

# Safety-Related Spending Accountability Report for Southern California Edison

Energy Division

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## Contents

Executive Summary .....	3
Key Findings .....	4
Safety Spending Breakdowns and Balancing Account Effects .....	6
Program Area Highlights .....	8
I. Introduction.....	10
I.A. Background.....	10
I.B. Translating Commission Authorization into Project Funding .....	12
I.C. Safety Accounting Framework .....	13
I.C.1. GRC Activities and WBS Elements .....	14
I.C.2. Expense vs. Capital .....	15
I.C.3. Balancing Account Implications .....	15
I.D. Selection Criteria and Selected Programs .....	16
II. Electric Transmission and Distribution .....	18
II.A. Electric Transmission and Distribution Expense Spending .....	18
II.A.1. Design Construction and Maintenance – Support Activities (Account 588.140) .....	23
II.A.2. Distribution Pole Assessments (Account 583.125).....	24
II.A.3. Transmission - Line, Structure, Road, and Right-Of-Way Maintenance (Account 571.150) .....	26
II.A.4. Distribution Pole Repairs and Distribution Pole-Related Expense (Account 593.125).....	28
II.B. Electric Transmission and Distribution Capital Spending .....	29
II.B.1. Distribution and Transmission Pole Replacement (CET-PD-IR-DP/DL and CET-PD-IR-TR/TL) .....	34
II.B.2. Distribution and Transmission Pole Remediation (CET-PD-IR-PD and CET-PD-IR-PT) .....	34
II.B.3. Overhead Conductor Program (CET-PD-IR-OC) .....	34
II.B.4. Cable in Conduit Replacement (CET-PD-IR-CC) .....	35
II.B.5. Distribution Rule 20B Conversions (CET-PD-CR-2B) .....	35
II.B.6. Underground Structure Replacements (CET-PD-IR-UG).....	35
II.B.7. Distribution Plant Betterment (CET-PD-LG-PB).....	36
II.B.8. Transmission Planned Capital Maintenance (Multiple WBS Elements) .....	36
II.B.9. Underground Oil Switch Replacement (CET-PD-IR-SR) .....	37
II.B.10. Substation Physical Security (CET-ET-IR-ME).....	37
II.C. Electric Transmission and Distribution Balancing Accounts.....	38
III. Electric Generation.....	40
III.A. Electric Generation Expense.....	40
III.A.1. Mountainview - Maintenance (Account 554) .....	42
III.B. Electric Generation Capital Spending .....	43
III.B.1. Mountainview Capital Projects .....	45
III.B.2. Hydro Generating Facilities – Electrical.....	46
IV. Other Safety-Related Programs .....	47
IV.A. Other Expense .....	48
IV.A.1. Corporate Security (Account 920-921-923) .....	50
IV.A.2. Corporate Real Estate – Administrative and General (Account 920-921).....	51
IV.B. Other Capital .....	51
IV.B.1. Hardware – Servers and Storage.....	53
Appendix A: SCE Risk Informed Planning Process and Risk Evaluation Methodology.....	55

## 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.<sup>1</sup> 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.

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<sup>1</sup> 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

- J 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.
- J 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.
- J 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.
- J For spending which is subject to balancing accounts, the utility has less incentive to under-spend 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 over-spending can be recovered.
  - o After taking into account balancing accounts<sup>2</sup>, SCE underspent authorized expense budget by \$129 million, or 16.2% less than authorized.
  - o 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.

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<sup>2</sup> 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) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	Actual vs. Requested		Actual vs. Authorized	
				(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(c-b) / b Percent Variance
<b>Electric Transmission and Distribution</b>							
Expense	\$ 532,583	\$ 520,506	\$ 439,023	\$ (93,560)	-17.6%	\$ (81,483)	-15.7%
Capital	\$ 1,639,440	\$ 1,401,708	\$ 1,810,699	\$ 171,260	10.4%	\$ 408,991	29.2%
Sub-total	\$ 2,172,022	\$ 1,922,214	\$ 2,249,722	\$ 77,700	3.6%	\$ 327,509	17.0%
<b>Electric Generation</b>							
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%
<b>Other</b>							
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%
<b>All</b>							
Expense	\$ 833,792	\$ 812,873	\$ 667,314	\$ (166,478)	-20.0%	\$ (145,559)	-17.9%
Capital	\$ 2,151,655	\$ 1,881,644	\$ 2,286,634	\$ 134,980	6.3%	\$ 404,990	21.5%

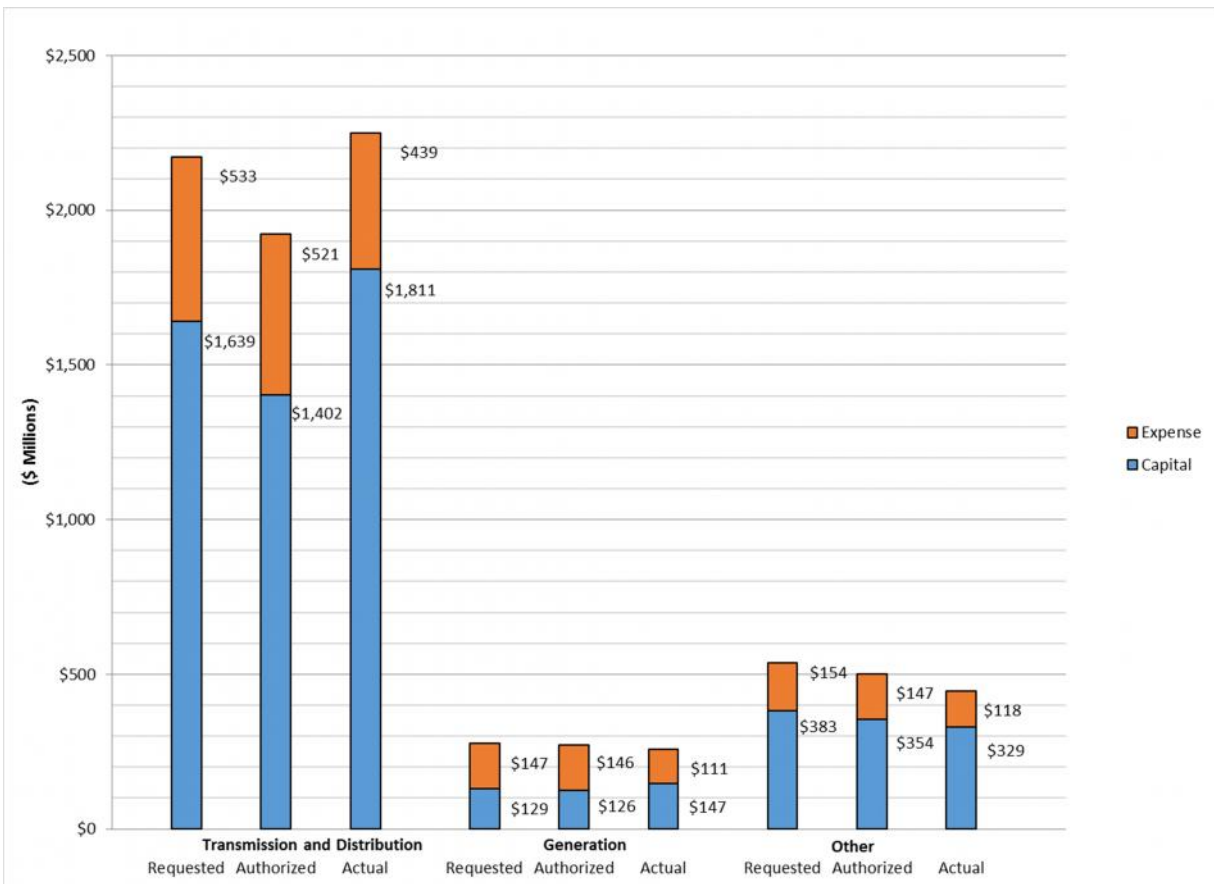


Figure ES-1: Comparison of Requested, Authorized, and Actual Safety Costs for 2015

## 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.<sup>3</sup> 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.

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<sup>3</sup> 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)**

	<b>2015 Safety Actual</b>	<b>2015 Total Actual</b>	<b>Safety Percent of Total</b>
<b>Electric Transmission and Distribution</b>			
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%
<b>Electric Generation</b>			
Expense	\$ 110,780	\$ 213,164	52.0%
Capital	\$ 146,896	\$ 145,484	101.0%
Sub-total	\$ 257,676	\$ 358,648	71.8%
<b>Other</b>			
Expense	\$ 117,511	\$ 1,045,385	11.2%
Capital	\$ 329,039	\$ 435,144	75.6%
Sub-total	\$ 446,550	\$ 1,480,529	30.2%
<b>All</b>			
<b>Expense</b>	<b>\$ 667,314</b>	<b>\$ 1,946,853</b>	<b>34.3%</b>
<b>Capital</b>	<b>\$ 2,286,634</b>	<b>\$ 3,701,391</b>	<b>61.8%</b>

Approximately \$20 million of safety-related expensed spending and \$576 million of spending on capital expenditures in 2015 is subject to balancing accounts. Balancing accounts<sup>4</sup> 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.

