Safety-Related Spending Accountability Report for Southern California Edison

Energy Division

Michael Zelazo, Electric Costs Section

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Executive Summary

Pursuant to Action Item #5 of the California Public Utilities Commission (CPUC or Commission) 2016 Update to the Safety Action Plan and Regulatory Strategy (Safety Update), the Energy Division (ED) has prepared this staff report on safety-related expenditures proposed by Southern California Edison (SCE) in their 2015 General Rate Case (GRC). The purpose of the report is to show how SCE spent the funds authorized in SCE's 2015 GRC and compare that spending to what it requested and what it was authorized. The report examines SCE's actual spending on safety-related projects by looking at both expensed spending, which is recovered in the same year, and capitalized spending, which is recovered over the life of the asset.

Ideally, this report would compare actual safety-related spending to what the Commission authorized in the 2015 GRC for Test Year 2015. However, Commission authorization was granted in D. 15-11-021 in November 2015, near the end of the Test Year. Spending by SCE in 2015, on both capital and expenses, was largely undertaken prior to this Commission decision. For this reason, the utility's spending request is presented as an alternative baseline for comparison to actual spending. It should be noted that the utility's request is not guaranteed to be authorized and that, in some cases, it could vary substantially from the authorized amount.

Utilities are given budgets through GRC proceedings for expenses and capital costs. Expenditures for capital projects and spending on expense items affect the utility's profits differently over time. Utilities have an incentive to spend less than their expensed spending budget, because any unspent expense boosts the company's net income by that amount. For example, SCE spent \$166 million, or 20.0%, less in expensed spending on safety-related projects than what it had requested in the Test Year 2015 GRC, and \$146 million, or 17.9%, less than what the Commission authorized. Since revenue was not affected by this underspending, SCE was able to retain the savings that resulted from the spending decrease.

The relationship between capital expenditures and short-term profits is not as clear as is the case with expenses. Underspending or overspending on capital expenditures has a diminished impact on short-term profits because capital spending is recovered over the life of the asset. Furthermore, the impact of capital expenditures is complicated by tax effects such as repair deductions and bonus depreciation, which can actually lower the revenue requirement. And while overspending on capital projects can be the result of unplanned cost over-runs, utilities are also motivated to add to their rate base, which is the capital base upon which they may earn a rate of return over an extended period of time. For capital projects in 2015, SCE spent \$135 million, or 6.3%, more than its requested amount and \$405 million, or 21.5%, more than what the Commission had authorized.

¹ Utilities have an opportunity to justify the cost over-runs in the next general rate case when capital spending becomes part of the authorized rate base.

Because some critical safety project spending is subject to balancing accounts, which allow the utility to recover more funds in a later period if actual spending is higher than authorized, or to return unspent funds, the report presents the comparison of actual spending to requested and authorized both with and without balancing accounts.

Key Findings

- 52.3% of all SCE GRC-related spending in 2015 is considered to be safety-related. 34.3% of all expense spending is safety-related, and 61.8% of all capital spending is safety-related.
- For safety-related expense items, SCE spent \$166 million, or 20.0%, less than its request for 2015, and \$146 million, or 17.9%, less than what the Commission authorized.
- For safety-related capital expenditures, SCE spent \$135 million, or 6.3%, more than its request for 2015. Since the Commission authorized SCE less than its requested amount, SCE's actual capital spending was \$405 million, or 21.5%, more than what the Commission authorized.
- For spending which is subject to balancing accounts, the utility has less incentive to underspend because the unspent money has to be returned to customers. The utility also has a diminished incentive to manage costs subject to a balancing account, since the overspending can be recovered.
 - o After taking into account balancing accounts², SCE underspent authorized expense budget by \$129 million, or 16.2% less than authorized.
 - Taking into account balancing accounts, SCE overspent its capital budget by \$185 million, or 8.8% over authorized.

ED staff has examined safety-related spending in three categories: Electric Transmission and Distribution (T&D), Electric Generation, and Other. The categories correspond to sections within the 2018 GRC testimony and contain expenses that have been adjusted by SCE to better align with GRC forecasting methods. The report's major findings are summarized in Table ES-1 and illustrated in Figure ES-1.

² The effect of balancing accounts is incorporated into the analysis by adjusting the budget against which the actual spending occurs (i.e. lowering the budget for cases of underspending, and raising the budget for cases of overspending).

Table ES-1: Comparison of Actual Safety Expense and Capital for 2015 (\$000s)

						A	ctual vs. Re	quested	Α	ctual vs. Au	thorized	
	Re	(a) 2015 equested	Aı	(b) 2015 uthorized		(c) 2015 Actual		(c-a) /ariance	(c-a) / a Percent Variance	,	(c-b) Variance	(c-b) / b Percent Variance
Electric Tra	ansm	ission and	Dist	ribution					·			
Expense	\$	532,583	\$	520,506	\$	439,023	\$	(93,560)	-17.6%	\$	(81,483)	-15.7%
Capital	\$ 3	1,639,440	\$	1,401,708	\$	1,810,699	\$	171,260	10.4%	\$	408,991	29.2%
Sub-total	\$ 2	2,172,022	\$	1,922,214	\$	2,249,722	\$	77,700	3.6%	\$	327,509	17.0%
Electric Ge	nera	tion							·			
Expense	\$	147,209	\$	145,723	\$	110,780	\$	(36,429)	-24.7%	\$	(34,943)	-24.0%
Capital	\$	128,877	\$	125,948	\$	146,896	\$	18,019	14.0%	\$	20,948	16.6%
Sub-total	\$	276,086	\$	271,671	\$	257,676	\$	(18,410)	-6.7%	\$	(13,995)	-5.2%
Other									·			
Expense	\$	154,000	\$	146,644	\$	117,511	\$	(36,489)	-23.7%	\$	(29,133)	-19.9%
Capital	\$	383,338	\$	353,988	\$	329,039	\$	(54,299)	-14.2%	\$	(24,949)	-7.0%
Sub-total	\$	537,338	\$	500,632	\$	446,550	\$	(90,788)	-16.9%	\$	(54,082)	-10.8%
All												
Expense	\$	833,792	\$	812,873	\$	667,314	\$	(166,478)	-20.0%	\$	(145,559)	-17.9%
Capital	\$ 2	2,151,655	\$	1,881,644	\$	2,286,634	\$	134,980	6.3%	\$	404,990	21.5%

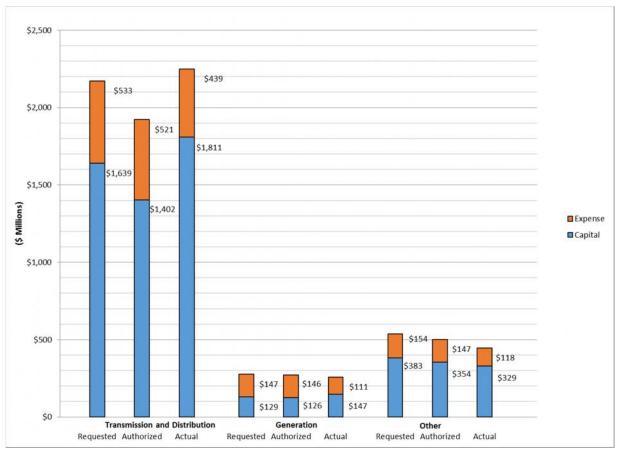


Figure ES-1: Comparison of Requested, Authorized, and Actual Safety Costs for 2015

Safety Spending Breakdowns and Balancing Account Effects

As shown in Table ES-1, SCE spent \$439 million on T&D expensed items, which was \$81 million, or 15.7%, less than the authorized amount of \$521 million and \$94 million, or 17.6%, less than its requested amount of \$533 million for this major project category. SCE spent \$1,810 million on capital projects, which was \$409 million, or 29.2%, over the authorized amount of \$1,402 million and \$171 million, or 10.4%, over the requested amount of \$1,639 million.

SCE spent \$111 million on Generation expensed items, which was \$35 million, or 24.0%, less than the authorized amount of \$146 million and \$36 million, or 24.7%, less than its requested amount of \$147 million for this major project category. SCE spent \$147 million on capital projects, which was \$21 million, or 16.6%, over the authorized amount of \$126 million and \$18 million, or 14.0%, over the requested amount of \$129 million.

SCE spent \$118 million on Other safety-related expensed items, which was \$29 million, or 19.9%, less than the authorized amount of \$147 million and \$36 million, or 23.7%, less than its requested amount of \$154 million for this major project category. SCE spent \$329 million on capital projects, which was \$25 million, or 7.0%, less than the authorized amount of \$354 million and \$54 million, or 14.2%, less than the requested amount of \$383 million.

In total, SCE spent \$667 million on safety-related expensed items, which was \$146 million, or 17.9%, less than the authorized total of \$813 million and \$166 million, or 20.0%, less than the requested amount of \$834 million. For capital programs, SCE spent \$2,287 million, which was \$405 million, or 21.5%, over the authorized total of \$1,882 million and \$135 million, or 6.3%, over the requested total of \$2,152 million.

Table ES-2 below shows that safety-related spending has become a large part of the total GRC budgets. The table compares SCE's safety-related spending to total actual GRC spending for 2015.³ SCE states that 34.3% of its \$1,947 million total GRC expensed spending was safety-related and 61.8% of SCE's \$3,701 million in spending on capital expenditures was related to safety.

³ Total Actual expense spending amounts are referenced from SCE-09 Vol. 1, p. 105, 108-112. Total Actual capital expenditures were referenced from SCE's "Attachment ED-001 Q1a supplemental recorded cap ex by exhibit."

Table ES-2: Comparison of Actual Safety vs. Total GRC-related Spending for 2015 (\$000s)

	2015 Safety Actual		2015 Total Actual	Safety Percent of Total
Electric Transmissi	on an	d Distribution		
Expense	\$	439,023	\$ 688,304	63.8%
Capital	\$	1,810,699	\$ 3,120,763	58.0%
Sub-total	\$	2,249,722	\$ 3,809,067	59.1%
Electric Generation	1			
Expense	\$	110,780	\$ 213,164	52.0%
Capital	\$	146,896	\$ 145,484	101.0%
Sub-total	\$	257,676	\$ 358,648	71.8%
Other				
Expense	\$	117,511	\$ 1,045,385	11.2%
Capital	\$	329,039	\$ 435,144	75.6%
Sub-total	\$	446,550	\$ 1,480,529	30.2%
All				
Expense	\$	667,314	\$ 1,946,853	34.3%
Capital	\$	2,286,634	\$ 3,701,391	61.8%

Approximately \$20 million of safety-related expensed spending and \$576 million of spending on capital expenditures in 2015 is subject to balancing accounts. Balancing accounts⁴ track the difference between actual and authorized costs and allow the utility to recover overspent amounts or refund underspent amounts subject to a reasonableness review. Table ES-3 shows the difference between authorized and actual costs tracked in the Pole Loading Deteriorated Pole Balancing Account (PLDPBA), a major account that tracks safety-related spending. The table also shows the adjustment to authorized costs to reflect either the overspending or underspending which is translated into adjustments to the pole-related revenue requirement when setting rates.

⁴ The balancing accounts pertinent to this report are "two-way" balancing accounts, which means that if the utility's expenses in a given cost category exceed the authorized level for that category, the utility is authorized to recoup those over-expenditures from ratepayers in a later true-up. "One-way" balancing account treatment requires the utility to reimburse ratepayers for any underspending in a cost category and does not allow recouping of expenses beyond a pre-designated cap; it thus places shareholders on the hook for those overages.

	Αι	(a) 2015 Ithorized	(b) 2015 Actual	,	(b-a) /ariance	(b-a) / a Percent Variance
Expense in PLDPBA	\$	36,904	\$ 20,034	\$	(16,870)	
Capital in PLDPBA	\$	356,244	\$ 576,189	\$	219,945	
Total Expense	\$	796,003	\$ 667,314	\$	(128,689)	-16.2%
Total Capital	\$	2,101,589	\$ 2,286,634	\$	185,045	8.8%

Table ES-3: Effect of Balancing Accounts on Spending (\$000s)

As shown in Table ES-3, SCE tracked \$17 million in underspending for expenses and \$220 million in overspending for capital expenditures that are subject to cost recovery via the PLDPBA. Because SCE has to refund the underspent amount for expenses, the total authorized expense amount is reduced by \$17 million from \$813 million (see Table ES-1) to \$796 million. Similarly, the total authorized capital spending is increased by the \$220 million in overspending from \$1,882 million (see Table ES-1) to \$2,102 million. The effect of balancing accounts reduces the total underspending for expensed items – when compared to the authorized amount – from \$146 million (see Table ES-1) to \$129 million, which is 16.2% less than the authorized amount of \$796 million. The total capital overspending of \$405 million (see Table ES-1) is reduced to \$185 million, which is 8.8% more than the authorized amount of \$2,102 million.

Program Area Highlights

This report identifies certain activity and investment areas for further review and discussion if they meet specific criteria related to variances between requested and actual spending. The selection criteria are described in the Introduction (Section I.D.) and the individual program areas are discussed in the body of the report.

The two expense spending areas showing the most significant variance are:

1. Mountainview Generating Station – Maintenance

This Generation activity includes all labor, non-labor and other expenses associated with maintenance and repair of the facility. SCE spent \$12.4 million which was \$28.7 million, or 69.9%, less than their request of \$41.1 million and \$28.4 million, or 69.7%, less than the authorized amount of \$40.8 million. The company explains that the reduced spending was due to cost savings resulting from renegotiation of the Contract Service Agreement with General Electric, a decrease in equipment repairs and a departmental reorganization.

2. Design Construction and Maintenance – Construction Support Activities

This T&D activity includes stand-by time of field crews, construction inspections, underground structure replacements, and other support services. SCE spent \$11.5 million which was \$19.3 million, or 62.7%, less than their request of \$30.8 million and \$15.6 million, or 57.6%, less than the authorized amount of \$27.1 million. The company explains that the reduced spending was caused by a reduction in underground replacements due to raised thresholds and improved work management processes.

The two capital spending areas showing the most significant variance are:

1. Distribution Pole Replacement

This T&D expenditure category combines pole inspection and remediation activities conducted in compliance with General Order (GO) 165 due to deterioration. SCE spent \$324 million which was \$213 million, or 191.4%, more than their request of \$111 million and \$240 million, or 286.8%, more than the authorized amount of \$84 million. The company explains that the increase in spending is due to increased unit costs, inspection scheduling, and changes in standards. Since this program area is subject to a balancing account, SCE has an opportunity to recover these cost over-runs.

2. Pole Remediation Distribution

This T&D expenditure category combines pole inspection and remediation activities that identify deficient poles that do not meet the safety factor requirements of GO 95 and SCE's internal standards. SCE spent \$147 million which was \$138 million, or 48.4%, less than their request of \$286 million and \$53 million, or 26.4%, less than the authorized amount of \$200 million. The company explains that the reduced spending was caused by improvements to the safety factor model and a delay in pole assessments. Since this program area is subject to a balancing account, SCE does not benefit from underspending in this area.

I. Introduction

I.A. Background

The California Public Utilities Commission (CPUC or Commission) has the responsibility to ensure that California ratepayers receive safe, reliable utility service at reasonable rates, with a commitment to environmental enhancement and a healthy economy. In 2014, the Commission renewed its commitment to safety with the issuance of its Safety Policy Statement. The policy statement clarified the CPUC's safety strategy and included a commitment to enacting a Safety Action Plan.

The CPUC released the first iteration of its Safety Action Plan in 2015 with the goal of creating clear, measurable steps for integrating safety into all aspects of the Commission's work. The Action Plan established the following four safety management "pillars" to guide the Commission's safety-related work:

- Safety Compliance and Enforcement: Audit, investigation and penalty assessment activities
- II. Risk Management: Risk assessment and risk mitigation strategies
- III. Safety Policy: Commission decision-making and development of rules and regulations
- IV. Safety Promotion: Communication, collaboration and outreach

An update to the Safety Action Plan was issued in February 2016 and included nine additional steps that the Commission would take to continue to build a safety culture, including two addressing risk management. One of the new action items supporting the risk management pillar is for the CPUC's Energy Division to prepare staff reports on the utilities' safety-related expenditures. These Spending Accountability Reports are to be completed within six months of a utility filing a general rate case (GRC). This Spending Accountability Report, which is the first to be completed for Southern California Edison (SCE), compares the utility's actual spending in 2015 to the funding level it requested in its Test Year 2015 GRC filing and to the amounts authorized by the Commission.

Similar to other large electric investor-owned utilities, SCE submits a GRC filing at the CPUC every three years to request funding for its electric infrastructure and operations. Parties to the proceeding examine the utility's proposals and contest programs and spending that they find unreasonable or unnecessary. The Commission then decides whether or not to approve the proposed programs and at what level of funding. Once the GRC decision is issued, the utility is allowed the flexibility to reprioritize the authorized funds in order to ensure safe and reliable operations. However, any reprioritization of funds must be reasonable, and the Commission looks critically at programs that are re-presented for funding at a subsequent GRC after having been funded in an earlier proceeding and then deferred.

⁵ 2016 Update: Safety Action Plan and Regulatory Strategy, p. 6. http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M158/K448/158448011.PDF

D. 11-05-018 provides an in-depth discussion of this balancing between the utilities' need for flexibility and the Commission's requirement that any deferrals be reasonable. The following excerpts from that decision illustrate the balance the Commission seeks.

It is generally recognized that when a utility files a GRC, expenditure estimates are based on plans and preliminary budgets developed at least two years in advance of when they will actually be incurred. When the utility finalizes its budget just prior to the year when costs will be incurred or adjusts the budget during the year, new programs or projects may come up, others may be cancelled, and there may be reprioritization. This process is expected and is necessary for the utility to manage its operations in a safe and reliable manner.⁶

While we reaffirm that it is the utility management's prerogative and responsibility to provide safe and reliable service by reprioritizing and deferring activities as necessary, the Commission must be assured that the process is reasonable. We have concerns in that respect. For instance, despite any financial implications of exceeding authorized cost levels, the utility does have the responsibility to spend what is necessary to ensure safe and reliable service. To the extent a utility uses authorized cost levels as a reason for deferring activities, the Commission must be assured that such deferrals are otherwise reasonable especially with respect to safe and reliable service. Also, justified or not, reprioritization and deferrals undermine the basis for the Commission's determination of the reasonableness of the utility's GRC request and the extent of the authorized revenue requirement. Much of what is authorized is based on the utility's depiction of its needs and associated costs. Those needs and costs are tested by the GRC process. Reprioritized needs and associated costs may not be so tested and may not result in the most efficient use of funds.⁷

In the Rate Case Plan proceeding (R.13-11-006), the Commission issued D.14-12-025 which directed the utilities to incorporate a risk-based decision-making framework into the GRC process. That decision requires the utilities to prepare two annual verification reports beginning in 2018: the Risk Mitigation Accountability and the Risk Spending Accountability Reports. The Risk Mitigation Accountability Report compares the projected costs and benefits of risk mitigation programs adopted in the GRC to their actual costs and benefits. The Risk Spending Accountability Report compares authorized spending on safety related projects with actual spending and explains any discrepancies. After the utilities file these reports, the Commission's Safety and Enforcement Division (SED) and Energy Division, respectively, must review the reports and then issue their own reports on their findings. Subsequent to D. 14-12-025, the Commission issued D. 16-08-018 which updates the reporting schedule. Table I-1 below shows the timeline of safety-related events since the Commission issued its Safety Policy Statement in 2014.

⁶ D.11-05-018, p. 27.

⁷ D.11-05-018, p. 29.

Table I-1: Timeline of Safety-Related Events and Reporting Requirements

Safety-Related Event	<u>Date</u>
CPUC issues Safety Policy Statement	Jul-14
CPUC issues D. 14-12-025 (Risk-Informed Decision-Making in Rate Case Plan)	Dec-14
CPUC issues Safety Action Plan	Feb-15
CPUC updates Safety Action Plan	Feb-16
CPUC issues D. 16-08-018 (Uniform Risk-Management Framework) ⁸	Aug-16
ED publishes PG&E Safety-Related Spending Report	Oct-16
ED publishes SCE Safety-Related Spending Report	May-17
SDG&E and SoCalGas to file 2016 Spending Accountability Report ⁹	Jun-17
PG&E to file first annual Spending Accountability Report for 2017 ¹⁰	Mar-18
SCE to file first annual Risk Spending Accountability Report for 2017	May-18
SoCalGas to file first annual Risk Spending Accountability Report for 2017	Jul-18
SDG&E to file first annual Risk Spending Accountability Report for 2017	Sep-18

This Energy Division report on SCE's safety-related spending, prepared in response to the CPUC's 2016 Safety Action Plan, represents a proactive way for the Commission to begin implementing the spending accounting report requirement sooner than the schedule contemplated in the Rate Case Plan decision.

I.B. Translating Commission Authorization into Project Funding

This report compares actual safety-related spending to what SCE had requested and what the Commission had authorized in the 2015 GRC in three categories: Electric Transmission and Distribution (T&D), Electric Generation, and Other Safety-Related Projects. Within each category, both expense and capital expenditures are reviewed. Items that exhibit significant variance between requested and actual spending are chosen for more in-depth review.

It must be noted that there was a delay in getting the 2015 GRC decision issued. Decision (D.) 15-11-021 was issued on November 5, 2015 - 309 days into the test year. The utilities have an obligation to do all that is needed to provide safe and reliable service, but due to the uncertainty of the funding level, some programs may have been deferred or cancelled. Comparison of actual safety-related spending to SCE's

⁸ Reporting schedule is discussed in D. 16-08-018 pp. 156-159.

⁹ See D. 16-06-054 addressing SDG&E and SoCalGas GRCs for reporting discussion in pp. 37-41.

 $^{^{10}}$ See the Proposed Decision in A. 15-09-001 on PG&E's 2017 GRC for reporting discussion in pp. 180-184

requested spending aligns with the Commission's goal of creating a similar record of information as that presented in the Pacific Gas & Electric 2017 GRC.¹¹ This report compares actual spending to authorized amounts in addition to requested amounts.

I.C. Safety Accounting Framework

Energy Division issued a data request to SCE on October 28, 2016 which sought information on all "safety-related, safety enhancement, risk assessment, or risk mitigation" programs within the utility. SCE determined which programs met the criteria of "safety-related, safety enhancement, risk assessment or risk mitigation" by selecting all activities that score within the safety dimension of their Risk Informed Planning Process and Risk Evaluation Methodology filed as part of the 2018 GRC application. The results are shown in the workpapers of SCE 2018 GRC Exhibit SCE-01 (see Appendix A).

SCE provided safety-related spending information for Total Company expenses and capital expenditures as opposed to separating into CPUC and Federal Energy Regulatory Commission (FERC) jurisdictions. Many of the utility's safety-related activities cross jurisdictional boundaries so SCE applies a method for recording costs and forecasting GRC items company-wide. As discussed under Section I.C.1, SCE records its costs by FERC account; then, after grouping into Final Cost Centers and "re-mapping" costs, it uses the modified recorded data to forecast its GRC requests for company-wide expense items. To allocate expenses between the CPUC and the FERC, SCE applies a method of jurisdictional factors and labor allocators first adopted by the CPUC in 2004, and since reaffirmed through subsequent proceedings including SCE'S 2015 GRC.

For capital cost items, SCE relies on the results of an annual jurisdictional study of recorded data reported in their prior year FERC Form 1 filing to identify capital projects by jurisdiction based on the scope of work and assets involved. For blanket capital expenditure (such as overhead line additions, circuit breaker replacements, and office equipment purchases), details are not known in advance so SCE relies on the classification system of historical data.

Staff recognizes the potential inaccuracy of comparing recorded and authorized data adopted in the 2015 GRC since the FERC portion of Total Company costs changes when the utility files an application for rate recovery with the FERC several months after filing with the CPUC. However, relying on CPUC-jurisdictional data results in error that is caused by applying allocation factors to safety-programs that cross jurisdictional boundaries.

SCE's general rate case testimony is typically organized by its Operating Units: Exhibit SCE-02 addresses Transmission and Distribution (T&D), Exhibit SCE-03 addresses Customer Service (CS), Exhibit SCE-04 addresses Information Technology (IT), and so on. Most Operating Units are further divided into program categories to differentiate between expenditures within the Operating Unit. For example, Customer Driven Programs, System Planning, and Distribution Maintenance and Inspection equate to

¹¹ Scoping Memo for SCE 2018 GRC Application A. 16-09-001, December 12, 2016, Section 2.e.ii.a, p. 12.

Volumes 2, 3 and 4 of the T&D Operating Unit, respectively. Expensed items and capital expenditures are presented separately within each program category.

SCE's testimony is organized such that SCE's Exhibit SCE-02 T&D contains program and cost information within the T&D category. SCE's Exhibit SCE-05 Power Supply contains information within the Generation category. SCE's Exhibit SCE-04 IT, Exhibit SCE-07 Operational Services, and Exhibit SCE-08 Administrative and General (A&G) contain information on other safety-related programs. Other exhibits were not identified as relating to safety.

I.C.1. GRC Activities and WBS Elements

SCE separates expensed items into GRC Activities and capitalized expenditures into Work Breakdown Structure (WBS) elements for GRC forecasting purposes. Expensed items are generally incurred by SCE for actions taken to furnish electric service to its customers and mainly consist of O&M activities such as inspections, maintenance, salaries, and customer accounts expenses. These costs are recorded by Final Cost Centers, which allows the company to group similar activities, and are entered into the balance sheet under the FERC Uniform System of Accounts structure. SCE adjusts these costs to better align with forecasting methods in the GRC. Examples of adjustments include the transfer of costs to memorandum and balancing accounts for later recovery, the transfer (or "re-mapping") of costs among activity groups, and the removal of shareholder funds expenses. The result is a recorded/adjusted expense item that can be used to forecast groups of similar expenses in the GRC.

Capital expenditures consist of costs related to the purchase, construction or maintenance of fixed assets, such as land, substations, and transmission lines and towers. Total costs for capital projects are not recorded all at once when the cost is incurred but rather are spread out over time as capital expenditures. SCE's total company capital expenditures include assets under the jurisdiction of the FERC as well as the CPUC. As noted above, total company expenditures are evaluated in this report. Capital expenditures are identified in testimony at the program or project category level and referred to as elements of a WBS. Costs recorded to a program or project category are a summation of many discrete projects. However, the information presented in the GRC is not attributed to specific projects. For example, capital expenditures for System Planning are managed through four categories: Transmission and Interconnection Planning Projects, Distribution and Subtransmission Planning Programs, System Improvement Programs, and Customer-Requested Projects. Overall capital spending is recorded for each category. It is difficult to compare spending for safety-related projects within each program or project category.

After the Commission authorizes the GRC budget, utilities allocate funds for each program to individual projects through its own internal budgeting process. When the amount authorized is less than the amount forecasted in the GRC testimony, the utilities often prioritize projects due to changed circumstances and determine which will be funded and at what level.

