

EXHIBIT C

(SCE 2021 GRC Application)

2019 Service-life Study



DISTRIBUTION PLANT
ACCOUNT: 361.00 – STRUCTURES AND IMPROVEMENTS

DESCRIPTION

This account includes the cost in place of structures and improvements used in connection with distribution operations. The account comprises mainly control houses and related structures at distributions substations. Account statistics and current and proposed parameters are shown in Table 1 below.

	Current	Proposed
PLife-Curve	50-L0.5	55-L0.5
Derived Additions	\$766,340,124	
Plant Retirements	\$69,837,862	
Percent Retired	9.1%	
Plant Balance	\$696,502,262	

Table 1. Account Parameters and Statistics

LIFE ANALYSIS

Major forces of retirement for this account include system upgrades, severe storms and earthquakes, traffic and fire accidents, rodent damage, automation, revisions in policy, code, and criteria, and wear and tear related to aging.

Statistical service life indications for this account range from the low-40s to low-60s for bands with lower censoring and conformance indexes. The majority of second and third-degree polynomial indications are considered less reliable than first-degree polynomial indications. Graduated hazard rates in these instances are unrealistically declining and were zeroed to remove negative hazard rates implied by the fitted polynomials.

The composition of major categories (or subpopulations) of plant classified in this account at December 31, 2018 and the service life indications obtained from a full-band statistical analysis of each category are shown in Table 2 below.

Category	Investment		Full Band PLife-Curve	Censoring (%)
	Amount (\$)	%		
Common & Other	161,772,713	23	62-O2	32.6
Foundations & Other Strct.	156,634,609	22	36-S2	74.5
MEER Building	149,417,330	21	42-L1	71.6
Water Supply Systems	65,494,336	9	51-S1	83.7
Power & Lighting Systems	58,804,270	8	36-S2	77.6
HVAC	40,299,493	6	36-S1	68.1
Monitoring Devices	24,355,501	3	49-S1.5	90.8
Non-unitized	39,724,009	6		
Total	696,502,261	100	46	

An analysis of the subpopulations indicates average service lives ranging between 36 and 62 years, various dispersions, and a dollar-weighted mean of 46 years.

LIFE ESTIMATION

Based on these observations and dismissing origin-modal dispersions in which chance is a more pervasive force of retirement, a 55-L0.5 projection life-curve is recommended for this account.

Service-life indications derived from a statistical analysis of the combined subpopulations are well within a zone of reasonableness when compared to the subpopulation indications. The analysis of subpopulations does not indicate forces of retirement that would significantly bias the observed indications for a combined, nonhomogeneous plant category. Company operations personnel do not expect policy or procedural changes or technological advances that would introduce significantly different forces of retirement from those observed in the past.

DISTRIBUTION PLANT
ACCOUNT: 362.00 – STATION EQUIPMENT

DESCRIPTION

This account includes the installed cost of station equipment, including transformer banks, used for the purpose of changing the characteristics of electricity in connection with its distribution. Account statistics and current and proposed parameters are shown in Table 1 below.

	Current	Proposed
PLife-Curve	65-L0.5	65-S-.5
Derived Additions	\$2,922,005,259	
Plant Retirements	\$194,185,857	
Percent Retired	6.6%	
Plant Balance	\$2,727,819,402	

Table 1. Account Parameters and Statistics

LIFE ANALYSIS

The statistical service life analysis for this account indicates average service lives within a narrow range between the mid-50s and mid-60s for bands with lower censoring and conformance indexes.

The composition of major categories (or subpopulations) of plant classified in this account at December 31, 2018 and the service life indications obtained from a full-band statistical analysis of each category are shown in Table 2 below.

Category	Investment		Full Band PLife-Curve	Censoring (%)
	Amount (\$)	%		
Common and Other	620,379,003	23	67-L0.5	27.2
Transformers	440,054,678	16	57-L1	79.7
Circuit Breakers	366,490,744	13	53-L1	78.1
Monitoring Devices	345,290,666	13	46-R1.5	77.7
Bus Support Structures	212,803,599	8	72-L0.5	85.3
Power Control Cable	169,521,056	6	37-L1	56.5
Switches	123,013,239	5	51-L0.5	75.8
Non-unitized	450,266,417			
Total	2,727,819,402	100	57	

Table 2. Major Structural Components

An analysis of the subpopulations indicates average service lives between 37 and 72 years with lower modal dispersions and a dollar-weighted mean of 57 years.