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<sup>4</sup> 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.

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

	(a) 2015 Authorized	(b) 2015 Actual	(b-a) Variance	(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%

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:

- I. **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).<sup>5</sup> 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.

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<sup>5</sup> 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.<sup>6</sup>

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.<sup>7</sup>

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.

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<sup>6</sup> D.11-05-018, p. 27.

<sup>7</sup> D.11-05-018, p. 29.

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

<b><u>Safety-Related Event</u></b>	<b><u>Date</u></b>
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) <sup>8</sup>	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 <sup>9</sup>	Jun-17
PG&E to file first annual Spending Accountability Report for 2017 <sup>10</sup>	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

<sup>8</sup> Reporting schedule is discussed in D. 16-08-018 pp. 156-159.

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

<sup>10</sup> 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.<sup>11</sup> 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

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<sup>11</sup> 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 accounts<sup>12</sup>, 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

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<sup>12</sup> 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.



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

Program	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	Actual vs. Requested		Actual vs. Authorized		Category	Group
				(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(c-b) / b Percent Variance		
Distribution Pole Replacement	\$ 111,066	\$ 83,675	\$ 323,684	\$ 212,618	191.4%	\$ 240,009	286.8%	T&D	Capital
Pole Remediation Distribution	\$ 285,563	\$ 200,276	\$ 147,324	\$ (138,239)	-48.4%	\$ (52,952)	-26.4%	T&D	Capital
Mountainview Capital Projects	\$ 1,139	\$ 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	\$ 31,910	\$ 30,953	\$ 88,000	\$ 56,090	175.8%	\$ 57,047	184.3%	T&D	Capital
Pole Remediation Transmission	\$ 58,501	\$ 41,341	\$ 9,923	\$ (48,578)	-83.0%	\$ (31,417)	-76.0%	T&D	Capital
Cable In Conduit Replacement	\$ 94,256	\$ 75,999	\$ 54,077	\$ (40,179)	-42.6%	\$ (21,923)	-28.8%	T&D	Capital
Hardware - Servers & Storage	\$ 63,199	\$ 61,637	\$ 23,122	\$ (40,077)	-63.4%	\$ (38,515)	-62.5%	Other	Capital
Electrical Equipment	\$ 38,256	\$ 38,256	\$ 2,426	\$ (35,830)	-93.7%	\$ (35,830)	-93.7%	Generation	Capital
Distribution Rule 20B Conversions	\$ 43,387	\$ 39,001	\$ 14,037	\$ (29,350)	-67.6%	\$ (24,963)	-64.0%	T&D	Capital
Underground Structure Replacement	\$ 72,712	\$ 58,169	\$ 102,060	\$ 29,348	40.4%	\$ 43,891	75.5%	T&D	Capital
Mountainview	\$ 41,084	\$ 40,750	\$ 12,363	\$ (28,721)	-69.9%	\$ (28,387)	-69.7%	Generation	Expense
Plant Betterment	\$ 8,012	\$ 8,012	\$ 35,250	\$ 27,238	340.0%	\$ 27,238	340.0%	T&D	Capital
Transmission Planned Capital Maintenance	\$ 6,268	\$ 6,268	\$ 32,151	\$ 25,883	413.0%	\$ 25,883	413.0%	T&D	Capital
Design Construction & Maintenance - Construction Support Activities	\$ 30,828	\$ 27,072	\$ 11,486	\$ (19,342)	-62.7%	\$ (15,586)	-57.6%	T&D	Expense
Underground Oil Switch Replacement	\$ 9,695	\$ 9,695	\$ 25,938	\$ 16,243	167.5%	\$ 16,243	167.5%	T&D	Capital
Corporate Security	\$ 42,950	\$ 42,950	\$ 26,906	\$ (16,044)	-37.4%	\$ (16,044)	-37.4%	Other	Expense
Distribution Pole Assessments	\$ 33,792	\$ 30,352	\$ 21,424	\$ (12,368)	-36.6%	\$ (8,928)	-29.4%	T&D	Expense
Substation Physical Security	\$ 5,791	\$ 5,791	\$ 17,673	\$ 11,883	205.2%	\$ 11,883	205.2%	T&D	Capital
Corporate Real Estate - A&G	\$ 27,896	\$ 25,812	\$ 16,062	\$ (11,834)	-42.4%	\$ (9,750)	-37.8%	Other	Expense
Transmission - Line, Structure, Road, and Right-Of-Way Maintenance	\$ 32,006	\$ 30,902	\$ 21,361	\$ (10,645)	-33.3%	\$ (9,541)	-30.9%	T&D	Expense
Distribution Pole Repairs and Distribution Pole Related Expense	\$ 11,153	\$ 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.<sup>13</sup>

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.

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

	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	Actual vs. Requested		Actual vs. Authorized	
				(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%

### 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%.

<sup>13</sup> 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.

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

Activity Description	GRC Activity	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	Actual vs. Requested		Actual vs. Authorized	
					(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(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 - Troublemens 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%
Reliability 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%

## Energy Division

May 11, 2017

Activity Description	GRC Activity	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	Actual vs. Requested		Actual vs. Authorized	
					(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(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%
<b>Total</b>		<b>\$ 532,583</b>	<b>\$ 520,506</b>	<b>\$ 439,023</b>	<b>\$ (93,560)</b>	<b>-17.6%</b>	<b>\$ (81,483)</b>	<b>-15.7%</b>

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 – Troublemens 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.<sup>14</sup> 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.<sup>15</sup> 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.<sup>16</sup> 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.<sup>17</sup> 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.

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<sup>14</sup> SCE 2018 GRC Exhibit SCE-02 Vol 05 p. 7-8

<sup>15</sup> *Ibid.* p. 18-20

<sup>16</sup> *Ibid.* p. 22-23

<sup>17</sup> *Ibid.* p. 30-33

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

<b>Expenses within GRC Account 588.140</b>	<b>2015 Requested</b>	<b>2015 Authorized</b>	<b>2015 Actual</b>	<b>Actual - Requested</b>	<b>Actual - Authorized</b>
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)
<b>Total</b>	<b>\$30,828</b>	<b>\$27,072</b>	<b>\$11,486</b>	<b>(\$19,342)</b>	<b>(\$15,586)</b>

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<sup>19</sup> (\$000s)**

<b>Expenses within GRC Account 588.140</b>	<b>2012 Actual</b>	<b>2015 Actual</b>	<b>Change</b>
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)
<b>Total</b>	<b>\$ 17,310</b>	<b>\$ 11,486</b>	<b>\$ (5,824)</b>

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.

<sup>18</sup> See SCE Workpapers SCE-02 Vol 5. p. 1

<sup>19</sup> 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.<sup>20</sup>

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.<sup>21</sup>

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.<sup>22</sup>

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.<sup>23</sup> Table II-5 summarizes the comparison between 2015 actual, authorized and requested amounts.

**Table II-5: 2015 Comparison of Distribution Pole Assessments Activities<sup>24</sup> (\$000s)**

<b>Expenses within GRC Account 583.125</b>	<b>2015 Requested</b>	<b>2015 Authorized</b>	<b>2015 Actual</b>	<b>Actual - Requested</b>	<b>Actual - Authorized</b>
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
<b>Total</b>	<b>\$33,792</b>	<b>\$30,352</b>	<b>\$21,424</b>	<b>(\$12,368)</b>	<b>(\$8,928)</b>

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.