I.C.2. Expense vs. Capital

Utilities are given budgets through GRC proceedings for expenses as well as capital costs. The distinction between capital and "expense spending" is important because they affect the utility's profits over time differently. For expenses, the utility does not make a return on the spending and is authorized to recover the entire authorized expense amount for the year in rates in the same year – or in subsequent years if the expenses are subject to balancing account treatment. For capital spending, the utility recovers the actual cost of the investment over time (known as "depreciation") as well as a return on the investment. If a utility underspends its authorized capital budget, over time it will lower its long term profits. Thus, while underspending on both expenses and capital costs can provide short term shareholder profits, underspending on capital costs diminishes the utility's long term profits. Inversely, while overspending on both expenses and capital costs can lower short term shareholder profits, higher spending on capital can increase the utility's long term profits.

For expense spending, a utility's GRC request typically includes a forecast for only the test year (2015, in this case). After the Commission decides how much of the test year forecast to grant and based on the attrition year adjustment granted, the utility imputes the test year amount for the attrition years (2016-2017). For capital spending, SCE includes forecasts for the test year and the attrition years in the General Rate Case. The Commission then authorizes funding levels for each year. In the 2015 GRC decision, the Commission authorized 2016-2017 capital spending based on historical capital costs.

I.C.3. Balancing Account Implications

Balancing accounts allow utilities to recover or refund funds to match the actual spending level depending on the type of account. The balancing accounts discussed in this report are two-way balancing accounts¹², which means that if the utility's expenses in that category exceed the authorized level for that category, the utility is authorized to recoup those over-expenditures from ratepayers in a later true-up, provided that the over-expenditure is deemed to be reasonable. Thus, from a shareholder perspective, a dollar overspent in an account with two-way balancing account treatment is not of concern. Similarly, underspending on projects where the underspent money is returned to ratepayers is not of as much ratepayer concern.

SCE has several balancing accounts that track safety-related cost items (discussed in Section II.C). The Pole Loading and Deteriorated Poles Program Balancing Account (PLDPBA) is a two-way balancing account that records the difference between: (1) recorded capital-related revenue requirements for the Pole Loading Program and the Deteriorated Pole Program, (2) O&M expenses for the Pole Loading Program, and (3) the authorized Pole Programs revenue requirement as adopted in D. 15-11-021. The Safety Reliability Investment Incentive Mechanism is a one-way balancing account covering seven major

¹² One-way balancing account treatment requires the utility to reimburse ratepayers for any underspending in an account and does not allow recouping of expenses beyond a pre-designated cap; it thus places shareholders on the hook for those overages. A two-way balancing account reimburses the utility for whatever amount of costs reasonably incurred in a given category, unconstrained by any target.

T&D programs and refunds underspending in capital expenditures related to safety. The Fire Hazard Program Memorandum Account records the increase in costs incurred related to fire hazard prevention. The Catastrophic Event Memorandum Account records all costs incurred by SCE associated with a catastrophic event.

I.D. Selection Criteria and Selected Programs

In order to determine which spending areas merited further detailed review, Energy Division developed selection criteria for expense items and capital expenditures separately. Selection criteria were set based both on the absolute dollar value and the percentage variance from requested amounts. The dollar variance selection criteria capture major programs with a significant dollar amount variance (overspending or underspending) between requested and actual amounts that may not be substantial in percentage terms. Conversely, the percentage variance selection criteria can mark smaller programs with a significant proportional variance in spending.

Energy Division set the following metrics for program selection:

- GRC expensed items: A variance of at least \$10 million, or a percentage variance of at least 50% subject to a minimum variance of \$5 million.
- Capital programs: A variance of at least \$20 million, or a percentage variance of at least 100% subject to a minimum variance of \$10 million.

Application of the criteria yielded seven expensed items and 15 capital expenditures for a total list of 22 items. Sixteen items were selected within the T&D category, three within the Generation category, and three within the Other category. Table I-1 shows the selected programs and cost information.

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Table I-2: Capital and Expense Items Selected for Further Discussion (\$000s)

	,				Actual vs.	Requested	Actual vs.	Authorized		
Program	(a) 2015 Requeste	d k	(b) 2015 Authorized	(c) 2015 Actual	(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(c-b) / b Percent Variance	Category	Group
Distribution Pole Replacement	\$ 111,06	6 5	\$ 83,675	\$ 323,684	\$ 212,618	191.4%	\$ 240,009	286.8%	T&D	Capital
Pole Remediation Distribution	\$ 285,56	3	\$ 200,276	\$ 147,324	\$ (138,239)	-48.4%	\$ (52,952)	-26.4%	T&D	Capital
Mountainview Capital Projects	\$ 1,13	9 !	\$ 1,139	\$ 74,978	\$ 73,839	6482.8%	\$ 73,839	6482.8%	Generation	Capital
Overhead Conductor Program	\$	-	\$ -	\$ 58,126	\$ 58,126		\$ 58,126		T&D	Capital
Transmission Pole Replacement	\$ 31,91	0 5	\$ 30,953	\$ 88,000	\$ 56,090	175.8%	\$ 57,047	184.3%	T&D	Capital
Pole Remediation Transmission	\$ 58,50	1 9	\$ 41,341	\$ 9,923	\$ (48,578)	-83.0%	\$ (31,417)	-76.0%	T&D	Capital
Cable In Conduit Replacement	\$ 94,25	6	\$ 75,999	\$ 54,077	\$ (40,179)	-42.6%	\$ (21,923)	-28.8%	T&D	Capital
Hardware - Servers & Storage	\$ 63,19	9 5	\$ 61,637	\$ 23,122	\$ (40,077)	-63.4%	\$ (38,515)	-62.5%	Other	Capital
Electrical Equipment	\$ 38,25	6	\$ 38,256	\$ 2,426	\$ (35,830)	-93.7%	\$ (35,830)	-93.7%	Generation	Capital
Distribution Rule 20B Conversions	\$ 43,38	7 5	\$ 39,001	\$ 14,037	\$ (29,350)	-67.6%	\$ (24,963)	-64.0%	T&D	Capital
Underground Structure Replacement	\$ 72,72	2 5	\$ 58,169	\$ 102,060	\$ 29,348	40.4%	\$ 43,891	75.5%	T&D	Capital
Mountainview	\$ 41,08	4	\$ 40,750	\$ 12,363	\$ (28,721)	-69.9%	\$ (28,387)	-69.7%	Generation	Expense
Plant Betterment	\$ 8,01	2 :	\$ 8,012	\$ 35,250	\$ 27,238	340.0%	\$ 27,238	340.0%	T&D	Capital
Transmission Planned Capital Maintenance	\$ 6,26	8 !	\$ 6,268	\$ 32,151	\$ 25,883	413.0%	\$ 25,883	413.0%	T&D	Capital
Design Construction & Maintenance - Construction Support Activities	\$ 30,82	8 5	\$ 27,072	\$ 11,486	\$ (19,342)	-62.7%	\$ (15,586)	-57.6%	T&D	Expense
Underground Oil Switch Replacement	\$ 9,69	5 !	\$ 9,695	\$ 25,938	\$ 16,243	167.5%	\$ 16,243	167.5%	T&D	Capital
Corporate Security	\$ 42,95	0	\$ 42,950	\$ 26,906	\$ (16,044)	-37.4%	\$ (16,044)	-37.4%	Other	Expense
Distribution Pole Assessments	\$ 33,79	2 5	\$ 30,352	\$ 21,424	\$ (12,368)	-36.6%	\$ (8,928)	-29.4%	T&D	Expense
Substation Physical Security	\$ 5,79	1 !	\$ 5,791	\$ 17,673	\$ 11,883	205.2%	\$ 11,883	205.2%	T&D	Capital
Corporate Real Estate - A&G	\$ 27,89	6	\$ 25,812	\$ 16,062	\$ (11,834)	-42.4%	\$ (9,750)	-37.8%	Other	Expense
Transmission - Line, Structure, Road, and Right-Of-Way Maintenance	\$ 32,00	6	\$ 30,902	\$ 21,361	\$ (10,645)	-33.3%	\$ (9,541)	-30.9%	T&D	Expense
Distribution Pole Repairs and Distribution Pole Related Expense	\$ 11,15	3	\$ 10,376	\$ 3,992	\$ (7,161)	-64.2%	\$ (6,384)	-61.5%	T&D	Expense

II. Electric Transmission and Distribution

The spending category of Transmission and Distribution (T&D) includes construction, maintenance, and inspection of T&D infrastructure, as well as customer driven extensions to the T&D grid, system planning, training and safety, etc. In response to Energy Division discovery, SCE identified 31 electric transmission and distribution safety-related expense items and 40 electric distribution safety-related capital expenditure programs for 2015.¹³

In 2015, SCE requested funding of \$533 million in expenses and \$1,639 million in capital expenditures for safety-related spending for electric T&D activities (see Table II-1). The Commission approved \$521 million for expenses and \$1,402 million for capital, or approximately 97.7% and 85.5% of SCE's request, respectively. SCE spent \$439 million on expensed items, which was \$94 million, or 17.6%, less than their request and \$81 million, or 15.7%, less than the authorized amount. SCE spent \$1,811 million on capital expenditures, which was \$171 million, or 10.4%, more than their request and \$409 million, or 29.2%, more than the authorized amount.

				Actual vs. I	Requested	Actual vs. A	Authorized
	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(c-b) / b Percent Variance
Expense Safety Program	\$532,583	\$520,506	\$439,023	(\$93,560)	-17.6%	(\$81,483)	-15.7%
Capital Safety Program	\$1,639,440	\$1,401,708	\$1,810,699	\$171,260	10.4%	\$408,991	29.2%

Table II-1: 2015 Electric Distribution Expense and Capital (\$000s)

II.A. Electric Transmission and Distribution Expense Spending

Overview

Based on the application of the expense selection criteria, four GRC Activities in the T&D category of expense spending were selected for further review and discussion. The four GRC Activities are (1) Design Construction and Maintenance – Construction Support Activities (Account 588.140, see Section II.A.1), which was underspent by \$19.3 million, or 62.7%; (2) Distribution Pole Assessments (Account 583.125, see Section II.A.2), which was underspent by \$12.4 million, or 36.6%; (3) Transmission – Line, Structure, Road, and Right-of-Way Maintenance (Account 571.150, see Section II.A.3), which was underspent by \$10.6 million, or 33.3%; and (4) Distribution Pole Repairs and Distribution Pole-Related Expense (Account 593.125, see Section II.A.4), which was underspent by \$7.2 million, or 64.2%.

¹³ Three programs – Overhead Conductor Program, Substation Switchrack Rebuilds, and Steel Stubbing/Fiberglass Wrap – along with Circuit Upgrades and IT Grid Modernization were not requested in the 2015 GRC. However, SCE spent funds on these three programs, and thus the programs were retained in this analysis.

Table II-2 lists the transmission and distribution GRC Activities relating to safety and their corresponding requested, authorized and actual amounts for 2015. The table is sorted by absolute dollar value of spending variance. Design Construction and Maintenance is shown in the top row with a variance of \$19.3 million, Distribution Pole Assessments is shown second with a variance of \$12.4 million and so on.

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Table II-2: 2015 Electric Distribution Expense Spending (\$000s)

							Actual vs. Requeste		Requested		Actual vs. A	uthorized
Activity Description	GRC Activity	Re	(a) 2015 equested	Αι	(b) 2015 Ithorized	(c) 2015 Actual		(c-a) ariance	(c-a) / a Percent Variance	V	(c-b) /ariance	(c-b) / b Percent Variance
Design Construction & Maintenance - Construction Support Activities	588.140	\$	30,828	\$	27,072	\$ 11,486	\$	(19,342)	-62.7%	\$	(15,586)	-57.6%
Distribution Pole Assessments	583.125	\$	33,792	\$	30,352	\$ 21,424	\$	(12,368)	-36.6%	\$	(8,928)	-29.4%
Transmission - Line, Structure, Road, and Right-Of-Way Maintenance	571.150	\$	32,006	\$	30,902	\$ 21,361	\$	(10,645)	-33.3%	\$	(9,541)	-30.9%
Distribution Pole Repairs and Distribution Pole Related Expense	593.125	\$	11,153	\$	10,376	\$ 3,992	\$	(7,161)	-64.2%	\$	(6,384)	-61.5%
Supervision of Transmission Substation Maintenance	568.150	\$	16,491	\$	16,276	\$ 9,594	\$	(6,897)	-41.8%	\$	(6,682)	-41.1%
Grid Operations - Distribution Storm	598.170	\$	13,031	\$	13,031	\$ 7,481	\$	(5,550)	-42.6%	\$	(5,550)	-42.6%
Inspection of Distribution Overhead and Underground Lines and Equipment	583.120	\$	15,027	\$	15,027	\$ 10,941	\$	(4,086)	-27.2%	\$	(4,086)	-27.2%
Training and Safety Delivery and Seat-Time for Dist. Personnel	588.250	\$	42,691	\$	41,160	\$ 38,607	\$	(4,084)	-9.6%	\$	(2,553)	-6.2%
Distribution Overhead and Underground Breakdown Maintenance	594.120	\$	28,988	\$	28,988	\$ 25,606	\$	(3,382)	-11.7%	\$	(3,382)	-11.7%
Corporate Environmental Services Waste Management	598.250	\$	5,305	\$	5,305	\$ 2,359	\$	(2,946)	-55.5%	\$	(2,946)	-55.5%
Grid Operations - Troublemen Patrol, Locate, and Repair Activities	583.170	\$	34,825	\$	34,825	\$ 31,889	\$	(2,936)	-8.4%	\$	(2,936)	-8.4%
Training and Safety Delivery and Seat-Time for Transmission and Substation Personnel	566.250	\$	15,748	\$	15,027	\$ 13,057	\$	(2,691)	-17.1%	\$	(1,970)	-13.1%
Planned Maintenance of Dist. Overhead & Underground Lines/Equip.; Veg. Mgmt.; Apparatus Inspection & Maintenance	593.120	\$	127,625	\$	127,625	\$ 124,944	\$	(2,681)	-2.1%	\$	(2,681)	-2.1%
Transmission Inspection and Operation of Fiber Optic Lines	566.150	\$	12,136	\$	12,136	\$ 9,678	\$	(2,458)	-20.3%	\$	(2,458)	-20.3%
Grid Operations - Street Light Operations and Maintenance	585.170	\$	9,245	\$	9,245	\$ 6,936	\$	(2,309)	-25.0%	\$	(2,309)	-25.0%
Distribution Grid Engineering and Technology	588.220	\$	2,086	\$	2,086	\$ 4,229	\$	2,143	102.7%	\$	2,143	102.7%
Transmission Pole Assessments	566.125	\$	3,743	\$	3,624	\$ 1,975	\$	(1,768)	-47.2%	\$	(1,649)	-45.5%
Reliablity Standards Compliance	560.221	\$	2,748	\$	2,748	\$ 1,407	\$	(1,341)	-48.8%	\$	(1,341)	-48.8%
Grid Contract Management	566.280	\$	8,903	\$	8,625	\$ 7,571	\$	(1,332)	-15.0%	\$	(1,054)	-12.2%
Substation Construction & Maintenance - Other Equipment M&I	592.150	\$	14,545	\$	14,545	\$ 13,241	\$	(1,304)	-9.0%	\$	(1,304)	-9.0%
Transmission Pole Repairs and Transmission Pole-Related Expense	571.125	\$	1,593	\$	1,457	\$ 645	\$	(948)	-59.5%	\$	(812)	-55.7%

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							1	Actual vs.	Requested	quested Actual vs. A		Authorized	
Activity Description	GRC Activity		(a) 2015 quested	Au	(b) 2015 thorized		(c) 2015 Actual	V	(c-a) ariance	(c-a) / a Percent Variance		(c-b) riance	(c-b) / b Percent Variance
Distribution Grid Technology	580.260	\$	12,393	\$	12,393	\$	13,317	\$	924	7.5%	\$	924	7.5%
Grid Operations - Misc. Operating Expense	588.170	\$	2,879	\$	2,879	\$	1,989	\$	(890)	-30.9%	\$	(890)	-30.9%
Grid Operations - Supervising and Operating Distribution Stations	582.170	\$	27,897	\$	27,897	\$	28,614	\$	717	2.6%	\$	717	2.6%
Transmission Planning	560.220	\$	10,967	\$	10,967	\$	10,497	\$	(470)	-4.3%	\$	(470)	-4.3%
Transmission Grid Technology	560.260	\$	3,024	\$	3,024	\$	2,598	\$	(426)	-14.1%	\$	(426)	-14.1%
Grid Operations - Management and Operation of the Grid Control Center (GCC)	561.170	\$	9,400	\$	9,400	\$	9,814	\$	414	4.4%	\$	414	4.4%
Substation Inspection & Maintenance - Activities Performed At SCE-Owned Generating Facilities	562.150	\$	1,337	\$	1,337	\$	1,574	\$	237	17.7%	\$	237	17.7%
Corporate Environmental Services Waste Management - Transmission	573.250	\$	407	\$	407	\$	171	\$	(236)	-58.0%	\$	(236)	-58.0%
Substation Inspection & Maintenance - Activities Performed At SCE-Owned Generating Facilities	582.150	\$	174	\$	174	\$	334	\$	160	91.5%	\$	160	91.5%
Grid Operations - Transmission and Substation Storm Expense	573.170	\$	1,595	\$	1,595	\$	1,692	\$	97	6.1%	\$	97	6.1%
Total		\$	532,583	\$	520,506	\$	439,023	\$	(93,560)	-17.6%	\$ ((81,483)	-15.7%

As shown in Table II-2, SCE's electric T&D expense underspending relative to its request in various areas totaled \$98.3 million and overspending in some areas totaled \$4.7 million resulting in a net underspending of \$93.6 million, or about 17.6%, relative to its GRC request. When compared to the amounts authorized by the Commission, SCE underspent its authorized budget by \$81.5 million. The major safety activities based on actual spending include Overhead and Underground Line Maintenance (Account 593.120), Training and Safety Delivery (Account 588.250), and Grid Operations – Troublemen Activities (Account 583.170). Figure II-1 compares SCE's requested, authorized, and actual safety-related transmission and distribution expense spending for 2015 by GRC Activity. Actual expense data for 2012 is presented in the discussion sections below to provide insight into the level of spending for 2015. The year was chosen because it was the Test Year of the 2012 GRC.

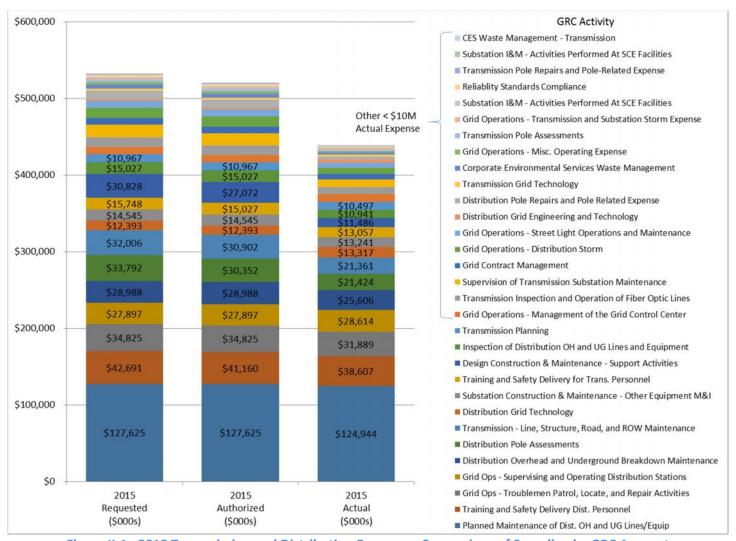


Figure II-1: 2015 Transmission and Distribution Expense – Comparison of Spending by GRC Account

II.A.1. Design Construction and Maintenance - Support Activities (Account 588.140)

Design Construction and Maintenance – Construction Support includes four activities: (1) Stand-By Time, (2) Distribution Business Line Construction Support, (3) Information Technology(IT)/Corporate Real Estate(CRE), and (4) Underground Structure Field Investigations and Repairs.

Stand-By Time refers to time recorded by distribution field crews held at the end of the workday in anticipation of potential after-hours emergency activity. ¹⁴ SCE spent \$282,000 on this activity in 2015 which is \$472,000, or 62.6%, less than their request and authorized amount of \$754,000.

Distribution Business Line Construction Support includes expenses for miscellaneous construction inspections, Facility Inventory Mapping (FIM), Field Accounting Organization (FAO), Shop Services and Instrumentation Division (SSID), and inspections of wireless carrier installations. Construction inspection activities include site readiness checks, civil inspections, and miscellaneous expenses. The FIM group develops and maintains maps that depict the location and description of SCE's overhead and underground distribution facilities throughout SCE's service territory. FAO provides accounting support to distribution field operations. SSID provides a variety of maintenance, test, and repair services to SCE's distribution, transmission and generation operations. SCE spent \$2.75 million on these activities in 2015 which is \$2.19 million, or 44.3%, less than their request of \$4.94 million and \$1.88 million, or 40.7%, less than the authorized amount of \$4.63 million.

SCE transferred expenses for IT/CRE Chargebacks (previously tracked in Account 580.260) and underground structure field investigations and repairs (previously tracked in Account 593.120) into this account for the 2018 GRC. IT/CRE Chargebacks include costs incurred by the Distribution Business Line for various communications equipment and usage charges. These charges are "charged back" to the Distribution Business Line by SCE's IT organization. Additional charges in this activity include costs from the CRE organization for minor modifications to physical facilities. ¹⁶ SCE spent \$3.82 million on this activity in 2015 which is \$3.13 million, or 45.0%, less than their request and authorized amount of \$6.95 million.

SCE conducts underground structure investigations to determine whether the structure must be repaired or replaced.¹⁷ SCE spent \$4.64 million on this activity in 2015 which is \$13.6 million, or 74.7%, less than their request of \$18.2 million and \$10.1 million, or 68.5%, less than the authorized amount of \$14.7 million. Table II-3 summarizes the comparison between 2015 actual, authorized and requested amounts.

¹⁴ SCE 2018 GRC Exhibit SCE-02 Vol 05 p. 7-8

¹⁵ *Ibid.* p. 18-20

¹⁶ *Ibid.* p. 22-23

¹⁷ *Ibid.* p. 30-33

Table II-3: 2015 Comparison of Design Construction and Maintenance Activities 18 (\$000s)

Function CDC Assourt F99 140	2015	2015	2015	Actual -	Actual -
Expenses within GRC Account 588.140	Requested	Authorized	Actual	Requested	Authorized
Stand-By Time	\$754	\$754	\$282	(\$472)	(\$472)
Distribution Business Line Construction Support	\$4,938	\$4,633	\$2,749	(\$2,189)	(\$1,884)
IT/CRE Chargebacks	\$6,945	\$6,945	\$3,817	(\$3,128)	(\$3,128)
Underground Structure Shoring and Repairs	\$18,191	\$14,740	\$4,638	(\$13,553)	(\$10,102)
Total	\$30,828	\$27,072	\$11,486	(\$19,342)	(\$15,586)

SCE testimony summarizes the expense items included in this account and shows actual costs from 2011 and 2015. Table II-4 compares the actual spending between 2012 and 2015. Totals may not tie to data presented in the workpapers.

Table II-4: Actual Comparison of Design Construction and Maintenance Activities 19 (\$000s)

Expenses within GRC Account 588.140	2012 Actual	2015 Actual	C	Change
Stand-By Time	\$ 737	\$ 282	\$	(455)
Distribution Business Line Construction Support	\$ 3,677	\$ 2,749	\$	(928)
IT/CRE Chargebacks	\$ 4,670	\$ 3,817	\$	(853)
Underground Structure Shoring and Repairs	\$ 8,226	\$ 4,638	\$	(3,588)
Total	\$ 17,310	\$ 11,486	\$	(5,824)

SCE spent \$11.5 million for this activity which was \$19.3 million, or 62.7%, less than their request of \$30.8 million and \$15.6 million, or 57.6%, less than the authorized amount of \$27.1 million. SCE's reduced spending can be attributed to several factors:

- 1) SCE reevaluated current standards and raised the threshold for the amount of deterioration within underground structures needing repair or replacement which caused a reduction in repair costs from the 2015 forecast,
- 2) FAO services were reduced or transferred to other departments,
- 3) Historical costs for IT/CRE Chargebacks declined as costs for wireless and computing services have declined,
- 4) Costs for Stand-By Time decreased since 2012 due to improved scheduling and work management processes. These cost savings were not included in the 2015 GRC forecast.

II.A.2. Distribution Pole Assessments (Account 583.125)

The Distribution Pole Assessments account includes four activities: (1) Distribution Pole Loading Program Assessments, (2) Distribution Intrusive (Deteriorated) Pole Inspections, (3) Joint Pole Organization, and (4) Joint Pole Credits.

¹⁸ See SCE Workpapers SCE-02 Vol 5. p. 1 ¹⁹ SCE 2018 GRC Exhibit SCE-02 Vol 05 p. 61

Distribution Pole Loading Program Assessments are performed to determine a pole's safety factor and require a field assessment and a desktop analysis. Costs recorded for this activity are tracked in the Pole Loading Deteriorated Pole Balancing Account (PLDPBA). SCE spent \$12.3 million for this activity in 2015 which is \$11.0 million, or 47.4%, less than their request of \$23.3 million and \$10.1 million, or 45.1%, less than the authorized amount of \$22.3 million.²⁰

Deteriorated Pole Inspections consist of visual and intrusive inspections and either non-grid or grid-based inspections. Pole inspections are performed by contract personnel to identify overloaded poles that present a safety hazard. SCE spent \$6.04 million for this activity in 2015 which is \$1.37 million, or 18.5%, less than their request and authorized amount of \$7.41 million.²¹

Joint Pole Organization (JPO) is responsible for the execution and administration of all joint pole agreements where SCE shares the ownership of electric poles with other utilities. JPO is also responsible for the execution and administration of agreements to lease pole space to other utilities. JPO performs inspections on poles to identify safety deficiencies and unauthorized attachments. SCE spent \$6.89 million for this activity in 2015 which is \$1.59 million, or 30.1%, more than their request of \$5.30 million and \$2.09 million, or 43.4%, more than the authorized amount of \$4.80 million.²²

Joint Pole Credits include penalty assessments against various utility companies for unauthorized attachments made by them to SCE poles and credits for payments from various utility companies for inspection and maintenance work performed by SCE. SCE received \$3.76 million worth of credits in 2015 which is \$1.55 million, or 70.3%, more than their forecast of \$2.21 million and \$422,000, or 10.1%, less than the authorized amount of \$4.18 million.²³ Table II-5 summarizes the comparison between 2015 actual, authorized and requested amounts.