Service-life indications derived from a statistical analysis of the combined subpopulations are well within a zone of reasonableness when compared to the subpopulation indications. The analysis of subpopulations does not indicate forces of

retirement that would significantly bias the observed indications for a combined, nonhomogeneous plant category.

LIFE ESTIMATION

Based on these observations and considerations, retaining a 65–L0.5 projection life–curve is recommended for this account. This recommendation is within the range of both full account and subpopulation service life indications. Foster Associates was informed that Company engineers do not anticipate that future forces of retirement will be significantly different from those observed in the past for this plant category.

Although not equivalent to dollar–years of service, SCE engineers estimate a mean time to wear–out of about 60 years for B–Bank (115 or 66 kV) transformers. At the end of 2018, the Company had 163 A–Bank and 2,267 B–Bank transformers classified in service. Company engineers also estimate that the mean time to wear–out is about 48 years for circuit breakers. The average age of transformers measured in unit–years is about 26 years whereas the average age measured in dollar–years is about 10 years. Similarly, the average age of circuit breakers measured in unit–years is about 32 years whereas the average age measured in dollar–years is about 10 years.

**GENERAL PLANT DEPRECIABLE
ACCOUNT: 390.00 – STRUCTURES AND IMPROVEMENTS**

DESCRIPTION

This account includes the cost in place of structures and improvements used for Company purposes, the cost of which is not properly includible in other structures and improvements accounts. Account statistics and current and proposed parameters are shown in Table 1 below.

	Current	Proposed
PLife-Curve	45-R0.5	50-SC
Derived Additions	\$1,202,126,326	
Plant Retirements	\$122,282,194	
Percent Retired	10.2%	
Plant Balance	\$1,079,844,132	

Table 1. Account Parameters and Statistics

LIFE ANALYSIS

The statistical service life analysis for this account indicates average service lives between 35 and 50 years for trials with lower censoring and conformance indexes. A number of trials are considered less reliable if hazard rates are unrealistically declining or zeroed to avoid the suggestion of negative hazard rates. The composition of major categories (or subpopulations) of plant classified in this account at December 31, 2018 and the service life indications obtained from a full-band statistical analysis of each category are shown in Table 2 below.

Category	Investment		Full Band PLife-Curve	Censoring (%)
	Amount (\$)	%		
Buildings	294,432,144	27	77-R0.5	75.5
Common & Other	227,917,867	21	62-L0.5	59.9
Power & Lighting Systems	191,421,606	18	80-O3	75.4
HVAC	114,069,632	11	30-R1	60.7
Monitoring Devices	102,374,310	9	28-L1	45.0
Foundations & Other Struct.	82,503,250	8	52-L1	76.4
Water Supply Systems	29,836,272	3	127-SC	82.9
Non-unitized	37,289,051	3		
Total	1,079,844,132	100	64	

Table 2. Major Structural Components

An analysis of the subpopulations indicates full-band average service lives between 28 and 127 years with lower modal dispersions and a dollar-weighted mean of 64 years.

LIFE ESTIMATION

Based on the indications obtained from the broader bands of the statistical life analysis, a 50-SC projection life-curve is recommended for this account. Foster Associates was informed that Company engineers do not anticipate that future forces of retirement will be significantly different from those observed in the past for this plant category.

1 **h) Account 359: Transmission Roads and Trails (0% Authorized, 0%**
2 **Proposed)**

3 The \$195 million⁶⁷ in this account primarily consists of roads and trails, with a
4 small portion consisting of bridges and trestles and culverts. Retirements have been few and sporadic
5 resulting in limited net salvage experience. As such, SCE proposes retaining the currently authorized 0%
6 net salvage rate for this account.