<sup>20</sup> SCE 2018 GRC Exhibit SCE-02 Vol 09 p. 17-19

<sup>21</sup> *Ibid.* p. 41-42

<sup>22</sup> *Ibid.* p. 69-71

<sup>23</sup> *Ibid.* p. 68-69

<sup>24</sup> See SCE Workpapers SCE-02 Vol 9. p. 83

**Table II-6: Actual Comparison of Distribution Pole Assessments Activities<sup>25</sup> (\$000s)**

<b>Expenses within GRC Account 583.125</b>	<b>2012 Actual</b>	<b>2015 Actual</b>	<b>Change</b>
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)
<b>Total</b>	<b>\$ 6,812</b>	<b>\$ 21,424</b>	<b>\$ 14,612</b>

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.<sup>26</sup>

### **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.<sup>27</sup> 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.<sup>28</sup> 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

<sup>25</sup> SCE 2018 GRC Exhibit SCE-02 Vol 09 p. 82

<sup>26</sup> *Ibid.* p. 17-18

<sup>27</sup> SCE 2018 GRC Exhibit SCE-02 Vol 07 p. 14-15

<sup>28</sup> *Ibid* p. 15-19

lines to short circuit.<sup>29</sup> 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.<sup>30</sup> 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.<sup>31</sup> 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 Activities<sup>32</sup> (\$000s)**

<b>Expenses within GRC Account 571.150</b>	<b>2015 Requested</b>	<b>2015 Authorized</b>	<b>2015 Actual</b>	<b>Actual - Requested</b>	<b>Actual - Authorized</b>
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
<b>Total</b>	<b>\$32,006</b>	<b>\$30,902</b>	<b>\$21,361</b>	<b>(\$10,645)</b>	<b>(\$9,541)</b>

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.

<sup>29</sup> *Ibid* p. 21-22

<sup>30</sup> *Ibid* p. 23-24

<sup>31</sup> *Ibid*. p. 24-25.

<sup>32</sup> See SCE Workpapers SCE-02 Vol 7. p. 77

**Table II-8: Recorded Comparison of Transmission Maintenance Activities<sup>33</sup> (\$000s)**

<b>Expenses within GRC Account 571.150</b>	<b>2012 Actual</b>	<b>2015 Actual</b>	<b>Change</b>
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
<b>Total</b>	<b>\$ 23,312</b>	<b>\$ 21,361</b>	<b>\$ (1,951)</b>

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).<sup>34</sup> 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.<sup>35</sup> Table II-9 summarizes the comparison between 2015 recorded and requested amounts.

<sup>33</sup> SCE 2018 GRC Exhibit SCE-02 Vol 07 p. 38

<sup>34</sup> SCE 2018 GRC Exhibit SCE-02 Vol 09, p. 20

<sup>35</sup> SCE 2018 GRC Exhibit SCE-02 Vol 13, p. 27

**Table II-9: 2015 Comparison of Pole Repairs and Related Expense Activities<sup>36</sup> (\$000s)**

Expenses within GRC Account 593.125	2015 Requested	2015 Authorized	2015 Actual	Actual - Requested	Actual - 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
<b>Total</b>	<b>\$11,153</b>	<b>\$10,376</b>	<b>\$3,992</b>	<b>(\$7,161)</b>	<b>(\$6,384)</b>

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 Activities<sup>37</sup> (\$000s)**

Expenses within GRC Account 593.125	2012 Actual	2015 Actual	Change
Distribution Pole Loading Program Repairs	\$ -	\$ 810	\$ 810
Distribution Pole Loading Program Capital Related Expense	\$ -	\$ 3,182	\$ 3,182
<b>Total</b>	<b>\$ -</b>	<b>\$ 3,992</b>	<b>\$ 3,992</b>

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.<sup>38</sup>

## 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),

<sup>36</sup> See SCE Workpapers SCE-02 Vol 9. p. 83

<sup>37</sup> SCE 2018 GRC Exhibit SCE-02 Vol 9, p. 83

<sup>38</sup> ED-SCE-Verbal-009 Q.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.

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

Capital Category (WBS)	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	Actual vs. Requested		Actual vs. Authorized	
				(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(c-b) / b Percent Variance
Distribution Pole Replacement	\$ 111,066	\$ 83,675	\$ 323,684	\$ 212,618	191.4%	\$ 240,009	286.8%
Pole Remediation Distribution	\$ 285,563	\$ 200,276	\$ 147,324	\$ (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	\$ -	\$ -	\$ 58,126	\$ 58,126	---	\$ 58,126	---
Pole Remediation Transmission	\$ 58,501	\$ 41,341	\$ 9,574	\$ (48,927)	-83.6%	\$ (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%

## Energy Division

May 11, 2017

Capital Category (WBS)	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	Actual vs. Requested		Actual vs. Authorized	
				(c-a) Variance	(c-a) / a Percent Variance	(c-b) Variance	(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	---
<b>Total</b>	<b>\$ 1,639,440</b>	<b>\$ 1,401,708</b>	<b>\$ 1,810,699</b>	<b>\$ 171,260</b>	<b>10.4%</b>	<b>\$ 408,991</b>	<b>29.2%</b>



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.

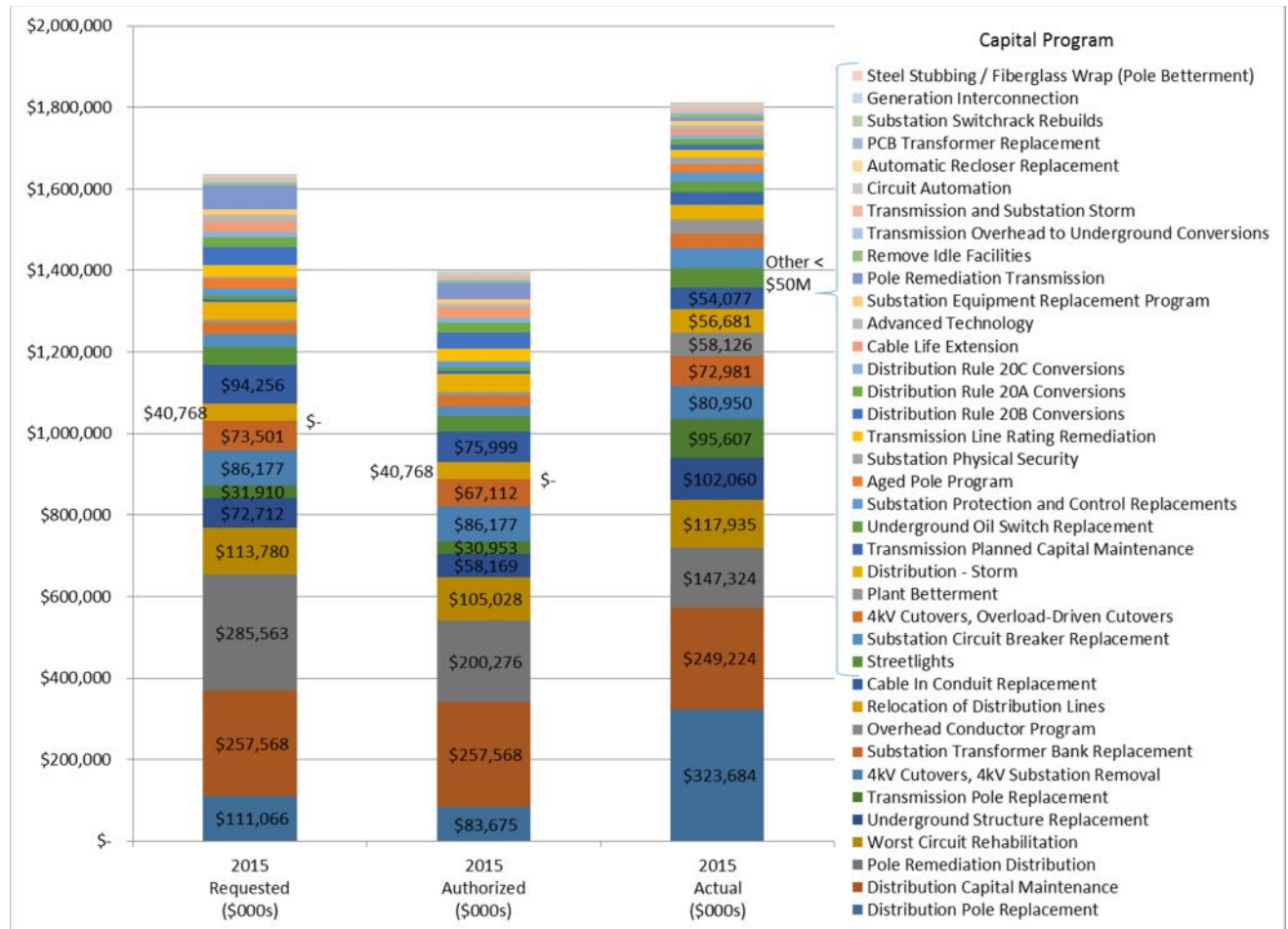


Figure II-2: 2015 Transmission and Distribution Capital Spending – Comparison by Program

### **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.<sup>39</sup> 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.<sup>40</sup>

### **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

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<sup>39</sup> SCE-02 Vol 9. P. 30-54

<sup>40</sup> *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.<sup>41</sup>

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.<sup>42</sup> 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.<sup>43</sup>

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

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<sup>41</sup> SCE-02 Vol 8, p. 48.

<sup>42</sup> *Ibid* p. 45

<sup>43</sup> SCE-02 Vol 2, p. 39-40.