Table II-5: 2015 Comparison of Distribution Pole Assessments Activities²⁴ (\$000s)

Functions within CDC Associat 592 125	2015	2015	2015	Actual -	Actual -
Expenses within GRC Account 583.125	Requested	Authorized	Actual	Requested	Authorized
Distribution Pole Assessments	\$23,295	\$22,323	\$12,255	(\$11,040)	(\$10,068)
Deteriorated Pole Inspections	\$7,409	\$7,409	\$6,042	(\$1,367)	(\$1,367)
Joint Pole Organization	\$5,297	\$4,804	\$6,889	\$1,592	\$2,085
Joint Pole Credits	(\$2,209)	(\$4,184)	(\$3,762)	(\$1,553)	\$422
Total	\$33,792	\$30,352	\$21,424	(\$12,368)	(\$8,928)

SCE testimony summarizes the expense items included in this account and shows actual costs from 2011 and 2015. Table II-6 compares the actual spending between 2012 and 2015. Totals may not tie to data presented in the workpapers.

²⁰ SCE 2018 GRC Exhibit SCE-02 Vol 09 p. 17-19

²¹ *Ibid.* p. 41-42

²² *Ibid* p. 69-71

²³ *Ibid* p. 68-69

²⁴ See SCE Workpapers SCE-02 Vol 9. p. 83

Table II-6: Actual Comparison of Distribution Pole Assessments Activities²⁵ (\$000s)

Expenses within GRC Account 583.125	2012 Actual	2015 Actual	Change		
Distribution Pole Loading Program Assessments	\$ 1,399	\$ 12,255	\$	10,856	
Deteriorated Pole Inspections	\$ 3,186	\$ 6,042	\$	2,856	
Joint Pole Organization	\$ 4,274	\$ 6,889	\$	2,615	
Joint Pole Credits	\$ (2,047)	\$ (3,762)	\$	(1,715)	
Total	\$ 6,812	\$ 21,424	\$	14,612	

SCE spent \$21.4 million for this activity which is \$12.4 million, or 36.6%, less than their request of \$33.8 million and \$8.93 million, or 29.4%, less than the authorized amount of \$30.4 million. SCE's reduced spending can be attributed to a delay in the program and SCE's consideration of extending the seven-year assessment plan to a ten-year assessment plan. The extension resulted in fewer assessments in 2015. Following the issuance of the 2015 GRC in November, SCE revised its plan estimates to correspond to a seven-year assessment plan.²⁶

II.A.3. Transmission - Line, Structure, Road, and Right-Of-Way Maintenance (Account 571.150)

SCE's Transmission Maintenance account includes five activities: (1) Transmission Overhead and Underground Line Maintenance, (2) Transmission Line Rating Remediation, (3) Transmission Insulator Washing, (4) Road and Right-of-Way Maintenance, and (5) Transmission Vegetation Management.

Transmission Overhead and Underground Line Maintenance includes performing repairs on transmission line equipment and structures, such as poles, towers, and conductors. Maintenance work on the transmission system can be both proactive work identified during regular inspections, or reactive maintenance due to unplanned events.²⁷ SCE spent \$6.84 million for this activity in 2015 which is \$574,000 or 9.2%, more than their request and authorized amount of \$6.27 million.

Transmission Line Rating Remediation expenses involves identifying transmission lines potentially in violation of GO 95 that will require line clearance remediation.²⁸ SCE spent \$37,000 for this activity in 2015 which is \$3.48 million, or 98.9%, less than their request and authorized amount of \$3.52 million.

Transmission Insulator Washing is performed by spraying high-pressure water onto insulators to remove contaminants such as salt, dirt, or automobile exhaust. Excessive contamination on an insulator can reduce its ability to insulate the energized line from the grounded support structure, which could cause

²⁵ SCE 2018 GRC Exhibit SCE-02 Vol 09 p. 82

²⁶ *Ihid* n 17-18

²⁷ SCE 2018 GRC Exhibit SCE-02 Vol 07 p. 14-15

²⁸ *Ibid* p. 15-19

lines to short circuit. 29 SCE spent \$396,000 for this activity in 2015 which is \$5.52 million, or 93.3%, less than their request and authorized amount of \$5.91 million.

Road and Right-of-Way Maintenance involves proactive and reactive road and right-of-way maintenance. This work provides field crews with safe access to SCE facilities. SCE's roads and rights-of-way are also used by public agencies as fire breaks and for access during other emergencies. Maintenance activities include annual grading, repairs of damaged storm drains, repairs of access roads, and annual brush clearing along access roads to allow safe passage of vehicles and equipment.³⁰ SCE spent \$3.65 million for this activity in 2015 which is \$5.89 million, or 61.8%, less than their request and authorized amount of \$9.54 million.

Transmission Vegetation Management includes all of the expenses associated with tree trimming and tree removal in proximity to transmission and distribution high voltage lines, and weed abatement around overhead structures in high fire designated areas in proximity to transmission and distribution high voltage lines. It also includes costs of planting different species of trees as replacements and in handling preventive soil treatment. SCE spent \$10.4 million for this activity in 2015 which is \$3.67 million, or 54.2%, greater than their request of \$6.77 million and \$4.78 million, or 84.3%, more than the authorized amount of \$5.67 million. Table II-7 summarizes the comparison between 2015 actual, authorized and requested amounts.

Table II-7: 2015 Comparison of Transmission Maintenance Activities³² (\$000s)

Expenses within GRC Account 571.150	2015	2015	2015	Actual -	Actual -
Expenses within GRC Account 571.150	Requested	Authorized	Actual	Requested	Authorized
Transmission Line Maintenance	\$6,267	\$6,267	\$6,841	\$574	\$574
Transmission Line Rating Remediation	\$3,518	\$3,518	\$37	(\$3,481)	(\$3,481)
Transmission Insulator Washing	\$5,912	\$5,912	\$396	(\$5,516)	(\$5,516)
Road and Right-of-Way Maintenance	\$9,538	\$9,538	\$3,645	(\$5,893)	(\$5,893)
Transmission Vegetation Management	\$6,771	\$5,667	\$10,442	\$3,671	\$4,775
Total	\$32,006	\$30,902	\$21,361	(\$10,645)	(\$9,541)

SCE testimony summarizes the expense items included in this account and shows actual costs from 2011 and 2015. Table II-8 compares the actual spending between 2012 and 2015. Totals may not tie to data presented in the workpapers.

²⁹ *Ibid* p. 21-22

³⁰ *Ibid* p. 23-24

³¹ *Ibid.* p. 24-25.

³² See SCE Workpapers SCE-02 Vol 7. p. 77

Table II-8: Recorded Comparison of Transmission Maintenance Activities³³ (\$000s)

Expenses within GRC Account 571.150	2012 Actual	2015 Actual	Change		
Transmission Overhead and Underground Line Maintenance	\$ 5,073	\$ 6,841	\$	1,768	
Transmission Line Rating Remediation	\$ 220	\$ 37	\$	(183)	
Transmission Insulator Washing	\$ 5,409	\$ 396	\$	(5,013)	
Road and Right-of-Way Maintenance	\$ 4,837	\$ 3,645	\$	(1,192)	
Transmission Vegetation Management	\$ 7,773	\$ 10,442	\$	2,669	
Total	\$ 23,312	\$ 21,361	\$	(1,951)	

SCE spent \$21.4 million for this activity which is \$10.6 million, or 33.3%, less than their request of \$32.0 million and \$9.54 million, or 30.9%, less than the authorized amount of \$30.9 million. SCE's reduced spending can be attributed to abnormal weather patterns in 2015 that contributed significantly to the low recorded cost for Insulator Washing. Sporadic and historic levels of rainfall in the summer and fall months made washing unnecessary in some of the months when SCE typically would otherwise wash. In addition, offshore winds throughout the year reduced salt contamination along the coastal areas. Other environmental conditions reduced the need for Road and Right-of-Way Maintenance along with fewer requirements for access.

II.A.4. Distribution Pole Repairs and Distribution Pole-Related Expense (Account 593.125)

The Distribution Pole Repairs and Expenses item includes two activities: (1) Distribution Pole Loading Program Repairs and (2) Distribution Pole Loading Program Capital Related Expense. Repairs involve the design and installation or modification of guy wires (excluding repairs at communication levels). A Costs recorded for this activity are tracked in the Pole Loading Deteriorated Pole Balancing Account (PLDPBA). SCE spent \$810,000 for this activity in 2015 which is \$7.44 million, or 90.2%, less than their request and authorized amount of \$8.25 million.

Capital—related expenses represent work that must be done when capital additions or replacements are being performed such as replacement of an insulator when a pole is replaced. SCE recorded \$3.18 million for this activity in 2015 which is \$278,000, or 9.6%, more than their request of \$2.90 million and \$1.06 million, or 49.6%, more than the authorized amount of \$2.13 million. These minor items do not qualify for capitalization according to standard accounting guidelines.³⁵ Table II-9 summarizes the comparison between 2015 recorded and requested amounts.

³³ SCE 2018 GRC Exhibit SCE-02 Vol 07 p. 38

³⁴ SCE 2018 GRC Exhibit SCE-02 Vol 09, p. 20

³⁵ SCE 2018 GRC Exhibit SCE-02 Vol 13, p. 27

Table II-9: 2015 Comparison of Pole Repairs and Related Expense Activities³⁶ (\$000s)

Eveness within CBC Assesset FO2 12F	2015	2015	2015	Actual -	Actual -
Expenses within GRC Account 593.125	Requested	Authorized	Actual	Requested	Authorized
Distribution Pole Loading Repairs	\$8,249	\$8,249	\$810	(\$7,439)	(\$7,439)
Distribution Pole Related Expense	\$2,904	\$2,127	\$3,182	\$278	\$1,055
Total	\$11,153	\$10,376	\$3,992	(\$7,161)	(\$6,384)

SCE testimony summarizes the expense items included in this account and shows actual costs from 2011 and 2015. Table II-10 compares the actual spending between 2012 and 2015. Totals may not tie to data presented in the workpapers.

Table II-10: Actual Comparison of Pole Repairs and Related Expense Activities³⁷ (\$000s)

Expenses within GRC Account 593.125	20 Act		2015 Actual	Change		
Distribution Pole Loading Program Repairs	\$		\$ 810	\$	810	
Distribution Pole Loading Program Capital Related Expense	\$	-	\$ 3,182	\$	3,182	
Total	\$		\$ 3,992	\$	3,992	

SCE spent \$4.0 million for this activity which is \$7.2 million, or 64.2%, less than their request of \$11.2 million and \$6.4 million, or 61.5%, less than the authorized amount of \$10.4 million. The reduced spending can be attributed to the lower number of poles replaced than anticipated and a reduced failure rate which contributed to a reduction in repair expenses compared to the request.³⁸

II.B. Electric Transmission and Distribution Capital Spending

Overview

Twelve programs in the transmission and distribution category of capital expenditures were selected for further review based on the application of the capital selection criteria. The twelve programs are (1) Distribution Deteriorated Pole Replacement and Restoration (see Section II.B.1), which was overspent by \$213 million, or 191.4%; (2) Pole Loading Distribution Pole Replacements (see Section II.B.2), which was underspent by \$138 million, or 48.4%; (3) Transmission Deteriorated Pole Replacement and Restoration (see Section II.B.1), which was overspent by \$63.7 million, or 199.6%; (4) Overhead Conductor Program (see Section II.B.3), which is a program that was not requested in the 2015 GRC, in which SCE spent \$58.1 million; (5) Pole Loading Distribution Pole Replacements (see Section II.B.2), which was underspent by \$48.9 million, or 83.6%; (6) Cable in Conduit Replacement (see Section II.B.4), which was underspent by \$40.2 million, or 42.6%; (7) Distribution Rule 20B Conversions (see Section II.B.5), which was underspent by \$29.4 million, or 67.6%; (8) Underground Structure Replacement (see Section II.B.6), which was overspent by \$29.3 million, or 40.4%; (9) Distribution Plant Betterment (see Section II.B.7),

³⁶ See SCE Workpapers SCE-02 Vol 9. p. 83

³⁷ SCE 2018 GRC Exhibit SCE-02 Vol 9, p. 83

³⁸ ED-SCE-Verbal-009 O.02 Answer 2.

which was overspent by \$27.2 million, or 340.0%; (10) Transmission Planned Capital Maintenance (see Section II.B.8), which was overspent by \$25.9 million, or 413.0%; (11) Underground Oil Switch Replacement (see Section II.B.9), which was overspent by \$16.2 million, or 167.5%; and (12) Substation Physical Security (see Section II.B.10), which was overspent by \$11.9 million, or 205.2%.

Table II-11 lists the transmission and distribution capital programs relating to safety and their corresponding requested, authorized and actual amounts for 2015. The table is sorted by spending variance. Distribution Pole Replacement is shown in the top row with a variance of \$213 million, Pole Remediation Distribution is shown second with a variance of \$138 million, and so on.

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Table II-11: 2015 Electric Distribution Capital Spending (\$000s)

	Actual vs. Requested					Requested	Actual vs. Authorized					
Capital Category (WBS)	Re	(a) 2015 equested	Δι	(b) 2015 Ithorized		(c) 2015 Actual	V	(c-a) (c-a) / a Percent Variance			(c-b) ariance	(c-b) / b Percent Variance
Distribution Pole Replacement	\$	111,066	\$	83,675	\$	323,684	\$	212,618	191.4%	Ċ	240,009	286.8%
Pole Remediation Distribution	\$	285,563	\$	200,276	\$	147,324	т	(138,239)	-48.4%		(52,952)	-26.4%
Transmission Pole Replacement	\$	31,910	\$	30,953	\$	95,607	\$	63,697	199.6%	\$	64,654	208.9%
Overhead Conductor Program	\$	31,310	\$	-	\$	58,126	\$	58,126		\$	58,126	
Pole Remediation Transmission	\$	58,501	\$	41,341	\$	9,574	\$	(48,927)	-83.6%	<u> </u>	(31,767)	-76.8%
Cable In Conduit Replacement	\$	94,256	\$	75,999	\$	54,077	\$	(40,179)	-42.6%		(21,923)	-28.8%
Distribution Rule 20B Conversions	\$	43,387	\$	39,001	\$	14,037	\$	(29,350)	-67.6%		(24,963)	-64.0%
Underground Structure Replacement	\$	72,712	\$	58,169	\$	102,060	\$	29,348	40.4%	\$	43,891	75.5%
Plant Betterment	\$	8,012	\$	8,012	\$	35,250	\$	27,238	340.0%	\$	27,238	340.0%
Transmission Planned Capital Maintenance	\$	6,268	\$	6,268	\$	32,151	\$	25,883	413.0%	\$	25,883	413.0%
Underground Oil Switch Replacement	\$	9,695	\$	9,695	\$	25,938	\$	16,243	167.5%	\$	16,243	167.5%
Substation Circuit Breaker Replacement	\$	31,658	\$	24,552	\$	47,711	\$	16,053	50.7%	\$	23,159	94.3%
Relocation of Distribution Lines	\$	40,768	\$	40,768	\$	56,681	\$	15,913	39.0%	\$	15,913	39.0%
Cable Life Extension	\$	27,087	\$	27,087	\$	11,665	\$	(15,423)	-56.9%		(15,423)	-56.9%
Transmission Line Rating Remediation	\$	28,782	\$	28,782	\$	16,260	\$	(12,522)	-43.5%		(12,522)	-43.5%
Substation Physical Security	\$	5,791	\$	5,791	\$	17,673	\$	11,883	205.2%	\$	11,883	205.2%
Distribution Rule 20A Conversions	\$	23,694	\$	23,694	\$	13,217	\$	(10,477)	-44.2%		(10,477)	-44.2%
Distribution - Storm	\$	43,415	\$	43,415	\$	34,425	\$	(8,990)	-20.7%	\$	(8,990)	-20.7%
4kV Cutovers, Overload-Driven Cutovers	\$	26,930	\$	26,930	\$	35,290	\$	8,360	31.0%	\$	8,360	31.0%
Distribution Capital Maintenance	\$	257,568	\$	257,568	\$	249,224	\$	(8,344)	-3.2%	\$	(8,344)	-3.2%
4kV Cutovers, 4kV Substation Removal	\$	86,177	\$	86,177	\$	80,950	\$	(5,227)	-6.1%	\$	(5,227)	-6.1%
Substation Protection and Control Replacements	\$	16,632	\$	12,625	\$	21,856	\$	5,225	31.4%	\$	9,232	73.1%
Transmission Breakdown Capital Maintenance	\$	4,680	\$	4,680	\$	(306)	\$	(4,987)	-106.5%	\$	(4,987)	-106.5%
Advanced Technology	\$	15,115	\$	8,691	\$	10,380	\$	(4,735)	-31.3%	\$	1,689	19.4%
Worst Circuit Rehabilitation	\$	113,780	\$	105,028	\$	117,935	\$	4,155	3.7%	\$	12,907	12.3%
Streetlights	\$	45,178	\$	36,829	\$	48,962	\$	3,784	8.4%	\$	12,133	32.9%
Aged Pole Program	\$	24,622	\$	-	\$	20,965	\$	(3,657)	-14.9%	\$	20,965	
Transmission Overhead to Underground Conversions	\$	4,044	\$	4,044	\$	7,604	\$	3,560	88.0%	\$	3,560	88.0%
Substation Equipment Replacement Program	\$	12,653	\$	9,887	\$	9,641	\$	(3,012)	-23.8%	\$	(246)	-2.5%
Transmission and Substation Storm	\$	5,044	\$	5,044	\$	7,255	\$	2,211	43.8%	\$	2,211	43.8%
Remove Idle Facilities	\$	6,632	\$	6,632	\$	8,477	\$	1,845	27.8%	\$	1,845	27.8%
Substation Switchrack Rebuilds	\$	-	\$	-	\$	1,304	\$	1,304		\$	1,304	
Distribution Rule 20C Conversions	\$	12,920	\$	11,586	\$	11,774	\$	(1,147)	-8.9%	\$	188	1.6%

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Actual vs. Pequested Actual vs. Authorized

						-	Actual vs. F	Requested	Actual vs. A		uthorized	
Capital Category (WBS)		(a) 2015 quested	Au	(b) 2015 thorized	(c) 2015 Actual	v	(c-a) ariance	(c-a) / a Percent Variance		(c-b) riance	(c-b) / b Percent Variance	
Substation Transformer Bank Replacement	\$	73,501	\$	67,112	\$ 72,981	\$	(521)	-0.7%	\$	5,868	8.7%	
PCB Transformer Replacement	\$	1,831	\$	1,831	\$ 1,326	\$	(505)	-27.6%	\$	(505)	-27.6%	
Automatic Recloser Replacement	\$	2,456	\$	2,456	\$ 2,488	\$	32	1.3%	\$	32	1.3%	
Circuit Automation	\$	7,110	\$	7,110	\$ 7,125	\$	15	0.2%	\$	15	0.2%	
Generation Interconnection	\$	-	\$	-	\$ 7	\$	7		\$	7		
Steel Stubbing / Fiberglass Wrap (Pole Betterment)	\$	-	\$	-	\$ 2	\$	2		\$	2		
Total	\$ 1	,639,440	\$:	1,401,708	\$ 1,810,699	\$	171,260	10.4%	\$ 4	108,991	29.2%	

As shown in Table II-11, SCE's electric T&D capital expenditures underspending relative to its request in various areas totaled \$336 million and overspending in some areas totaled \$508 million resulting in a net overspending of \$171 million, or about 10.4%, overall on capital programs relative to its GRC request. When compared to the amounts authorized by the Commission, SCE overspent its authorized budget by \$409 million. The major safety programs based on actual spending include Distribution Pole Replacement, Distribution Capital Maintenance, and Pole Remediation Distribution. Figure II-2 compares SCE's requested, authorized, and actual safety-related spending for 2015 by capital program.

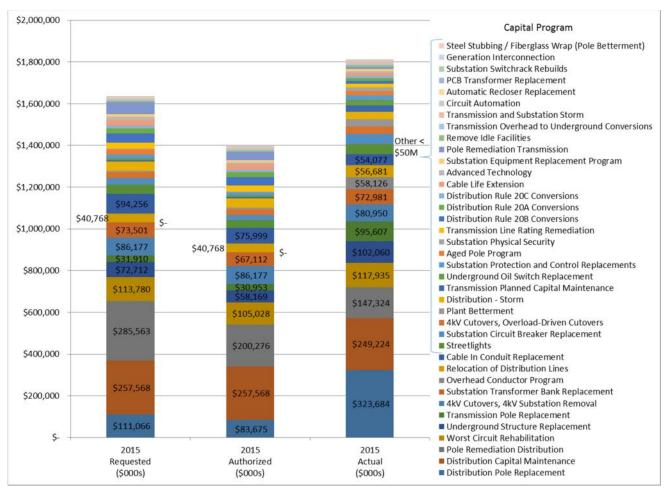


Figure II-2: 2015 Transmission and Distribution Capital Spending – Comparison by Program

II.B.1. Distribution and Transmission Pole Replacement (CET-PD-IR-DP/DL and CET-PD-IR-TR/TL)

The Distribution and Transmission Deteriorated Pole Replacement and Restoration programs combine pole inspection and remediation activities conducted in compliance with General Order (GO) 165 for distribution and transmission poles due to deterioration. Poles can also be identified for replacement based on their external condition not under the GO 165 program or based on pole loading calculations not under the GO 95 requirements. The number of inspections due any year can vary significantly depending on the ages of the poles and when the last inspections were performed. ³⁹ Costs recorded for this program are tracked in the Pole Loading Deteriorated Pole Balancing Account (PLDPBA).

SCE spent \$324 million for distribution pole replacements which was \$213 million, or 191.4%, more than their request of \$111 million for 2015 and \$240 million, or 286.8%, more than the authorized amount of \$83.7 million. SCE spent \$95.6 million for transmission pole replacements which was \$63.7 million, or 199.6%, more than their request of \$31.9 million for 2015 and \$64.7 million, or 208.9%, more than the authorized amount of \$31.0 million. In 2012, SCE spent \$105 million for distribution pole replacements and \$16.9 million for transmission pole replacements. The increase in spending for pole replacements can be attributed to increased unit costs, timing and type of inspections within the program, and changes to inspection standards.

II.B.2. Distribution and Transmission Pole Remediation (CET-PD-IR-PD and CET-PD-IR-PT)

The Pole Loading Distribution and Transmission Pole Replacement programs combine pole inspection and remediation activities that identify distribution and transmission poles for repair or replacement that do not meet safety factor requirements of GO 95 and SCE's internal design and construction standards, including wind loading in high wind areas. Costs recorded for this program are tracked in the Pole Loading Deteriorated Pole Balancing Account (PLDPBA).

SCE spent \$147 million for distribution pole remediation which was \$138 million, or 48.4%, less than their request of \$286 million and \$53.0 million, or 26.4%, less than the authorized amount of \$200 million. SCE spent \$9.57 million for transmission pole remediation which was \$48.9 million, or 83.6%, less than their request of \$58.5 million and \$31.8 million, or 76.8%, less than the authorized amount of \$41.3 million. Improvements in accuracy were made to the pole loading safety factor model in November 2015 that reduced the rate at which poles fail loading simulations. Replacements were temporarily put on hold causing fewer assessments to be completed.⁴⁰

II.B.3. Overhead Conductor Program (CET-PD-IR-OC)

The Overhead Conductor Program aims to reduce the frequency and impact of wire down events by executing proactive overhead conductor replacement projects, reactive emergency wire down work

³⁹ SCE-02 Vol 9. P. 30-54

⁴⁰ *Ibid* p. 11

during events, and reactive planned conductor work after wire down events. Historically, work was conducted in accordance with SCE's Distribution Inspection and Maintenance Program, which conducts overhead detailed inspections. The Overhead Conductor Program focuses on causes and mitigations leading to a specific strategy to address wire down risks.⁴¹

This is a new program; it was not requested in the 2015 GRC but SCE started scoping and executing work in 2015. SCE spent \$58.1 million on this program and expects to increase its spending in the future once the program is in full operation.

II.B.4. Cable in Conduit Replacement (CET-PD-IR-CC)

The Cable-in-Conduit (CIC) Replacement program replaces segments of SCE's CIC population that are approaching the end of their service life which reduces the number of in-service failures and unplanned outages.

SCE spent \$54.1 million for CIC replacements which was \$40.2 million, or 42.6%, less than their request of \$94.3 million for 2015 and \$21.9 million, or 28.8 million, less than the authorized amount of \$76 million. In 2012, SCE spent \$4.67 million for this program. SCE more than doubled their number of replacements (in conductor-miles) in 2015 compared to annual data from 2011 to 2014. However, SCE reduced the unit cost of replacements which contributed to the reduced spending.

II.B.5. Distribution Rule 20B Conversions (CET-PD-CR-2B)

This program involves the conversion of existing overhead facilities to underground facilities pursuant to CPUC Tariff Rule 20B. These projects generally arise when an entity wishes to remove lines along at least one block or 600 feet as a condition to obtain permitting from various governmental agencies. Rule 20B conversions include installing underground vaults and conduits, and placing overhead risers at each end of the conversion.⁴³

SCE spent \$14.0 million for this program which was \$29.4 million, or 67.6%, less than their request of \$43.4 million for 2015 and \$25.0 million, or 64.0%, less than the authorized amount of \$39.0 million. In 2012, SCE spent \$12.5 million. A portion of the recorded costs is collectible from the customer which reduces the impact on rates. The decrease in spending is related to a lower number of customer requests than was expected.

II.B.6. Underground Structure Replacements (CET-PD-IR-UG)

Underground structures house energized equipment, including switches, transformers, and cable splices which may run under streets and other surface structures. GO 165 requires periodic inspections of underground equipment. Results of these inspections determine whether shoring or replacement is

⁴³ SCE-02 Vol 2, p. 39-40.

⁴¹ SCE-02 Vol 8, p. 48.

⁴² *Ibid* p. 45

necessary. Shoring an underground structure is the process of supporting an existing vault or structure until it is ready to be replaced.

SCE spent \$102 million for underground structure replacements and shoring which was \$29.3 million, or 40.4%, more than their request of \$72.7 million for 2015 and \$43.9 million, or 75.5%, more than the authorized amount of \$58.2 million. In 2012, SCE spent \$6.32 million. The number of shored units (vaults and manholes) increased significantly from 75 in 2012 to 171 in 2015. The number of replaced units increased as well from 17 in 2012 to 220 in 2015. Unit costs increased by about 14% during that time. The increase in costs of replacements can be attributed to switching to the "shoe-fly" method of replacement, which removes the energized equipment from the vault and re-energizes the equipment outside of the vault before placing it back into service. This method removes much of the safety risk but requires additional traffic control and security, resulting in a higher unit cost of replacement. ⁴⁴

II.B.7. Distribution Plant Betterment (CET-PD-LG-PB)

The Distribution Plant Betterment program expenditures include distribution system upgrades that may be caused by new developments that require a single-phase circuit voltage where none exists, individual changes in load profiles that drive local low voltage problems, where new protection devices and switches are needed for safety and reliability, or new street or freeway improvements. Expenditures in this program include work required to meet anticipated load growth, neutral conductors to serve new customers, and to meet contingency scenarios.

