PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

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April 12, 2019

Agenda ID #17375
Ratesetting

TO PARTIES OF RECORD IN APPLICATION 16-09-001:

This is the proposed decision of Administrative Law Judges Roscow and Wildgrube. Until and unless the Commission hears the item and votes to approve it, the proposed decision has no legal effect. This item may be heard, at the earliest, at the Commission's May 16, 2019, Business Meeting. To confirm when the item will be heard, please see the Business Meeting agenda, which is posted on the Commission's website 10 days before each Business Meeting.

Parties of record may file comments on the proposed decision as provided in Rule 14.3 of the Commission's Rules of Practice and Procedure.

The Commission may hold a Ratesetting Deliberative Meeting to consider this item in closed session in advance of the Business Meeting at which the item will be heard. In such event, notice of the Ratesetting Deliberative Meeting will appear in the Daily Calendar, which is posted on the Commission's website. If a Ratesetting Deliberative Meeting is scheduled, ex parte communications are prohibited pursuant to Rule 8.2(c)(4)(B).

/s/ MICHELLE COOKE for
Anne E. Simon
Chief Administrative Law Judge

AES:jt2

Attachment

Decision **PROPOSED DECISION OF ALJs ROSCOW and WILDGRUBE**
(Mailed 4/12/2019)

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of Southern California Edison Company (U338E) for Authority to Increase its Authorized Revenues for Electric Service in 2018, among other things, and to Reflect that increase in Rates.	Application 16-09-001

DECISION ON TEST YEAR 2018 GENERAL RATE CASE FOR SOUTHERN CALIFORNIA EDISON COMPANY

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DECISION ON TEST YEAR 2018 GENERAL RATE CASE FOR SOUTHERN CALIFORNIA EDISON COMPANY

Summary

This decision approves a test year revenue requirement of $5.102 billion for Southern California Edison Company (SCE) pursuant to its 2018 General Rate Case Application 16-09-001. The adopted amount is 9.55% lower than SCE's request, but reflects our careful assessment and determination of the operating expenses and capital expenditures that are necessary for SCE to provide safe and reliable service at just and reasonable rates. The adopted 2018 revenue requirement shall become effective upon filing of tariffs pursuant to the directives of this decision.

This decision also authorizes post-test year revenue requirement adjustments of $320 million for 2019 (a 6.3% increase) and $401 million for 2020 (a 7.4% increase). These adjustments provide funds necessary for SCE to continue to provide safe and reliable service to customers beyond the test year, while providing SCE a reasonable opportunity to earn the rate of return authorized by the Commission in Decision 17-07-005. The cumulative adopted effect on SCE's revenue requirement over the 2018-2020 period, relative to present rates, is a 3.4% increase. The revenue requirement authorized in this decision does not include commodity costs of electricity procured for customers or costs of fuel used in generating electricity; these are addressed in a separate proceeding.

The authorized amounts are less than SCE requested. SCE's final updated 2018 revenue requirement request is $5.534 billion, representing a $22 million decrease relative to present rates. SCE requested attrition year increases of $431 million and $503 million for 2019 and 2020, respectively. SCE's requested

cumulative increase by 2020, relative to present rates and inclusive of other adjustments, is 14.7%.

A significant component of SCE's request in this application is for capital expenditures, reflecting its proposals for long-term investments in its facilities. On a Total Company basis, SCE requests approximately $4.7 billion in capital expenditures during 2018 alone. The impact of current capital expenditures on current revenue requirements may be limited and incremental, but the cumulative impact is powerful over time as the value of the capital assets (including rate of return and cost of removal) is repaid by ratepayers. We approve approximately $3.86 billion of total capital expenditures, reflecting our judgement that the long-term benefits of these investments justify the costs. However, we also deny notable portions of SCE's request for expenditures that SCE has not demonstrated are just and reasonable costs of safe and reliable service.

Appendix C to this decision contains the detailed results of operations tables that summarize the annual GRC revenue requirements approved in this decision for 2018-2020, based on our decisions regarding the forecasted costs we find to be reasonable, and which are adopted in today's decision.

1. Factual Background

This is the General Rate Case (GRC) Phase 1 application of Southern California Edison Company (SCE). In Phase 1 of a GRC proceeding, the Commission determines the utility applicant's electric system revenue requirements and addresses related issues. Phase 2 of the GRC follows a

separate application and addresses marginal cost, revenue allocation, and rate design matters.[1]

In this Phase 1 application, SCE originally requested an authorized base revenue requirement of $5.885 billion, effective January 1, 2018, representing an increase of $221 million over currently authorized levels.[2] SCE requested further increases in 2019 and 2020 of $533 million and $570 million, respectively.

SCE served updated testimony on December 8, 2017 and on February 16, 2018 served additional updated testimony addressing the impact of the Tax Cuts and Jobs Act (TCJA).

With the latest update, SCE now requests a 2018 GRC revenue decrease of $22 million, 0.38% below the 2017 authorized GRC revenue requirement. SCE has also requested attrition year increases of $431 million and $503 million for 2019 and 2020, respectively.

1.1. Procedural Background

On September 1, 2016, SCE filed its Application for authority to increase its authorized revenue, electric rates, and charges effective January 1, 2018.

Protests or responses to SCE's application were filed by the Office of Ratepayer Advocates (ORA),[3] the Office of the Safety Advocates, The Utility Reform Network (TURN), Consumer Federation of California (CFC), National

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[1] The Phase 2 proceeding, A.17-06-030, was filed June 30, 2017.

[2] SCE's request for 2018 originally represented a total revenue increase of $313 million, 5.5% over currently authorized base rates prior to consideration of expected sales reductions and $48 million in other one-time balancing and memorandum account recoveries.

[3] ORA was renamed the Public Advocates Office of the Public Utilities Commission pursuant to Senate Bill 854 in 2018. Because most of the pleading by this party were under the name of ORA, we utilize that name throughout the decision.

Diversity Coalition (NDC), Solar Energy Industries Association (SEIA), City of Lancaster, and Alliance for Retail Energy Markets jointly with Direct Access Customer Coalition. Small Business Utility Advocates (SBUA) filed a motion for party status. Wald Street L.L.C., Tesla Business Center Owners Association, Inc., 38 Tesla, LLC, David Voo and Mary Voo, as Trustees of the Voo Trust, AKM Consulting Engineers, Inc., and Spyglass Tesla, LLC jointly filed a motion for party status. Each of these motions was granted by ruling. SCE filed a reply to the protests and responses on October 13, 2016.

KEZY, LLC, and Betmar, LLC, also filed a joint motion for party status. Prior to the prehearing conference (PHC), Pacific Gas and Electric Company (PG&E) filed a motion for party status. Each of these motions was granted at the PHC. During the PHC held on October 25, 2016, party status was granted on oral motions of: California Street Light Association (CALSLA), Coalition of California Utility Employees (CUE), Vote Solar, Southern California Gas Company, and San Diego Gas & Electric Company. Following the PHC, motions for party status have been granted for: Western Manufactured Housing Communities Association, Collaborative Approaches to Utility Safety Enforcement, Local Government Sustainable Energy Coalition, City of Rancho Cucamonga, City of Victorville, and California Choice Energy Authority.

TURN, Consumer Federation of California, Vote Solar, National Asian American Coalition, and SBUA each have been found eligible to claim intervenor compensation.

Public Participation Hearings were held in the cities of Fontana, Lancaster, Azusa, Long Beach, South Gate, Santa Ana, Santa Barbara, and Oxnard.

Evidentiary Hearing was held July 13 through August 2, 2017 and on March 19, 2018. Parties filed and served briefs on September 8, 2017 and reply briefs on September 29, 2017.

As noted above, pursuant to the Commission's Rate Case Plan, SCE served Update Testimony on December 8, 2017, followed by additional updated testimony addressing the impact of the TCJA.