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.<sup>44</sup>

#### **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.<sup>45</sup> 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.<sup>46</sup>

#### **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

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<sup>44</sup> SCE-02 Vol 5, p. 37.

<sup>45</sup> SCE-02 Vol 03R, p. 35.

<sup>46</sup> *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.<sup>47</sup>

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.<sup>48</sup>

### **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.<sup>49</sup> 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.

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<sup>47</sup> SCE-02 Vol 07, p. 10

<sup>48</sup> *Ibid*, p. 12

<sup>49</sup> 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 taxes<sup>50</sup>, and (3) the authorized Pole Programs revenue requirement as adopted in D. 15-11-021.<sup>51</sup> 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

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

<sup>51</sup> 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.<sup>52</sup> 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.<sup>53</sup> 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.<sup>54</sup> A total of \$162,000 was transferred to this account and may be recovered upon Commission approval.

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

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

<sup>54</sup> 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.

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

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

#### 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.



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

Activity Description	GRC Account	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	Actual vs. Requested		Actual vs. Authorized	
					(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%
<b>Total</b>		<b>\$147,209</b>	<b>\$145,723</b>	<b>\$110,780</b>	<b>(\$36,429)</b>	<b>-24.7%</b>	<b>(\$34,943)</b>	<b>-24.0%</b>

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), Mountainview (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.

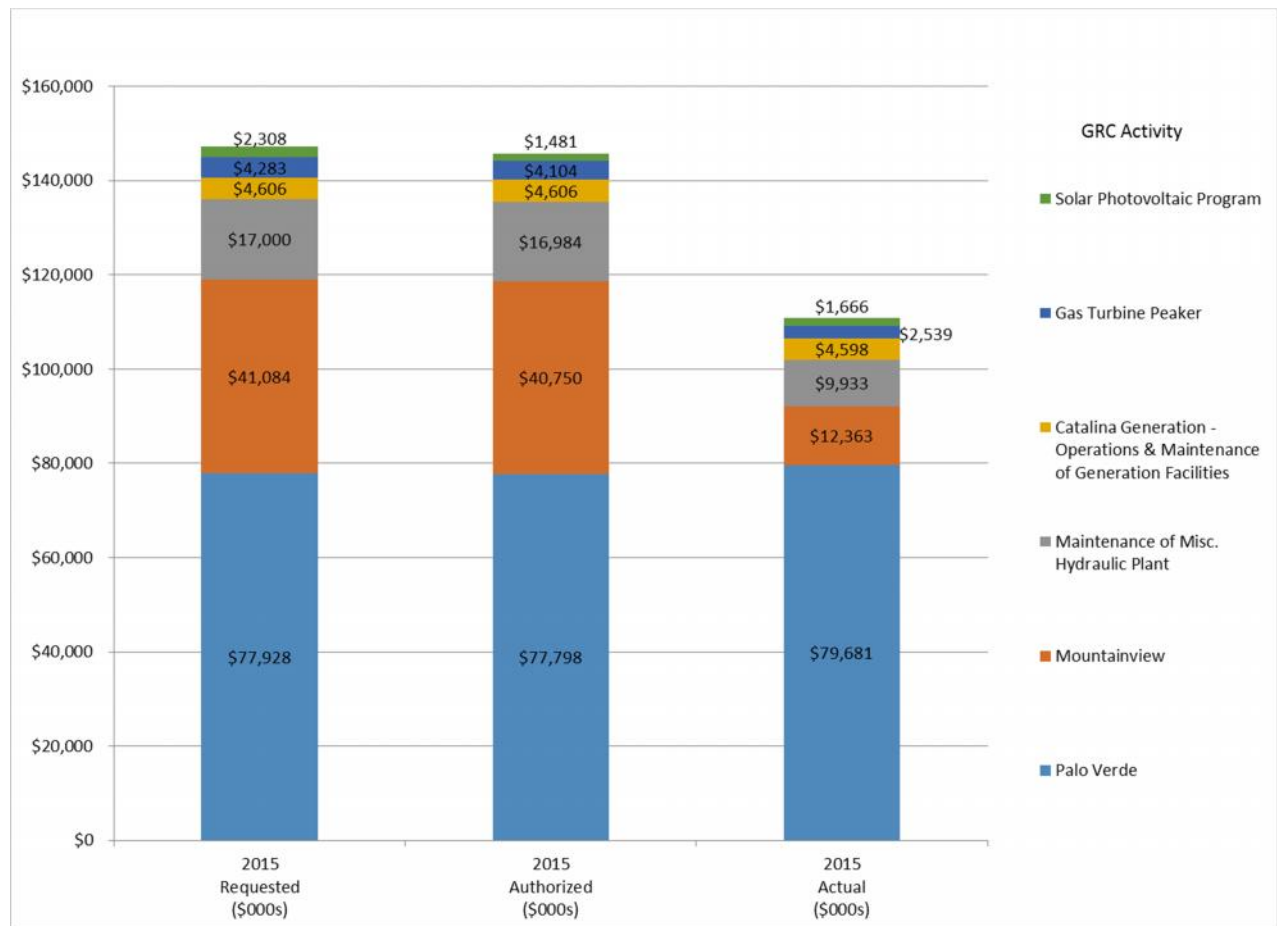


Figure III-1: 2015 Electric Generation Expense – Comparison of Spending by GRC Account

**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.

**Table III-3: Mountainview – Maintenance Activities<sup>55</sup> (\$000s)**

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)
<b>Total</b>	<b>\$22,132</b>	<b>\$12,363</b>	<b>(\$9,769)</b>

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.<sup>56</sup>

### 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.

<sup>55</sup> See SCE-05 Vol. 4, Book A, Workpapers, p. 30-32

<sup>56</sup> SCE-05 Vol 4, p. 2-3

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

Capital Category (WBS)	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	Actual vs. Requested		Actual vs. Authorized	
				(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 Photovoltaic Program	\$1,043	\$1,043	\$627	(\$416)	-39.9%	(\$416)	-39.9%
<b>Total</b>	<b>\$128,877</b>	<b>\$125,948</b>	<b>\$146,896</b>	<b>\$18,019</b>	<b>14.0%</b>	<b>\$20,948</b>	<b>16.6%</b>

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.