SCE spent \$35.3 million, which was \$27.2 million, or 340.0%, more than their request and authorized amount of \$8.01 million for 2015. In 2012, SCE spent \$7.94 million for this program. Expenditures increased due to the inclusion of upgrades completed to meet regional needs identified by districts throughout the SCE service territory, upgrades to the Long Beach secondary network system after the downtown area experienced long outage durations in 2015 including the installation of vault cover restraints, and work similar to the Overhead Conductor Program before SCE officially created the program. ⁴⁶

II.B.8. Transmission Planned Capital Maintenance (Multiple WBS Elements)

Transmission Planned Capital Maintenance along with Breakdown or Reactive Capital Maintenance form the Transmission Capital Maintenance program, which includes the costs to remove, replace, and retire assets on a programmatic or reactive basis. Planned transmission capital maintenance is driven by inspection results or infrastructure replacement activities. In 2013, SCE initiated its Transmission

⁴⁴ SCE-02 Vol 5, p. 37.

⁴⁵ SCE-02 Vol 03R, p. 35.

⁴⁶ *Ibid.* p. 58-59.

Infrastructure Replacement program, which programmatically identifies capital maintenance work for items such as conductor and switch replacements using grid and/or engineering analyses.⁴⁷

SCE spent \$32.2 million for this program, which was \$25.9 million, or 413.0%, more than their request and authorized amount of \$6.27 million for 2015. In 2012, SCE spent \$5.83 million. SCE implemented a new planned capital maintenance approach in 2013 that increased the number of maintenance items addressed in this category. SCE expanded its focus from items that needed immediate replacement to replacement items resulting from inspection activities. Increased costs in 2015 were sustained by replacements of underground cable that have high material costs.⁴⁸

II.B.9. Underground Oil Switch Replacement (CET-PD-IR-SR)

The Underground Oil Switch Replacement Program replaces oil-filled switches in underground structures which are approaching the end of their service lives. Switches are used in the distribution system for opening and closing electrical circuit connections. Inspections are conducted pursuant to GO 165 to identify potential switch failures which could result in property damage and injuries from violent explosions.

The number of switches replaced from 2012 to 2015 decreased from 269 to 232 however the spending increased from \$9.80 million to \$25.9 million. ⁴⁹ SCE's spent \$16.2 million, or 167.5%, more than their request and authorized amount of \$9.70 million. The increase in spending is due to an increase in unit costs due to the need to perform additional work to expand the size of the underground structure to accommodate the larger switch replacements.

II.B.10. Substation Physical Security (CET-ET-IR-ME)

Substation Physical Security includes the measures to protect substations against physical attacks from terrorism, theft, and vandalism. Some examples are block walls to prevent access and to conceal visibility of substation assets, alarms, improved gates and walls to deter break-ins, and threat detection systems.

SCE spent \$17.7 million for this program which was \$11.9 million, or 205.2%, more than their request of \$5.79 million and \$23.2 million, or 94.3%, more than the authorized amount of \$24.6 million. SCE did not record costs for this capital program from 2011 to 2013. The increase in spending is due to SCE's response to security issues identified after filing the 2015 GRC. SCE developed a copper theft program to respond to several break-ins from 2013 to 2014 and selected facilities received security enhancements which included high security fencing and improved lighting. In 2014, the North American Electric Reliability Corporation (NERC) developed physical security regulations to require utilities to protect critical substations from attack that could cause widespread outages in the electrical system.

⁴⁷ SCE-02 Vol 07, p. 10

⁴⁸ *Ibid*, p. 12

⁴⁹ SCE-02 Vol 8, p. 53.

SCE responded by initiating physical security enhancements to four out of seven substations identified in its system evaluation. These enhancements included improvements to walls, reinforcement of gates, concealment of key assets, and improvements to technical security to detect threats and improve threat response.

II.C. Electric Transmission and Distribution Balancing Accounts

The CPUC authorized the use of several balancing accounts to track differences between recorded and authorized expenses and capital costs.

Pole Loading and Deteriorated Pole Programs Balancing Account (PLDPBA)

SCE's Pole Programs are comprised of the Pole Loading Program and the Deteriorated Pole Program. In the 2015 GRC Decision, the Commission authorized establishing the two-way PLDPBA effective January 1, 2015 that records the difference between: (1) recorded capital-related revenue requirements for the Pole Loading and the Deteriorated Pole programs which includes depreciation, taxes, and return on rate base, (2) operating expenses incurred for pole loading inspections, repairs and replacements within the Pole Loading program including payroll taxes⁵⁰, and (3) the authorized Pole Programs revenue requirement as adopted in D. 15-11-021. Any variance in spending effectively adjusts the authorized spending level and is reconciled through rates.

The PLDPBA enables SCE to match recorded cost items to authorized cost items. Expenses tracked in the PLDPBA include GRC Activities Distribution Pole Repairs and Distribution Pole-Related Expense (Account 583.125), Transmission Pole Repairs and Transmission Pole-Related Expense (Account 571.125), Pole Loading Program Transmission (Final Cost Center F529107 of Transmission Pole Assessments [Account 566.125]), Pole Loading Program Costs (Summary Final Cost Center of Distribution Pole Assessments [Account 583.125]), and the portion of Joint Pole Organization (Account 583.125) costs related to the Poles Program. SCE recorded \$20.0 million in eligible O&M safety-related expenses tracked in the PLDPBA compared to an authorized amount of \$36.9 million, excluding payroll taxes. The underspending of approximately \$16.9 million should be removed from the total T&D expense variance and added to the 2015 requested amount.

Capital expenditures related to safety that contribute to the capital-related revenue requirement tracked in the PLDPBA include Pole Loading Distribution Pole Replacements (CET-PD-IR-PD), Pole Loading Transmission Pole Replacements (CET-PD-IR-PT), Distribution Deteriorated Pole Replacement and Restoration (CET-PD-IR-DP and CET-PD-IR-DL), and Transmission Deteriorated Pole Replacement and Restoration (CET-PD-IR-TR and CET-PD-IR-TL). SCE recorded \$576 million in eligible capital expenditures tracked in the PLDPBA compared to the authorized spending of \$356 million. The overspending

⁵⁰ Recorded expenses exclude results sharing, pensions, and other benefits because these items are recorded in separate memorandum or balancing accounts.

⁵¹ See SCE Preliminary Statement J., Pole Loading and Deteriorated Pole Programs Balancing Account.

associated with the PLDPBA capital expenditures totals approximately \$220 million and should be removed from the total T&D capital difference and added to the 2015 requested amount.

Safety and Reliability Investment Incentive Mechanism (SRIIM)

Effective January 1, 2015, the SRIIM tracks the difference between: (1) actual safety and reliability-related capital additions and (2) the authorized level of safety and reliability-related capital additions in D. 15-11-021 with the caveat that any spending in excess of authorized funding will not be recovered from ratepayers. The SRIIM compares spending for the following programs: Cable-in-Conduit Replacement, Underground Structure Replacement, Underground Oil Switch Replacement, Substation Circuit Breaker Replacement, Cable Life Extension, Worst Circuit Rehabilitation, and Substation Transformer Bank Replacement. SCE recorded \$432 million in expenditures tracked in the SRIIM compared to the authorized spending of \$368 million. Since SCE overspent on programs tracked in this mechanism, no adjustment should be made to the difference totals.

Catastrophic Event Memorandum Account (CEMA)

In the CEMA, SCE records costs associated with restoring service or facilities and complying with governmental orders.⁵³ Certain costs related to bark beetle mitigation and drought totaling \$13,172,000 were transferred to this account and may be recovered upon approval of the Commission.

Fire Hazard Prevention Memorandum Account

SCE records costs related to vegetation management and fire prevention activities to reduce the risk of fire. ⁵⁴ A total of \$162,000 was transferred to this account and may be recovered upon Commission approval.

⁵² See SCE Preliminary Statement LL, Safety and Reliability Investment Incentive Mechanism (SRIIM)

⁵³ See SCE Preliminary Statement N.4, Catastrophic Event Memorandum Account (CEMA)

⁵⁴ See SCE Preliminary Statement N.53 Fire Hazard Prevention Memorandum Account

III. Electric Generation

The spending category of Electric Generation includes the generation of electric power from various sources and the operation and maintenance of generating facilities. In response to Energy Division discovery, SCE identified six electric generation safety-related expense categories and ten electric generation safety-related capital expenditure categories for 2015. The Other Catalina Capital program received zero authorized funding; however SCE spent \$5.5 million on this program, and thus the program was retained in this analysis.

In 2015, SCE requested funding of \$147 million in expenses and \$129 million in capital expenditures for safety-related spending for electric generation activities (see Table II-1). The Commission approved \$146 million for expenses and \$126 million for capital, or approximately 99.0% and 97.7% of SCE's request, respectively. SCE spent \$111 million on expensed items, which was \$36 million, or 24.7%, less than their request and \$35 million, or 24.0%, less than the authorized amount. SCE spent \$147 million on capital expenditures, which was \$18 million, or 14.0%, more than their request and \$21 million, or 16.6%, more than the authorized amount.

Actual vs. Requested Actual vs. Authorized (a) (b) (c-b) / b (c) (c-a) / a (c-a) (c-b) 2015 2015 2015 **Percent Percent** Variance Variance Requested **Authorized Actual** Variance **Variance Expense Safety Program** \$ 145,723 \$110,780 \$ (36,429) \$ (34,943)-24.0% \$ 147,209 -24.7% **Capital Safety Program** \$ 128,877 125,948 \$146,896 18,019 14.0% 20,948 16.6%

Table III-1: 2015 Electric Generation Expense and Capital (\$000s)

III.A. Electric Generation Expense

Overview

Of the six expense GRC Activities identified by SCE as relating to safety or risk, one activity was selected for further review based on application of the expense selection criteria: (1) Mountainview Generating Station (Mountainview) – Maintenance (Account 554), which was underspent by \$28.7 million, or 69.9%. Section III.a.1 discusses Mountainview expenses in detail.

Table III-2 lists the electric generation GRC Activities relating to safety and their corresponding requested, authorized and actual amounts for 2015. The table is sorted by spending variance. Mountainview is shown in the top row with a variance of \$28.7 million, Maintenance of Misc. Hydraulic Plant is shown second with a variance of \$7.1 million, and so on.

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Table III-2: 2015 Electric Generation Expense Spending (\$000s)

					Actual vs. F	Requested	Actual vs. A	Authorized
Activity Description	GRC Account	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(c-b) / b Percent Variance
Mountainview	554	\$41,084	\$40,750	\$12,363	(\$28,721)	-69.9%	(\$28,387)	-69.7%
Maintenance of Misc. Hydraulic Plant	545	\$17,000	\$16,984	\$9,933	(\$7,067)	-41.6%	(\$7,051)	-41.5%
Palo Verde	524	\$77,928	\$77,798	\$79,681	\$1,753	2.2%	\$1,883	2.4%
Gas Turbine Peaker	554	\$4,283	\$4,104	\$2,539	(\$1,744)	-40.7%	(\$1,565)	-38.1%
Solar Photovoltaic Program	549	\$2,308	\$1,481	\$1,666	(\$642)	-27.8%	\$185	12.5%
Catalina Generation - Operations & Maintenance of Generation Facilities	549.140	\$4,606	\$4,606	\$4,598	(\$8)	-0.2%	(\$8)	-0.2%
Total		\$147,209	\$145,723	\$110,780	(\$36,429)	-24.7%	(\$34,943)	-24.0%

As shown in Table III-2, SCE's electric generation expense underspending relative to its request in various areas totaled \$38.2 million and overspending in some areas totaled \$1.8 million resulting in a net underspending of \$36.4 million, or 24.7%, relative to its GRC request. When compared to the amounts authorized by the Commission, SCE underspent its authorized budget by \$34.9 million. The major safety activities based on recorded spending include Palo Verde (Account 524), Moutainview (Account 554), and Maintenance of Misc. Hydraulic Plant (Account 545). Figure III-1 compares SCE's requested, authorized, and actual safety-related generation expense spending for 2015 by GRC Activity. Actual expense data for 2012 is presented in the discussion sections below to provide insight into the level of spending for 2015. The year was chosen because it was the Test Year of the 2012 GRC.

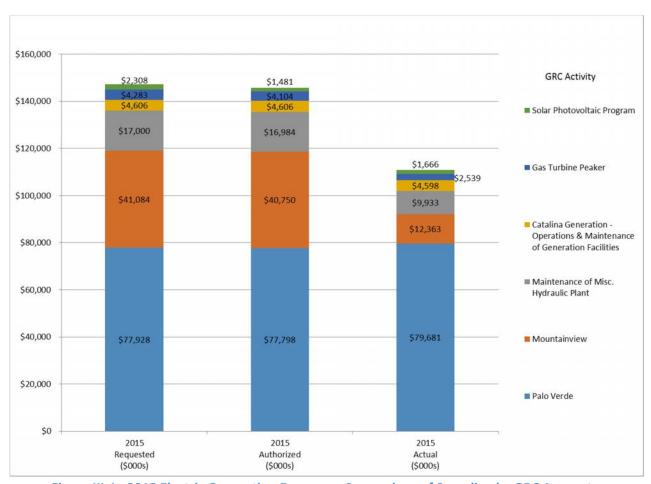


Figure III-1: 2015 Electric Generation Expense – Comparison of Spending by GRC Account

III.A.1. Mountainview - Maintenance (Account 554)

Mountainview – Maintenance includes all labor, non-labor and other expenses associated with the maintenance and repair of the facility. Other expenses include a Contract Service Agreement (CSA) with General Electric to provide operations support, maintenance services, and warranty coverage for the plant's turbine generators. Four activities are tracked within this account.

Maintenance Supervision and Engineering includes all labor and non-labor expenses for the general supervision, direction, and engineering of support maintenance activities. Maintenance of Structures includes labor and non-labor expenses required to maintain and repair structures such as offices, control rooms, shops, garages and improvements to grounds. Maintenance of Generating and Electric Plant includes labor, non-labor and other expenses to maintain and repair generating equipment, including costs of the CSA. Maintenance of Miscellaneous Other Power Generation Plant includes labor and non-labor expenses to maintain and repair power plant auxiliary equipment.

SCE testimony summarizes the expense items included in this account and shows actual costs from 2011 and 2015. Table III-3 compares the actual spending between 2012 and 2015. Totals may not tie to data presented in the workpapers.

GRC Activity	2012 Actual	2015 Actual	Variance
Maintenance Supervision and Engineering	\$631	\$469	(\$162)
Maintenance of Structures	\$575	\$405	(\$170)
Maintenance of Generating and Electric Plant	\$18,591	\$10,470	(\$8,121)
Miscellaneous Other Power Generation Plant	\$2,335	\$1,019	(\$1,316)
Total	\$22.132	\$12.363	(\$9,769)

Table III-3: Mountainview – Maintenance Activities⁵⁵ (\$000s)

SCE spent \$12.4 million for this activity which was \$28.7 million, or 69.9%, less than their request of \$41.1 million and \$28.4 million, or 69.7%, less than the authorized amount of \$40.8 million. SCE's reduced spending can be attributed to the drop in CSA costs due to renegotiation of the CSA, labor savings resulting from a departmental reorganization, and a decrease in equipment repairs. ⁵⁶

III.B. Electric Generation Capital Spending

Overview

Two programs in the generation category of capital expenditures were selected based on application of the capital selection criteria. The two programs are: (1) Mountainview Generating Station (Mountainview) (See Section III.B.1), which was overspent by \$73.8 million, or 6,482.8% and (2) Hydroelectric (Hydro) Generating Facilities – Electrical Equipment (See Section III.B.2), which was underspent by \$35.8 million, or 93.7%.

Table III-4 lists the generation capital programs relating to safety and their corresponding requested, authorized and actual amounts for 2015. The table is sorted by variance of absolute dollar value spending. Mountainview Capital Projects is shown in the top row with a variance of \$73.8 million, Electrical Equipment is shown second with a variance of \$35.8 million, and so on.

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⁵⁵ See SCE-05 Vol. 4, Book A, Workpapers, p. 30-32

⁵⁶ SCE-05 Vol 4, p. 2-3

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Table III-4: 2015 Electric Generation Capital Spending (\$000s)

				Actual vs.	Requested	Actual vs.	Authorized
Capital Category (WBS)	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(c-b) / b Percent Variance
Mountainview Capital Projects	\$1,139	\$1,139	\$74,978	\$73,839	6482.8%	\$73,839	6482.8%
Electrical Equipment	\$38,256	\$38,256	\$2,426	(\$35,830)	-93.7%	(\$35,830)	-93.7%
Dams & Waterways	\$31,151	\$31,151	\$11,443	(\$19,708)	-63.3%	(\$19,708)	-63.3%
Relicensing	\$8,984	\$8,984	\$3,713	(\$5,271)	-58.7%	(\$5,271)	-58.7%
Palo Verde Capital Projects	\$31,829	\$31,829	\$36,940	\$5,111	16.1%	\$5,111	16.1%
Other Catalina Capital	\$2,929	\$0	\$5,455	\$2,526	86.2%	\$5,455	
Prime Movers	\$7,152	\$7,152	\$4,708	(\$2,444)	-34.2%	(\$2,444)	-34.2%
Structures and Grounds	\$3,329	\$3,329	\$5,656	\$2,327	69.9%	\$2,327	69.9%
Peakers Capital Projects	\$3,065	\$3,065	\$950	(\$2,115)	-69.0%	(\$2,115)	-69.0%
Solar Photovaltaic Program	\$1,043	\$1,043	\$627	(\$416)	-39.9%	(\$416)	-39.9%
Total	\$128,877	\$125,948	\$146,896	\$18,019	14.0%	\$20,948	16.6%

As shown in Table III-4, SCE's electric generation capital expenditures underspending relative to its request in various areas totaled \$65.8 million and overspending in some areas totaled \$83.8 million resulting in a net overspending of \$18 million, or about 14.0%, overall on capital programs relative to its GRC request. When compared to the amounts authorized by the Commission, SCE overspent its authorized budget by \$20.9 million. The major safety programs based on recorded spending include Mountainview Capital Projects, Palo Verde Capital Projects, and Hydro Generation Facilities – Dams and Waterways. Figure III-2 compares SCE's requested, authorized, and actual safety-related spending for 2015 by capital program.

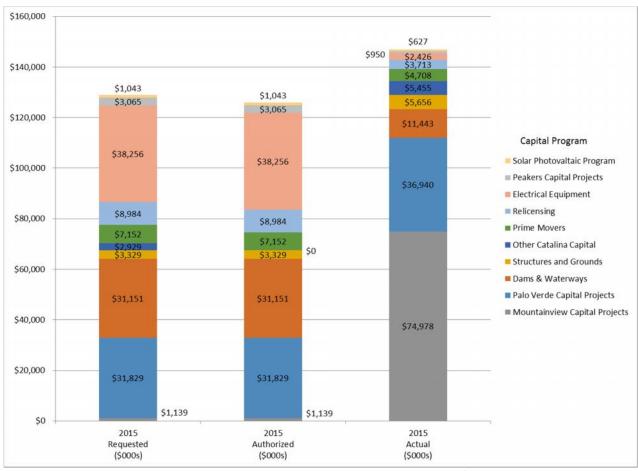


Figure III-2: 2015 Electric Generation Capital Spending - Comparison of Spending by Program

III.B.1. Mountainview Capital Projects

This program includes projects for compliance with safety and environmental objectives, and projects to sustain station reliability. Mountainview is a 1,050-MW combined-cycle electric power generating facility located 90 miles east of Los Angeles in Redlands, CA. In 2015, SCE incurred significant capital costs from two projects. First, the Advanced Gas Path (AGP) and Dry Low NOx 2.6 (DLN) Combustion Turbine Upgrades were implemented as part of the renegotiated CSA to reduce major maintenance overhauls and improve plant performance, while complying with the plant's air emissions permit limits. The second capital expenditure was the purchase of a replacement rotor for the Unit 3B gas combustion

turbine intended as an immediate replacement for a stub shaft used to repair the damaged original 3B rotor. However, the replacement rotor was not installed in 2015 and remains in storage on site for eventual installation in 2020. These projects were not anticipated when SCE prepared its 2015 GRC. ⁵⁷

SCE spent \$75.0 million for this program which was \$73.8 million, or 6,482.8%, greater than their request and authorized amount of \$1.1 million in 2015. The 2015 actual costs for the unanticipated capital expenditures were \$55.602 million for the AGP/DLN CT Upgrade and \$18.0 million for the 3B CT Replacement Rotor, which contributed to the significant variance in costs.

III.B.2. Hydro Generating Facilities - Electrical

SCE electrical projects for hydro generating facilities include substation replacements, powerhouse transformer replacements, and powerline replacements for power and control circuits to reservoirs. SCE spent \$2.4 million for this program which was \$35.8 million, or 93.7%, less than their request and authorized amount of \$38.3 million. SCE's reduced spending can be attributed to SCE's re-evaluation of its approach to managing assets and to project delays. For example, SCE decided to transfer management of three substation refurbishment projects (Lee Vining, Minaret, and Casa Diablo) from the Generation Department to SCE's T&D organization. The Generation Department's scope of the projects was consequently reduced resulting in an underspending of \$24.6 million. Additional delays and cost under-runs of numerous other projects account for the remainder of the underspending. ⁵⁸

⁵⁷ *Ibid*, p. 3-4.

⁵⁸ SCE-05 Vol. 3, p. 7-8.

IV. **Other Safety-Related Programs**

Other safety-related programs encompass activities within the IT, Operational Services, and A&G Operating Units. The IT Operating Unit includes costs for O&M, hardware, and capital software projects. SCE identified five of the categories within the Operational Services Operating Unit as relating to safety or risk: (1) Business Resiliency, (2) Corporate Environmental, (3) Corporate Real Estate, (4) Corporate Safety, and (5) Corporate Security. A sixth program – Supply Management and Supplier Diversity – was not identified as relating to safety or risk. SCE's safety-related spending within the A&G Operating Unit consists of costs for corporate communications and local public affairs. Other divisions within the A&G Operating Unit include ethics and compliance, financial services and Enterprise Risk Management, workers compensation and other laws, and insurance.

SCE reorganized its IT department after the utility filed its 2015 GRC leading it to record O&M expenses for this new structure in 2015 that were not included in the 2015 authorized amount. In addition, SCE transferred into the IT category the IT O&M expenses that were previously included as components of broader GRC activities and outside of IT. 59 Consequently, authorized vs. recorded costs are not directly comparable. Thus, the IT expense activities (Grid Services and Business Integration & Delivery) are excluded in the comparison.

In response to Energy Division discovery, SCE identified 13 other safety-related expense categories 60 and 30 other safety-related capital programs for 2015. SCE identified several capitalized software programs that were consolidated into one program for this report. Nine programs show zero requested, authorized and actual funding for 2015. As a result, 17 programs were evaluated in this report.

In 2015, SCE requested funding of \$154 million in expenses and \$383 million in capital expenditures for other safety-related activities (see Table II-1). The Commission approved \$147 million for expenses and \$354 million for capital, or 95.2% and 92.3% of SCE's request, respectively. SCE spent \$118 million on expensed items, which was \$36.5 million, or 23.7%, less than their request and \$29.1 million, or 19.9%, less than the authorized amount. SCE spent \$329 million on capital expenditures, which was \$54.3 million, or 14.2%, less than their request and \$24.9 million, or 7.0%, less than the authorized amount.

Table IV-1: 2015 Other Safety-Related Expense and Capital Spending (\$000s)

				Actual vs.	Requested	Actual vs.	Authorized
	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(c-b) / b Percent Variance
Expense Safety Program*	\$154,000	\$146,644	\$117,511	(\$36,489)	-23.7%	(\$29,133)	-19.9%
Capital Safety Program	\$383,338	\$353,988	\$329,039	(\$54,299)	-14.2%	(\$24,949)	-7.0%

^{*}Excludes \$61,497,000 SCE spent in 2015 for IT – Grid Services and IT – Business Integration and Delivery

⁵⁹ SCE-04 Vol. 1 p. 14.

⁶⁰ Seismic Mitigation was not requested in the 2015 GRC.

IV.A. Other Expense

Overview

Application of the expense metrics resulted in the selection of two other safety-related expense items: (1) Corporate Security (Account 920-921-923, see Section IV.A.1), which was underspent by \$16.0 million, or 37.4% and (2) Corporate Real Estate – Administrative and General (Account 920-921, see Section IV.A.2), which was underspent by \$11.8 million, or 42.4%.

Table IV-2 lists the other safety-related GRC Activities and their corresponding requested, authorized and actual amounts for 2015. The table is sorted by variance in the absolute dollar spending. Corporate Security is shown in the top row with a variance of \$16.0 million, Corporate Real Estate – A&G is shown second with a variance of \$11.8 million, and so on.

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Table IV-2: 2015 Other Safety-Related Expense Spending (\$000s)

					Actual vs. I	Requested	Actual vs. A	Authorized
Activity Description	GRC Activity	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(c-b) / b Percent Variance
Business Integration & Delivery	920-921	N/A See SCE-04, Vol. 1, pp. 14-15 for discussion	N/A See SCE-04, Vol. 1, pp. 14-15 for discussion	\$31,970				
Grid Services	920-921	N/A See SCE-04, Vol. 1, pp. 14-15 for discussion	N/A See SCE-04, Vol. 1, pp. 14-15 for discussion	\$29,527				
Corporate Security	920-921-923	\$42,950	\$42,950	\$26,906	(\$16,044)	-37.4%	(\$16,044)	-37.4%
Corporate Real Estate - A&G	920-921	\$27,896	\$25,812	\$16,062	(\$11,834)	-42.4%	(\$9,750)	-37.8%
Corporate Real Estate - Maintenance	935	\$11,499	\$12,548	\$16,858	\$5,359	46.6%	\$4,310	34.3%
Local Public Affairs	920-921	\$14,193	\$13,744	\$8,845	(\$5,348)	-37.7%	(\$4,899)	-35.6%
Cybersecurity & Compliance	920-921	\$20,240	\$18,512	\$14,936	(\$5,304)	-26.2%	(\$3,576)	-19.3%
Corporate Communications - Communications Products	930	\$11,882	\$7,738	\$7,133	(\$4,749)	-40.0%	(\$605)	-7.8%
Business Resiliency	920-921	\$4,010	\$4,010	\$6,230	\$2,220	55.4%	\$2,220	55.4%
Field Facility Maintenance - CRE	580.282	\$11,090	\$11,090	\$10,314	(\$776)	-7.0%	(\$776)	-7.0%
Corporate Health & Safety	925	\$5,573	\$5,573	\$5,053	(\$520)	-9.3%	(\$520)	-9.3%
Substation Facility Maintenance - CRE	566.282	\$4,667	\$4,667	\$5,174	\$507	10.9%	\$507	10.9%
Total		\$154,000	\$146,644	\$117,511	(\$36,489)	-23.7%	(\$29,133)	-19.9%

As shown in Table IV-2, SCE's other safety-related expense underspending relative to its request in various areas totaled \$44.6 million and overspending in some areas totaled \$8.1 million resulting in a net underspending of \$36.5 million, or about 23.7%, relative to its GRC request. When compared to the amounts authorized by the Commission, SCE underspent its authorized budget by \$29.1 million. The major safety activities based on recorded spending include Corporate Security (Account 920-921-923), Corporate Real Estate – Maintenance (Account 935), and Corporate Real Estate – A&G (Account 920-921). Figure IV-1 compares SCE's requested, authorized, and actual safety-related other expense spending for 2015 by GRC Activity.