7 **2. Distribution Plant Net Salvage**

8 **a) Account 361: Distribution Substation Structures and Improvements (-25%**
9 **Authorized, -40% Proposed)**

10 The currently authorized net salvage rate for Distribution Substation Structures
11 and Improvements is -25%. SCE proposes a net salvage rate of -40%. The impact of SCE's net salvage
12 proposal is an increase in depreciation expense of \$2.2 million.

13 This account contains the buildings, foundations, and other structures located at
14 over 750 distribution substation locations across SCE's territory. The \$697 million of investment in this
15 account is broadly distributed amongst these components. Retirement history is similarly distributed
16 across the broad array of assets. During the last ten years, SCE has retired \$52 million of plant from this
17 account, representing 10% of the average plant balance over this time. Historical net salvage rates from
18 2009 to 2018 range from -15% to -64%, with a ten-year average of -40% as shown in Table III-17,
19 below.

⁶⁷ \$22 million on a CPUC-jurisdictional basis.

Table III-17
Account 361 Recorded Net Salvage Rates
(in millions of dollars)

Year	Plant Retired	Net Salvage		
		Amount	% of Ret.	3-yr Avg %
2009	\$1.5	(\$0.6)	-42%	
2010	\$6.4	(\$1.3)	-20%	
2011	\$6.3	(\$2.3)	-36%	-29%
2012	\$4.4	(\$0.7)	-15%	-24%
2013	\$1.4	(\$0.4)	-28%	-27%
2014	\$11.4	(\$3.5)	-30%	-26%
2015	\$6.9	(\$4.4)	-64%	-42%
2016	\$3.5	(\$2.2)	-63%	-46%
2017	\$4.8	(\$2.5)	-53%	-60%
2018	\$5.9	(\$3.4)	-57%	-57%
2009-2018	\$52.5	(\$21.2)	-40%	
2009-2013	\$20.0	(\$5.2)	-26%	
2014-2018	\$32.4	(\$16.0)	-49%	

As demonstrated by the three-year rolling averages above, the historical retirements have experienced more negative trends in the realized net salvage rates. The five-year average for 2009 to 2013 of -26% increased to -49% for the most recent five years. These more negative net salvage rates are driven in part by the advancing retirement age of infrastructure moving from an average of 29 years to 35 years. The last five years are also more negative because of an increased share of substation-related retirements (compared to service center related locations) which made up approximately 30% of the total cost of removal during the period. These activities are also more representative of the surviving plant balances, which have approximately 36% of the investment in substations with the remainder in service center locations. Additionally, the composition of assets reflected in the ten-year net salvage rate (-40%) is different than for the plant balance. Reweighting the historical net salvage rates consistent with the asset mix for the plant balance would increase the net salvage rate from -40% to -83%. Even though the most recent five-year retirement experience supports a net salvage rate of about -50% based on the level of retirements, the increased retirement ages, and the

asset composition of the surviving plant balances, SCE proposes a more conservative -40% based on the 10-year average net salvage rates realized for this account.

b) Account 362: Distribution Substation Equipment (-25% Authorized, -40% Proposed)

The currently authorized net salvage rate for distribution substation equipment is -25%. SCE proposes a net salvage rate of -40%. The impact of SCE’s net salvage proposal is an increase in depreciation expense of \$7.4 million.

This account consists of \$2,728 million in station equipment at distribution substations. The majority of the account is split between transformers, circuit breakers, monitoring devices, and various substation equipment. During the last ten years, SCE has retired \$131 million of plant from this account, representing approximately 7% of the average plant balance over this time.

Table III-18
Account 362 Recorded Net Salvage Rates
(in millions of dollars)

Year	Plant Retired	Net Salvage		
		Amount	% of Ret.	3-yr Avg %
2009	\$5.5	(\$3.4)	-62%	
2010	\$8.4	(\$7.0)	-83%	
2011	\$9.5	(\$7.1)	-75%	-75%
2012	\$10.5	(\$5.0)	-48%	-67%
2013	\$17.2	(\$6.2)	-36%	-49%
2014	\$11.8	(\$8.1)	-69%	-49%
2015	\$11.5	(\$8.5)	-74%	-56%
2016	\$8.3	(\$2.4)	-28%	-60%
2017	\$13.4	(\$13.4)	-100%	-73%
2018	\$34.3	(\$28.8)	-84%	-80%
2009-2018	\$130.5	(\$89.9)	-69%	
2014-2018	\$79.4	(\$61.2)	-77%	

Generally the mix of retirements experienced over the past ten years is similar to the mix of assets in SCE’s current plant balance. As such, reweighting the historical net salvage rates consistent with the asset mix for the plant account increases the negative net salvage only slightly from -69% to -75%. The three-year rolling average is frequently more negative than -40%. As such, SCE proposes a conservative net salvage rate of -40% at this time.