At SCE's request pursuant to Rule 13.13, the Commission held an oral argument on June 20, 2018 in order to provide parties the opportunity to address the Commission on the issues in this proceeding. The proceeding was submitted for the Commission's decision on this date.

1.2. Settlements

On September 14, 2017, the Commission issued D.17-09-007 adopting as filed, a settlement agreement between SCE and the City of Lancaster. In this decision, the Commission approved SCE's proposal to modify its Community Choice Aggregator fee structure.

In addition to this settlement, SCE and SBUA reached stipulations resolving all issues between them. These stipulations are discussed at Section 5.4.

2. Evidentiary Standards and the Burden of Proof

Public Utilities Code Section 451 provides, in part, "all charges demanded or received by any public utility … shall be just and reasonable." Section 454 provides,

> … no public utility shall change any rate or so alter any classification, contract, practice or rule as to result in any new rate, except upon a showing before the commission and a finding by the commission that the new rate is justified.

Based on the foregoing it is undisputed that SCE bears the burden to establish that its requests are just and reasonable. The evidentiary standard SCE must meet in establishing its requests are just and reasonable is by the preponderance of the evidence.[4]

We also note however, SCE states,

> As this brief will demonstrate, there are many instances where SCE has introduced evidence supporting its requests, yet no other party has met the burden of going forward with a contrary position. In these many instances, SCE must be found to have met its burden of proof.[5]

Although there are many instances when SCE is the only party to have introduced evidence on an issue; we will not conclude, based on the lack of any evidence to the contrary, that SCE has met its burden to establish that its request is just and reasonable. Even in the absence of any countervailing evidence from another party, SCE must meet its burden of proof to establish by a preponderance of the evidence that its proposal, if adopted, will result in fair and reasonable rates at a just and reasonable rate of return. Nevertheless, as a general matter, with respect to individual uncontested issues in this proceeding, we find that SCE has made a prima facie just and reasonable showing, and adopt the proposal, unless otherwise stated in this opinion.

3. Affordability

Parties raised a number of themes in their testimony and briefs that have helped to frame our approach to this decision, and we introduce those themes here. One overarching theme has been referenced by parties as the "the

[4] *See* Decision (D.) 15-11-021 at 8-9.

[5] SCE Opening Brief, at 10.

regulatory compact" between a regulatory body, the regulated entity, and the customers it serves. Parties engaged in a somewhat philosophical debate over the meaning of this "compact" but we offer what we consider to be a neutral definition: "the regulatory approach that grants individual companies exclusive franchises to provide power within a specific geographic area as long as their rates are regulated by state regulatory commissions based on the cost of providing service, including a reasonable return on investment."[6]

In this proceeding SCE requests authority to make significant capital investments during the three-year GRC period, not only for basic maintenance and replacement of equipment on its distribution system, but also additional investments to modernize that system. In the updated request we address in this decision, SCE's 2018 revenue requirement would remain essentially unchanged from 2017 levels due to the effects of the Tax Cuts and Jobs Act, but its revenue requirements for 2019 and 2020 would increase by 7% and 9%, respectively. Those increases are considerably higher than the inflation forecasts for the same period that are in the evidentiary record of this proceeding, approximately 2.65%.[7]

The magnitude and substance of SCE's requests in this proceeding stimulated testimony and briefing regarding the obligations imposed by the "regulatory compact" and how those are expressed within California's framework for forecast-based cost-of-service utility regulation. A major area of

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[6] Timothy P. Duane, Regulation's Rationale: Learning from the California Energy Crisis, 19 Yale J. on Reg. (2002) at 476-477. Available at: http://digitalcommons.law.yale.edu/yjreg/vol19/iss2/5

[7] TURN-08-A, at 3. February 2016 Short-Term Macro Forecast provided to TURN by SCE in its response to TURN data request TURN-SCE-12 Q.05.

contention was the extent to which the Commission should prioritize the affordability of SCE's services as it weighs SCE's requests for funds to maintain or enhance the safety and reliability of its service. The topic of affordability was included in the common briefing outline developed by parties at the close of evidentiary hearings. Although parties placed this topic near the end of their briefs, we find it important to discuss at the outset of this decision, so that the reasons underlying our decisions about SCE's revenue requirement are clear.

3.1. Affordability and "Just and Reasonable" Rates

This is the third consecutive SCE GRC where the Commission has emphasized the importance of affordability as a metric for evaluating funding request. In SCE's test year 2012 proceeding, the Commission acknowledged that under cost-of-service ratemaking principles, "the utility is generally entitled to its reasonable costs and expenses, as well as the opportunity, but no guarantee, to earn a rate of return on the utility's rate base."[8] The Commission included the same acknowledgement in its decision in SCE's test year 2015 proceeding.[9] In both instances, the Commission was simply acknowledging its role within the regulatory compact. However, the Commission was also very specific in describing SCE's corresponding responsibilities in the cost-of-service framework of general rate cases:

> The burden is on SCE to not only establish that the proposed work activities are necessary, but also that SCE has prudently examined alternatives before coming to ratepayers to fund the chosen action.

[8] D.12-11-051 at 10.

[9] D.15-11-021 at 2.

> The Commission reviews SCE's showing to ensure that SCE is addressing the work in a cost-effective manner.[10]

In both the 2012 and 2015 proceedings, the Commission made clear that if SCE did not meet this burden and justify a higher revenue requirement, its proposals would not be approved:

> We confirm that the Commission's mandate is specific and requires a balancing of interests to authorize rate recovery only for those just and reasonable costs necessary for safe and reliable service. This requires a hard look at each proposed expense, including whether it is necessary during the coming rate cycle and is appropriately calculated.[11]

> Ratepayers are entitled to the Commission's sharp eye and consideration of other options before committing their hard-earned cash. Therefore, we have neither accepted all requests nor adopted across-the-board percentage reductions. Instead, the decision is the result of scrutinizing each request according to the standards and policy articulated here.[12]

> One of the central tasks facing the Commission in this proceeding is to balance safety and reliability risks in comparison with cost. SCE is required by law to "promote the safety, health, comfort, and convenience of its patrons, employees, and the public" while including only "just and reasonable" charges in its rates. Our fundamental challenge in many disputed areas of this case is to reach an outcome consistent with these twin objectives.[13]

> We approve approximately $3.4 billion of total capital expenditures, reflecting our judgement that the long-term benefits of these

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[10] D.12-11-051 at 16.

[11] *Id.* at 9.

[12] *Id.* at 10.

[13] D.15-11-021 at 11, citing Pub. Util. Code § 451.

> investments justify the costs. However, we also deny notable portions of SCE's request for expenditures that SCE has not demonstrated are just and reasonable costs of safe and reliable service.[14]

As these references demonstrate, the Commission's decisions in general rate case proceedings are guided, above all, by Public Utilities Code §§ 451 and 454:

> All charges demanded or received by any public utility, … for any product or commodity furnished or to be furnished or any service rendered or to be rendered shall be just and reasonable. Every unjust or unreasonable charge demanded or received for such product or commodity or service is unlawful.
>
> Every public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities, … as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public.[15]
>
> … a public utility shall not change any rate or so alter any classification, contract, practice, or rule as to result in any new rate, except upon a showing before the Commission and a finding by the Commission that the new rate is justified.[16]

For this Commission, a key element of finding a charge or rate just and reasonable is whether that charge or rate is affordable. Public Utilities Code § 382(b) states:

> recognizing that electricity is a basic necessity, and that all residents of the state should be able to afford essential electricity and gas supplies, the Commission shall ensure that low-income ratepayers

[14] *Id.* at 3.

[15] Public Utilities Code § 451.

[16] Public Utilities Code § 454(a).