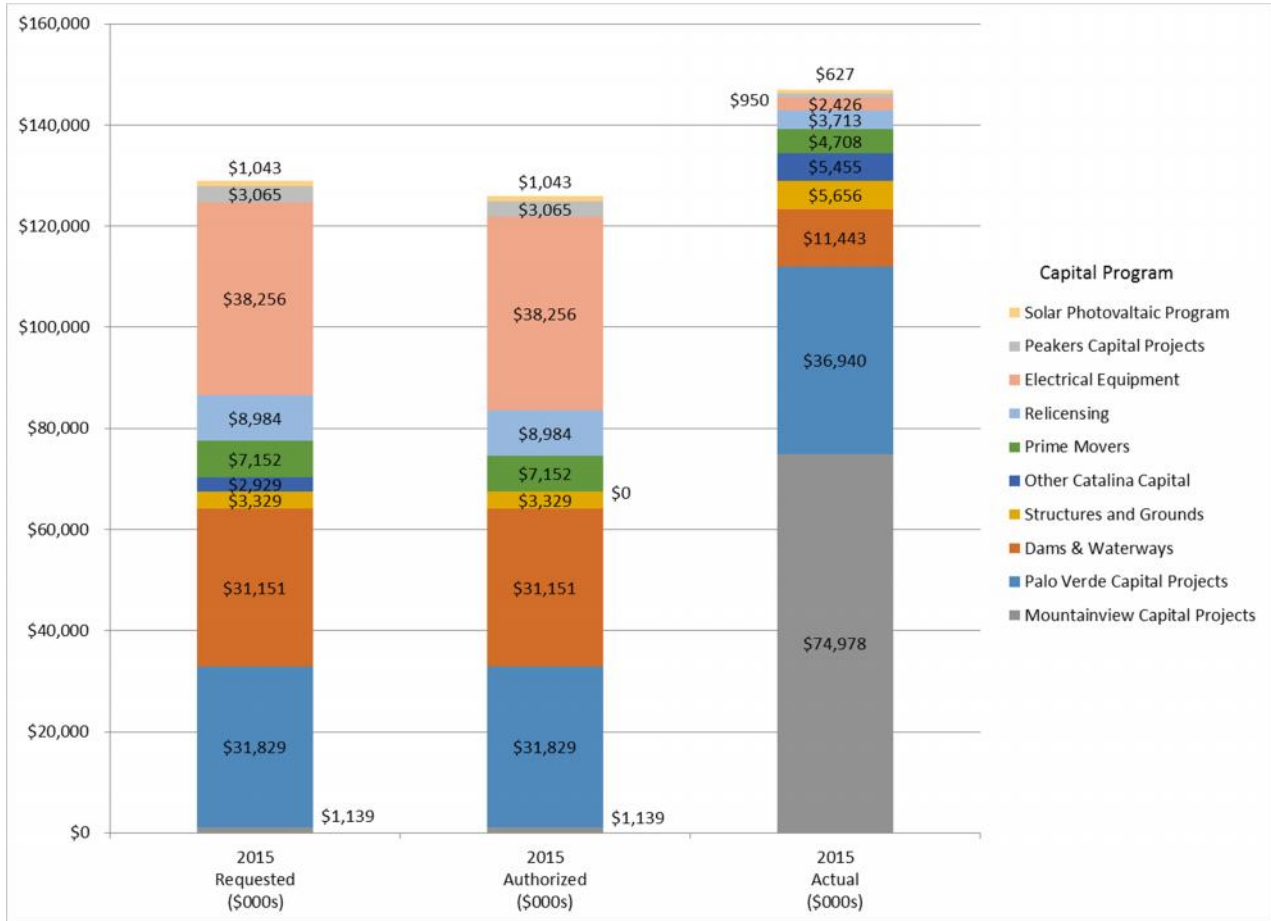


Figure III-2: 2015 Electric Generation Capital Spending – Comparison of Spending by Program

### 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.<sup>57</sup>

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.<sup>58</sup>

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<sup>57</sup> *Ibid*, p. 3-4.

<sup>58</sup> 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.<sup>59</sup> 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<sup>60</sup> 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)**

	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	Actual vs. Requested		Actual vs. Authorized	
				(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

<sup>59</sup> SCE-04 Vol. 1 p. 14.

<sup>60</sup> 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.



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

Activity Description	GRC Activity	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	Actual vs. Requested		Actual vs. Authorized	
					(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%
<b>Total</b>		<b>\$154,000</b>	<b>\$146,644</b>	<b>\$117,511</b>	<b>(\$36,489)</b>	<b>-23.7%</b>	<b>(\$29,133)</b>	<b>-19.9%</b>

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.

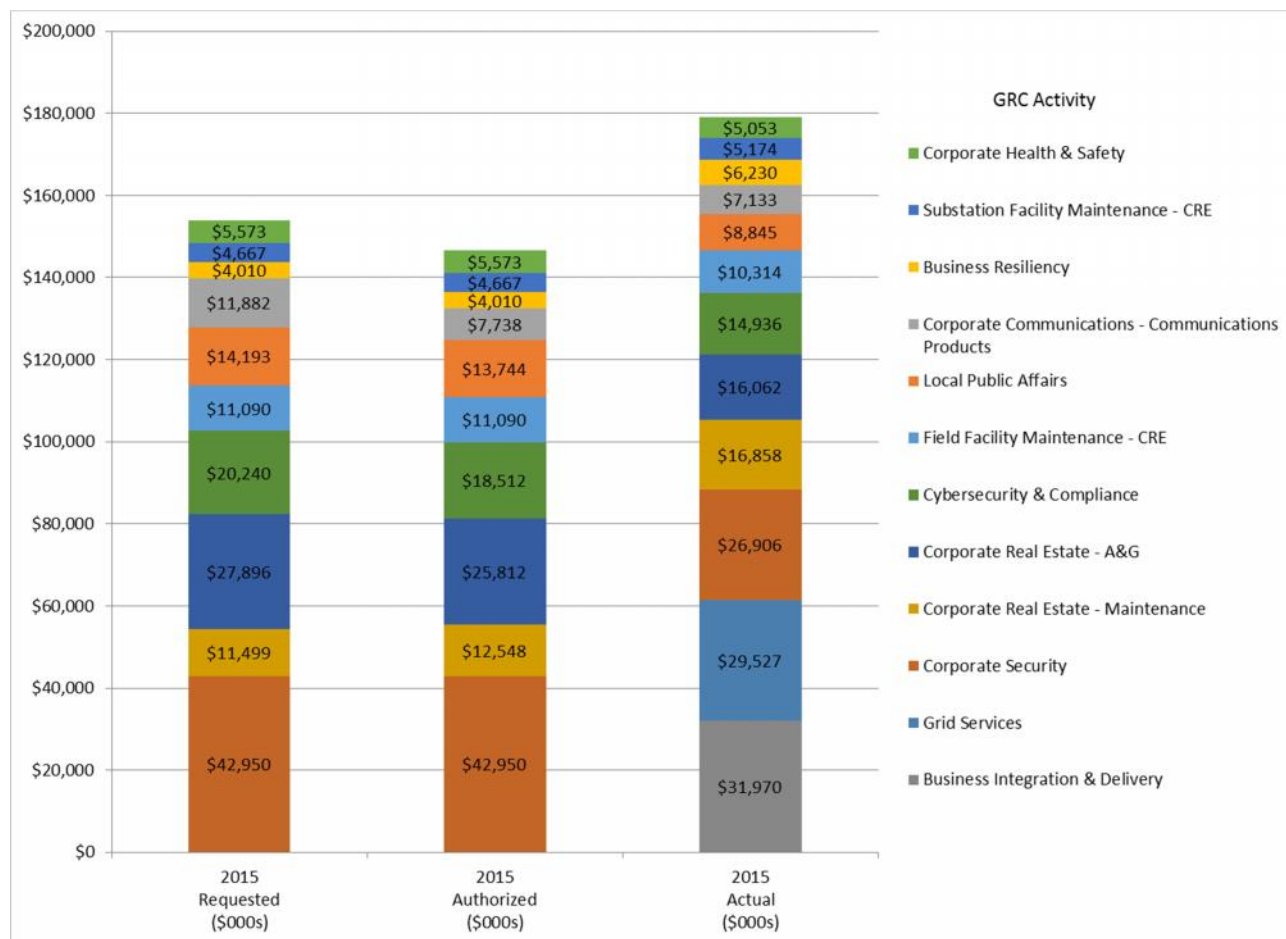


Figure IV-1: 2015 Other Expense – Comparison of Spending by GRC Account

#### 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.<sup>61</sup>

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.<sup>62</sup>

#### **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.<sup>63</sup> 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.

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<sup>61</sup> SCE-07 Vol 5, p. 7

<sup>62</sup> SCE Workpapers SCE-07 Vol 5. p. 36-39

<sup>63</sup> SCE-02 Vol 3, p. 27-28

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

Capital Category (WBS)	(a) 2015 Requested	(b) 2015 Authorized	(c) 2015 Actual	Actual vs. Requested		Actual vs. Authorized	
				(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	---
<b>Total</b>	<b>\$383,338</b>	<b>\$353,988</b>	<b>\$329,039</b>	<b>(\$54,299)</b>	<b>-14.2%</b>	<b>(\$24,949)</b>	<b>-7.0%</b>

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.