Table III-26
Account 373 Recorded Net Salvage Rates

Year	Plant Retired	Net Salvage		
		Amount	% of Ret.	3-yr Avg %
2009	\$5.9	(\$3.6)	-61%	
2010	\$5.2	(\$4.9)	-93%	
2011	\$7.1	(\$6.0)	-84%	-79%
2012	\$7.5	(\$8.1)	-109%	-96%
2013	\$10.1	(\$7.2)	-72%	-87%
2014	\$14.1	(\$15.4)	-109%	-97%
2015	\$17.1	(\$40.2)	-234%	-152%
2016	\$8.0	(\$14.6)	-182%	-179%
2017	\$11.4	(\$12.3)	-108%	-184%
2018	\$11.8	(\$18.2)	-154%	-145%
2009-2018	\$98.2	(\$130.5)	-133%	
2014-2018	\$62.4	(\$100.7)	-161%	

SCE incurred \$130 million of net salvage costs to retire the \$98 million of plant, resulting in a ten-year average net salvage rate of -133%. A significant portion of the historical net salvage results are driven by retirements of shorter-lived fixtures (luminaires). Due to the shorter lives of these assets, the net salvage rate is less negative than other assets in the account such as electroliers, conduit, etc. Weighting the net salvage results by the percent of investment results in a more negative net salvage rate of -243%. Although a more negative net salvage rate is justified, SCE proposes a conservative net salvage rate of -50% at this time.

3. General Plant Net Salvage

a) Account 390: General Buildings

The currently authorized net salvage rate for General Buildings is -10%. SCE proposes to retain the authorized net salvage rate at this time.

This account consists of \$1,080 million of buildings at SCE's general offices, operations centers, garages, and similar structures. During the last ten years, SCE had \$100 million of retirements (12% of the average plant balance). Most of the retirements in this account are related to the interim removal of supporting systems such as HVAC, lease-hold improvements, water systems, etc.

1 SCE incurred \$24 million of net salvage costs to retire the \$100 million of plant, resulting in a ten-year
 2 average net salvage rate of -23% as shown in Table III-27, below.

Table III-27
Account 390 Recorded Net Salvage Rates

Year	Plant Retired	Net Salvage		
		Amount	% of Ret.	3-yr Avg %
2009	\$0.4	(\$0.1)	-20%	
2010	\$5.3	(\$2.6)	-50%	
2011	\$9.0	(\$2.0)	-23%	-32%
2012	\$23.0	(\$2.7)	-12%	-20%
2013	\$4.9	(\$2.7)	-56%	-20%
2014	\$11.7	(\$2.7)	-23%	-21%
2015	\$11.3	(\$3.7)	-33%	-33%
2016	\$8.2	(\$2.7)	-33%	-29%
2017	\$8.6	(\$1.5)	-17%	-28%
2018	\$17.9	(\$2.7)	-15%	-20%
2009-2018	\$100.3	(\$23.5)	-23%	
2009-2013	\$42.6	(\$10.2)	-24%	
2014-2018	\$57.7	(\$13.3)	-23%	

3 Over the ten-year period, average net salvage rates have remained consistent with
 4 a five-year average between 2009 and 2013 of -24% and -23% over the last five years. Although the
 5 consistency of the historical data supports a more negative net salvage rate, SCE is proposing to retain
 6 the authorized net salvage rate of -10% at this time.

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VI.