> are not jeopardized or overburdened by monthly energy expenditures.

Public Utilities Code § 739(d)(2) directs that the Commission

> shall ensure that the rates are sufficient … to recover a just and reasonable amount of revenue … while observing the principle that electricity and gas services are necessities, for which a low affordable rate is desirable….

3.2. SCE's Capital Expenditure Request

SCE does not dispute this statutory framework, but asks the Commission to evaluate its request from a broader perspective. SCE's approach to its GRC request is explained in the direct and rebuttal testimony of its Chief Executive Officer (CEO), Kevin Payne. We note here that the record in this proceeding benefitted from the direct participation of Mr. Payne, who also appeared as a witness during evidentiary hearings and responded to questions from intervenors, the Administrative Law Judges (ALJ), and Commission President Michael Picker. In response to intervenors' criticisms and recommendations, Mr. Payne's rebuttal testimony acknowledges "capital expenditures have indeed increased"[17] but contends this occurred for valid reasons: "[o]ur need to keep our aging system reliable and resilient for our customers drives infrastructure replacement, which in turn drives prudent but increased capital spending."[18] Mr. Payne also defends SCE's request for separate and additional funding to modernize its grid because it will support additional safety and reliability now,

[17] SCE-17 at 28.

[18] *Ibid*.

while also establishing a foundation for distributed energy resources (DER) integration as future needs emerge.[19]

Mr. Payne's testimony provides us with a useful summary and distillation of the reasoning behind SCE's requests in this proceeding. We focus on capital expenditures in the following discussion because O&M spending levels are in large part reflective of authorized capital expenditures. Very generally, SCE seeks funding for three purposes regarding its distribution system, and a fourth category of funding for company-wide purposes. Mr. Payne provided shorthand explanations of these categories in his rebuttal testimony:

1. Conventional programs that are part and parcel of owning and managing the electric grid: grid management programs that SCE "currently undertake to *maintain* safety and reliability. This includes inspection-based maintenance and infrastructure replacement programs and load-growth driven programs that SCE has undertaken for decades."[20]

2. "New programs that are driven by conventional needs, [which] can be viewed as both Grid Management and Grid Modernization. These are upgrades we would have to undertake regardless of any additional DER growth. They are triggered by safety and reliability needs, but in the future will provide ancillary benefits associated with DER enablement."[21]

3. New programs driven by new needs, which have been referenced in this proceeding as "grid modernization" and which Mr. Payne states

[19] *Id.* at 9-11.

[20] SCE-17 at 10. Italics in the original.

[21] *Ibid.*

are needed "to support DER growth, enable DER penetration, foster DER integration, and maximize DER value."[22]

4. Other Capital Projects and Programs completes SCE's capital request. SCE's requested funding for this category in 2018 totals almost $1 billion, and includes capital expenditures related to SCE's generation assets, customer service, information technology, and operational services business units that support SCE's daily operations (such as corporate real estate, service centers, supply management and transportation services).

For the 2018 test year, SCE's capital expenditure requests for the four purposes discussed in Mr. Payne's testimony and outlined above total $3.998 billion. SCE's request is summarized in the table below:

[22] *Id.* at 11. Mr. Payne notes that this third group is the subject of matters being evaluated in the Commission's Distribution Resources Plan proceeding (R.14-08-013). He further notes that some of the solutions for similar challenges in the second and third group "are largely the same, except the locations selected for deployment would differ based on the driver."

Summary of SCE's Updated
2018 Capital Expenditure Request
($ Nominal)

Category	Description	2018 Request
1	*Conventional Programs to Meet Conventional Needs*	
	Transmission &Distribution (T&D) Infrastructure Replacement & Maintenance	1,244,952
	Capacity-Driven T&D Activities	691,000
	Customer-Driven T&D Activities	539,002
2	*New Programs to Meet Conventional Needs* (T&D Testimony other than SCE-02, Volume 10)	145,872
3	*New Programs to Meet New Needs*	
	Grid Modernization: Exhibit SCE-02, Volume 10	491,337
4	*Other Capital Projects/Programs*	986,047
	Distribution Construction & Maintenance	80,907
	Substation Construction & Maintenance	96,572
	Transmission Construction & Maintenance	38,513
	Generation	100,679
	Customer Service	38,839
	Information Technology	366,015
	Operational Services	252,147
	Total Updated Request	3,998,000

3.3. Our Decision-Making Framework

We have described the Commission's approach to GRCs and SCE's conceptual approach to its request at some length in order to illustrate the framework we have used to evaluate SCE's forecast expenditures. Consistent with the manner in which SCE justifies its requests, we follow a three-step process:

First, we agree with Mr. Payne that a certain level of revenue requirement is necessary to support the fundamental operation of any electric utility. We must ensure that we authorize the funds necessary for SCE to maintain its current infrastructure, at current levels of safety and reliability. However, even

in this basic category, parties that agreed on the fundamental necessity of these funds still disagreed over the proper pace of such maintenance. Referring to the table above, SCE's requests for these "conventional programs to meet conventional needs" sum to approximately $2.7 billion, or 67.5% of SCE's 2018 request.

Second, SCE requests an additional increment of funding to upgrade its existing distribution grid, contending that new technology could cost-effectively provide useful upgrades. Mr. Payne described these investments as "new programs that are driven by conventional needs," which he considers "prudently updating the grid so that it can continue providing safe and reliable service to our customers year after year after year."[23] Again, Mr. Payne suggests that these programs can be viewed as both grid management and grid modernization investments, useful today but also likely to provide future benefits as DERs expand. Referring again to the table above, this additional increment of funding is equal to $300 million, or 7.5% of SCE's 2018 request. Intervenors in this proceeding made numerous recommendations regarding this second category of funding requests, often relying on the cost-effectiveness principles articulated by the Commission in SCE's 2012 and 2015 GRCs.

Third, SCE requests authority to invest another additional increment of funds in modernizing its distribution grid, in the category described by Mr. Payne as "new programs driven by new needs."[24] SCE's September 2016 testimony emphasized that these investments would support DER growth,

[23] SCE-17 at 10.

[24] *Id.* at 11.

enable DER penetration, foster DER integration, and maximize DER value, but in its rebuttal testimony SCE shifted the emphasis of its rationale for these investments and stressed that they were necessary for reliability improvements. This additional increment of funding is equal to $237 million, or 5.9% of SCE's 2018 request. It is this third group that led to the strongest disagreements between parties. SCE argues forcefully that infrastructure upgrades to modernize its grid must begin now in order to enable implementation of California's ambitious clean energy policies. Other parties argue just as forcefully that SCE's preferred approach is either not necessary at this time, too costly, or too deterministic because the Commission had yet to issue policy directives regarding distributed resource planning.

Fourth and finally, this decision addresses SCE's funding requests related to "other capital projects and programs." As we noted above, this category accounts for nearly $1 billion of SCE's proposed capital expenditures in 2018, but we have already counted Distribution, Substation and Transmission Construction and Maintenance as part of "conventional programs to meet conventional needs, so the other remaining projects sum to $757.7 million out of SCE's total 2018 request, or 19% of the total. Several intervenors registered strong opposition to certain SCE proposals in this category.

By distinguishing between the specific purposes of each category of its proposals as SCE has done, we can evaluate SCE's funding requests while remaining cognizant of the incremental effect that various investments will have on SCE's revenue requirement and, consequently, on customer bills. This returns us to the central theme of affordability, and we conclude this introduction with an overview of the positions taken by SCE and intervenors on this topic.