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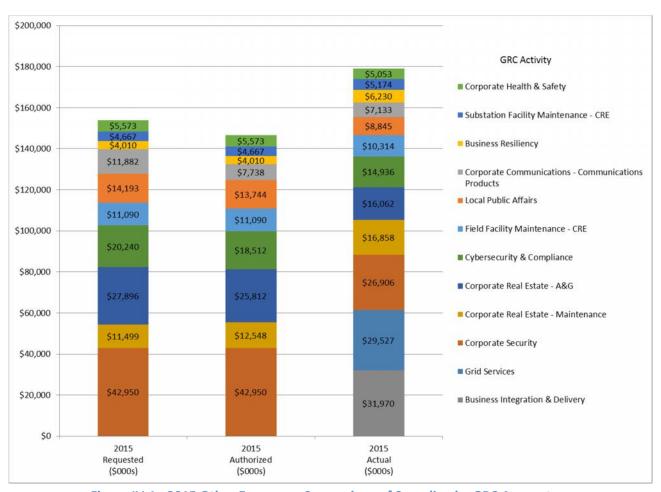


Figure IV-1: 2015 Other Expense – Comparison of Spending by GRC Account

IV.A.1. Corporate Security (Account 920-921-923)

Corporate Security includes expenses of SCE personnel as well as consultant services engaged in security activities such as background investigations, security management, maintenance of security systems, training, etc.

SCE spent \$26.9 million for this activity in 2015 which was \$16.0 million, or 37.4%, less than their request and authorized amount of \$43 million. SCE's underspending can be attributed primarily to the utility's decision not to proceed with implementing various workplace security and grid protection

improvements projects such as the addition of metal detectors and X-ray scanning devices at multiple locations. The decision was made after completing pilot studies at two sites that suggested the equipment made little improvement in perceived security and that workplace violence prevention and related training programs may be a more effective alternative.⁶¹

SCE increased the presence of contract security officers at several facilities – an action which has been received positively. Since 2012, SCE's spending in this account increased from \$15.6 million to \$26.9 million. The increased cost of security deployments accounts for much of the \$11.3 million increase in spending. It is possible that SCE would have exceeded its request in 2015 if the utility had put in place the security projects included in its 2015 GRC.⁶²

IV.A.2. Corporate Real Estate - Administrative and General (Account 920-921)

Corporate Real Estate – A&G includes expenses for strategic planning, planned preventative facilities maintenance services, and management of capital projects. This account includes labor expenses as well as facility planning and long-range planning consultant services. SCE's spending in this account decreased from \$17.6 million in 2012 to \$16.1 million in 2015 mostly due to a reduction in staff, renegotiation of a janitorial contract, and reduced consultant fees. SCE's spending was \$11.8 million, or 42.4%, less than the requested amount of \$27.9 million and \$9.8 million, or 37.8%, less than the authorized amount of \$25.8 million. The reduced spending can be attributed to the fluctuations in recorded costs and the use of the three year average in the 2015 GRC which may not have captured the downward trend of recorded costs.

IV.B. Other Capital

Overview

Application of the capital metrics resulted in the selection of one program out of the seventeen evaluated in this report. Hardware – Servers and Storage was underspent by \$40.1 million, or 63.4%. Table IV-3 lists the other safety-related capital programs and their corresponding requested, authorized and actual amounts for 2015. The table is sorted by spending variance. Hardware – Servers and Storage is shown in the top row with a variance of \$40.1 million, Hardware – Grid Services and Telecomm is shown second with a variance of \$17.0 million, and so on.

⁶¹ SCE-07 Vol 5, p. 7

⁶² SCE Workpapers SCE-07 Vol 5. p. 36-39

⁶³ SCE-02 Vol 3, p. 27-28

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Table IV-3: 2015 Other Safety-Related Capital Spending (\$000s)

				Actual vs. F	Requested	Actual vs. A	uthorized
Capital Category (WBS)	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(c-b) / b Percent Variance
Hardware - Servers & Storage	\$63,199	\$61,637	\$23,122	(\$40,077)	-63.4%	(\$38,515)	-62.5%
Hardware - Grid Services & Telecomm	\$48,217	\$35,146	\$31,212	(\$17,005)	-35.3%	(\$3,934)	-11.2%
Software - Cybersecurity & Compliance	\$187,551	\$185,286	\$173,266	(\$14,285)	-7.6%	(\$12,020)	-6.5%
Capital Maintenance	\$20,912	\$18,922	\$34,649	\$13,737	65.7%	\$15,727	83.1%
Vehicle Maintenance Facility Modernization Program	\$5,228	\$2,339	\$0	(\$5,228)	-100.0%	(\$2,339)	-100.0%
Various Major Structure	\$7,842	\$7,842	\$10,755	\$2,913	37.1%	\$2,913	37.1%
Physical Security Systems - Non-Electric	\$7,439	\$7,439	\$10,108	\$2,669	35.9%	\$2,669	35.9%
Physical Security Systems - Electric	\$2,300	\$2,300	\$0	(\$2,300)	-100.0%	(\$2,300)	-100.0%
Hardware - End User Computing, Data & Voice	\$24,807	\$24,807	\$26,703	\$1,896	7.6%	\$1,896	7.6%
Irvine Operations Center Upgrade	\$2,091	\$2,091	\$205	(\$1,886)	-90.2%	(\$1,886)	-90.2%
Menifee Service Center Site Access	\$0	\$0	\$1,764	\$1,764		\$1,764	
Camp Edison Buildings	\$0	\$0	\$1,727	\$1,727		\$1,727	
Service Center Modernization Program	\$10,456	\$3,167	\$11,848	\$1,392	13.3%	\$8,681	274.1%
On-Going Furniture Modifications	\$2,982	\$2,698	\$2,139	(\$843)	-28.3%	(\$559)	-20.7%
SCE ERGO Equipment	\$314	\$314	\$857	\$543	172.9%	\$543	172.9%
Well Decommissioning Program	\$0	\$0	\$452	\$452		\$452	
Alhambra Grid Operations Center	\$0	\$0	\$232	\$232		\$232	
Total	\$383,338	\$353,988	\$329,039	(\$54,299)	-14.2%	(\$24,949)	-7.0%

As shown in Table IV-3, SCE's other safety-related capital expenditures underspending relative to its request in various areas totaled \$81.6 million and overspending in some areas totaled \$27.3 million resulting in a net underspending of \$54.3 million, or about 14.2%, overall on other capital programs relating to safety. When compared to the amounts authorized by the Commission, SCE underspent its authorized budget by \$24.9 million. The major safety programs based on recorded spending include Software – Cybersecurity and Compliance, Capital Maintenance, and Hardware – Grid Services and Telecomm. Figure IV-2 compares SCE's requested, authorized, and actual safety-related other spending for 2015 by capital program.

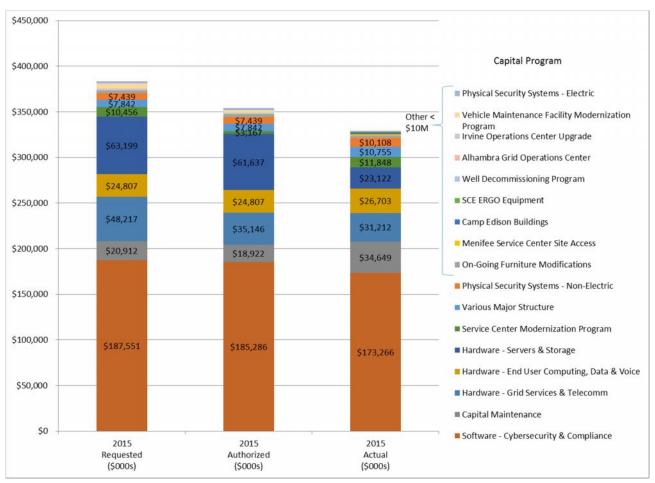


Figure IV-2: 2015 Other Capital – Comparison of Spending by Program

IV.B.1. Hardware - Servers and Storage

Servers and Storage include the use of mainframe servers, midrange servers, disk and tape storage and other items. Mainframe servers are powerful computers used for critical business applications and work flow systems integral to SCE's business operations. Midrange servers consist of the hardware and associated operating software supporting the majority of SCE's application portfolio including SAP Enterprise Resource Planning, Edison SmartConnect®, and Outage Management System. Disk and tape

storage is the computer data storage medium designed for enterprises with requirements for high scalability, reliability, and fault tolerance.⁶⁴

SCE spent \$23.1 million for this program in 2015 which was \$40.1 million, or 63.4%, less than their request of \$63.2 million and \$38.5 million, or 62.5%, less than the authorized amount of \$61.6 million. SCE's underspending can be attributed to less spending on midrange servers. IT resources were temporarily assigned to support the IT transition to a managed services operating model. In addition, physical servers were transitioned to virtualized instances on converged infrastructure, which reduced the need to purchase server hardware. Spending on disk and tape storage was reduced due to the consolidation of storage systems and a change in disk and tape storage technologies. ⁶⁵

⁶⁴ SCE-04 Vol 1, p. 68-76

⁶⁵ SCE-04 Vol. 1 p. 16-17

Appendix A

SCE Risk Informed Planning Process and Risk Evaluation Methodology⁶⁶

 $^{^{\}rm 66}$ See SCE 2018 GRC Exhibit SCE-01 workpapers.

		Other (e.g. Customer Expectation)							×	×		×	×		×		×				×				×	
sis									×			*	×		*		*				*				×	
isk Analys		Financial	×	×	×	×	×	×	×	×	×		×	×	×	×	×	×	×	×	×	х	×	х	×	×
rt of T&D F	Impact Dimensions	Compliance													×		×						×	х		
Evaluated as part of T&D Risk Analysis	Impact Di	Environmental			×	×	×							×				×		×		х	х	х		
		Service Reliability	x	×	×	×	×	×	x	×				×	×	х	x	×	×	×	×	x	×	x	×	×
	Ī	Safety	×	×	×	×	×	×	х	×	×			×	×	×	×	×	×	×		х	×	х	×	×
		Outcome 5			Property damage	Freeway/road closure	Freeway/road closure							Property damage				Property damage		Property damage		Property damage	Worker injury/fatality			
	f it occurs	Outcome 4	Outage	Outage	Outage	Public injury/fatality	Public injury/fatality		Customer dissatisfaction	Customer dissatisfaction				Outage		Property damage		Outage		Outage		Outage	Regulatory fines	Regulatory fines		
	Potential effect of risk event if it occurs	Outcome 3	Worker injury/fatality	Worker injury/fatality	Wildfire	Property damage	Property damage		Wildfire	Outage	Operational or business disruption			Wildfire		Worker injury/fatality		Wildfire		Wildfire	Customer dissatisfaction	Wildfire	Property damage	Leakage/spills	Customer dissatisfaction	Worker injury/fatality
	Potential eff	Outcome 2	Public injury/fatality	Public injury/fatality	Worker injury/fatality	Wildfire	Wildfire	Outage	Worker injury/fatality	Worker injury/fatality	Customer dissatisfaction			Worker injury/fatality	Customer dissatisfaction	Public injury/fatality		Worker injury/fatality	Curtailment	Worker injury/fatality	Curtailment	Worker injury/fatality	Outage	Worker injury/fatality	Curtailment	Public injury/fatality
TO RISK		Outcome 1	Operational or business disruption	Operational or business disruption	Public injury	Outage	Outage	Worker injury/fatality	Outage	Public injury/fatality	Public injury/fatality	Customer dissatisfaction	Customer dissatisfaction	Public injury/fatality	Operational or business disruption	Outage	Operational or business disruption	Public injury/fatality	Outage	Public injury/fatality	Outage	Public injury/fatality	Leakage/spills	Outage	Outage	Outage
S IN 2018 GRC REQUEST TO RISK		Event (risk incident the activity is expected to mitigate)	9	9	In-service failure of overhead and underground distribution equipment	Vegetation grows or blows into line	In-service failure of overhead and underground distribution equipment	In-service failure of overhead and underground distribution equipment	Equipment failure	Inadequate response to outage event or customer problem	Equipment failure results in inadequate lighting for pedestrians	Inability to respond to customer requests in a timely manner	Failure to meet service guarantees	Equipment failure	Inability to respond to customer requests in a timely manner	Structure failure	Inability to fulfill compliance reporting brequirements	Equipment failure	Inability to perform grid control functions	Equipment failure	Inability to perform grid control functions	Equipment failure	Failure of AA and A bank transformers	Failure of circuit breakers >115kV	Failure of TPU	Lack of adherence to construction standards or recordkeeping
018 GR		Category	Non-Asset	Non-Asset	Asset	Asset	я	Asset	Asset	Non-Asset o	Asset ir	Non-Asset	Non-Asset	Asset	Non-Asset	Asset	Non-Asset	Asset	Non-Asset	Asset	Non-Asset	Asset	Asset	Asset	Asset	Asset
		2018 Forecast (\$000)	10,494	4,230	11,315	123,085		25,567		32,238	856,9	10,270	577		9,094		1,992	9,387	9,814	1,574	17,924			9,592		
QUALITATIVE MAPPING OF O&M ACTIVITIE		Activity Description	Transmission Planning	Distribution Grid Engineering and Technology	Inspection of Distribution Overhead and Underground Lines and Equipment	Planned Maintenance of Dist. Overhead & Underground Lines/Equip.; Veg. Mgmt.;	Apparatus Inspection & Maintenance	Distribution Overhead and Underground Breakdown Maintenance	Grid Operations - Troublemen	Patrol, Locate, and Repair Activities	Grid Operations - Street Light Operations and Maintenance	Design Construction & Maintenance - Set, Remove, and Relocate Meters	Grid Operations - Service Guarantees		Design Construction & Maintenance - Construction Support Activities		Grid Operations - Misc. Operating Expense	Grid Operations - Distribution Storm	Grid Operations - Management and Operation of the Grid Control Center	Substation Inspection & Maintenance - Activities Performed At SCE-Owned Generating Facilities	Grid Operations - Operating Transmission Stations			Supervision of Transmission	ANTENNAME TO THE PROPERTY OF T	
PING		GRC	560.220	588.220	583.120	593.120		594.120		583.170	585.170	586.140	587.170		588.140		588.170	598.170	561.170	562.150	562.170			568.150		
E MAP		Volume Title	System Planning	System Planning	Distribution M&I	Distribution	Mexi	Distribution M&I		DC&M	DC&M	DC&M	DC&M		DC&M		DC&M	DC&M	SC&M	SC&M	SC&M			SC&M		
ATIVE		Witness	E. Takayesu	E. Takayesu	M. Stark	M. Stark		M. Stark		A. Edeson	A. Edeson	A. Edeson	A. Edeson		A. Edeson		A. Edeson	A. Edeson	M. Flores	M. Flores	M. Flores			M. Flores		
QUALIT		Testimony Reference	SCE-02, Vol. 1	SCE-02, Vol. 1	SCE-02, Vol.	SCE-02, Vol.	**	SCE-02, Vol.	SCE OF VA	00	SCE-02, Vol. 05	SCE-02, Vol. 05	SCE-02, Vol. 05		SCE-02, Vol. 05		SCE-02, Vol. 05	SCE-02, Vol. 05	SCE-02, Vol. 06	SCE-02, Vol. 06	SCE-02, Vol. 06			SCE-02, Vol.	3	

W. Flore CREAN	QUALIT	ATIVE	MAPI	PING	QUALITATIVE MAPPING OF O&M ACTIVITII	[T	018 GF	S IN 2018 GRC REQUEST TO RISK	TO RISK						I	Evaluated as part of T&D Risk Analysis	rt of T&D Ris	k Analysis	
N. Flue S. EAM GGT According Description 3.34 According to the November of Section According to the November of Section One of the Section		Ħ								Potential ef	fect of risk event	if it occurs				Impact Dimensions	mensions		
N. Flores S.EAM SELEM	Testimony	Witness	Volume	GRC Activity		2018 Forecast (\$000)	Category	Event (risk incident the activity is expected to mitigate)	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Safety	Service Reliability F	Environmental	Compliance	Financial	Other (e.g. Customer Expectation)
N. Flore SCAM SCAM SCAM SCAD Numbous Control demander of the contr	SCE-02, Vol. 06	M. Flores	SC&M	582.150	Substation Inspection & Maintenance - Activities Performed At SCE-Owned Generating Facilities	334	Asset	Equipment failure	Outage	Worker injury/fatality				×	×			×	
M. Triera SCAM 50.150 Name and contraction & contracti	SCE-02, Vol. 06	M. Flores	SC&M		Grid Operations - Supervising and Operating Distribution Stations	25,670	Non-Asset	Inability to perform grid control functions	Outage	Curtailment	Customer dissatisfaction			×	×			×	×
No.							Asset	Equipment failure	Outage	Worker injury/fatality				х	х			×	
M. Flore Sc. RM 92.219 Maintenance - O-ther Equipment 1.340 Aveat Family of Equipment of Equipment (FIV) Cotage Invalidation Cotage Public Cotage Invalidation Replacement of Equipment of Equ							Asset	Failure of B bank transformers	Leakage/spills	Outage	Property damage	Regulatory fines	Worker injury/fatality	×	×	×	×	×	
About Part Change Part Change Part Change Part Change Part Change Part Change Part P	SCE-02, Vol. 06	M. Flores	SC&M	592.150	Maintenance - Other Equipment	13,240	Asset	Failure of circuit breakers <=115kV	Outage	Worker injury/fatality	Leakage/spills	Regulatory fines		×	×	×	×	×	
1. 1. 1. 1. 1. 1. 1. 1.					M&I		Asset	Failure of DPU	Outage					×	×				
1. Columb Sec. 15 Columb Colu								Lack of adherence to construction standards or recordkeeping	Outage	Public injury/fatality	Worker injury/fatality			×	×			×	
1							Asset	In-service pole failure	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	×	×	×		×	
Hallingsky TC&M 566.150 Operation of Fiber Optic Lines Land of Abstract Contraction standards or Transmission Part Secretarial Contraction standards or Transmission Packet Contraction standards or Transmission Packet Contraction States Land of Abstraction Packet Contraction States States Land of Abstraction Packet States Land o	SCE-02 Vol	-			Transmission Inspection and		Asset	Equipment failure	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	×	×	×		х	
1	07	Billingsley	TC&M	566.150	Operation of Fiber Optic Lines	9,728		Lack of adherence to construction standards or recordkeeping	Outage	Worker injury/fatality				×	х			х	
Hillingstoff TC&M 571150 Road, and Right-OF-Way. Billingstoff TC&M 571150 Road-and Right-OF-Way. A mark Sharihora Pole Road-and Right-OF-Way. C. Famous Poles 58112 Distribution Pole Road-and Right-OF-Way. C. Famous Poles 58112 Transmission Pole-Road-and Right-OF-Way. C. Famous Poles 58112 Transmission Pole-Road-and Right-OF-Way. C. Famous Poles 58112 Transmission Pole-Road-and Annual Poles Road-and Right-OF-Way. C. Famous Poles 58112 Transmission Pole-Road-and Annual Poles Road-and Right-OF-Way. C. Famous Poles 58112 Transmission Pole-Road-and Annual Poles Road-and Right-OF-Way. C. Famous Poles 58112 Transmission Pole-Road-and Annual Poles Road-and Right-OF-Way. C. Famous Poles 58112 Transmission Pole-Road-and Annual Poles Road-and Right-OF-Way. C. Famous Poles 581123 Transmission Pole-Road-and Annual Poles Road-and Annual Poles Road-and Right-OF-Way. C. Famous Poles 581123 Transmission Pole-Road-and Annual Poles Road-and Right-OF-Way. C. Famous Poles 581123 Transmission Pole-Road-and-Annual Right-OF-Way. C. Famous Poles 581123 Transmission Pole-Road-and-OF-Way. C. Famous Poles 581200 Transmission Pole-Road-and-OF-Way. C. Famous Poles 581200 Transmission Pole-Road-and-OF-Way. C. Famous Poles 581200 Transmission Grid Technology 13,907 Non-Asset Pole-Road-and-OF-Way. T. Faching S. Soc. 20120 Transmission Grid Technology 13,907 Non-Asset Pole-Road-and-OF-Way. T. Faching S. Soc. 20120 Transmission Grid Technology 13,907 Non-Asset Pole-Road-and-OF-Way. T. Faching S. Soc. 20120 Transmission Grid Technology 13,907 Non-Asset Pole-Road-and-OF-Way. T. Faching S. Soc. 20120 Transmission Grid Technology 13,907 Non-Asset Pole-Road-and-OF-Way. T. Faching S. Soc. 20120 Transmission Grid Technology 13,907 Non-Asset Pole-Road-And-OF-Way. T. Fach S. Soc. 20120							Asset	Overhead conductor down	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	x	x	х		х	
Fig. 27 17 17 17 17 17 17 18 18		_				•	Asset	Equipment failure due to intrusion or wire down event	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	×	×	×		×	
1		Billingsley		571.150		29,627	Asset	Excessive sagging or insufficient clearance	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	×	×	×		×	
Fig.							Asset	Lack of access to transmission facilities	Outage	Worker injury/fatality				×	×			×	
C. Fanous Poles 566.12 Transmission Pole Assessments 683 Assert In-service pole failure injuny/family Merkert Onuge C. Fanous Poles 566.12 Transmission Pole Repairs and Transmission Pole Repairs and Poles 566.12 Transmission Pole Repairs and Poles 571.125 Transmission Pole Repairs and Poles 571.125 Transmission Pole Repairs and Poles 683 Assert In-service pole failure injuny/family injuny/family Worker Onuge C. Fanous Poles 571.125 Transmission Pole Repairs and Assert In-service pole failure injuny/family Worker Onuge R. Ragsdale Modernization Pole Repairs and States of Mon-Asset In-service pole failure injuny/family Worker Onuge C. Fanous Poles 571.125 Transmission Pole Repairs and Assert In-service pole failure injuny/family Worker Onuge C. Fanous Poles 582.260 Grid Modernization Pole Repairs and Assert In-service pole failure injuny/family injuny/family Worker Onuge C. Fanous Poles 582.260 Transmission Tealed Expense Assert In-service pole failure Injuny/family Morker Non-compliance D. Kim Technology Soc 260 Distribution Pole Repairs and Assert In-service pole failure Injuny/family Morker Non-compliance D. Kim Technology Soc 260 Distribution Fole Repairs and Assert In-service pole failure Injuny/family Morker Non-compliance D. Kim Technology Soc 260 Distribution Crid Technology Industrial Soc 260 Sant-Time for Transmission and Salety Delivery and Salety Deliver	SCE-02, Vol. 07	J. Billingsley	TC&M	573.170	Grid Operations - Transmission and Substation Storm Expense	1,670	Asset	Equipment failure	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	×	x	х		х	
C. Fanous Poles 56.125 Transmission Pole Assessments 685 Asset In-service pole failure injury/flaulity injury/flaulity Worker Ounge C. Fanous Poles 571.125 Transmission Pole Assessments 685 Asset In-service pole failure injury/flaulity Worker Ounge C. Fanous Poles Sealed Expense 7.329 Asset In-service pole failure injury/flaulity injury/flaulity Worker Ounge On circuit with Insury/flaulity injury/flaulity Worker Ounge On circuit with Insury/flaulity Worker Worker Ounge On circuit with Insury/flaulity Injury/flaulity Worker Insury/flaulity Insury/flaulity Injury/flaulity Worker Insury/flaulity Insury/flaulity Injury/flaulity Injury/f	SCE-02, Vol. 09	C. Fanous	Poles	583.125	Distribution Pole Assessments	34,799	Asset	In-service pole failure	Public injury/fatality	Worker Injury/Fatality	Wildfire	Outage	Property damage	×	x	×		×	
C. Fanous Poles 571.125 Transmission Pole Repairs and Language C. Fanous Poles 571.125 Transmission Pole Repairs and Language C. Fanous Poles 593.125 Transmission Pole Repairs and Language C. Fanous Ragistale Modernization Poles Repairs and Language C. Fanous Poles 593.125 Distribution Pole Repairs and Language C. Fanous Ragistale Modernization Poles Repaired Poles C. Fanous C. Fanou	SCE-02, Vol. 09	C. Fanous		566.125	Transmission Pole Assessments	685	Asset	In-service pole failure	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	×	x	×		x	
R. Ragadale Modernization Pole Repairs and Salach Internation Pole Repairs and Cirid Modernization Taining and Salach Distribution Pole Repairs and Cirid Modernization Taining and Salach Distribution Pole Repairs and Cirid Modernization Taining and Salach Distribution Cirid Technology 2597 Non-Asset Taining and Salach Distribution Cirid Technology 13,907 Non-Asset Taining and Salach Distribution Cirid Technology 260.250 Distribution Cirid Technology 13,907 Non-Asset Taining and Salach Distribution Cirid Technology 260.250 Salach Time for Transmission and Salach Distribution Cirid Technology 260.250 Non-Asset Taining and Salach Distribution Cirid Technology 260.250 Salach Time for Transmission and Salach Distribution Cirid Technology 260.250 Salach Time for Distribution Cirid Technology 260.250 Salach Sa	SCE-02, Vol. 09	C. Fanous	Poles	571.125	Transmission Pole Repairs and Transmission Pole-Related Expense	746	Asset	In-service pole failure	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	×	×	×		×	
R. Ragsdale (Modernization 17 alming and Set 260 Distribution 250 Transmission Grid Vectories) Cried Modernization (Training and Safety Delivery and Safety Delivery and Training as 562.26 Transmission Grid Technology 2.597 Non-Asset Indeptod Recention Outage on circuit with Delivery mid Injury/fainthy Worker (Training And Safety Delivery Safety	SCE-02, Vol. 09	C. Fanous	Poles			7,329	Asset	In-service pole failure	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	×	×	×		×	
D. Kim Technology Technology 560.260 Transmission Grid Technology San 260 2.597 Non-Asset Industrial Edologyment Outage Of new technology of new technology Technology Injusy/faulity Non-Asset Non-Asset Injusy/faulity Technology Technology Non-Asset Injusy/faulity Technology Technology Technology Technology Technology Technology Salicy Technology Salicy Technology Salicy Technology Salicy Technology Salicy Technology Salicy Technology Salicy Technology Salicy Technology Salicy Technology Salicy Technology Salicy Technology		R. Ragsdale ?	Grid Modernizatio n		Grid Modernization Training and Support Activities	4,550	Non-Asset	Outage on circuit with high DER penetration	Outage						×				
D. Kim Technology 580.260 Distribution Grid Technology 13.907 Non-Asset Indicate deployable Indicate deployable <th< td=""><td>SCE-02, Vol. 11</td><td></td><td></td><td>560.260</td><td></td><td>2,597</td><td>Non-Asset</td><td>Inadequate deployment of new technologies</td><td>Outage</td><td>Worker injury/fatality</td><td>Non-compliance</td><td></td><td></td><td>x</td><td>х</td><td></td><td>х</td><td>х</td><td></td></th<>	SCE-02, Vol. 11			560.260		2,597	Non-Asset	Inadequate deployment of new technologies	Outage	Worker injury/fatality	Non-compliance			x	х		х	х	
T&D Training & 566.250 Training and Safety Delivery and Safety Delivery and Safety Non-Asse Field employee improper Field majories Field majories improper Field majories Field	SCE-02, Vol. 11		Grid Technology	580.260	Distribution Grid Technology	13,907	Non-Asset	Inadequate deployment of new technologies	Outage	Worker injury/fatality	Non-compliance			х	x		х	×	
A. Martinez Traning & 588.250 Training and Safety Delivery and Safety Seat-Time for Dist. Personnel Non-Asset Training and Safety Delivery and Safety Table Training and Safety Delivery and Safety Table Training and Safety Delivery and Safety Table Training and Safety Training and					£ .	13,061	Non-Asset	Field employee improper conduct around equipment	Outage		Equipment damage			×	×			×	
Acceptance Acc			T&D			117 06	Non-Asset	Linemen improper performance conducting work on OH Structures	Outage		Equipment damage			×	×			×	
D. Neal Taining & 565.281 Environmental Programs - 4,608 Non-Asset destruction habital destruction Contage destruction Salety Component Environmental Services D. Non-Asset Training & 773.540 Water Manusonment - 246 Non-Asset Training & 773.541			Safety	00000		10,00	Non-Asset	Linemen improper performance conducting work on OH primary conductors	Outage	Worker Injury/Fatality				×	×			×	
D Novel Training 5 573.54 Corporate Environmental Services 746 Non-Assest Training 5 573.54 Waste Managament 2	SCE-02, Vol. 12		T&D Training & Safety	565.281	Environmental Programs - Transmission	4,608	Non-Asset	Environmental destruction	Plant and animal habitat destruction	Outage					×	×	×		
Safety Transmission injury/fatality injury/fatality	SCE-02, Vol. 12	D. Neal	T&D Training & Safety	573.250	Corporate Environmental Services Waste Management - Transmission	246	Non-Asset	Toxic waste not disposed properly	Public injury/fatality	ity	Plant and animal habitat destruction			×		×	×	×	