DEPRECIATION STUDY FOR GENERAL AND INTANGIBLE PLANT

Some categories of plant do not lend themselves to statistical analysis, but do not belong in the life span category. These plant assets include most general plant (*i.e.*, FERC Accounts 391-397), intangible plant (*e.g.*, software, radio frequencies, etc.), and easements. SCE determined average service lives through conducting discussions with SCE engineers familiar with the assets, considering prior company procedure, and relying on knowledge of (or research into) industry practice.

Table VI-34, below, shows the forecast depreciation service lives for general and intangible plant accounts. The table compares SCE's proposed depreciation rates to authorized service lives from D.19-05-020 (the 2018 GRC Decision). SCE is proposing to retain the currently authorized average service lives for all general and intangible accounts included in this section with the exception of Account 391.4 (DDSMS - Power Management System). As described below, SCE is proposing a life extension for this account from an average of 8.5 years to 10 years.

Table VI-34¹⁰⁴
General and Intangible Plant Service Life Proposals

FERC Account	Description	2018-2020 Authorized	2021-2023 Proposed
General Plant			
391.1	Office Furniture	20	20
391.2-3	Personal and Mainframe Computers	5	5
391.4	DDSMS - Power Management System	8.5	10
391.5-6	Office Equipment	5	5
393	Stores Equipment	20	20
394	Tools & Work Equipment	10	10
395	Laboratory Equipment	15	15
397	Telecommunication Equipment	17.9	17.9
398	Miscellaneous Equipment	20	20
Intangibles			
302.020	Hydro Relicensing	Various	Various
303.640	Radio Frequency	40	40
302.050	Miscellaneous Intangibles	20	20
303.105	Capitalized Software - 5-year	5	5
303.707	Capitalized Software - 7-year	7	7
303.210	Capitalized Software - 10-year	10	10
303.315	Capitalized Software - 15-year	15	15
Easements			
350	Transmission Easements	60	60
360	Distribution Easements	60	60
389	General Easements	60	60

A. General Plant

Most general and intangible plant accounts contain many low-value, relatively short-lived individual items. Following FERC guidelines, non-structural items in these accounts are amortized by vintage group over the specified service life and retired at the end of the life span.¹⁰⁵ For example, personal computers are amortized over a 5-year period (*i.e.*, a 20 percent annual depreciation rate) and

¹⁰⁴ Refer to WP SCE-07 Vol. 03, Book A p. 193 (G&I Rate Determination Schedule).

¹⁰⁵ FERC Accounting Release Number AR15 provided for the vintage year accounting method allowing companies to amortize vintage groups of assets over their designated service life and subsequently retire them. See <https://www.ferc.gov/enforcement/acct-matts/docs/ar-15.asp>.

1 when a vintage group reaches five years of age, the vintage group of computers will be retired off the
2 books. Following this approach eliminates costly plant record-keeping and continuous physical tracking
3 of the equipment. Over time, imbalances in the accumulated depreciation can occur if, for example,
4 there are depreciation life or rate changes and if net salvage is recorded to the books but not reflected in
5 the depreciation rate. These accumulated depreciation surpluses (deficits) are amortized over the GRC
6 cycle (2021-2023).

7 **1. Account 391.1 – Office Furniture**

8 Account 391.1 contains all costs incurred to acquire office furniture. It includes such
9 items as modular furniture, desks, and cabinets used for general utility service that are not permanently
10 attached to buildings. SCE proposes retaining the currently authorized 20-year average service life for
11 this account.

12 **2. Account 391.2 And 391.3 – Computer Equipment**

13 The assets in Account 391.2 can include mostly personal computers and associated
14 components (*e.g.*, monitors, printers, etc.) when purchased as a bundled unit, or when any of these items
15 are purchased individually and meet the capitalization threshold. Account 391.3 is where SCE records
16 all investment related to mainframe computer and file server equipment. SCE proposes retaining the
17 currently authorized 5-year average service life for this account.