We remain mindful that our fundamental responsibility is to ensure that the utilities under our jurisdiction are equipped to provide safe and reliable service at just and reasonable rates. TURN makes the same point in the closing paragraph of its opening brief:

> The Commission should only approve the minimum spending truly necessary to provide safe and reliable service, and spending proposals ostensibly meant to improve "safety or reliability" must be scrutinized to ensure they provide meaningful benefits in relation to the requested spending, and to ensure that SCE is not ignoring less expensive methods that would work as well to achieve valid goals.[25]

TURN asserts the increases in SCE's rates of 38% from 2005 to 2015, while inflation increased approximately 23%, may largely be attributed to a doubling of capital expenditures for SCE's transmission and distribution systems between 2006 and 2015.[26] This has led to a doubling of rate base during that period from $10.304 billion to $22.231 billion.[27] TURN contends this increased rate base "will contribute to revenue requirement and rate increases for decades to come."[28]

Citing its testimony regarding what it considers to be SCE's inordinately high bills, high rates of utility service disconnections and "extraordinary spending increases" authorized in recent SCE GRCs, TURN urges the Commission to consider this information when weighing approval of certain spending requests:

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[25] TURN Opening Brief, at 370. TURN is quoting its witness Hawiger, TURN-10 at 18-19.

[26] *Id.*, at 364-365.

[27] *Id.* at 365.

[28] *Id.* at 366.

> Undoubtedly there are many requests in this rate case that represent spending necessary to provide safe and reliable service. However, there are also many programs and spending requests that may be desirable, but are not necessary for safe and reliable service and should be deferred or denied.

TURN offers one final useful reminder:

> The Commission can, and does, address issues related to affordability in other proceedings, especially those focused on rate design, low income energy efficiency, and the design of the CARE discount program. However, those cases address how to deal with the backend - how to ameliorate the impact of high rates and bills through other programs and cost allocation. They do not address the underlying cause of the high bills. The primary drivers of high customer bills, even with relatively low consumption levels compared to other states, are the high revenue requirements and associated high electric rates. It is in this rate case that the Commission can actually mitigate the root of the problem by weeding out spending requests that provide minimal benefit from a safety and reliability perspective.[29]

CFC also references the testimony of SCE's Mr. Payne in its discussion of affordability. CFC notes Mr. Payne's agreement that SCE's request in this proceeding is a "substantial one" and his assertion that, nevertheless, "[w]hen viewed in the context of safety and grid needs, our request is reasonable.[30] CFC responds that "[w]hen viewed in the context of affordability, however, the application's proposed increases are less reasonable."[31] CFC cites the same Public Utilities Code sections that we quoted above, and asks, "what is

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[29] *Id.* at 368.

[30] CFC Opening Brief at 5, citing SCE-01 at 4.

[31] *Ibid.*

'reasonable'?"[32] CFC suggests that a good or service whose price is rising faster than consumer incomes is, by definition, becoming less affordable and notes that SCE initially proposed to increase its revenue requirement over this three-year GRC period at an annualized rate of 7.25%. CFC counters that a reasonable rate increase would be one that did not "vastly" exceed the growth rate of the typical utility customer's income. CFC showed in testimony that SCE's customers have seen annual income gains that were typically on the order of 1.4%, and the median growth rate has been 2.3%. Finally, somewhat generously in light of its testimony, CFC concludes that a reasonable rate increase would be limited to double the rate of median income growth, or 4.6 %, not the 7.25% proposed in SCE's application.

We share the concerns of TURN and CFC. Not only is this GRC proceeding following upon the significant historical increases in SCE's revenue requirements demonstrated by TURN, in this GRC after an initial 0.38% reduction for 2018 (due to the one-time benefits of the Tax Cut and Jobs Act) SCE's final updated request seeks revenue requirement increases of 7.15% for 2019, and 9.39% for 2020. We do not consider increases of this magnitude to be affordable for ratepayers. Therefore, in every instance where SCE cannot establish by a preponderance of the evidence that a request is necessary to provide safe and reliable service, we deny their requests. We do so with a goal of limiting the annual increase in SCE's revenue requirements during this GRC period to, not double the growth in customer income, but rather a true alignment

[32] *Id.*, at 2.

with no more than that growth rate. It is only by endeavoring to meet that goal, that we can begin to strive for greater affordability.

3.4. Recent Statutes and Commission Rulemakings Regarding Affordability

In the time since SCE filed its application, new statutes have been enacted, and the Commission has initiated two rulemaking proceedings related to affordability.

First, in September 2017 the Legislature passed, and the Governor signed, Senate Bill (SB) 598. SB 598 requires the Commission to develop policies, rules, or regulations with a goal of the statewide level of gas and electric service disconnections for nonpayment by residential customers.

In Section 1 of SB 598 The Legislature finds and declares the following:

> (a) Residential disconnections for nonpayment by major gas and electrical corporations rose significantly from 547,000 in 2010 to 816,000 in 2015.
>
> (b) Gas and electric service shutoffs threaten the health of two million people annually with significant impact on infants, children, the elderly, low-income families, communities of color, people for whom English is a second language, physically disabled persons, and persons with life-threatening medical conditions.
>
> (c) The loss of basic gas or electric service causes tremendous hardship and undue stress, including increased health risks to vulnerable populations, as well as overreliance on emergency services and underutilization of preventive programs.

Senate Bill 598 added §718 to the Public Utilities Code. Section 718, subsection (b)(1) provides that in each gas and electrical general rate case, the Commission shall do both of the following:

> (A) Designate the impact of any proposed increase in rates on disconnections for nonpayment as an issue in the scope of the proceeding.
>
> (B) Conduct an assessment of and properly identify the impact of any proposed increase in rates on disconnections for nonpayment, which shall be included in the record of the proceeding.

Because Senate Bill 598 became effective in 2018, after SCE filed its GRC application, we do not implement its provisions in this decision. However, CFC made a similar proposal in its testimony, that the Commission require SCE, as part of its next GRC application: (1) to show that disconnections subsequent to the decision on this GRC are not unjustifiably biased toward any district or other customer group as the result of the company being limited by resource availability, and (2) to provide an analysis of the relationship between rate increases, arrearages, and disconnections.

SCE urges rejection of CFC's first proposal, contending it is unnecessary because SCE already complies with Commission-approved tariffs and Public Utilities Code § 453, which SCE argues preclude any bias or discrimination against localities or classes of service. We find CFC has not established the need for a report of this nature as to "the company being limited by resource availability" as the term is not defined for this context.

CFC's second proposal is supported by SCE and TURN. SCE agrees to work with CFC and other stakeholders to develop a report, to be included as part of its next GRC, that analyzes the relationship between rate increases, arrearages, and disconnections, if any. TURN supports CFC, but also requests that SCE's

methodology for this analysis be vetted through a stakeholder process before SCE undertakes this project.[33]

CFC's second proposal is consistent with the requirements of SB 598, and this decision directs SCE to prepare the report. In addition, we consider it reasonable to direct that the report includes an analysis of the relationship of the agreed-upon metrics to localities and customer class of service. We also direct SCE to engage in a stakeholder process to review its proposed methodology with stakeholders and incorporate their input prior to beginning its analysis.

Turning to Commission proceedings, on July 12, 2018, the CPUC opened two related Rulemakings that address the affordability of utility service.

First, as directed by SB 598 the Commission opened R.18-07-005, its "Order Instituting Rulemaking to Consider New Approaches to Disconnections and Reconnections to Improve Energy Access and Contain Costs." The proceeding is following a phased approach, with Phase 1 intended to identify and adopt near-term improvements to the current system. Phase 1 is now complete, with the Commission adopted D.18-12-013 in December 2018. That decision approved interim rules with immediate reforms to help reduce the statewide level of service disconnections for residential energy customers, and improve the reconnection process following future disconnections.[34] Phase 2 of the proceeding will take a broader approach to the evaluation of residential natural gas and electric disconnections with the goal of determining whether the

[33] TURN Reply Brief at 94.