O&M	QUALITATIVE MAPPING OF O&M ACTIVITII
Activity Description (\$000) Category activity is expected to mitigate)	2018 Forecast Category (S000)
vironmental Programs - 2,012 Non-Asset Environmental Distribution	Non-Asset
Tate Environmental Services 3,550 Non-Asset Harmful waste not Waste Management disposed properly	srvices 3,550 Non-Asset
Equipment or processes Equipment or processes are determined to be noncompliant with FERC standands	Non-Asset
mission Workorder Write- ad Capital-Related Expense	
d Contract Management 7,568 Non-Asset Failure to monitor and enforce contract terms	Non-Asset
ansmission Line Rents 17,203 Asset Failure to meet financial obligations	Asset
ansmission Operational -2,536 N/A Excellence	-2,536
mission IT Internal Market Mechanism on N/A one Software/Communicati on	nal Market ommunicati 0
smission Participant Share 14,083 N/A Costs	icipant Share 14,083
istribution Operational -7,464 N/A Excellence	
n and Collection Write-Off 11,413 N/A Expense	n Write-Off 11,413
r Installation and Removal Credit Entries	Removal 0
stribution Construction 1,293 N/A	1,293
ibution Workorder Write- and Underground Locating 18,868 N/A Service	18,868
Design Construction & 0 N/A Rents Rents	nction & 0
tribution Capital Related 40,724 N/A Expense	al Related 40,724
Accruals 0 N/A	0
Real Properties 3,339 Asset Inability to build infrastructure	3,339 Asset
x Services Operations and 5,826 Non-Asset training and/or Sandor Management supervision	ions and 5,826 Non-Asset
Manual customer turn- um On and Off Service 4,875 Non-Asset ons and turn-offs delayed or not completed	Non-Asset
Failure to conduct Test/Inspect/Repair Meters 15,511 Non-Asset sample and routine meter	

	ALIT,	ATIVE	MAP	PING	QUALITATIVE MAPPING OF O&M ACTIVITI		2018 GF	ES IN 2018 GRC REQUEST TO RISK	TO RISK							Evaluated as part of T&D Risk Analysis	t of T&D Ri	sk Analysis	
	+							7		Potential efi	fect of risk event	if it occurs				Impact Dir	nensions		
1. 1. 1. 1. 1. 1. 1. 1.		Witness	Volume	GRC		2018 Forecast (\$000)	Category	(risk incident the activity is expected to mitigate)	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Safety	Service Reliability		Compliance	Financial	Other (e.g. Customer Expectation)
1. Car C			Customer Service	587	CS Customer Installation Expense	6,932	Non-Asset	Delayed response to customer requests and undetected energy theft	Customer dissatisfaction	Inadequate recovery of costs								×	×
1	ol.		Customer Service	106	Operating Unit Management & Support	5,122	Non-Asset	Unable to develop or implement business plans	Operational or Business Disruption									×	
Decidio Columno Colu			Customer Service	902	Meter Reading Operations	10,165	Non-Asset		Inaccurate billing and recovery of costs		Non-compliance	Operational or Business Disruption					×	×	×
C NEW CHANGE (CHORM CONTINUE WITH C		D. Kempf	Customer Service	903.100	Postage	15,309	N/A	N/A											
No. Columne			Customer Service	903.200		16,125		Loss of revenue due to fraud and/or inability to minimize arrearages and uncollectible expenses	Operational or Business Disruption	Customer dissatisfaction	Inadequate recovery of costs	Non-compliance					×	×	×
National Columna Colum			Customer Service	903.500	Billing	28,272		_	Inadequate recovery of costs		Non-compliance	Operational or Business Disruption					×	×	×
L. May office and partial supposed and partial su	_		Customer Service	903.700		0	N/A	N/A											
December Content Con	_		Customer Service	903.800		46,289	Non-Asset	Delayed answering of calls	Customer dissatisfaction	Non-compliance	Delay in dispatch activities				×		×		×
Limit Change State Column Change State Column Change State Column Change State Change State Change State Sta	-		Customer Service	904	Uncollectible Expenses	14,182	N/A	N/A											
Line Chicago Service Communication of Communicati			Customer Service	902	Ratemaking Adjustments	0	N/A	N/A											
L. Lo Counter 40,00 Operating L. Lo Counter 40,00 Operating L. Lo Counter 40,00 Operating Marchinery Counter 40,00 Operating Marchinery Counter 40,00 Operating Marchinery Marchinery Counter 40,00 Operating Marchinery Marchin				905.900		24,442		Inability to communicate and educate customers or program changes	Customer dissatisfaction		Operational or business disruption						×	×	×
Lack Service Ass Miscellacous Blancing Assistance Miscellacous Miscel			Customer Service	907.600	Operating Unit Management & Support	2,487	Non-Asset		Operational or ousiness disruption									×	
Catalonisis Service	\vdash		Customer Service	806	Miscellaneous Balancing Accounts	0	N/A	N/A											
C. Carrino Ir Okek and Stock and			Customer Service	009:806		18,607		Inadequate interaction with business customers regarding programs or issues	Customer dissatisfaction										×
Not	-		IT O&M and Hardware		Grid Services	3,198	Asset	Lack of communicating abilities to operate and maintain the grid	Outage	Operational or business disruption					×				
Total Mark Part August Total Mark Part August Pa		M. I. rovenzano	IT O&M and Hardware		HW/SW License Maintenance	71,188	Asset	Nonfunctional or outdated software solutions	Outage	Operational or business disruption					×			х	
The Planch and State and S		3. Haddox	IT O&M and Hardware	920-921		18,133	Asset	Breach of systems containing personal identifiable information and operational confidential informatior	Non-compliance	Outage	Customer dissatisfaction	Employee dissatisfaction	Loss of confidence in company to perform its core duties		×		×		×
C. Carzzo Tr. O&M. mid. State Label Auroland and state Label Auroland and an anti-continuous and the destination of the foliable and a support grid operations of the foliable and the	SCE-04, Vol. 01		IT O&M and Hardware	920-921		12,032	Non-Asset		Operational or ousiness disruption									×	×
J. If Cock Mand Classification at Delivery Increase and Contraction at Delivery Increase and Contra			IT O&M and Hardware	920-921	Grid Services	44,375		Insufficient telecommunications and dysfunctional or non- existent applications to support grid operations	Outage	Operational or business disruption	Customer dissatisfaction			×	×			×	×
T. Inlander IT O&M and 920-921 IT OpX Savings -14,741 N/A		J. T. Zastleberry	IT O&M and Hardware	920-921		46,612	Non-Asset	Tardy, uncoordinated, and/or costly implementation of IT services across OUs	Outage	Non-compliance	Customer dissatisfaction			×	×		×		×
		T. Inlander	IT O&M and Hardware	920-921	IT OpX Savings	-14,741	N/A	N/A											

		Other (e.g. Customer Expectation)	×			×												×	
k Analysis		Financial	×	×			×	×	×			×	×	×	×		×		×
t of T&D Risl	nensions	Compliance	×	×	×	×	×	×				×	×						
Evaluated as part of T&D Risk Analysis	Impact Dimensions	Environmental						×				×	×						
Е		Service Reliability E			×	×		×	×			×	×	×	×	×	×	×	×
		Safety							×					×	×		×	×	
		Outcome 5																	
	if it occurs	Outcome 4		Employee dissatisfaction				Operational or business disruption	Worker or public injury			Operational or business disruption	Operational or business disruption	Worker Injury	Worker Injury				
	Potential effect of risk event if it occurs	Outcome 3	Non-compliance	Non-compliance		Customer dissatisfaction		Potential environmental permit or fee deficiency or violations	Operational or business disruption			Potential environmental permit or fee deficiency or violations	Potential environmental permit or fee deficiency or violations	Operational or business disruption	Operational or business disruption		Worker injury	Public injury/fatality	
	Potential eff	Outcome 2	Customer dissatisfaction	Customer dissatisfaction	Non-compliance	Non-compliance	Non-compliance with FERC and other agencies	Non-compliance with FERC and other agencies	Increased purchased power costs			Non-compliance with FERC and other agencies	Non-compliance with FERC and other agencies	Increased purchased power costs	Increased purchased power toosts		Operational or business disruption	Customer dissatisfaction	
TO RISK		Outcome 1	Operational or business disruption	Operational or business disruption	Outage	Outage	Operational or business disruption	Non-compliance with FERC and other agencies	Plant or unit outages	Potential environmental violation		Plant or unit outages	Plant or unit outages	Plant or unit outages	Plant or unit outages	Plant or unit outages	Plant or unit outages	Outage	Plant or unit
S IN 2018 GRC REQUEST TO RISK		Event (risk incident the activity is expected to mitigate)	and	Nonfunctional or outdated software solutions	SCE oversight function inadequately performed	inadequate power supply delivered to our transmission system	Inability to pay annual fees and rent expense charged by various l	Inadequate support for dispatch and monitoring activities of hydro operations	Inadequate maintenance of plant leads to failure to generate power when called upon	Ongoing ash landfill maintenance not adequately performed	V/A	Inability to provide adequate support, studies, and environmental monitoring for peaker operations	Inability to provide adequate support, water treatment, for power operations	Inadequate maintenance of plant leads to failure to generate power when called upon	Inadequate maintenance of plant leads to failure to generate power when called upon	Inability to comply with various service agreements	Inability to provide adequate support for SPVP sites	Equipment deterioration and/or unsafe operating conditions	Inability to pay rent
2018 GR		Category	Non-Asset	Asset	Non-Asset	Non-Asset	Non-Asset	Non-Asset	Asset	Asset	N/A	Non-Asset	Non-Asset	Asset	Asset	Non-Asset	Non-Asset	Non-Asset	Non-Asset
(-)		2018 Forecast (\$000)	86.710	60,119	76,747	32,441	5,128	26,779	9,539	583	-257	4,736	7,419	2,715	16,056	379	1,510	4,377	2,332
QUALITATIVE MAPPING OF O&M ACTIVITI		Activity Description	Service Management Office &	Operations	Palo Verde	Power Procurement	Water for Power	Hydro Operations	Maintenance of Misc. Hydraulic Plant	Mohave	Mohave - Participant Billing Transaction	Gas Turbine Peaker	Mountainview	Gas Turbine Peaker	Mountainview	Fuel Cell	Solar Photovoltaic Program	Catalina Generation - Operations & Maintenance of Generation Facilities	Solar Photovoltaic Program
PING		GRC Activity	d 000.001	176-076	524	t 557	1 536	1 539	545	506.013	506.013	549	549	554	554	549	549	549.140	550
E MAP		Volume Title	IT O& M and	Hardware	Palo Verde	Power Procurement	T. Condit Hydro O&M	Hydro O&M	Hydro O&M	Coal, Mtnview & Peakers	Coal, Mtnview & Peakers	Coal, Mtnview & Peakers	Coal, Mtmiew & Peakers	Coal, Mtnview & Peakers	Coal, Mtnview & Peakers	SPVP & Fuel Cells	SPVP & Fuel Cells		SPVP &
ATIVI		Witness	M.	Provenzano	T. Champ	J. Tran	T. Condit	T. Condit	T. Condit	S. Handschin	S. Handschin	S. Handschin	S. Handschin	S. Handschin	S. Handschin	S. Handschin	S. Handschin	A. Edeson	S. Handsohin
QUALIT		Testimony Reference	SCE-04, Vol.	10	SCE-05, Vol. 01	SCE-05, Vol. 02	SCE-05, Vol.	SCE-05, Vol.	SCE-05, Vol.	SCE-05, Vol. 04	SCE-05, Vol. 04	SCE-05, Vol.	SCE-05, Vol. 04	SCE-05, Vol.	SCE-05, Vol. 04	SCE-05, Vol. 05	SCE-05, Vol. 05	SCE-05, Vol. 05	SCE-05, Vol.

		Other (e.g. Customer Expectation)											
k Analysis		Financial	×	×	×	×	×	×	×	×	×	×	×
rt of T&D Ris	nensions	Compliance											
Evaluated as part of T&D Risk Analysis	Impact Dimensions	Environmental											
Ð		Service Reliability E											
		Safety											
		Outcome 5											
	f it occurs	Outcome 4											
	Potential effect of risk event if it occurs	Outcome 3											
	Potential effe	Outcome 2	Increased training and/or recruitment costs										
TO RISK		Outcome 1	Operational inefficiencies or business disruption (turnover, retraining, etc.)	Operational inefficiencies or business disruption (turnover, retraining, etc.)	Operational inefficiencies or business disruption (turnover, retraining, etc.)	Operational inefficiencies or business disruption (turnover, retraining, etc.)	Operational inefficiencies or business disruption (turnover, retraining, etc.)	Operational inefficiencies or business disruption (turnover, retraining, etc.)	Operational inefficiencies or business disruption (turnover, retraining, etc.)	Operational inefficiencies or business disruption (turnover, retraining, etc.)	Operational inefficiencies or business disruption (turnover, retraining, etc.)	Operational inefficiencies or business disruption (turnover, retraining, etc.)	Operational inefficiencies or business disruption (turnover, retraining, etc.)
ES IN 2018 GRC REQUEST TO RISK		Event (risk incident the activity is expected to mitigate)	Inadequate staffing 1	Inadequate staffing	Inadequate staffing 1	Inadequate staffing 1	Inadequate staffing 1	Inadequate staffing t					
2018 GR		Category	Non-Asset										
		2018 Forecast (\$000)	1,547	6,954	5,109	31,729	19,611	13,726	7,516	64,905	17,039	15,035	79,190
QUALITATIVE MAPPING OF O&M ACTIVITII		Activity Description	Executive Officers	Human Resources	Human Resources	Human Resources	Executive Officers	Long Term Incentives	Short-Term Incentive Program - Generation	Short-Term Incentive Program - T&D	Short-Term Incentive Program - CS	Dental Plans	401(K) Savings Plan
PING (GRC Activity	923	923	926	920-921	920-921	920-921	200	288	506	926	926
E MAP		Volume Title	нк о&м	HR O&M	нк о&м	HR O&M	нк о&м	нк о&м	Benefits & Other Comp.				
ATIVI		Witness	Ј. Тврр	C. Hernandez	C. Hernandez	C. Hernandez	М. Ветеп	M. Bennett					
QUALII		Testimony Reference	SCE-06, Vol. 01	SCE-06, Vol.	SCE-06, Vol.	SCE-06, Vol. 02	SCE-06, Vol. 02	SCE-06, Vol. 02					

OF O&M ACTIVITIES IN 2018 GRC REQUEST TO RISK		QUALITATIVE MAPPING OF O&M ACTIVITIES IN 2018 GRC REQUEST TO RISI
Activity Description 2018 Forceast Category activity to expected to minigare)	Activity Description 2018 Forecast Category (5000)	2018 Forecast Category (\$000)
Executives Benefits 21,087 Non-Asset Inadequate staffing	Executives Benefits 21,087 Non-Asset	21,087 Non-Asset
Group Life Insurance 1,426 Non-Asset Inadequate staffing	Group Life Insurance 1,426 Non-Asset	1,426 Non-Asset
Medical Programs 110,719 Non-Asset Inadequate staffing	Medical Programs 110,719 Non-Asset	110,719 Non-Asset
Miscellaneous Benefit Programs 5,592 Non-Asset Inadequate staffing	Missellaneous Benefit Programs 5,592 Non-Asset	5,592 Non-Asset
PBOP Costs 36,823 Non-Asset Inadequate staffing	PBOP Costs 36,823 Non-Asset	36,823 Non-Asset
Pension Costs 97,474 Non-Asset Inadequate staffing	Persion Costs 97,474 Non-Asset	97,474 Non-Asset
Third Party Billing & Non-Utility Affiliates P&B Credits	Third Party Billing & Non-Utility Affiliates P&B Credits	0
Vision Service Plan 3,443 Non-Asset Inadequate staffing	Vision Service Plan 3,443 Non-Asset	3,443 Non-Asset
Short-Term Incentive Program - 44,389 Non-Asset Imdequate staffing	Short-Term Incentive Program - 44,389 Non-Asset A&G	926.921 Short-Term Incentive Program - 44,389 Non-Asset
NA N/A	NA	
Business Resiliency 1,533 Asset Building damage	Business Resiliency 1,533 Asset	935 Business Resiliency 1,533 Asset
Business Resiliency 6,431 Non-Asset disaster	Business Resiliency 6,431 Non-Asset	920-921 Business Resiliency 6,431 Non-Asset
San Dieguito Wetlands and 3,493 Asset Environmental Wheeler North Reef destruction	San Dieguito Wetlands and 3,493 Asset	S49 San Dieguiro Wetlands and 3,493 Asset
Environmental Operational -1,991 N/A	Environmental Operational -1,991	-1,991
Corporate Environmental Services 10.618 N/A Environmental destruction	Corporate Environmental Services 10,618 N/A	8 10,618 N/A
Substation Facility Maintenance 5,174 Asset Reality deterioration and/or unsafe conditions	Substation Facility Maintenance - 5,174 Asset	5,174 Asset

		(e.g. mer ition)																			
		Other (e.g. Customer Expectation)																×			
sk Analysi		Financial	х		х	x	×	x													
rt of T&D Ri	nensions	Compliance	х		х	×	×	х	x	×		x	х	х	×		×	х		х	×
Evaluated as part of T&D Risk Analysis	Impact Dimensions	Environmental																			
Á		Service Reliability Er	×					×													
		Safety	×		×	×	×	×										×		×	×
		Outcome 5																			
	occurs	Outcome 4	Property damage					Non-compliance													
	Potential effect of risk event if it occurs	Outcome 3 C	Non-compliance Proj		Non-compliance	Non-compliance	Non-compliance	Outage Nor													
	tential effect o	Outcome 2 O	Outage Non-		Property damage Non-	Property damage Non-	Worker injury/fatality	Worker injury/fatality													
×	Po	Oute	no		Property	Property	Wo injury/	Wo injury/										-	s		
TO RIS		Outcome 1	Worker/public injury		Worker/public injury	Worker/public injury	Public injury/fatality	Public injury/fatality	Non-compliance	Non-compliance		Non-compliance	Non-compliance	Non-compliance	Non-compliance		Non-compliance	Diminished awareness and understanding of safety issues and other relevant topics	industry progress and important energy policy developments	Diminished awareness and understanding of safety issues and other relevant topics	Diminished awareness and understanding of safety issues and other relevant topics
S IN 2018 GRC REQUEST TO RISK		Event (risk incident the activity is expected to mitigate)	Facility deterioration and/or unsafe conditions	N/A	Facility deterioration and/or unsafe conditions	Facility deterioration and/or unsafe conditions	SCE does not meet OSHA compliance requirements	Physical Security Breach	SCE does not meet GO 156 compliance requirements	SCE does not meet GO 156 compliance requirements	N/A	SCE does not meet compliance requirements	SCE does not meet NERC compliance requirements	SCE does not meet compliance requirements	SCE does not meet compliance requirements	N/A	Non-compliance risk to regulatory requirements and procedures	Inadequate communication and emergency response preparedness	Poor industry engagement	Inadequate communication and emergency response preparedness	Inadequate communication and emergency response preparedness
018 GR		Category	Asset	N/A	Asset	Asset	Non-Asset	Non-Asset P	Non-Asset	Non-Asset	N/A	Non-Asset	Non-Asset	Non-Asset	Non-Asset	N/A	Non-Asset n	Non-Asset	Non-Asset	Non-Asset	Non-Asset
		2018 Forecast (\$000)	10,314	4,448	14,245	16,806	5,688	26,906	1,966	1,421	880'9	4,985	3,176	3,911	1,891	-4,100	10,000	1,689	1,973	5,828	5,071
QUALITATIVE MAPPING OF O&M ACTIVITIE		Activity Description	Field Facility Maintenance - CRE	Corporate Real Estate - Rents	Corporate Real Estate - Maintenance	Corporate Real Estate - A&G	Corporate Health & Safety	Corporate Security	Supplier Diversity and Development	Supplier Diversity and Development	Supply Management	Compliance, Policy & IG	NERC Compliance Program	Compliance, Policy & IG	Regulatory Compliance	Compliance Operational Excellence	Regulatory Affairs - Integrated Planning Power Procurement Regulatory Support	Corporate Communications - Outside Services	Corporate Membership Dues and Fees	Corporate Communications - Communications Products	Corporate Communications - Communications Operations
SING		GRC Activity	580.282	931	935	126-026	925	920-921- 923	923	920-921	920-921	923	920-921	920-921	920-921	920-921	557	923	930	930	920-921
MAPI		Volume Title	CRE	CRE	CRE	CRE	Corp. Safety	Corp. Safety	Supply Mgmt. & Div.	Supply Mgmt. & Div.	Supply Mgmt. & Div.	Ethics & Compliance	Ethics & Compliance	Ethics & Compliance		Ethics & Compliance	RA, Corp Comm, LPA	RA, Corp Comm, LPA	RA, Corp Comm, LPA	RA, Corp Comm, LPA	RA, Corp Comm, LPA
ATIVE		Witness	N. Desrocher	N. Desrocher	N. Desrocher	N. Desrocher	P. Jeske	P. Jeske	E. Fisher	E. Fisher	K. Landrith	J. Shotwell	J. Pespisa	J. Shotwell	J. Shotwell	J. Pespisa	R. Worden	D. Tasaka	Z. Armenian	D. Tasaka	D. Tasaka
QUALII		Testimony Reference	SCE-07, Vol. 03	SCE-07, Vol. 03	SCE-07, Vol. 03	SCE-07, Vol. 03	SCE-07, Vol. 04	SCE-07, Vol. 05	SCE-07, Vol. 06	SCE-07, Vol. 06	SCE-07, Vol. 06	SCE-08, Vol. 01	SCE-08, Vol. 01	SCE-08, Vol. 01	SCE-08, Vol. 01	SCE-08, Vol. 01	SCE-08, Vol. 02	SCE-08, Vol. 02	SCE-08, Vol. 02	SCE-08, Vol. 02	SCE-08, Vol. 02

QUALII	TATIVI	E MAPI	PING	QUALITATIVE MAPPING OF O&M ACTIVITII		2018 GI	S IN 2018 GRC REQUEST TO RISK	TO RISK							Evaluated as part of T&D Risk Analysis	rt of T&D Risl	k Analysis	
		Ī					,		Potential ef	Potential effect of risk event if it occurs	f it occurs				Impact Dimensions	mensions	Ī	
Testimony Reference	Witness	Volume Title	GRC Activity	Activity Description	2018 Forecast (\$000)	Category	Event (risk incident the activity is expected to mitigate)	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Safety	Service Reliability	Environmental	Compliance	Financial	Other (e.g. Customer Expectation)
SCE-08, Vol. 02	Z. Armenian	RA, Corp Comm, LPA	920-921	Local Public Affairs	7,904	Non-Asset	Inadequate communication and emergency response preparedness	Communication failure between SCE and local government officials					х			×		
SCE-08, Vol. 02	R. Worden	RA, Corp Comm, LPA	920-921	Regulatory Affairs	15,214	Non-Asset	Non-compliance risk to regulatory requirements and procedures	Non-compliance								×		
SCE-08, Vol. 03	J. Duran	Finance, Audits & ERM	920	Severance	0	V/N	V/N											
SCE-08, Vol. 03	J. Duran	Finance, Audits & ERM	922	Capitalized A&G Expense	-166,215	N/A	N/A											
SCE-08, Vol. 03	J. Duran	Finance, Audits & ERM	926	Capitalized P&B Expense	-244,368	N/A	N/A											
SCE-08, Vol. 03	J. Duran	Finance, Audits & ERM	926	Financial Services	331	Non-Asset	Incomplete or inaccurate financial reports and regulatory filings	Non-compliance								х		
SCE-08, Vol. 03	J. Duran	Finance, Audits & ERM	926	Participant Credits	9,870	N/A	N/A											
SCE-08, Vol. 03	J. Duran	Finance, Audits & ERM	927	Franchise Requirement	64,198	N/A	N/A											
SCE-08, Vol. 03	J. Duran	Finance, Audits & ERM	930	Financial Services Miscellaneous Expenses	0	N/A	N/A											
SCE-08, Vol. 03	J. Duran	Finance, Audits & ERM	930	Participant Credits	11,258	N/A	N/A											
SCE-08, Vol. 03	E. Andersen	Finance, Audits & ERM	920-921	Audit Services	8,657	Non-Asset	Financial, operational, contracting, environmental, etc. non- compliant event occurs	Non-compliance	Operational or business disruption							×	×	
SCE-08, Vol. 03	J. Duran	Finance, Audits & ERM	920-921	Financial Services	43,297	Non-Asset	Incomplete or inaccurate financial reports and regulatory filings	Non-compliance								×		
SCE-08, Vol. 03	J. Duran	Finance, Audits & ERM	920-921	Financial Services Miscellaneous Expenses	0	N/A	N/A											
SCE-08, Vol.	T Duran	Finance,	023-030	En ancia Services	20 916	Non-Asset	Incomplete or inaccurate financial reports, regulatory filings, etc.	Non-compliance								×		
03		ERM				Non-Asset	Inability to finance debt in capital markets or maintain core banking operations	Inability to meet funding needs for ongoing operations									×	
SCE-08, Vol. 04	R. Ramos	Law, Claims & WC	925	Claims Reserves	21,348	N/A	N/A											
SCE-08, Vol. 04	J. Smolk	Law, Claims & WC	925	Workers' Compensation	6,783	N/A	N/A											
SCE-08, Vol. 04	J. Smolk	Law, Claims & WC	925	Workers' Compensation Reserve	7,811	N/A	N/A							_				
SCE-08, Vol. 04	S. Tran	Law, Claims & WC	926	Disability Management Programs	19,740	Non-Asset	Inadequate staffing 1	Operational inefficiencies or business disruption (turnover, retraining, etc.)	Increased training and/or recruitment costs								×	
SCE-08, Vol. 04	S. Tran	Law, Claims & WC	926	Disability Administration	833	V/N	N/A											
SCE-08, Vol. 04	R. Swartz	Law, Claims & WC	930	Law - Corp. Governance and Misc.	4,102	N/A	N/A											