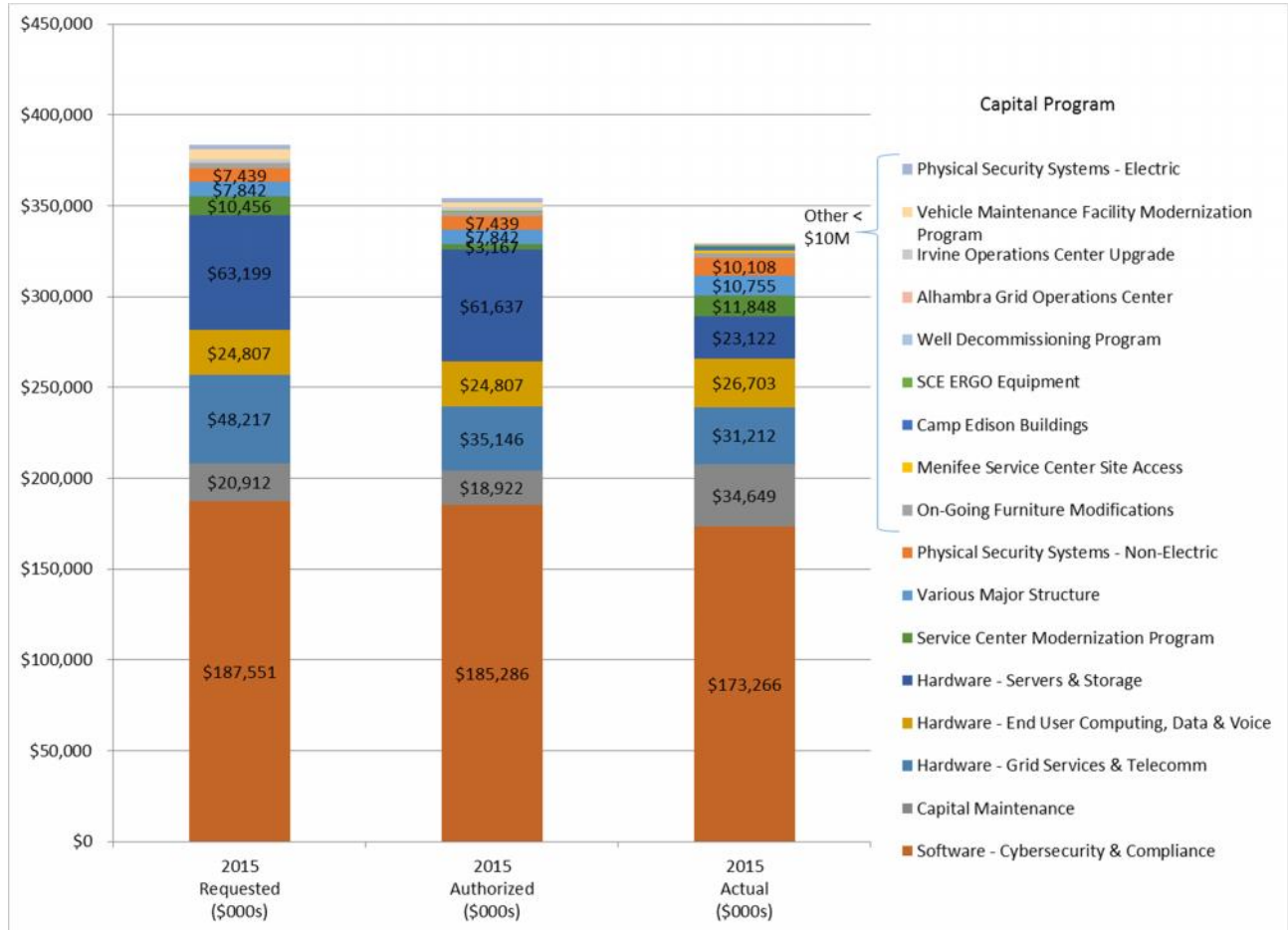


Figure IV-2: 2015 Other Capital – Comparison of Spending by Program

### 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.<sup>64</sup>

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.<sup>65</sup>

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<sup>64</sup> SCE-04 Vol 1, p. 68-76

<sup>65</sup> SCE-04 Vol. 1 p. 16-17

## **Appendix A**

### **SCE Risk Informed Planning Process and Risk Evaluation Methodology<sup>66</sup>**

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<sup>66</sup> See SCE 2018 GRC Exhibit SCE-01 workpapers.

QUALITATIVE MAPPING OF O&M ACTIVITIES IN 2018 GRC REQUEST TO RISK														Evaluated as part of T&D Risk Analysis					
Testimony Reference	Witness	Volume Title	GRC Activity	Activity Description	2018 Forecast (\$000)	Category	Event (risk incident the activity is expected to mitigate)	Potential effect of risk event if it occurs					Impact Dimensions						
								Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Safety	Service Reliability	Environmental	Compliance	Financial	Other (e.g. Customer Expectation)	
SCE-02, Vol. 03	E. Takayesu	System Planning	560.220	Transmission Planning	10,494	Non-Asset	Not identifying and implementing adequate apparatus or design	Operational or business disruption	Public injury/fatality	Worker injury/fatality	Outage		x	x			x		
SCE-02, Vol. 03	E. Takayesu	System Planning	588.220	Distribution Grid Engineering and Technology	4,230	Non-Asset	Not identifying and implementing adequate apparatus or design	Operational or business disruption	Public injury/fatality	Worker injury/fatality	Outage		x	x			x		
SCE-02, Vol. 04	M. Stark	Distribution M&I	583.120	Inspection of Distribution Overhead and Underground Lines and Equipment	11,315	Asset	In-service failure of overhead and underground distribution equipment	Public injury	Worker injury/fatality	Wildfire	Outage	Property damage	x	x	x		x		
SCE-02, Vol. 04	M. Stark	Distribution M&I	593.120	Planned Maintenance of Dist. Overhead & Underground Lines/Equip., Veg. Mgmt., Apparatus Inspection & Maintenance	123,085	Asset	Vegetation grows or blows into line	Outage	Wildfire	Property damage	Public injury/fatality	Freeway/road closure	x	x	x		x		
							In-service failure of overhead and underground distribution equipment	Outage	Wildfire	Property damage	Public injury/fatality	Freeway/road closure	x	x	x		x		
SCE-02, Vol. 04	M. Stark	Distribution M&I	594.120	Distribution Overhead and Underground Breakdown Maintenance	25,567	Asset	In-service failure of overhead and underground distribution equipment	Worker injury/fatality	Outage				x	x			x		
SCE-02, Vol. 05	A. Edeson	DC&M	583.170	Grid Operations - Troublemn Patrol, Locate, and Repair Activities	32,238	Asset	Equipment failure	Outage	Worker injury/fatality	Wildfire	Customer dissatisfaction		x	x			x	x	
						Non-Asset	Inadequate response to outage event or customer problem	Public injury/fatality	Worker injury/fatality	Outage	Customer dissatisfaction		x	x			x	x	
SCE-02, Vol. 05	A. Edeson	DC&M	585.170	Grid Operations - Street Light Operations and Maintenance	6,938	Asset	Equipment failure results in inadequate lighting for pedestrians	Public injury/fatality	Customer dissatisfaction	Operational or business disruption			x				x		
SCE-02, Vol. 05	A. Edeson	DC&M	586.140	Design Construction & Maintenance - Set, Remove, and Relocate Meters	10,270	Non-Asset	Inability to respond to customer requests in a timely manner	Customer dissatisfaction										x	
SCE-02, Vol. 05	A. Edeson	DC&M	587.170	Grid Operations - Service Guarantees	577	Non-Asset	Failure to meet service guarantees	Customer dissatisfaction										x	x
						Asset	Equipment failure	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	x	x	x			x	
						Non-Asset	Inability to respond to customer requests in a timely manner	Operational or business disruption	Customer dissatisfaction				x	x		x	x	x	
SCE-02, Vol. 05	A. Edeson	DC&M	588.140	Design Construction & Maintenance - Construction Support Activities	9,094	Asset	Structure failure	Outage	Public injury/fatality	Worker injury/fatality	Property damage		x	x			x		
						Non-Asset	Inability to fulfill compliance reporting requirements	Operational or business disruption				x	x		x	x	x		
SCE-02, Vol. 05	A. Edeson	DC&M	588.170	Grid Operations - Misc. Operating Expense	1,992	Non-Asset	Inability to fulfill compliance reporting requirements	Operational or business disruption					x	x			x	x	
SCE-02, Vol. 05	A. Edeson	DC&M	598.170	Grid Operations - Distribution Storm	9,387	Asset	Equipment failure	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	x	x	x		x		
SCE-02, Vol. 06	M. Flores	SC&M	561.170	Grid Operations - Management and Operation of the Grid Control Center	9,814	Non-Asset	Inability to perform grid control functions	Outage	Curtailment				x	x			x		
SCE-02, Vol. 06	M. Flores	SC&M	562.150	Substation Inspection & Maintenance - Activities Performed At SCE-Owned Generating Facilities	1,574	Asset	Equipment failure	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	x	x	x		x		
SCE-02, Vol. 06	M. Flores	SC&M	562.170	Grid Operations - Operating Transmission Stations	17,924	Non-Asset	Inability to perform grid control functions	Outage	Curtailment	Customer dissatisfaction				x				x	x
						Asset	Equipment failure	Public injury/fatality	Worker injury/fatality	Wildfire	Outage	Property damage	x	x	x			x	
						Asset	Failure of AA and A bank transformers	Leakage/spills	Outage	Property damage	Regulatory fines	Worker injury/fatality	x	x	x	x	x		
						Asset	Failure of circuit breakers >115kV	Outage	Worker injury/fatality	Leakage/spills	Regulatory fines		x	x	x	x	x		
						Asset	Failure of TPU	Outage	Curtailment	Customer dissatisfaction			x	x				x	x
SCE-02, Vol. 06	M. Flores	SC&M	568.150	Supervision of Transmission Substation Maintenance	9,592	Asset	Lack of adherence to construction standards or recordkeeping	Outage	Public injury/fatality	Worker injury/fatality			x	x			x		