[34] The new rules will: (1) prohibit the disconnection of elderly and medically vulnerable customers, such as those who qualify for medical baseline, life support and/or who are above 65 years old; (2) prevent disconnections during extremely hot or freezing days; and, (3) limit the rate of disconnections to utility-specific 2017 levels. See D.18-12-013, Ordering Paragraph 1.

disconnection rate can be reduced through broader reforms and new preventive approaches.

Second, the Commission also opened a rulemaking directly focused on affordability, with the intent to develop a common understanding and tools to assess, consistent with Commission jurisdiction, the impacts on affordability of individual Commission proceedings and utility rate requests.[35] Pursuant to the scoping memo in that proceeding, an initial workshop was held in January 2019 and is expected to be followed by additional workshops, issuance of a Commission staff report to provide a framework for subsequent comments by interested parties, and a Commission decision by the end of 2019.

We expect that the results of these rulemakings will lead to better data and other information being available to intervenors in SCE's next GRC proceeding. This, in turn, will assist the Commission in continuing its analysis of the affordability of SCE's service and the specific areas of its revenue requirement that are putting upward pressure on SCE's rates. We encourage intervenors to continue their efforts in this area and we will ensure that SCE provides any information and analysis that will assist those efforts.

4. Transmission and Distribution

4.1. T&D – General

SCE's Transmission and Distribution (T&D) organization plans, engineers, constructs, operates, and maintains transmission and distribution facilities required to deliver electricity to approximately 14 million residents and 5 million customer accounts throughout SCE's 50,000 square mile service territory. The

[35] R.18-07-006 at 2.

T&D organization is SCE's largest operating unit. The table below broadly summarizes the SCE assets that are operated by the T&D organization.[36]

SCE Transmission and Distribution Organization
Physical Assets

Asset Type	Count (as of 12/31/2015)
Transmission Lines (circuit miles)	13,061
Distribution Lines (primary conductor miles)	105,773
Substations	865
Circuits	4,636
Wood Poles	1,406,811
Substation Transformers	2,753
Distribution Transformers	728,627
Underground Structures	422,707
Switches	67,302
Capacitors	13,568
Streetlights (lamps)	683,813

In this proceeding, for Test Year 2018 SCE requests approval of $3,586 million for T&D capital expenditures, and $739 million for Operations and Maintenance (O&M) expenses. The details of SCE's request are shown in the table below.

[36] SCE-02, Vol. 1, at 2, Table I-1 "SCE Key Physical Assets."

SCE Requested
Test Year 2018
Transmission & Distribution
Capital Expenditures and O&M Expenses
($000)

Subject	Capital[37]	O&M[38]	Exhibit Source (plus errata)
Operational Overview and Risk-Informed Decision-Making	(146.758)	(10.200)	SCE-18, Vol. 1
Customer Driven Programs	539.002		SCE-18, Vol. 2
System Planning	1,038.161	14.724	SCE-18, Vol. 3
Distribution Maintenance and Inspection	273.955	159.967	SCE-18, Vol. 4
Distribution Construction & Maintenance	203.700	70.496	SCE-18, Vol. 5
Substation Construction & Maintenance	176.329	78.148	SCE-18, Vol. 6
Transmission Construction & Maintenance	216.793	40.919	SCE-18, Vol. 7
Infrastructure Replacement	493.661		SCE-18, Vol. 8
Poles	317.992	41.941	SCE-18, Vol. 9
Grid Modernization	440.683	4.135	SCE-18, Vol. 10
Grid Technology	32.841	15.914	SCE-18, Vol. 11
Safety, Training & Environmental Programs		62.080	SCE-18, Vol. 12
Other Costs, Other Operating Revenues		261.282	SCE-18, Vol. 13
Total T&D GRC Request	**3,586.359**	**739.406**	

4.1.1. Operational Overview

In Exhibit SCE-01 (Policy) SCE discusses how it pursues affordability by implementing initiatives intended to increase how effectively and efficiently it serves its customers. SCE's testimony states that the company has renewed its focus on "Operational Excellence" (OpX) as it relates to prioritizing work and improving productivity.[39] The results of SCE's OpX initiatives are captured in its

[37] SCE Reply Brief, Summary of SCE's Updated Capital Expenditures Request, 2018, CPUC-Jurisdictional Only, Nominal $ millions.

[38] *Id.*, Summary of SCE's Updated O&M Request (Including Other Operating Revenue), Total Company 2015, Constant $ millions.

[39] SCE-01, at 20. SCE states that it initiated Operational Excellence in 2013 and launched a second phase in 2015.

forecast savings of Test Year 2018 O&M expenses and capital expenditures. For the T&D organization, SCE forecasts 2018 savings of $10 million for O&M[40] and $145.529 million for capital.[41] No other party disputes the level of OpX savings forecast by SCE. We find SCE's forecasts of OpX savings reasonable and adopt them in this decision.

4.1.2. Risk-Informed Decision Making

SCE describes its risk-informed planning approach as "relatively new" and therefore its risk analysis and resulting risk spend efficiency (RSE) metric "has not matured sufficiently to drive our 2018 GRC request at a program or project level."[42] ORA and CUE agree that at this stage of SCE's progress, the Commission should not base its decision on safety-related cost recovery on SCE's risk-informed decision-making analyses.[43] SCE agrees, though notes that its risk- approach has nevertheless influenced some operational decisions and scoping efforts, and "was one of many factors considered in funding allocation decisions for this GRC."[44]

4.1.3. Safety and Reliability Investment Incentive Mechanism

In SCE's 2006, 2009, 2012, and 2015 GRCs, the Commission adopted the Reliability Investment Incentive Mechanism (RIIM). In SCE's 2015 GRC, the Commission enhanced and renamed the RIIM, as the Safety and Reliability

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[40] SCE-18, Vol. 1, at 3: Table II-3 "T&D OpX O&M Benefits."

[41] *Ibid.*: Table II-2 "T&D OpX Capital Benefits."

[42] SCE-18, Vol. 1, at 11.

[43] ORA-05, at 2.

[44] SCE-18, Vol. 1, at 11.

Investment Incentive Mechanism (SRIIM). SRIIM replaced previous reliability mechanisms that had focused solely on reliability metrics.

SRIIM is comprised of two components:

1. Capital spending on core safety and reliability-related projects and programs; and
2. Hiring field personnel that directly work on safety and reliability-related projects and programs.

SCE proposes continuing SRIIM for this rate case cycle. In response to recommendations made by CUE in its testimony, SCE agreed to withdraw its proposal to eliminate two programs in SRIIM (Underground Structures and Underground Switch Replacements). SCE also agreed with CUE that 4kV Substation Elimination should be added to SRIIM.[45]

Based on SCE's agreement with CURE, we consider three enhancements to the capital mechanism and four enhancements to the workforce mechanism.

First, we adopt the three capital mechanism enhancements in SCE's request, as revised by SCE in its rebuttal testimony to reflect agreements with CUE:

1. The programs included in SRIIM shall now include SCE's new Overhead Conductor Program (OCP) and 4 kilovolt (kV) Overload-Driven Cutovers, plus the SCE/CUE agreed-upon 4 kV Elimination Program. Thus, SRIIM now includes 10 core categories;
2. SRIIM capital expenditure targets should be established based on the actual level of capital expenditures that the Commission authorizes in this decision; and

[45] SCE Opening Brief at 12, citing SCE-18, Vol. 1, at 9.

3. Any spending occurring in the High Priority categories in excess of authorized amounts can be used to achieve the targets established for the SRIIM capital categories. However, as CUE recommends (and SCE appears to accept in its rebuttal testimony) we leave in place the two limits on SRIIM transfers that we adopted in D.15-11-021: (1) that such limits cannot occur until High Priority Spending is more than 10 percent over the adopted forecast, and (2) SCE is earning less than its authorized rate of return.