QUALIT	FATIV	E MAP	PING	QUALITATIVE MAPPING OF O&M ACTIVIT		2018 GF	ES IN 2018 GRC REQUEST TO RISK	T TO RISK							Evaluated as part of T&D Risk Analysis	rrt of T&D Risk	k Analysis	
									Potential ef	Potential effect of risk event if it occurs	if it occurs				Impact Di	Impact Dimensions		
Testimony Reference	Witness	Volume Title	GRC	Activity Description	2018 Forecast (\$000)	Category	Event (risk incident the activity is expected to mitigate)	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Safety	Service Reliability 1	Service Compliance Financial Compliance Expectation)	Compliance	Financial	Other (e.g. Customer Expectation)
SCE-08, Vol. 04	_	Law, Claims & WC	s 920-921	R. Swartz & WC 920-921 Law - In-House Legal Resources & WC & Corporate Governance & Misc.	25,397	N/A	N/A											
SCE-08, Vol. 04	R. Ramos	Law, Claims & WC	s 920-921	Claims	3,025	N/A	N/A											
SCE-08, Vol. 04	R. Swartz	Law, Claims 923-925- & WC 928	s 923-925- 928	Law - Outside Counsel	14,872	N/A	N/A											
SCE-08, Vol. 05	J. Butler	Property & Liability Insurance	924	Corp Property Insurance	16,070	Non-Asset	Inability to procure satisfactory property Lawsuit/penalties insurance coverage	Lawsuit/penalties									×	
SCE-08, Vol. 05	J. Butler	Property & Liability 925	925	Corp Liability Insurance	92,427	Non-Asset	Inability to procure satisfactory liability Lawsuit/penalties insurance coverage	Lawsuit/penalties									×	
SCE-09, Vol. 01		R. Results of	920-921	SONGS Decommissioning Credits	-6,111	N/A	N/A											

		Other (e.g. Customer Expectation)	×	×	×	×	×	×	×	×	×	×											×	×		
		Financial C Exp											×	x	Х	×	×	×	×	×	х	×				
	suo																									
sis	Impact Dimensions	al Compliance																								
Evaluated as part of T&D Risk Analysis	Impa	Environmental											х	x		х	×		×	×						
is part of T&		Service Reliability	x	x	x	x	x	x	x	x	x		Х	x		Х	×		×	×		x	x	×	x	x
Evaluated a		Safety											Х	Х	Х	х	Х	Х	Х	Х	Х	x	x			х
		Outcome 7																								
		Outcome 6																								
	if it occurs	Outcome 5											Freeway/road closure			Freeway/road closure			Freeway/road closure							
ISK	of risk event	Outcome 4											Wildfire			Wildfire			Wildfire							
ST TO F	Potential effect of risk event if it occurs	Outcome 3											Worker injury/fatality			Worker in jury/fatality			Worker injury/fatality			Worker injury/fatality				
2018 GRC REQUEST TO RISK	I	Outcome 2	Customer dissatisfaction	Customer dissatisfaction		Public injury/fatality	Wildfire		Public injury/fatality	Wildfire		Public injury/fatality			Public injury/fatality	Customer dissatisfaction	Customer dissatisfaction									
18 GRC		Outcome 1	Outage	Outage	Customer dissatisfaction	Outage	Outage	Public injury/fatality	Outage	Outage	Public injury/fatality	Outage	Outage	Public injury/fatality	Outage	Outage	Outage	Outage	Outage							
CTIVITIES IN 20		Event (risk incident the activity is expected to mitigate)	Inability to connect new customers to the grid	Inability to connect new customers to the grid	Inability to connect new customers to the grid	Inability to connect new customers to the grid	Inability to connect new customers to the grid	Inability to connect new customers to the grid	Inability to connect new customers to the grid	Inability to connect new customers to the grid	Inability to connect new customers to the grid	>	Overhead conductor down in service	Intact conductor failure in service	Third-party contact with intact conductor	Overhead conductor down in service	Intact conductor failure in service	Third-party contact with intact conductor	Overhead conductor down in service	Intact conductor failure in service	Third-party contact with intact conductor	Failure of obsolete equipment	Lines are not relocated in a timely manner	Inability to meet customer requests for non-standard service	Inability to purchase transformers	System protection fails
ACTIV		Category acti	Asset Inab	Asset Inab	Asset Inal	Asset O	Asset Inta	Asset Thir	Asset Ov	Asset Inta	Asset Thir	Asset Ov	Asset Inta	Asset Thir	Asset Fi	Asset Lines	Asset cus	Asset In	Asset Sys							
CAPITAL A		2016-2020 Forecast (\$000)	\$ 163,938 A	144,499	\$ 451,106 A	\$ 138,064 A	\$ 135,614 A	\$ 216,500 A	98,614 A	13,093 A	14,123 A	\$ 180,337 A	V	\$ 115,939 A	A	V	75,017 A	_	V	41,268 A	A	30,213 A	S 303,791 A	A 766,59	\$ 474,582 A	60,585 A
				S					spment \$	al Service \$	ural Line \$	Streetlight Service S Installations		Distribution Rule \$ 20A Conversions			ion Rule \$			ion Rule \$		nission ead to \$ ground rsions		on Added \$		ration mection M Action
PPING (le Capital Category (WBS)	n Residential Service Connections	n Residential Line Extensions	n Residential Tract Development	n Residential Backbone Development	n Commercial Service Connections	n Commercial Line Extensions	n Commercial Tract Development	n Agricultural Service Connections	n Agricultural Line Extensions		_				n Distribution Rule 20B Conversions			n Distribution Rule 20C Conversions		Transmission Overhead to Underground Conversions	n Relocation of Distribution Lines	n Distribution Added Facilities	n Distribution Transformers	Generation Interconnection Remedial Action
QUALITATIVE MAPPING OF		Volume Title	Cust. Driven Programs	Cust. Driven Programs	Cust. Driven Programs	Cust Driven Programs	Cust. Driven Programs	Cust. Driven Programs	Cust Driven Programs	Cust. Driven Programs	Cust. Driven Programs	Cust. Driven Programs		Cust. Driven Programs			Cust Driven Programs			Cust. Driven		Cust. Driven Programs	Cust. Driven Programs		Cust. Driven	
LITATI		Witness	A. Ayorinde	A. Ayorinde	A. Ayorinde		A. Ayorinde			A. Ayorinde			A. Ayorinde		A. Ayorinde	A. Ayorinde	A. Ayorinde	A. Ayorinde	E. Takayesu							
QUA		Testimony Reference	SCE-02, Vol. 02	SCE-02, Vol. 02	SCE-02, Vol. 02		SCE-02, Vol. 02			SCE-02, Vol. 02			SCE-02, Vol. 02		SCE-02, Vol. 02	SCE-02, Vol. 02	SCE-02, Vol. 02	SCE-02, Vol. 02	SCE-02, Vol. 03							

UALI	TATIV	TE MAPI	OUALITATIVE MAPPING OF CAPITAL	APITA	4	CTIVITIES IN 2	018 GR	REOU	2018 GRC REOUEST TO RISK	RISK			Д	valuated as	part of T&E	Evaluated as part of T&D Risk Analysis			
									Potential effe	Potential effect of risk event if it occurs	nt if it occurs					Impact 1	Impact Dimensions		
Testimony ,	Witness	Volume Title	Capital Category (WBS)	2016-2020 Forecast (\$000)	Category	Event (risk incident the activity is expected to mitigate)	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Outcome 6	Outcome 7	Safety	Service Reliability 1	Environmental	Compliance	Financial	Other (e.g. Customer Expectation)
SCE-02, Vol. 03	E. Takayesu	System Planning	Substation Equipment Replacement Program	\$ 128,584	4 Asset	Equipment Failure	Outage	Curtailments						×	×				
SCE-02, Vol. 03 E.	E. Takayesu	System Planning	Lee Vining	\$ 48,376	Asset	Inability to serve load	Outage								×				х
SCE-02, Vol. 03	E. Takayesu	System Planning	Distribution Substation Planning Circuits	\$ 124,011	Asset	Demand greater than capacity	Outage								×				
SCE-02, Vol. 03	E. Takayesu	System Planning	DER-Driven Circuits	\$ 65,540	Asset (Unable to integrate higher penetrations of DERs	Outage	Customer dissatisfaction	Operational or business disruption						х			х	Х
SCE-02, Vol. 03	E. Takayesu	System Planning	Distribution Circuit Work (Misc. Non- Circuit)	\$ 263,343	Asset	Demand greater than capacity	Outage								х				x
SCE-02, Vol. 03	E. Takayesu	System	Added Facilities	\$ 152,909	Asset	Customer requests incomplete	Customer dissatisfaction												x
SCE-02, Vol. 03	E. Takayesu	System Planning	Distribution Substation Planning Substations	\$ 388,317	7 Asset	Demand greater than capacity	Outage								×				
SCE-02, Vol. 03	E. Takayesu	System Planning	Transmission Substation Planning Projects	\$ 520,917	7 Asset	Demand greater than capacity	Outage								х				
SCE-02, Vol. 03	E. Takayesu	System	Substation Load Info Monitoring System	\$ 828	Asset	Inability to serve load	Outage								×				×
SCE-02, Vol. 03	E. Takayesu	System Planning	New Capacitors, Distribution VAR Plan	\$ 35,147	7 Asset	Inability to serve load	Outage								х				Х
-		System			Asset	Energized wire down	Outage	Public injury/fatality	Worker injury/fatality	Wildfire	Freeway/road closure			×	х	х		Х	
Vol. 03 E.	E. Takayesu	Planning	Plant Betterment	\$ 81,015	Asset	Voltage fluctuation	Tripping of sensitive equipment											×	x
	E. Takayesu	System	Transmission Project Economic	s	Asset	Inability to incorporate new capacity from Colorado River	Outage	Non- compliance							×		х		
	E. Takayesu	System	Transmission Project Reliability	##########	Asset	Transmission outage	Outage								х				
SCE-02, Vol. 03	E. Takayesu	System Planning	Transmission Project Renewable	\$ 469,648	3 Asset	Inability to incorporate new renewable capacity	Outage	Non- compliance							×		×		
SCE-02, Vol. 03	E. Takayesu	System Planning	CRELand	~	Asset	Transmission line project impacted	Operational or business disruption											×	
	E. Takayesu	System 1 Planning	Transmission Projects - Real Properties	\$ 14,467	7 Asset	Inability to serve load	Outage								×				
SCE-02, Vol. 03	E. Takayesu	System Planning	IT Transmission Projects	\$ 23,652	Asset	System protection fails	Outage								х				
SCE-02, Vol. 03	E. Takayesu	System	Wholesale Distribution Access Tariff / Transmission Owner / Generation Tie	\$ 101,793	N/A	N/A													
SCE-02, Vol. 03	E. Takayesu	System	Various Rights of Way	\$ 2,693	Asset	T&D project impacted	Operational or business disruption											Х	
					Asset	Overhead conductor down in service	Outage	Public injury/fatality	Worker injury/fatality	Wildfire	Freeway/road closure			×	×	x		Х	
					Asset	Intact conductor failure in service	Outage	Public injury/fatality						×	×			Х	
SCE-02, Vol. 03	E. Takayesu	System	4kV Cutovers, 4kV Substation Removal	\$ 184,089	Asset	Human contact with intact conductor	Public injury/fatality							х				x	
					Asset	Circuit breaker unavailable	Curtailment	Equipment	Leakage/spills	Outage	Property	Public injury/fatality	Worker injury/fatality	×	×	×	×	×	

	Other (e.g. Customer Expectation)							×																				
	Financial	×	х	х	х	х	×		×		х	×		× ×	: × ×	: × × ×	: × × ×	: × × × ×	· × × × × ×	: × × × × ×	: × × × × × ×	. × × × × × ×	. × × × × × ×				. × × × × × × × ×	
Impact Dimensions	Compliance	×				х	x																					
Evaluated as part of 1 ccD Nisk Arialysis.	Environmental	×	х			Х	х		×								×	×	×	×	×	×	×	×	×	×	×	×
as part of 18	Service Reliability	×	Х	х		Х	х		×	×		^	<	××	× × ×	< × ×	× × × ×	< × × ×	< × × ×	< × × ×	< × × ×	× × × ×	× × × ×	× × × × ×	× × × × ×	× × × × × × ×	× × × × × × × × × × × × × × × × × × ×	× × × × × × × × × ×
Eyalualeu	Safety	×	Х	Х	Х	Х	х		х	x	Х		×	× ×	× × ×	× × × ×	* * * * *	* * * * *	× × × × ×	* * * * *	* * * * * *	* * * * * *	* * * * * *	* * * * * *	* * * * * *	* * * * * *	* * * * * *	* * * * * * * * * *
	Outcome 7	Worker injury/fatality				Worker injury/fatality																						
	Outcome 6	Public injury/fatality				Public injury/fatality	Public injury/fatality																					
t if it occurs	Outcome 5	Property damage	Freeway/road closure			Property	Property damage										Freeway/road closure	Freeway/road	closure	Freeway/road	Freeway road closure	Freeway road closure	Freeway road clesure	Frewwy/road closure	clesure described	Frevery road closure	closure	closure closure
TO risk even	Outcome 4	Outage	Wildfire			Outage	Outage		Wildfire								Wildfire	Wildfire	Wildfire	Widfire	Wildfre	Widfre	Wildfre	Widfire	Wildfre	Wildfre	Wildfire	Wildfree
Potential effect of risk event if it occurs	Outcome 3	Leakage/spills	Worker in jury/fatality			Leakage/spills	Leakage/spills		Worker injury/fatality				Outage	Outage	Outage	Outage Outage	Outage Outage Outage	Outage Outage	Outage Outage	Outage	odatio odatio	onnige agento	oderno oderno	ademo ademo	adenno adenno	ademo ademo	Outage Outage	ademo ademo
NEVO	Outcome 2	Equipment derating	ξ	Public injury/fatality		Equipment derating	Equipment derating	Customer dissatisfaction	Public injury/fatality				Equipment	Equipment damage Equipment damage	Equipment damage Equipment damage Outage	Equipment danage Equipment danage Outage	Equipment danage Equipment danage Outage Worker injury/fatality	Equipment damage Equipment damage Outage Outage Worker	Equipment damage Equipment Equipment Coutage Outage Worker mjury/fatality	Equipment damage Equipment damage Outage Outage Worker injury/fatality	Equipment damage Outage Outage Worker	Equipment Equipment damage Outage Outage Worker	Equipment	Equipment Equipment Equipment Equipment Equipment Counge Outage Outage Outage Courainment Equipment Equipment Equipment Equipment	Equipment damage Ounge Ounge Ounge Curainent Equipment Equip	Equipment damage Outage Outage Outage Outage Contage Contage Outage Equipment Equipmen	Equipment damage Duninge Ounge Ounge Ounge Cunge Curainent Equipment Equipment Equipment Equipment Equipment Equipment Penines disruption Equipment Penines disruption	Equipment damage damage damage Outage Outage Outage Currailment Equipment Equipment Equipment Equipment Equipment Outage Outage
10 GRC	Outcome 1	Curtailment	Outage		Public injury/fatality	Curtailment	Curtailment	Operational or business disruption	Outage	Outage	Public injury/fatality		Traffic	Traffic accident Traffic accident	Traffic accident Traffic accident Equipment damage	Traffic accident Traffic accident Equipment damage Worker injury/fatality												
Potential effect of risk	Event (risk incident the activity is expected to miricate)	Transformer unavailable	Overhead conductor down in service	Intact conductor failure in service	Human contact with intact conductor	Circuit breaker unavailable	Transformer unavailable	Unable to integrate higher penetrations of DERs	Equipment damage or failure	Inability to serve load due to not performing reactive replacement	Contact with energized wire	7	External collapse, non- standard		1. 1 1 1 -													
<	Category a	Asset Tr	Asset	Asset In	Asset	Asset	Asset Tr	Asset	Asset	Asset d	Asset C		Asset E															
	2016-2020 Forecast (\$000)				\$ 760,057			\$ 19,749	\$ 8,712	##########	\$ 39,471			0000000	\$ 340,290	\$ 340,290	\$ 340,290	\$ 340,290 \$ 184,863 \$ 148,909	\$ 340,290 \$ 184,863 \$ 148,909 \$ 20,741	\$ 340,290 \$ 184,863 \$ 148,909 \$ 20,741 \$ 53,829	\$ 340,290 \$ 148,909 \$ 20,741 \$ 53,829 \$ 200,282	\$ 340,290 \$ 148,963 \$ 20,741 \$ 53,829 \$ 200,282 \$ 277,304	\$ 340,290 \$ 184,863 \$ 148,909 \$ 20,741 \$ 53,829 \$ 200,282 \$ 277,304	\$ 340,290 \$ 184,863 \$ 148,909 \$ 20,741 \$ 232,829 \$ 277,304 \$ 128,739				
	Capital Category (WBS)				4kV Cutovers, DER- Driven Cutovers			4kV Substation Removal, DER- Driven Substation Eliminations	Circuit Breaker Upgrades	ital	Remove Idle Facilities			Underground	Underground Structure Replacement	Underground Structure Replacement	Underground Structure Replacement Distribution - Storm	Underground Structure Replacement Distribution - Storm	Undegreand Smeture Replacement Distribution - Storm Distribution - Claim Furniture Distribution Lab Eggin, Distribution Lab Pergin, Distribution Lab Pergin, Distribution Lab Pergin, Distribution Lab Pergin, Distribution Lab	Underground Structure Replacement Distribution - Storm Distribution - Claim Furniture, Distribution - Equip. Distribution Furnity Furnity Furnity Furnity	Underground Structure Replacement Distribution - Stom Distribution - Claim Furniture, Distribution Lab Bistribution Lab Structure Prefibrication Prefibrication Streetlights	Underground Structure Replacement Distribution - Storm Distribution - Claim Distribution - Claim Purniture, Distribution Leb Reput, Distribution Perfetty, Distribution Perfetty, Distribution Prefetty, Streetights Streetights Substation Capital Maintenance	Underground Structure Replacement Distribution - Storm Distribution - Claim Furnium, Distribution - Claim Furnium, Distribution - Claim Pertabrication Pertabrication Pertabrication Streetlights Streetlights Substation Capital Maintenance and Control Rubstation Protection and Control Replacements	Underground Smeture Replacement Distribution - Storm Distribution - Claim Pruniture, Distribution Leb Brithation Leb Potrable Tools Prefabrication Streetights Streetights Streetights Relay Upgandes Relay Upgandes	Underground Structure Replacement Distribution - Storm Distribution - Claim Furniture, Distribution Leb Equit, Distribution Leb Furnity Distribution Leb Furnity Distribution Leb Rough, Distribution Leb Rough, Distribution Leb Rough Control Streetlights Streetlights Streetlights and Control Replacements Relay Upgrades Relay Upgrades Relay Upgrades	Underground Smeture Replacement Distribution - Storm Distribution - Claim Furniture, Distribution Leb Furniture, Purniture, Purniture, Purniture, Purniture, Replacements Streetlights Streetlights Substation Capital Maintenance and Control Replacements Relay Upgrades Relay Upgrades Substation Spure Parits Parits Substation Spure Parits P	Underground Structure Replacement Distribution - Storm Distribution - Claim Furniture, Distribution - Claim Furniture, Distribution - Claim Furniture, Distribution - Claim Furnity, Distribution Perdabrication Streetlights Substation Capital Maintenance and Control Relay Lipgrades Relay Lipgrades Relay Lipgrades Furniture Furniture Furniture Substation Spare Furniture Capital Substation Spare Welly Lipgrades Furniture Capital Substation Spare Furniture Control Substation Spare Furniture Capital Work Equipment Tools and Work Equipment Tools and Work Equipment Tools and Work Equipment	Underground Structure Replacement Distribution - Storm Distribution - Claim Parallure, Distribution Leb Furnibution Leb Furnibution Leb Furnibution Leb Furnibution Leb Structlights Structlights Structlights Anithenance and Control Replacements and Control Replacements Substation Potention Substation Tools and Work Equipment Substation Tools and Substation Tools and Work Equipment Substation Tools and Substation Pagenter Substation Physical Substation Phy
EMALL	Volume Title				System 4 Planning			System Planning	System Planning		Distribution M&I			DOE.M	DC&M	DC&M												
	Witness				E. Takayesu			E. Takayesu	E. Takayesu	M. Stark	M. Stark			A Edward	A. Edeson	A. Edeson	A. Edeson	A. Edeson A. Edeson A. Edeson	A. Edeson A. Edeson A. Edeson A. Edeson	A. Edeson A. Edeson A. Edeson A. Edeson A. Edeson A. Edeson	A. Edeson A. Edeson A. Edeson A. Edeson A. Edeson A. Edeson	A. Edeson	A. Edeson A. Edeson A. Edeson A. Edeson A. Edeson M. Flores M. Flores	A. Edeson A. Edeson A. Edeson A. Edeson A. Edeson M. Flores M. Flores	A. Edeson A. Edeson A. Edeson A. Edeson A. Edeson M. Flores M. Flores M. Flores	A. Edeson A. Edeson A. Edeson A. Edeson A. Edeson M. Flores M. Flores M. Flores M. Flores	A Edeson A Edeson A Edeson A Edeson A Edeson M Flores M Flores M Flores M Flores	A. Edeson A. Edeson A. Edeson A. Edeson A. Edeson M. Flores
COAL	Testimony Reference				SCE-02, Vol. 03				SCE-02, Vol. 03	SCE-02, Vol. 04	SCE-02, Vol. 04			SCE-02,	SCE-02, Vol. 05	SCE-02, Vol. 05	SCE-02, Vol. 05 SCE-02, Vol. 05	SCE-02, Vol. 05 SCE-02, Vol. 05 SCE-02, Vol. 05	SCE-02, Vol. 05 SCE-02, Vol. 05 SCE-02, Vol. 05 SCE-02, Vol. 05	SCE-02, Vol. 05 SCE-02, Vol. 05 SCE-02, Vol. 05 SCE-02, Vol. 05 Vol. 05	SCE-02, Vol. 05 SCE-02, Vol. 0	SCE-02, Vol. 05 SCE-02, Vol. 0	SCE-02, Vol. 05 SCE-02, Vol. 0	SCE-02, Vol. 05 SCE-02, Vol. 06 SCE-02, Vol. 0	SCE-02, Vol. 05 SCE-02, Vol. 06 SCE-02, Vol. 0	SCE-02, Vol. 05 SCE-02, Vol. 06 SCE-03, Vol. 06 SCE-03, Vol. 06 SCE-03, Vol. 06 SCE-04, Vol. 06 SCE-05, Vol. 0	SCE-02, Vol. 05 SCE-02, Vol. 06 SCE-02, Vol. 0	SCE-02, Vol. 05 SCE-02, Vol. 06 SCE-02, Vol. 0