QUALITATIVE MAPPING OF O&M ACTIVITIES IN 2018 GRC REQUEST TO RISK											Evaluated as part of T & D Risk Analysis											
Testimony Reference	Witness	Volume Title	GRC Activity	Activity Description	2018 Forecast (\$000)	Category	Event (risk incident the activity is expected to mitigate)	Potential effect of risk event if it occurs					Impact Dimensions									
								Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Safety	Service Reliability	Environmental	Compliance	Financial	Other (e.g. Customer Expectation)				
SCE46, Vol. 02	M. Bennett	Benefits & Other Comp.	926	Executives Benefits	21,087	Non-Asset	Inadequate staffing	Operational inefficiencies or business disruption (turnover, retaining, etc.)	Increased training and/or recruitment costs											X		
SCE46, Vol. 02	M. Bennett	Benefits & Other Comp.	926	Group Life Insurance	1,426	Non-Asset	Inadequate staffing	Operational inefficiencies or business disruption (turnover, retaining, etc.)	Increased training and/or recruitment costs												X	
SCE46, Vol. 02	M. Bennett	Benefits & Other Comp.	926	Medical Programs	110,719	Non-Asset	Inadequate staffing	Operational inefficiencies or business disruption (turnover, retaining, etc.)	Increased training and/or recruitment costs												X	
SCE46, Vol. 02	M. Bennett	Benefits & Other Comp.	926	Miscellaneous Benefit Programs	5,592	Non-Asset	Inadequate staffing	Operational inefficiencies or business disruption (turnover, retaining, etc.)	Increased training and/or recruitment costs												X	
SCE46, Vol. 02	G. Henry	Benefits & Other Comp.	926	PBOP Costs	36,823	Non-Asset	Inadequate staffing	Operational inefficiencies or business disruption (turnover, retaining, etc.)	Increased training and/or recruitment costs												X	
SCE46, Vol. 02	G. Henry	Benefits & Other Comp.	926	Pension Costs	97,474	Non-Asset	Inadequate staffing	Operational inefficiencies or business disruption (turnover, retaining, etc.)	Increased training and/or recruitment costs												X	
SCE46, Vol. 02	M. Bennett	Benefits & Other Comp.	926	Third Party Billing & Non-Utility Affiliates P&B Credits	0	N/A	N/A															
SCE46, Vol. 02	M. Bennett	Benefits & Other Comp.	926	Vision Service Plan	3,443	Non-Asset	Inadequate staffing	Operational inefficiencies or business disruption (turnover, retaining, etc.)	Increased training and/or recruitment costs												X	
SCE46, Vol. 02	C. Hernandez	Benefits & Other Comp.	920-921	Short-Term Incentive Program - A&G	44,389	Non-Asset	Inadequate staffing	Operational inefficiencies or business disruption (turnover, retaining, etc.)	Increased training and/or recruitment costs												X	
SCE46, Vol. 03	A. Peterson	Total Comp. Study	NA	NA		N/A	N/A															
SCE47, Vol. 01	D. Daigler	Business Resiliency	935	Business Resiliency	1,533	Asset	Building damage	Worker/Public Injury	Property damage												X	
SCE47, Vol. 01	D. Daigler	Business Resiliency	920-921	Business Resiliency	6,431	Non-Asset	Natural or manmade disaster	Worker/Public Injury	Property damage												X	
SCE47, Vol. 02	D. Neat	Corporate Environ.	549	San Diego Wetlands and Wheeler North Reef	3,493	Asset	Environmental destruction	Plant and animal habitat destruction	Non-compliance												X	
SCE47, Vol. 02	D. Neat	Corporate Environ.	920-921	Environmental Operational Excellence	-1,991	N/A	N/A															
SCE47, Vol. 02	D. Neat	Corporate Environ.	920-921	Corporate Environmental Services	10,618	N/A	Environmental destruction	Plant and animal habitat destruction	Non-compliance												X	
SCE47, Vol. 03	N. Desrocher	CRE	566,282	Substation Facility Maintenance - CRE	5,174	Asset	Facility deterioration and/or unsafe conditions	Worker injury	Outage	Non-compliance	Property damage										X	X







QUALITATIVE MAPPING OF O&M ACTIVITIES IN 2018 GRC REQUEST TO RISK																		
Testimony Reference	Witness	Volume Title	GRC Activity	Activity Description	2018 Forecast (\$000)	Category	Event (risk incident the activity is expected to mitigate)	Potential effect of risk event if it occurs					Other (e.g. Customer Expectation)					
								Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5		Safety	Service Reliability	Environmental	Compliance	Financial
SCE-08, Vol. 04	R. Swartz	Law, Claims & WC	920-921	Law - In-House Legal Resources & Corporate Governance & Misc	25,397	N/A	N/A											
SCE-08, Vol. 04	R. Ramos	Law, Claims & WC	920-921	Claims	3,025	N/A	N/A											
SCE-08, Vol. 04	R. Swartz	Law, Claims & WC	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 insurance coverage	Lawsuit/penalties									X	
SCE-08, Vol. 05	J. Butler	Property & Liability Insurance	925	Corp Liability Insurance	92,427	Non-Asset	Inability to procure satisfactory liability insurance coverage	Lawsuit/penalties										X
SCE-09, Vol. 01	R. Manandy	Results of Operations	920-921	SONGS Decommissioning Credits	-6,111	N/A	N/A											

Evaluated as part of T & D Risk Analysis







QUALITATIVE MAPPING OF CAPITAL ACTIVITIES IN 2018 GRC REQUEST TO RISK																			
Testimony Reference	Witness	Volume Title	Capital Category (NBS)	2016-2020 Forecast (\$000)	Category	Event (risk incident the activity is expected to mitigate)	Potential effect of risk event if it occurs							Impact Dimensions					
							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-02, Vol. 07	J. Billingsley	TC&M	Transmission Planned Capital Maintenance	\$ 151,583	Asset	Failure of obsolete equipment	Outage	Public Injury/Fatality	Worker Injury/Fatality								X	X	
SCE-02, Vol. 07	J. Billingsley	TC&M	Transmission Breakdown Capital Maintenance	\$ 11,589	Asset	Failure of obsolete equipment	Outage	Public Injury/Fatality	Worker Injury/Fatality								X	X	
SCE-02, Vol. 07	J. Billingsley	TC&M	Transmission Line Rating Remediation	\$ 652,720	Asset	Failure of noncompliant equipment	Outage	Public Injury/Fatality	Worker Injury/Fatality								X	X	
SCE-02, Vol. 07	J. Billingsley	TC&M	Fiber-Optic Network Maintenance	\$ 32,406	Asset	Failure of obsolete equipment													
SCE-02, Vol. 07	J. Billingsley	TC&M	Transmission and Substation Storm	\$ 30,319	Asset	Wire-down	Outage	Worker Injury/Fatality	Outage	Wildfire	Freeway/road closure						X	X	
SCE-02, Vol. 07	J. Billingsley	TC&M	Transmission and Substation Claims	\$ 19,116	N/A	N/A													
SCE-02, Vol. 07	J. Billingsley	TC&M	Transmission Spare Parts	\$ 532	Asset	Slowed maintenance of failed parts	Outage										X		
SCE-02, Vol. 07	J. Billingsley	TC&M	Transmission Relocations	\$ 77,770	Asset	Lines are not reloaded per customer or community request	Customer dissatisfaction												X
SCE-02, Vol. 07	J. Billingsley	TC&M	Transmission Tools and Work Equipment	\$ 9,775	Asset	Slowed maintenance of failed parts	Outage										X		
SCE-02, Vol. 08	J. Goizuela	Infrastructure Replacement	Worst Circuit Rehabilitation	\$ 651,611	Asset	Cable failure	Outage	Public injury/fatality	Worker injury/fatality								X	X	
SCE-02, Vol. 08	J. Goizuela	Infrastructure Replacement	Cable Life Extension	\$ 119,237	Asset	Cable failure	Outage	Public injury/fatality	Worker injury/fatality	Property damage							X	X	
SCE-02, Vol. 08	J. Goizuela	Infrastructure Replacement	Cable In Conduit Replacement	\$ 186,578	Asset	Cable failure	Outage	Public injury/fatality	Worker injury/fatality	Property damage							X	X	
SCE-02, Vol. 08	J. Goizuela	Infrastructure Replacement	Overhead Conductor Program	\$ 710,160	Asset	Overhead conductor down in service	Outage	Public injury/fatality	Worker injury/fatality	Wildfire	Freeway/road closure						X	X	
SCE-02, Vol. 08	J. Goizuela	Infrastructure Replacement	Overhead Conductor Program	\$ 710,160	Asset	Third-party contact with intact conductor	Outage	Public injury/fatality	Worker injury/fatality								X	X	
SCE-02, Vol. 08	J. Goizuela	Infrastructure Replacement	Underground Oil Switch Replacement	\$ 61,389	Asset	Switch (oil BURD, gas BURD, oil mainline, or gas mainline) failure	Outage	Public injury/fatality	Worker injury/fatality	Leakage/spills							X	X	
SCE-02, Vol. 08	J. Goizuela	Infrastructure Replacement	Capacitor Bank Replacement	\$ 83,605	Asset	Voltage collapse	Outage										X		
SCE-02, Vol. 08	J. Goizuela	Infrastructure Replacement	Automate Recloser Replacement	\$ 12,206	Asset	Energized wire down	Public injury/fatality	Worker injury/fatality	Outage	Wildfire	Freeway/road closure						X	X	
SCE-02, Vol. 08	J. Goizuela	Infrastructure Replacement	PCB Transformer Replacement	\$ 7,283	Asset	PCB oil leak	Leakage/spills	Worker injury/fatality									X		
SCE-02, Vol. 08	J. Goizuela	Infrastructure Replacement	Substation Transformer Bank Replacement	\$ 417,720	Asset	Transformer unavailable	Curtailed	Equipment derating	Leakage/spills	Outage	Property damage	Worker injury/fatality					X	X	
SCE-02, Vol. 08	J. Goizuela	Infrastructure Replacement	Substation Circuit Breaker Replacement	\$ 240,788	Asset	Circuit breaker unavailable	Curtailed	Equipment derating	Leakage/spills	Outage	Property damage	Worker injury/fatality					X	X	
SCE-02, Vol. 08	J. Goizuela	Infrastructure Replacement	Substation Switchrack Rebuilds	\$ 72,270	Asset	Switchrack failure	Outage	Worker injury/fatality									X	X	
SCE-02, Vol. 09	C. Fanous	Poles	Buddy Poles	\$ -	N/A	N/A													
SCE-02, Vol. 09	C. Fanous	Poles	Distribution Pole Replacements	\$ 965,430	Asset	Pole failure	Outage	Public injury/fatality	Property damage	Wildfire							X	X	
SCE-02, Vol. 09	C. Fanous	Poles	Distribution Pole Replacements	\$ -	Asset	Pole failure	Outage	Public injury/fatality	Property damage	Wildfire							X	X	
SCE-02, Vol. 09	C. Fanous	Poles	Loading Calculation Replacements	\$ 589,355	Asset	Pole failure	Outage	Public injury/fatality	Property damage	Wildfire							X	X	
SCE-02, Vol. 09	C. Fanous	Poles	Pole Remediation Distribution	\$ 100,769	Asset	Pole failure	Outage	Public injury/fatality	Property damage	Wildfire							X	X	
SCE-02, Vol. 09	C. Fanous	Poles	Transmission Pole Replacements	\$ -	Asset	Pole failure	Outage	Public injury/fatality	Property damage	Wildfire							X	X	
SCE-02, Vol. 09	C. Fanous	Poles	Transmission Pole Replacements	\$ 358,266	Asset	Pole failure	Outage	Public injury/fatality	Property damage	Wildfire							X	X	