Second, we adopt the four enhancements to the existing SRIIM workforce mechanism requested by SCE:

1. Add foreman/troubleman trainer and operator trainee classifications;
2. Increase the headcount target from 2,225 to 2,375. As agreed to by SCE, we adopt CUE's proposal to measure headcount as an average of the last quarter of 2020.
3. Adjust the headcount target by one-half the percentage change in the authorized versus requested T&D capital; and
4. Change the measurement period from a single day to a more reasonable actual time frame, so that if SCE meets the headcount during the designated time frame, it will be deemed to have satisfied the workforce component of SRIIM.

4.2. T&D – Customer-Driven Programs

Customer-Driven Programs include capital expenditures that SCE incurs when responding to requests from its customers. The major costs in this area include the following:

1. Connecting new residential, commercial, and agricultural customers to SCE's system;
2. Meeting customer requests under Rule 20 to underground certain overhead facilities;
3. Relocating existing SCE facilities to meet customer needs; and
4. Providing customers with added facilities under Rule 2.

SCE states that these programs are necessary for SCE to meet its obligation to serve its customers, and are subject to SCE's Preliminary Statement and certain SCE Tariff Rules such as Rule 2 (Description of Service), Rule 15 (Distribution Line Extensions), Rule 16 (Service Extensions), and Rule 20 (Replacement of Overhead with Underground Electric Facilities). Thus, SCE contends that the level of capital expenditures in this area is largely outside of its control because spending will change based on the number and type of customer requests actually experienced by SCE, as well as other external factors such as permitting.

4.2.1. New Service Connections

SCE uses its forecast of new meter installations and its estimated unit costs of various customer-related activities to develop its capital expenditure forecasts for each new service connection work category. This approach is consistent with the forecasting methodology the Commission adopted in SCE's 2012 GRC and 2015 GRCs. ORA agrees with SCE's forecast methodology for New Service Connections but utilizes its own meter forecast in developing its proposal.

As shown in the table below, SCE forecasts $539.002 million in Test Year 2018 capital expenditures. ORA recommends $508.278 million; TURN recommends $494.517 million; and CFC recommends $505.755 million.

Summary of Customer-Driven Programs
2018 Capital Expenditure Forecasts[46]
100% CPUC Jurisdictional – Nominal $000

Activity	SCE	ORA	TURN	CFC
Residential Service Connections	35,363	33,845	30,857	
Residential Line Extension	31,425	29,946	26,733	
Residential Tract Development	94,530	90,015	75,710	
Residential Backbone Development	28,941	27,549	19,294	
Commercial/Industrial Service Connections	25,877	23,323	18,172	20,800
Commercial/Industrial Line Extensions	41,338	37,141	42,604	
Commercial/Industrial Tract Development	15,694	14,098	15,314	
Agricultural Service Connections	2,562	2,560		
Agricultural Line Extensions	2,779	2,742		
Street Light Installations	38,900	37,231		
Distribution Rule 20A Conversions	23,643	14,085		
Distribution Rule 20B Conversions	14,924	14,924		
Distribution Rule 20C Conversions	8,210	8,210		
Transmission Overhead to Underground Conversion	6,031	6,031		
Relocation of Distribution Lines	60,437	60,437		
Distribution Added Facilities	13,130	13,130		
Distribution Transformers	95,217	93,011		
Total Capital – Customer Driven Programs	**539,002**	**508,278**		

Many of the disputed forecasts between SCE and other parties will ultimately be resolved by the meter set forecasts that we adopt in this decision, which we address in Section 13 below (Sales and Customer Forecast). SCE agrees to re-calculate its cost forecasts for New Service Connections based on the final new meter set forecast adopted in this GRC. In Section 13 we adopt TURN's forecast of new meters, and we summarize those adopted values here in order to provide context for our discussion of customer-driven programs. Our

[46] SCE-18, Vol. 2, at 3: Table I-2 "Summary of Customer-Driven Programs Capital Expenditures."

adopted forecast results in reductions to SCE's forecast levels of capital expenditures for residential and commercial customers.[47]

New Meter Connections Adopted Forecast[48]					
	Residential		Commercial		Agricultural
	# Requested	# Adopted	# Requested	# Adopted	# Adopted
	SCE	TURN	SCE	TURN	Uncontested
2016	29,895	31,142	6,092	6,092	349
2017	33,532	34,013	6,666	6,697	321
2018	41,702	36,388	6,825	7,045	321
2019	43,438	37,955	7,665	7,350	321
2020	42,801	37,729	8,188	7,534	321

In addition to disagreement over new meters, other disputes stem from differences between SCE and TURN regarding SCE's unit cost forecasts. TURN also challenged (separately from its recommended reductions in meter sets) SCE's unit cost estimates for several of the customer-driven activities listed in the table above. We address those cost disputes here.

4.2.1.1. Residential Line Extensions

Residential line extension capital expenditures generally include the cost of installing primary and secondary systems in two situations:

[47] For this reason, we agree with SCE's responses to ORA and CFC regarding their recommendations for customer-driven programs: SCE agrees that it will adjust its forecast for new residential service connections (ORA) and new commercial service connections (CFC) based on the new meter set forecasts adopted in this decision. *See* SCE-18, Vol. 2, at 6 and 10.

[48] As we discuss below in Section 13 (Sales and Customer Forecast) TURN did not develop its own forecasts for Streetlights. However, since the number of streetlights is directly related to the number of new residential meter connections, and since we adopt TURN's forecasts for new residential meters, our adopted 2017 and 2018 forecasts for Streetlights reflect revisions to SCE's request to align those values with our adopted residential forecasts.

1. when small-scale development and construction of four or fewer homes occurs beyond the current end of SCE's distribution system; and
2. when a multi-unit complex replaces a single-family home or small apartment building.[49]

SCE defines the unit cost for this work as the average cost to provide a mile of line extension. SCE shows that unit costs have varied between $122,000 and $168,000 per mile of cable from 2011-2015. SCE calculates a five-year weighted average cost of $140,000 per cable-mile and calculated the total forecast capital expenditures by multiplying the forecast unit cost per mile by the miles of cable SCE expects to install from 2016-2020. SCE contends that this method reflects the "strong" historical correlation between counts of new meters set in a given year and miles of line extension cable installed in that same year.[50]

TURN differs from SCE regarding how many years of data should be used in the forecast of how many cable-feet will be needed for each meter that is installed: TURN uses 2006-2015 data, while SCE uses 2007-2015. SCE contends that 2006 data should be excluded because in that year SCE installed a "significantly higher" number of residential meters in 2006 than either SCE or TURN forecasts for 2018. SCE asserts that including 2006 data will cause the forecast to less accurately predict 2018 activity.

We find SCE's approach to forecasting cable-feet per installed meter for residential line extensions to be reasonable and we approve SCE's use of its estimates to calculate its capital expenditure forecast for Test Year 2018.

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[49] SCE-02, Vol. 2, at 11.

[50] SCE-02, Vol. 2, at 12.

4.2.1.2. Residential Tract Development

SCE's residential tract development work category involves extension of service to new housing developments where no electrical infrastructure currently exists. SCE states that capital expenditures for residential tract development generally include the cost of cable installed by SCE in customer-installed conduits and structures. Expenditures also include SCE-installed transformers and the secondary system needed to serve the residential development.

SCE defines the cost unit for this work as the length of installed underground cable measured in miles. SCE states that its analysis shows a "strong" correlation between the miles of tract cable installed in a given year and the number of meter sets in the next year as the tract cable is required to complete service installations of new developments in the following year.[51] SCE states that its unit cost for tract cable includes the labor and material to install the cable itself as well as any other associated assets such as transformers, switches, conduits, and underground structures.