	EN	(IAP)	QUALITATIVE MAPPING OF C	CAPITAL A		CTIVITIES IN 2	918 GRC	2018 GRC REQUEST TO RISK	ST TO	RISK				Evaluated a	as part of T&	Evaluated as part of T&D Risk Analysis	S		
									Potential effec	ct of risk even	it if it occurs					Impact	Dimensions		
Contact Anticome Contact Ant	Volume Title	itle	Capital Category (WBS)				Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Outcome 6	Outcome 7	Safety	Service Reliability	Environmental		Financial	Other (e.g. Customer Expectation)
	TC&M	2	Transmission Planne Capital Maintenance			Failure of obsolete equipment	Outage		Worker Injury/Fatality					×	×			×	
Note that the section Note Note	TC&M	×	Transmission Breakdown Capital Maintenance	S		Failure of obsolete equipment	Outage		Worker Injury/Fatality					×	×			×	
Particular Par	TC&M	M	Transmission Line Rating Remediation	_		Failure of noncompliant equipment	Outage	-	Worker Injury/Fatality					×	x		х	×	
Transferred S. 1824 SAC	TC	ķМ	Fiber-Optic Network Maintenance	s		Failure of obsolete equipment												×	
National Street 19 19 19 19 19 19 19 1	TC	&М	Transmission and Substation Storm			Wire down	Outage	Worker Injury/Fatality	Outage		Freeway/road closure			х	×	×		×	
Transition S 4,774 Ace Legic lateral and lateral l	TC	&M	Transmission and Substation Claims			N/A													
Transmission S 1777 Assi Linear for a Contage	TC	TC&M	Transmission Spare Parts	S		\vdash	Outage								х				
Management Sept. Anne Sept. Cable failure Coluge Sept. Cable failure Cab	TC	&М	Transmission Relocations			Lines are not relocated per customer or community request	Customer dissatisfaction												х
Regularization of Serior Consideration of Serior Consid	TC	TC&M	Transmission Tools and Work Equipmen	\$		Slowed maintenance of failed parts	Outage								×				
Clob Life Entennent 1 19.27 Asset Chable dilute Ortage officiality Publica Property Property Ass Chabe dilute Chabe dilute Chabe dilute Chabe dilute Chabe dilute Chabe dilute Property Asset Chabe dilute Chabe dilute Property Asset Chabe dilute Chabe dilute Chabe dilute Property Asset Chabe dilute Chabe dilute Property Asset Chabe dilute Property Asset Property Asset Asset Asset Property Asset	Infras Repla	tructure		\$ 651,6	_	Cable failure	Outage	Public injury/fatality						×	×			×	
Cubic placement State of Coulous Cubic fighter Outside Windered Programs Programs Accession Coulous (all submits) Windered Coulo	Infra: Repla					Cable failure	Outage		Worker injury/fatality	Property				×	×			×	
Overhead Conclusion Sasked Conclusion Orange Conclusion Orange Conclusion Winder Columns Winder Columns Winder Columns Asset Third-patched failure Columns Winder Columns Wind	Infra: Repla	structure				Cable failure	Outage		Worker injury/fatality	Property				×	×			×	
Overhead Conductor (1) Fingalism Asset Interspectored failure Contact with Program Public Interspectored Contact (1) Findage (1)					Asset	Overhead conductor down in service	Outage		Worker injury/fatality	Н	Freeway/road closure			×	Х	×		×	
Liberground Oil S. 61,389 Asset Bilbiology contact with Public	Infrast Repla	ructure	Overhead Conducto. Program			Intact conductor failure in service	Outage	Public injury/fatality						×	×			×	
Strict Replacement Strict					Asset	Third-party contact with intact conductor	Public injury/fatality							×				×	
Capacitor Blank Septiment Blank Septiment Blank Septiment Blank Septiment Blank Septiment Septiment Septiment Septiment Blank Septiment	Infras Repla	tructure	Underground Oil Switch Replacement	S		Switch (oil BURD, gas BURD, oil mainline, or gas mainline) failure	Outage			Leakage/spills				×	×	×		×	
Automatic Replication In Intervitation In Replication In Intervitation In Intervitation In Intervitation In Intervitation In Intervitation Intervitation In Intervitation	Infra: Repla	structure	Capacitor Bank Replacement			Voltage collapse	Outage								х				
Problement Pro	Infra Repl	Infrastructure Replacement	Automatic Recloser Replacement	\$		Energized wire down	Public injury/fatality	Worker injury/fatality	Outage		Freeway/road closure			×	x	x		×	
Transformer Assertation	Infra Repl	structure				PCB oil leak	Leakage/spills	Worker injury/fatality						×		×		×	
Substation Sub	Infra Repl	Infrastructure Replacement				Transformer unavailable			Leakage/spills	Outage		Public injury/fatality	Worker injury/fatality	×	×	x	х	×	
8 7.2,270 Asset Switchrack failure Outage Public Property Widfre X <t< td=""><td>Infra Rep</td><td>Infrastructure Replacement</td><td>Substation Circuit Breaker Replacemen</td><td>_</td><td></td><td>Circuit breaker unavailable</td><td>Curtailment</td><td></td><td>Leakage/spills</td><td>Outage</td><td></td><td>Public injury/fatality</td><td>Worker injury/fatality</td><td>×</td><td>×</td><td>×</td><td>×</td><td>×</td><td></td></t<>	Infra Rep	Infrastructure Replacement	Substation Circuit Breaker Replacemen	_		Circuit breaker unavailable	Curtailment		Leakage/spills	Outage		Public injury/fatality	Worker injury/fatality	×	×	×	×	×	
Buddy Poles S - NA	Infra Repl	structure	Switchrack Rebuilds	S		Switchrack failure	Outage	Worker injury/fatality						×	×			×	
Distribution Pulse S 96.54.30 Asset Pulse failure Outage Public Pulse	_	oles	Buddy Poles	S	- NA	N/A													
Destribution S - Asset Pole failure Outage Public Property Wildfre Property Wildfre Property Wildfre Property Property Wildfre Property Wildfre Property Public Property Wildfre Property Public Property Wildfre Property Public Property Wildfre Property Public Property Public Property Wildfre Property Public Property Wildfre Property Public Property Public Property Wildfre Property Public Property Public Property Public Property Wildfre Property Public Property Public Property Wildfre Property Public	Н	oles	Distribution Pole Replacement	\$ 965,4		Pole failure	Outage	Public injury/fatality	Property damage	Wildfire				х	х	х		х	
Delegementation S. 589.355 Asset Pole failure Outage Public Property Wildfre Pole Remediation S. 100.769 Asset Pole failure Outage Public Property Wildfre Property Wildfre Property Replacement S. 100.769 Asset Pole failure Outage Public Property Wildfre Property Wildfre Property Public Publ	ď	oles	Distribution Pole Loading Calculation Replacements			Pole failure	Outage	Public injury/fatality	Property	Wildfire				×	×	×		×	
Probe Remediation S 100,709 Asset Probe failure Outage Public Property Wildfree Replacementation S 108,266 Asset Probe failure Outage Public Property Mildfree Replacementation Probe failure Outage Property Property Mildfree Property Mildfree Property Mildfree Property Prope	P(seles	Pole Remediation Distribution	_		Pole failure	Outage	Public injury/fatality	Property	Wildfire				×	×	×		×	
Transmission Pole S - Asset Pole failure Outage Public Property Wildfree Transmission Pole Transmission Pole Asset Pole failure Outage Property Property Wildfree Property Property Wildfree Property Prop	Pc	səles	Pole Remediation Transmission			Pole failure	Outage	Public injury/fatality	Property	Wildfire				×	×	×		×	
Transmission Pole Loading College Asset Pole failure Outage injuvifiability damage Renkonservation 8 358,266 Asset Pole failure Outage injuvifiability damage Renkonservation	ď		Transmission Pole Replacement	s	- Asset		Outage	Public injury/fatality	Property	Wildfire				×	×	×		×	
	1		Transmission Pole Loading Calculation	\$ 358,2		Pole failure		Public injury/fatality	Property	Wildfire				×	×	х		×	

╗		Other (e.g. Customer Expectation)																				×	×	
		Financial			×		×	×	×	×	×	×			Х	X		×	×		×		×	×
s	Impact Dimensions	Compliance																		×				×
Evaluated as part of T&D Risk Analysis	Impact	Environmental			×	×			x	х		×				x					x			
s part of T&l		Service Reliability			×				Х	Х	Х	х	х	х	x	x	×				Х	×		
svaluated a		Safety			х					х	х	х									×			
E		Outcome 7																						
		Outcome 6																						
	t if it occurs	Outcome 5			Free way/road closure					Freeway/road closure		Freeway/road closure									Wildfire			
RISK	Potential effect of risk event if it occurs	Outcome 4			Wildfire					Wildfire	Curtailment	Wildfire									Worker injury/fatality			
EST TO	Potential effe	Outcome 3			Worker injury/fatality					Outage	Worker injury/fatality	Outage									Public injury/fatality			
REQUI		Outcome 2			Public injury/fatality				Equipment failure	Worker injury/fatality	Public injury/fatality	Worker injury/fatality			Operational or business disruption	Equipment failure					Equipment failure	Customer dissatisfaction	Customer dissatisfaction	Non- compliance
018 GRC		Outcome 1			Outage	Leakage/spills	Operational or Business Disruption	Operational or Business Disruption	Outage	Public injury/fatality	Outage	Public injury/fatality	Outage	Outage	Outage	Outage	Outage	Operational or business disruption	Operational or business disruption	Non- compliance	Outage	Prolonged outage	Operational or business disruption	Operational or business disruption
CTIVITIES IN 2018 GRC REQUEST TO RISK		Event (risk incident the activity is expected to mitigate)	N/A	N/A	Wire down	Pole disposed of improperly	T&D project impacted	T&D project impacted	Outage on circuit with high DER penetration	Wire Down	NetComm oversaturated	Wire down	Concentric failure	Concentric failure	Bank outage in an area with high DER penetration	Outage on circuit with high DER penetration	Ineffective distribution automation	System inefficiency resulting in higher than necessary energy procurement	System inefficiency resulting in higher than necessary energy procurement	Inability to meet Commission goal and/or acquire data to improve storage functioning and integration	Energized wire down	Inability to monitor and respond to outages	Inability to bill customers for energy usage	Inability to integrate legacy and smart meters
ACT]		Category	N/A	N/A	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset
PITAI		2016-2020 Forecast (\$000)	\$(257,064)	\$ (49,146)	·	\$ 18,339	\$ 28,812	\$ 19,554	\$ 261	\$ 191,985	\$ 542,849	\$ 13,789	\$ 231,648	\$ 330,067	\$ 366,779	\$ 166,978	\$ 30,703	\$ 18,899	\$ 4,459	\$ 68,583	\$ 43,808	\$ 43,247	\$ 163,394	
QUALITATIVE MAPPING OF CAPITAL A		è	Joint Pole - Distribution		Steel Stubbing / Fiberglass Wrap (Pole Betterment)	=		Pole Loading Program Transformers			IT Grid Modernization	Circuit Automation	WCR Automation	WCR Circuit Ties		Grid Modernization (PWRD), Grid Mod - Distribution Automation	Distribution System Efficiency Enhancement Project	Distribution Volt- VAR Control	Conservation Voltage Regulation	Energy Storage Initiative	Advanced	Customer outage Notofication Initiative	Meters - Customer Service Operations	
E MAPP		Volume Title	Poles	Poles	Poles	Poles	Poles	Poles	Grid Modernization	ш	Grid Modernization	\vdash				Grid (F Modernization	Grid I Modernization E	Grid Technology	Grid C Technology	Grid Technology	Grid Technology	Grid Technology N	Customer Service	
TATIV		Witness	C. Fanous	C. Fanous	C. Fanous	C. Fanous	C. Fanous	C. Fanous	R. Ragsdale	R. Ragsdale	R. Ragsdale	R. Ragsdale	R. Ragsdale	R. Ragsdale	R. Ragsdale	R. Ragsdale	R. Ragsdale	D. Kim	D. Kim	D. Kim	D. Kim	D. Kim	D. Bernaudo	
QUAL		Testimony Reference	SCE-02, Vol. 09	SCE-02, Vol. 09	SCE-02, Vol. 09	SCE-02, Vol. 09	SCE-02, Vol. 09	SCE-02, Vol. 09	SCE-02, Vol. 10	SCE-02, Vol. 10	SCE-02, Vol. 10	SCE-02, Vol. 10	SCE-02, Vol. 10	SCE-02, Vol. 10	SCE-02, Vol. 10	SCE-02, Vol. 10	SCE-02, Vol. 10	SCE-02, Vol. 11	SCE-02, Vol. 11	SCE-02, Vol. 11	SCE-02, Vol. 11	SCE-02, Vol. 12	SCE-03, Vol. 01	

_				1						-	1						1	1
		Other (e.g. Customer Expectation)	×	×	×	×	×	×	×	×		×				×		
		Financial	×	×	×	×	×	×	×	×	×	×	×	×	×	×		
	Impact Dimensions	Compliance		×						×		×	×	×	×	×		
Evaluated as part of T&D Risk Analysis	Impact D	Environmental															×	
s part of T&I		Service Reliability			×	×	×	×	×	×		×	×	×		×	×	×
Evaluated a		Safety		×	×	×	×		×	×			×	×	×	×	×	
		Outcome 7																
		Outcome 6																
	it if it occurs	Outcome 5					Worker injury/fatality						Worker injury/fatality					
RISK	Potential effect of risk event if it occurs	Outcome 4		Non- compliance	Outage	Outage	Public injury/fatality	Outage				Operational or business disruption	Public injury/fatality	Worker injury/fatality		Operational or business disruption		
ST TO	Potential effe	Outcome 3		Operational or business disruption			Customer dissatisfaction						Operational or business disruption	Public injury/fatality	Worker injury/fatality	Customer dissatisfaction		
REQUI		Outcome 2	Operational or business disruption	Customer dissatisfaction	Customer dissatisfaction	Customer dissatisfaction	Operational or business disruption	Customer dissatisfaction	Outage	Non- compliance		Reduced/elimi nated customer use of digital channels	Outage	Outage	Operational or business disruption	Reduced/elimi nated customer use of digital channels	Environmental damage	
2018 GRC REQUEST TO RISK		Outcome 1	Customer dissatisfaction	Public injury/fatality	Operational or business disruption	Operational or business disruption	Outage	Operational or business disruption	Cybersecurity	Cybersecurity	Operational or business disruption	Non- compliance	Non- compliance	Non- compliance	Non- compliance	Non- compliance	Outage	Delayed outage restoration
ACTIVITIES IN 2		Event (risk incident the activity is expected to mitigate)	Inability to measure energy use, temperatures, and other data at customer sites to support evaluation of energy consumption and performance of equipment	Inability to adequately maintain Commission mandated workforce training program facilities	Equipment failure	Equipment failure	Lack of, or insufficient, telecommunications to support grid operations	Inability to operate personal computing devices and business servers	Breach of grid control systems	Breach of systems with customer/worker personal identifiable information and operational confidential information	Costly and uncoordinated operation of enterprise IT applications	Software obsolescence, incompatibility, functionality issues	Comply with safety and environmental objectives and sustain station reliability	Delayed or inefficient communication and monitoring of contracted generating plants				
~		Category	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset
CAPITAL		2016-2020 Forecast (\$000)	\$ 3,033	\$ 7,965	\$ 199,600	\$ 115,610	\$ 157,863	\$ 82,600		\$ 308,858	\$ 41,650	\$ 51,250	\$ 67,365	\$ 211,225	\$ 46,160	\$ 208,800	\$ 188,020	\$ 8,190
ING OF CA		Capital Category (WBS)	Specialized Equipment	Structures - Business Customer Department	Hardware - Servers & Storage	Hardware - End User Computing, Data & Voice	Hardware - Grid Services & Telecomm	Software - Operating Software		Software - Cybersecurity & Compliance	Software - TC&O	IT Capitalized Software - Customer Software	Software - Power Supply	Software - Transmission & Distribution	Software - Ethics, Compliance, HR, Finance, Other	CS Re-platform	Palo Verde Capital Projects	Communication Equipment
QUALITATIVE MAPPING OF		Volume Title	Customer	Customer Service C	IT O&M and Hardware	IT O&M and Hardware	IT O&M and Hardware	IT Capitalized Software		IT Capitalized Software	IT Capitalized Software	IT Capitalized Software	IT Capitalized Software	IT Capitalized Software	IT Capitalized Software	CS Re- Platform	Palo Verde	Power Procurement
ITATIV		Witness	D. Tunicliff	D. Bernaudo	M. Provenzano	M. Provenzano, C. Carazo	C. Carazo	M. Provenzano		G. Haddox	J. Kelly	J. Lim	J. Tran. T. Condit	T. Boucher	I. Castleberry	T. Walker	T. Champ	J. Tran
QUAL		Testimony Reference	SCE-03, Vol. 01	SCE-03,	SCE-04, Vol. 01	SCE-04, Vol. 01	SCE-04, Vol. 01	SCE-04, Vol. 02		SCE-04, Vol. 02	SCE-04, Vol. 02	SCE-04, Vol. 02	SCE-04, Vol. 02	SCE-04, Vol. 02	SCE-04, Vol. 02	SCE-04, Vol. 03	SCE-05, Vol. 01	SCE-05, Vol. 02

		Other (e.g. Customer Expectation)																		
		Financial C	×	×	×	×	×	×	×	×	×		×	×	×	×	×	×	×	×
	ensions	Compliance F		×	×			×						×	×	×	×	×		×
sk Analysis	Impact Dimensions	Environmental C		×					×	×						×				
Evaluated as part of T&D Risk Analysis		Service Reliability Env	×	×	×	×			×	×	×	×	×		×				×	
aluated as pa		Safety R	×	×	×	×	×		×	×			×	×	×	×	×	×	×	×
Á		Outcome 7																		
		Outcome 6																		
	if it occurs	Outcome 5 (
ISK	Potential effect of risk event if it occurs	Outcome 4	Potential increased safetyrisk			Potential increased safety risk			Potential increased safety risk	Potential increased safety risk										
ST TO R	otential effect	Outcome 3	Operational or business disruption	Potential increased public/worker safety risk	Increased purchased power costs	Operational or business disruption	Plant or unit outages		Potential environmental damage	Potential environmental damage			Operational or business disruption		Outage	Plant and animal habitat destruction				
REQUE	I	Outcome 2	Increased C purchased power costs	Potential environmental damage	Plant or unit outages	Increased (purchased power costs		Potential lawsuit	Increased purchased e power costs	Increased purchased e power costs	Increased operation costs		Outage	Non- compliance	Non- compliance	Worker injury/fatality	Non- compliance	Non- compliance	Outage	Non- compliance
018 GRC		Outcome 1	Plant or unit outages	Plant or unit outages	Non- compliance	Plant or unit outages	Operational or business disruption	Non- compliance	Plant or unit outages	Plant or unit outages	Delayed outage restoration	Outage	Worker injury/fatality	Worker injury/fatality	Potential increased safety risk	Public injury/fatality	Worker injury/fatality	Worker injury/fatality	Worker injury/fatality	Worker injury/fatality
CTIVITIES IN 2018 GRC REQUEST TO RISK		Event (risk incident the activity is expected to mitigate)	Inability to provide timely repairs to turbine unitsor other specialized equipment for hydro facilities	Failure to restore reservoirs, flowlines, and other critical equipment for reliable hydro operations	Failure to obtain FERC relicenses for hydro facilities	Failure of electrical equipment at hydro plants	Inability to perform various work related to infrastructure and maintenance of hydro facility grounds	Failure to perform construction work to meet contractual obligations	Failure to comply with safety and environmental objectives and sustain station reliability	Failure to comply with safety and environmental objectives and sustain station reliability	Failure to connect SPVP control system to Mountainview system	Failure of obsolete equipment	Equipment deterioration and/or unsafe operating conditions	Facility deterioration and/or unsafe conditions	Structure deterioration and/or unsafe conditions	Someone or something accesses an out of service well	Facility deterioration and/or unsafe conditions	Facility deterioration and/or unsafe conditions	Facility deterioration and/or unsafe conditions	Facility deterioration and/or unsafe conditions
ACTI		Category	ti Asset un	re: Asset o	Asset	Asset	v Asset	Asset	Asset sa	Asset sa	Asset	Asset	Asset au	Asset	Asset ar	Asset ac	Asset	Asset	Asset	Asset
CAPITAL A		2016-2020 Forecast (\$000)	\$ 86,667	\$ 66,248	\$ 27,084	\$ 10,089	\$ 30,784	\$ 6,400	\$ 67,678	\$ 12,862	\$ 1,480	\$ 6,649	\$ 12,500	s	\$ 162,366	\$ 3,364	- 8	\$ 5,797	\$ 8,490	\$ 3,918
ING OF CA		Capital Category (WBS)	Prime Movers	Dams & Waterways	Relicensing	Electrical Equipment	Structures and Grounds	Decommissioning- San Gorgonio	Mountainview Capital Projects	Peakers Capital Projects	SPVP Capital Projects	Pebbly Beach Generation Station Automation	Other Catalina Capital	Admin Facilities Infrastructure Upgrade	Seismic Program	Well Decommissioning Program	Building Renovation	Maintenance Asset Management	Alhambra Data Center Build Out	Camp Edison Buildings
QUALITATIVE MAPPING OF		Volume Title	Hydro Capital	Hydro Capital E	Hydro Capital	Hydro Capital E	Hydro Capital	Hydro Capital	Coal, Minview & Peakers	Coal, Minview & Peakers	SPVP & Fuel Cells	Catalina	Catalina	CRE	Business Resiliency	Corporate Environ.	CRE B	Corp. Security	CRE	CRE
ITATIV		Witness	T. Condit	T. Condit	T. Condit	T. Condit	T. Condit	T. Condit	S. Handschin	S. Handschin	S. Handschin	A. Edeson	A. Edeson	N. Desrocher	D. Daigler	D. Neal	N. Desrocher	D. Bauder	N. Desrocher	N. Desrocher
QUAI		Testimony Reference	SCE-05, Vol. 03	SCE-05, Vol. 03	SCE-05, Vol. 03	SCE-05, Vol. 03	SCE-05, Vol. 03	SCE-05, Vol. 03	SCE-05, Vol. 04	SCE-05, Vol. 04	SCE-05, Vol. 05	SCE-05, Vol. 5	SCE-05, Vol. 5	SCE-07, Vol 03	SCE-07, Vol. 01	SCE-07, Vol. 02	SCE-07, Vol. 03	SCE-07, Vol. 05	SCE-07, Vol. 03	SCE-07, Vol. 03

DUALIT	ATIVE MA	QUALITATIVE MAPPING OF CAPITAL A	APIT		CTIVITIES IN 2018 GRC REQUEST TO RISK	1018 GRC	REQUE	ST TO	RISK				Evaluated a	as part of T&i	Evaluated as part of T&D Risk Analysis	s		
							Ī	Potential effec	Potential effect of risk event if it occurs	t if it occurs					Impact	Impact Dimensions	-	
Testimony Win	Witness Volume Title	Capital Category (WBS)	2016-2020 Forecast (\$000)	st Category	Event (risk incident the activity is expected to mitigate)	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Outcome 6	Outcome 7	Safety	Service Reliability	Environmental	Compliance	Financial	Other (e.g. Customer Expectation)
SCE-07, Vol. 03	N. Desrocher CRE	Capital Maintenance Projects	\$ 116,086	186 Asset	Facil and/or	Worker injury/fatality	Non- compliance						×			×	×	
SCE-07, N. De Vol. 03	N. Desrocher	Gateway Emergency Operation Center	\$ 3,026	26 Asset	Inability to properly respond to emergencies	Outage								×				
	N. Desrocher	Energy Efficiency	\$ 14,510	10 N/A	N/A													
SCE-07, Vol. 03	N. Desrocher	Facility Repurpose	\$ 42,635	35 NA	N/A													
SCE-07, N. De Vol. 03	N. Desrocher	Garage Infrastructure Upgrade Program	s 22,290	90 Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality	Operational or business disruption						×				×	
SCE-07, Vol. 03	N. Desrocher CRE	Irvine Operations Center Upgrade	\$ 6,948	48 Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality							×				×	
SCE-07, N. De Vol. 03	Desrocher CRE	Long Beach Regional Office Infrastructure Upgrade	\$ 5,212	112 Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality							×				×	
SCE-07, Vol. 03	N. Desrocher	Lease Exits	\$ 2,932	32 N/A	N/A													
SCE-07, Vol. 03	N. Desrocher CRE	Maintenance & Test Bldg Improvements	\$ 32,230	30 Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality							×				×	
SCE-07, N. De Vol. 03	N. Desrocher CRE	Menifee Service Center Offsite - Phase 2	e \$ 1,211	111 Asset	Facility deterioration and/or unsafe conditions	Public injury/fatality	Worker injury/fatality						×				×	
	N. Desrocher CRE	On-Going Furniture Modifications	\$ 19,545	45 Asset	Equipment deterioration and/or unsafe conditions	Worker injury/fatality							×				×	
SCE-07, N. De Vol. 03	N. Desrocher CRE	Pomona Innovation 2	2 8,877	177 N/A	N/A													
SCE-07, Vol. 03	Desrocher CRE	SCE ERGO Equipment	\$ 6,781	181 Asset	Equipment deterioration and/or unsafe conditions	Worker injury/fatality							×				×	
SCE-07, Vol. 03	N. Desrocher CRE	Service Center Modernization Program	\$ 196,437	137 Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality	Non- compliance						×			×	×	
SCE-07, N. De Vol. 03	N. Desrocher	Substation Capital Maintenance	\$ 69,135	35 Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality	Non- compliance						×			×	×	
SCE-07, Vol. 03	N. Desrocher CRE	Substation Reliability Upgrades	y s 17,900	000 Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality	Non- compliance	Outage					×	×		×	×	
SCE-07, Vol. 03	N. Desrocher CRE	T&D Training Facility	\$ 84,598	98 Asset	Deficient training	Worker injury/fatality							×				×	
SCE-07, Vol. 03	N. Desrocher	Various Major Structure	\$ 83,637	37 Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality	Non- compliance						×			×	×	
	N. Desrocher	Future Anticipated Projects	\$ 95,542	42 Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality	Non- compliance						×			×	×	
	N. Desrocher	Less than \$3M and CRE related IT	\$ 62,453	153 N/A	N/A													
\vdash	D. Bauder Corp. Security	by NERC CIP V6 Low BES Sites	\$ 10,233	33 Asset	Physical security breach	ijii	Worker injury/fatality	Outage	Non- compliance				×	×		×	×	
_	D. Bauder Corp. Security	_	\$ 29,538	38 Asset	Physical security breach	Public injury/fatality	Worker injury/fatality	Outage	Non- compliance				×	×		×	×	
SCE-07, D. B Vol. 05	D. Bauder Corp. Security		\$ 38,788	rsset Asset	Physical security breach	Public injury/fatality	Worker injury/fatality	Outage					×	×			×	
SCE-07, D. B Vol. 05	D. Bauder Corp. Security		\$ 47,354	54 Asset	Physical security breach	Public injury/fatality	Worker injury/fatality	Outage					×	×			×	
-	K. Landrith Supply Mgmt. & Div.	Supply	\$ 2,232	32 N/A	N/A													
SCE-07, Vol. 07	T. Guntrip Transportation Services	Aircraft Operations	\$ 5,078	N/A	N/A													

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	Impact Dimensions	Compliance Financial Customer Expectation)					
		Financial					
Evaluated as part of T&D Risk Analysis		Compliance					
		Service Reliability Environmental					
Evaluated a	Potential effect of risk event if it occurs	Safety					
		Outcome 1 Outcome 2 Outcome 3 Outcome 4 Outcome 6 Outcome 7 Safety					
QUALITATIVE MAPPING OF CAPITAL ACTIVITIES IN 2018 GRC REQUEST TO RISK		Outcome 6					
		Outcome 5					
		Outcome 4					
		Outcome 3					
		Outcome 2					
		Event (risk incident the activity is expected to mitigate)	N/A	N/A	N/A	N/A	N/A
		gory	N/A	N/A	N/A	N/A	N/A
		2016-2020 Forecast Cate (\$000)	\$ 1,230	\$ 9,754	\$ 653	\$ 2,659	\$ 8,439
		Capital Category (WBS)	Vehicle Electrification \$ 1,230 Program	T. Guntrip Services Lease Buyout	Transportation Electric Vehicle Fleet Services Chargers	T. Guntrip Transportation Garage Tools and Services Equipment	T. Guntrip Transportation Vehicle Leasehold Services Capital Improvements
		Witness Volume Title	T. Guntrip Transportation Services	Transportation Services	Transportation E Services	Transportation Services	Transportation V
ITATIV		Witness	T. Guntrip	T. Guntrip	T. Guntrip	T. Guntrip	T. Guntrip
QUAL		Testimony Reference	SCE-07, Vol. 07	SCE-07, Vol. 07	SCE-07, Vol. 07	SCE-07, Vol. 07	SCE-07, Vol. 07