18 **3. Account 391.4 – Power Management System**

19 This account represents a \$89.2 million net investment in Supervisory Control and Data
20 Acquisition (SCADA) equipment for controlling and monitoring the SCE electrical system. Contained
21 within this account are the components making up the Power Management System, specifically
22 computer and data gathering equipment, man-machine interface, analog and digital telemetry devices,
23 and data center facility infrastructure. Although this account consists of components with varying levels
24 of technical sophistication and other factors affecting retirements, 95% of the SCADA investment have
25 current authorized service lives of 7 years (44%) and 10 years (51%), or a combined 8.5 years (on a
26 dollar weighted basis). SCE's power management personnel have assessed this equipment and indicate
27 that the currently authorized lives are still reflective of current expectations. Given that about 95% of the
28 account's investment is consolidated in these two similar life groups, SCE proposes to simplify the
29 service life applied to these assets and use the more conservative 10-year average service life for this
30 account. This depreciation service life results in a \$2.4 million annual expense reduction (*i.e.*, based on
31 year-end 2018 plant).

1 **4. Account 391.5 and 391.6 – Office Equipment**

2 These accounts represent an \$18.7 million net investment in miscellaneous office
3 equipment such as video projection equipment, public address equipment, duplicating equipment, and so
4 forth. SCE proposes retaining the currently authorized 5-year average service life for this account.

5 **5. Account 393 – Stores Equipment**

6 Account 393 represents a \$6.3 million net investment in equipment used for the
7 receiving, shipping, handling, and storing materials and supplies for warehouses. It includes electric
8 pallet jacks, lifting tables, stretch wrapping machine, transformer trays, lockers, warehouse heaters,
9 cable cutting machines, and so forth. SCE proposes retaining the currently authorized 20-year average
10 service life for this account.

11 **6. Account 394 – Tools & Work Equipment**

12 Account 394 represents a \$37.4 million net investment in tools and equipment for
13 construction, repair, maintenance, general shop, and garage, but not specifically includable in other
14 accounts. SCE proposes retaining the currently authorized 10-year average service life for this account.

15 **7. Account 395 – Laboratory Equipment**

16 Account 395 represents a \$67.8 million net investment in laboratory and field test
17 equipment. The account has a wide variety of equipment. It includes, for example, calibrators, furnaces,
18 gauge calibrators, insulation testers, gas leak detectors, phase meters, power system analyzers, sound
19 meters, metrology standards, and volt meters. The expected average service life of lab and test
20 equipment is impacted by two major retirement factors: technological obsolescence and normal “wear
21 and tear” from usage in both the field and lab environments. SCE proposes retaining the currently
22 authorized 15-year average service life for this account.

23 **8. Account 397 – Telecommunication Equipment**

24 Account 397 represents SCE’s investment in communication equipment for the
25 company’s system. Contained within this account are the electronic and computer-based equipment
26 (such as transmission equipment, dynamic network multiplexers, data network interconnection system,
27 and radio equipment), as well as communication infrastructure (such as the copper and fiber optic cable,
28 conduit, microwave equipment, and the electrical power generator system). SCE telecommunication
29 engineers have assessed this equipment as having service lives of 5, 7, 10, 15, 25, or 40 years depending

1 on the type of equipment.¹⁰⁶ In general, state-of-the-art modern and sophisticated equipment has been
2 authorized shorter average service lives while infrastructure (poles, cable, conduit, etc.) has been
3 authorized longer service lives. SCE is proposing to retain the same service lives the Commission
4 authorized in the 2018 GRC.

5 **9. Account 398 – Miscellaneous**

6 Account 398 represents a \$34.4 million net investment in miscellaneous utility equipment
7 that does not fit other plant accounts. Examples can include such diverse items as kitchen and infirmary
8 equipment. SCE proposes to retain the currently authorized service life of 20 years for this account.

9 **B. Intangibles**

10 SCE has investments in several intangible assets, including hydro relicensing, radio frequencies,
11 long-term franchise fees, capitalized software, and land easements and rights-of-way. As previously
12 discussed, the hydro relicensing costs are amortized over the remaining life of the FERC project license
13 period. SCE proposes to continue amortizing the radio frequency investments over the 40-year service
14 life, and land easements and rights-of-way over the 60-year service life determined in prior rate case
15 proceedings. The other categories are discussed below.