TURN argues that SCE's estimate of cumulative cable-feet per installed meter is highly dependent on the year the analysis is started; and SCE did not properly account for excess installed cable in SCE's system due to the large amount of overbuild several years ago, when housing developers required SCE to install more residential tract cable than turned out to be justified as the housing market softened in Southern California.

In rebuttal testimony, SCE explained why its use of all data from the last ten years would be more logical than TURN's use of a 14-year average that

[51] SCE-02, Vol. 2, at 16.

excludes the two most recently available years of data, 2014 and 2015. SCE also cited to its opening testimony, where it explained that the excess installed cable has in fact been reduced as the housing market gradually recovered in recent years.[52]

We find SCE's estimation methods to be sound, and we agree that SCE has shown that previous levels of excess tract cable have in fact been reduced. We find SCE's approach to forecasting cable-feet per installed meter for residential tract developments to be reasonable and we approve SCE's use of its estimates to calculate its capital expenditure forecast for Test Year 2018.

4.2.1.3. Residential Backbone Development

SCE's "backbone" system consists of sections of distribution line on major thoroughfares that connect multiple tracts and commercial/industrial projects together. The residential distribution system connects to the backbone system through conduits and vaults with cable connections at the switch positions.[53]

SCE summarizes the capital expenditures for this work category as follows:

1. Main-line feeder-system installations to serve residential tract developments; and
2. The conduits required to feed smaller, non-residential customers located in a residential area, such as gas stations, restaurants, retail stores, etc. The conduits installed in these backbone systems also support the collateral streetlight subsystems along the major arterial thoroughfares, as well as the public safety

[52] SCE-18, Vol. 2, at 7.

[53] SCE-02, Vol. 2, at 15.

> services for controlled intersections, and the power required for landscape irrigation systems and public sanitation lift-stations.[54]

SCE defines the cost unit for residential backbone development as the length of underground cable installed in miles. SCE states that its unit cost for residential backbone includes the labor and material to install the cable as well as associated assets such as transformers, switches, conduits, and underground structures. SCE's unit cost for 2011-2015 has varied from $121,000 to $176,000 per mile. SCE used a five-year weighted average cost of $148,000 per mile of cable as the basis to forecast total 2016-2020 costs for residential backbone development.

The dispute between SCE and TURN again centers on which years of historical data should be used to forecast the length of underground cable that will serve as the basis for forecast costs. SCE uses a ten-year average in order to account for the year-to-year variability during the housing bubble and decline. SCE asserts that this is preferable to TURN's use of a five-year average, which is less accurate in smoothing out the variability of this work area and taking into account historical developments.

SCE provides a convincing explanation of the proper years from which historical data should be relied upon for this forecast. We find SCE's approach to forecasting the length of underground cable to be used in future residential backbone developments to be reasonable and we approve SCE's use of its estimates to calculate its capital expenditure forecast for Test Year 2018.

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[54] *Id.*, at 19.

4.2.1.4. Commercial/Industrial Service Connections and Tract Development

SCE's commercial/industrial service connection work category involves the costs to provide a new service connection to individual commercial and industrial customers per SCE's Tariff Rule 16. SCE states that capital expenditures for this category generally include installation of the permanent service cables or cables from the SCE distribution transformer (or other distribution structures) to the new customer's electric service panel(s). SCE defines the unit of work for this category as the number of meter sets, just as is done in the case of residential service connections.

SCE's commercial/industrial tract development work category involves the costs to construct system additions to serve new commercial and industrial customers under SCE's Line Extension Tariff Rule 15, which are usually constructed in conjunction with street improvements. SCE states that capital expenditures for this category generally include installing conduit and structures, cable, transformers, switches, and other apparatus that are necessary to provide service to the current development.[55] SCE defines the unit of work for this category as the length of underground cable installed, as measured in miles.

TURN and SCE disagree regarding the number of years to use in calculating unit costs. SCE used a 5-year average (2011-2015) for new connections and a 10-year average (2006-2015) for tract development. TURN recommends using a 10-year average for both work categories. In this instance, SCE argues that data from 2011-2015 better reflect the expected level of new

[55] SCE-02, Vol. 2, at 28. SCE adds, "we may also install a limited amount of conduits and structures when we have a reasonable expectation that we will need to serve future developments located beyond the geographical limits of the current project."

connections in the forecast period because the years prior to 2006 included costs for a significant increase in connections resulting from the robust housing market during that period. SCE asserts that the recorded commercial meter sets for 2000-2006 do not reflect the typical current-day commercial service connections and tract development, which are characterized by smaller-scale development.[56]

We find SCE's approach to forecasting the unit costs of commercial/industrial service connections and tract development to be reasonable and we approve SCE's use of its cost estimates to calculate its forecast capital expenditure forecast for Test Year 2018.

4.2.2. Rule 20 Issues

SCE manages programs to convert existing overhead electric facilities to underground facilities pursuant to Tariff Rule 20. SCE explains that Rule 20 consists of three sub-parts:

1. Under Rule 20A, each governmental agency in SCE's service territory is allocated a portion of SCE's Commission-authorized Rule 20A capital budget to be used for overhead conversions based on a system wide formula. SCE describes Rule 20A conversion projects as "among the most complex projects within the Distribution Business Line. Each project requires coordination with multiple utilities and customers, and necessitates acquiring multiple permits based on the magnitude and duration of the projects."[57]
2. Under Rule 20B, SCE converts overhead lines to underground at the request of a governmental agency, developer, an individual,

[56] SCE-18, Vol. 2, at 9. We are left to infer that SCE's reference to data from 2000-2006, which TURN did not rely upon, is meant to suggest that the activity in those earlier years created imbalances that were addressed from 2006-2010, and that justifies SCE's approach of excluding the entire period and simply using data from 2011-2015.

[57] SCE-02, Vol. 2, at 39.

or a group of customers. SCE explains that these projects generally arise when a private party or governmental agency wishes to eliminate the visual impact of existing overhead lines in a proposed project, or must remove the lines as a condition to obtain permitting from various governmental agencies.[58] The entity requesting a Rule 20B conversion pays part of the project costs.

3. Under Rule 20C, SCE converts overhead lines to underground when an individual customer or group of customers makes a request. SCE explains that these projects generally arise when an individual property owner or small developer of a new project wishes to remove existing overhead lines less than 600 feet in total length, or on one side of the street, or overhead lines on private property.[59] The customer or customers requesting a Rule 20C conversion pays part of the project costs.

ORA opposes SCE's requested budget for Rule 20A. SCE states that in its 2015 rate case it simply used its forecast from the 2012 GRC as the basis for its projection of spending. SCE revised its approach in the instant proceeding. Based on its recorded costs for 2011-2015 and its estimated costs for 2016, SCE requests authorization of an annual amount equal to the five-year average of 2011-2015 recorded costs, which is $22.182 million in constant 2015 dollars during the forecast period (or $23.065 million for 2017, $23.643 million for 2018, $24.380 million for 2019, and $25.151 million for 2020 in nominal dollars).[60]

ORA notes that it has recommended reduced funding levels for this program because SCE's subsequent recorded expenditures were usually less than the amounts authorized by the Commission. ORA showed in its testimony that

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[58] *Ibid.*

[59] *Id.*, at 40.

[60] *Id.*, at 41, Figure II-18: (Distribution Rule 20A Conversions Capital Expenditure Summary).

SCE failed to spend the amounts authorized in 2014, 2015 and 2016. ORA also notes that in D.15-11-021 the Commission adopted ORA's proposal to adjust authorized Rule 20A expenditures to account for prior underspending.[61] In this proceeding ORA again recommends the same approach, whereby the Commission adopts SCE's forecasted 2017 and 2018 Rule 20A expenditures, but also incorporate an adjustment to reflect the underspending that occurred in 2014 through 2016. ORA calculates an adjustment of $9.558 million in each of the years 2017 and 2018 (each year's proposed offset represents one half of the underspent $19.117 million).