QUALITATIVE MAPPING OF CAPITAL ACTIVITIES IN 2018 GRC REQUEST TO RISK										Evaluated as part of T&D Risk Analysis										
Testimony Reference	Witness	Volume Title	Capital Category (NBS)	2016-2020 Forecast (\$000)	Category	Event (risk incident the activity expected to occur)	Potential effect of risk event if it occurs							Impact Dimensions						
							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-05, Vol. 03	T. Condit	Hydro Capital	Prime Movers	\$ 86,667	Asset	Inability to provide timely repairs to turbine and/or other specialized equipment for hydro facilities	Plant or unit outages	Increased purchased power costs	Operational or business disruption	Potential increased safety risk				X	X				X	
SCE-05, Vol. 03	T. Condit	Hydro Capital	Dams & Waterways	\$ 66,248	Asset	Failure to restore reservoirs, flowlines, and other critical equipment for reliable hydro operations	Plant or unit outages	Potential environmental damage	Potential increased safety risk					X	X	X			X	
SCE-05, Vol. 03	T. Condit	Hydro Capital	Relicensing	\$ 27,084	Asset	Failure to obtain FERC relicenses for hydro facilities	Non-compliance	Plant or unit outages	Increased purchased power costs	Operational or business disruption	Potential increased safety risk			X	X			X		
SCE-05, Vol. 03	T. Condit	Hydro Capital	Electrical Equipment	\$ 10,089	Asset	Failure of electrical equipment at hydro plants	Plant or unit outages	Increased purchased power costs	Operational or business disruption	Potential increased safety risk				X	X			X		
SCE-05, Vol. 03	T. Condit	Hydro Capital	Structures and Grounds	\$ 30,784	Asset	Inability to perform various work related to infrastructure and maintenance of hydro facility grounds	Operational or business disruption	Potential increased safety risk	Plant or unit outages					X				X		
SCE-05, Vol. 03	T. Condit	Hydro Capital	Decommissioning- San Geronimo	\$ 6,400	Asset	Failure to perform construction work to meet contractual obligations	Non-compliance	Potential lawsuit										X		
SCE-05, Vol. 04	S. Handehein	Coal, Mineweb & Peakers	Mountainview Capital Projects	\$ 67,678	Asset	Failure to comply with safety and environmental objectives and sustain station reliability	Plant or unit outages	Increased purchased power costs	Potential environmental damage	Potential increased safety risk				X	X	X			X	
SCE-05, Vol. 04	S. Handehein	Coal, Mineweb & Peakers	Peakers Capital Projects	\$ 12,862	Asset	Failure to comply with safety and environmental objectives and sustain station reliability	Plant or unit outages	Increased purchased power costs	Potential environmental damage	Potential increased safety risk				X	X	X			X	
SCE-05, Vol. 05	A. Edeson	SPVP & Fuel Cells	SPVP Capital Projects	\$ 1,480	Asset	Failure to connect SPVP control system to Mountainview system	Delayed restoration	Increased operation costs							X				X	
SCE-05, Vol. 5	A. Edeson	Catalina	Pebble Beach Generation Station Automation	\$ 6,649	Asset	Failure of obsolete equipment	Outage							X	X					
SCE-05, Vol. 5	A. Edeson	Catalina	Other Catalina Capital	\$ 12,500	Asset	Equipment deterioration and/or unsafe operating conditions	Worker injury/fatality	Outage	Operational or business disruption					X	X			X		
SCE-07, Vol. 03	N. Destrocher	CRE	Admin Facilities Infrastructure Upgrade	\$ -	Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality	Non-compliance						X				X		
SCE-07, Vol. 01	D. Dugler	Business Resiliency	Seismic Program	\$ 162,366	Asset	Structure deterioration and/or unsafe conditions	Potential increased safety risk	Non-compliance	Outage					X	X			X		
SCE-07, Vol. 02	D. Neal	Corporate Environ.	Well Decommissioning Program	\$ 3,364	Asset	Someone or something accesses an out of service well	Public injury/fatality	Worker injury/fatality	Plant and animal habitat destruction					X		X		X		
SCE-07, Vol. 03	N. Destrocher	CRE	Building Renovation	\$ -	Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality	Non-compliance						X				X		
SCE-07, Vol. 05	D. Bauder	Corp. Security	Maintenance Asset Management	\$ 5,797	Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality	Non-compliance						X				X		
SCE-07, Vol. 03	N. Destrocher	CRE	Alliandra Data Center Build Out	\$ 8,490	Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality	Outage						X	X			X		
SCE-07, Vol. 03	N. Destrocher	CRE	Camp Edison Buildings	\$ 3,918	Asset	Facility deterioration and/or unsafe conditions	Worker injury/fatality	Non-compliance						X				X		





QUALITATIVE MAPPING OF CAPITAL ACTIVITIES IN 2018 GRC REQUEST TO RISK																			
Evaluated as part of T&D Risk Analysis																			
Testimony Reference	Witness	Volume Title	Capital Category (NBS)	2016-2020 Forecast (\$000)	Category	Event (risk incident the activity is expected to mitigate)	Potential effect of risk event if it occurs												
							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. 07	T. Gantrip	Transportation Services	Vehicle Electrification Program	\$ 1,230	N/A	N/A													
SCE-07, Vol. 07	T. Gantrip	Transportation Services	TSD Helicopter Lease Buyout	\$ 9,754	N/A	N/A													
SCE-07, Vol. 07	T. Gantrip	Transportation Services	Electric Vehicle Fleet Chargers	\$ 653	N/A	N/A													
SCE-07, Vol. 07	T. Gantrip	Transportation Services	Garage Tools and Equipment	\$ 2,659	N/A	N/A													
SCE-07, Vol. 07	T. Gantrip	Transportation Services	Vehicle Leasehold Capital Improvements	\$ 8,439	N/A	N/A													