAS FOM_01-12-22.docx
 Custom Envelope Field: SCE UAS FOM
 Source Envelope:
 Document Pages: 74
 Certificate Pages: 5
 AutoNav: Enabled
 Envelope Stamping: Enabled
 Time Zone: (UTC-08:00) Pacific Time (US & Canada)

Status: Completed

Envelope Originator:
 airops
 P.O. Box 700
 Rosemead, CA 91770
 airops@sce.com
 IP Address: 163.116.139.113

Record Tracking

Status: Original
 3/16/2022 1:00:20 PM

Holder: airops
 airops@sce.com

Location: DocuSign

Signer Events**Signature****Timestamp**

[REDACTED]
 [REDACTED]@SCE.COM
 Director
 SCE Enterprise Procurement
 Security Level: Email, Account Authentication
 (None)

DocuSigned by:
 [REDACTED]
 16C3430A933C4F5...
 Signature Adoption: Pre-selected Style
 Using IP Address: 136.52.2.229
 Signed using mobile

Sent: 3/16/2022 1:48:17 PM
 Viewed: 3/16/2022 1:50:29 PM
 Signed: 3/16/2022 1:50:41 PM

Electronic Record and Signature Disclosure:
 Accepted: 2/2/2021 2:51:01 PM
 ID: d886bae5-3551-4594-a3cb-c6b0b2fa5792

[REDACTED]
 [REDACTED]@SCE.COM
 Vice President Operational Services
 Southern California Edison Company
 Security Level: Email, Account Authentication
 (None)

DocuSigned by:
 [REDACTED]
 EBC91B17FE5D423...
 Signature Adoption: Pre-selected Style
 Using IP Address: 163.116.132.116

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 Viewed: 3/20/2022 10:20:19 PM
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In Person Signer Events**Signature****Timestamp****Editor Delivery Events****Status****Timestamp****Agent Delivery Events****Status****Timestamp****Intermediary Delivery Events****Status****Timestamp****Certified Delivery Events****Status****Timestamp****Carbon Copy Events****Status****Timestamp**

[REDACTED]
 [REDACTED]@sce.com
 principal Manager Aircraft Operations
 Security Level: Email, Account Authentication
 (None)

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Electronic Record and Signature Disclosure:
 Accepted: 2/15/2022 4:58:03 PM
 ID: 7af46353-75b7-41aa-84e1-8add3183eb0b

Carbon Copy Events	Status	Timestamp
<div>██████████ ██████████@SCE.COM</div> <p>Security Level: Email, Account Authentication (None)</p> <p>Electronic Record and Signature Disclosure: Accepted: 1/28/2021 4:00:05 PM ID: 8d4276a7-80cf-44c9-bf3a-85bae70eb029</p>	<div>COPIED</div>	<p>Sent: 3/20/2022 10:20:29 PM</p> <p>Viewed: 3/21/2022 8:10:43 AM</p>

Witness Events	Signature	Timestamp
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Notary Events	Signature	Timestamp
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Envelope Summary Events	Status	Timestamps
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Envelope Sent	Hashed/Encrypted	3/16/2022 1:48:17 PM
Certified Delivered	Security Checked	3/20/2022 10:20:19 PM
Signing Complete	Security Checked	3/20/2022 10:20:25 PM
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