16 **1. Miscellaneous Intangibles**

17 The year-end 2018 net investment for miscellaneous intangibles is approximately
18 \$339,000, which is largely made up of long-term franchise costs. SCE proposes to retain the currently
19 authorized life of 20 years for these costs.

20 **2. Capitalized Software**

21 Software requires ongoing investment to upgrade and optimize its usefulness. The
22 estimated life of capitalized software reflects the time between its initial deployment and/or upgrade, to
23 the time it is required to be replaced or overhauled because of technology, vendor, or business
24 obsolescence. SCE proposes to continue the four existing average service life categories of five, seven,
25 ten, and 15 years authorized in prior proceedings. Given rapid technological change, the trend has been
26 towards shorter service lives. As of year-end 2018, 82% of SCE's capitalized software has a five-year
27 amortization and about 17% has a seven-year amortization. The remaining software has ten-year or
28 fifteen-year amortization periods.

¹⁰⁶ Refer to WP SCE-07 Vol. 03, Book A pp. 197-199 (Telecomm. Engineering Survey).

1 Amortization periods of five- and seven-year lives are not uncommon in the utility
2 industry for capitalized software. Based on benchmarking with other utilities and reviews of industry
3 practice, SCE has found that five years is the most frequently applied amortization for typical capitalized
4 software for utilities. Longer service lives of seven years or more are generally used for the initial
5 implementation of complex backbone systems such as an Enterprise Resource Planning (ERP) system or
6 billing systems. While initial ERP system implementations might be amortized over longer periods,
7 subsequent upgrades are generally amortized over a shorter period equivalent to the amortization period
8 for typical capitalized software.

9 When considering capitalized software lives, there are similarities and dissimilarities with
10 tangible plant assets. Most utility plant assets have identifiable component parts that can be discretely
11 retired and replaced when they are no longer useful. For example, a substation as a whole will provide
12 service for a longer period than the individual units of property required to keep it operating. Similarly,
13 enterprise-wide software has ongoing additions, replacements, and/or deletions of programming code
14 through various enhancement revisions, upgrades, and platform revamps over its lifecycle. These can
15 result from ongoing technological advances, security enhancements, incremental and extensive changes
16 to industry, regulatory and operational requirements, obsolescence, system upgrades, and so forth.

17 The effect of technical advances has become increasingly impactful on software lives.
18 For example, SAP has released multiple version upgrades to its software since SCE's initial installation
19 in 2008. In addition, there have been implementations and upgrades to numerous SAP add-on software
20 such as PowerPlan and Ariba that have required ongoing revisions to SAP interface programming. An
21 example of emerging technological impacts is cloud computing. The approach of installing on-premises
22 software is being replaced as software providers are moving away from supporting on-site solutions.
23 Moreover, the Financial Accounting Standards Board recently issued accounting guidance regarding
24 cloud computing arrangements that will result in shorter-lived capitalized software costs.¹⁰⁷ Beginning
25 in 2020, the associated capitalized costs amounts will need to be expensed over the period of the hosting
26 agreements, which generally is expected to be in the range of three to five years. These kinds of
27 technological disruptors will continue to affect and generally reduce software lives.

¹⁰⁷ FASB Accounting Standards Update (ASU) 2018-15, *Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract*. Under this ASU, beginning in 2020, the associated capitalized costs amounts will need to be amortized over the period of the hosting agreements, which generally are expected to be in the range of three to five years.

1 When portions of the software programming code are revised/replaced, it is not practical
2 to identify discrete retirement amounts. Consequently, there is no statistical manner to reasonably
3 evaluate capitalized software service lives. Instead, there is a need to apply judgement in establishing an
4 average amortization period to reasonably reflect the software's service value. Although the
5 amortization period of a particular software is set at seven years, there is a recognition that that
6 represents an *average* service life of the programming code, with some portions being replaced/revised
7 earlier than seven years and other portions having value beyond seven years. Taken together, the service
8 life should be reasonable on average, given the expected on-going change to the software. Based on the
9 current technological trends and consistency with industry software amortization lives, SCE proposes to
10 continue applying the currently authorized set of capitalized software lives.

11 **3. Easements**

12 SCE proposes to retain the authorized amortization period of 60 years for its easements
13 and rights-of-way.