As ORA noted in its opening brief, since ORA filed its testimony in April 2017 the Commission has acted to address similar patterns of underspending of Rule 20A budgeted amounts by PG&E. The Commission's decision in PG&E's 2017 Test Year GRC ordered PG&E to establish a one-way Rule 20A balancing account that tracks the annual capital and expense costs for Rule 20A undergrounding projects, on a forecast and recorded basis. The Commission ordered that overcollected balances in the account shall remain available for future Rule 20A projects, and that the balances in the account would be reviewed in PG&E's next GRC proceeding. We take the same approach here and order SCE to establish a one-way Rule 20A balancing account that tracks the annual capital and expense costs for Rule 20A undergrounding projects, on a forecast and recorded basis. With the creation of this one-way balancing account, we find it reasonable to authorize the capital expenditure forecasts requested by SCE, equal to $23.065 million for 2017 and $23.643 for 2018.

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[61] D.15-11-021 at 90.

4.2.3. Distribution Transformers

SCE states that its T&D organization must maintain an inventory of distribution transformers (rated less than 500 Kilovolt-Ampere (kVA) of load) because relatively large numbers must be on hand for installation and replacement on a regular basis. SCE explains that new service connections are a major driver for new transformer purchases, but most distribution work activity involves installing or replacing under-sized, failed or deteriorated transformers:

> SCE replaces distribution transformers when they fail in service, or when we observe deterioration during inspection or other fieldwork. Deterioration includes leaks, corrosion, and damage caused by vehicle collisions or acts of nature. When SCE replaces a pole or cable, it is often cost-effective and prudent to replace the attached transformer at the same time, depending on the condition of the transformer.[62]

SCE forecasts the total cost of transformer replacement for all activities by estimating the transformers needed for various activities as well as the cost per transformer for each activity. SCE's forecast Test Year 2018 capital expenditures for distribution transformers is $95.217 million.[63]

ORA agrees with SCE's proposed methodology, but its recommended capital expenditure forecast for 2017-2018 differs from SCE's because ORA modifies its inputs of units of work to reflect the numerous recommendations of various ORA witnesses regarding capital activities which utilize distribution transformers.[64]

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[62] SCE-02, Vol. 2, at 49.

[63] SCE-18, Vol. 2, at 15, Table I-9 (Distribution Transformers Capital Expenditures, 100% CPUC Jurisdictional - Nominal $000)

[64] ORA-08 (Wilson) at 61. ORA notes that SCE lists 31 different types of capital programs that require some level of transformer installation or replacement.

In its rebuttal testimony, SCE agrees to revise its distribution transformer forecast based on the Commission's authorized amounts for those capital activities which utilize distribution transformers.[65]

Having resolved each of the contested items in SCE's testimony on customer-driven programs, our final authorized levels of capital expenditures for each activity are shown in the table below.

[65] SCE-18, Vol. 2, at 16.

Summary of Adopted 2017-2018 Capital Expenditure Forecasts
for Customer-Driven Programs
(100% CPUC Jurisdictional – Nominal $000)

	SCE Proposed			Adopted		
Activity	**2017**	**2018**	**Total 2017-2018**	**2017**	**2018**	**Total 2017-2018**
Residential Service Connections	27,736	35,363	63,099	28,134	30,857	58,991
Residential Line Extension	24,067	31,425	55,493	24,216	26,733	50,949
Residential Tract Development	88,536	94,530	183,066	70,808	75,710	146,518
Residential Backbone Development	27,151	28,941	56,092	18,049	19,294	37,344
Commercial/Industrial Service Connections	24,654	25,877	50,531	16,850	18,172	35,023
Commercial/Industrial Line Extensions	39,294	41,338	80,632	39,500	42,604	82,104
Commercial/Industrial Tract Development	14,877	15,694	30,571	14,324	15,314	29,638
Agricultural Service Connections	2,500	2,562	5,062	2,500	2,562	5,062
Agricultural Line Extensions	2,710	2,779	5,489	2,710	2,779	5,489
Street Light Installations	30,511	38,900	69,411	30,949	33,944	64,893
Distribution Rule 20A Conversions	23,065	23,643	46,708	23,065	23,643	46,708
Distribution Rule 20B Conversions	14,558	14,924	29,482	14,558	14,924	29,482
Distribution Rule 20C Conversions	8,008	8,210	16,218	8,008	8,210	16,218
Transmission Overhead to Underground Conversion	5,888	6,031	11,919	5,888	6,031	11,919
Relocation of Distribution Lines	58,953	60,437	119,390	58,953	60,437	119,390
Distribution Added Facilities	12,807	13,130	25,937	12,807	13,130	25,937
Distribution Transformers	90,531	95,217	185,748	82,669	89,446	172,115
Total Capital – Customer Driven Programs	495,846	539,001	1,034,848	453,988	483,790	937,777

4.3. T&D – System Planning

The Test Year 2018 O&M and capital expenditure forecasts presented in SCE's testimony on transmission and distribution system planning is based on

SCE's current 10-year plan for "the projects and programs required to expand, upgrade, and reconfigure the electrical grid over the next 10 years."[66] In this context, SCE states that the term "grid" refers to "the infrastructure comprised generally of transmission lines, substations, distribution circuits, and critical equipment such as circuit breakers, relays, substation transformers, conductors, and automation apparatus." The overall drivers of SCE's planning process are accommodating increased capacity needs (resulting from new customers or increased load from existing customers) while meeting system reliability. SCE states that in this GRC it has taken an integrated, long-term approach to planning and asset management to simultaneously account for multiple drivers such as aging infrastructure, technology changes, or policy goals.

For Test Year 2018, SCE forecasts $1,039.208 million in capital costs[67] and $14.726 million for O&M expenses.[68] We authorize SCE's uncontested O&M forecast. Various components of SCE's capital expenditure forecast are opposed by ORA, TURN and SEIA-Vote Solar. ORA's recommended reductions would result in a $261.66 million reduction to SCE's 2017-2018 capital expenditure forecast.[69] TURN's recommended reductions would result in a $240.903 million reduction to SCE's 2017-2018 capital expenditure forecast.[70] SEIA-Vote Solar's

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[66] SCE-02, Vol. 3R, at 1.

[67] SCE-18, Vol. 3A, at 3, Table I-2 (Summary of System Planning Capital Expenditures, SCE and ORA Forecasts, Total Company – Nominal $000).

[68] SCE-18, Vol. 3, at 6, Table I-5 (Summary of System Planning O&M Expenses).

[69] SCE-18, Vol. 3A, at 3: Table I-2 "Summary of System Planning Capital Expenditures, SCE and ORA Forecasts, Total Company – Nominal $000)".

[70] *Id.*, at 4: Table I-3 "Summary of System Planning Capital Expenditures, SCE and TURN Forecasts, Total Company – Nominal $000)".

recommended reductions would result in a $389.424 million reduction to SCE's 2017-2018 capital expenditure forecast.[71]

Summary of Parties' Positions
on 2017-2018 Capital Expenditure Forecasts
for System Planning
(TOTAL COMPANY – Nominal $000)

Activity	SCE	ORA	TURN	SEIA-Vote Solar
Added Facilities Projects	49,184	49,184		
Substation Expansion Projects	224,101	215,602		0
Transmission System Generation Interconnection	117,209	117,209		
Generator Interconnection Program	1,758	1,758		
In-Service Projects	9,191	9,191		
4 kV Cutover Program	72,618	56,315		0
4 kV Elimination Program	317,765	180,210	144, 109	
Distribution Circuit Upgrades	100,485	99,438	92,238	0
New Distribution Circuits	90,137	67,463		0
Substation Equipment Replacement Program	49,785	20,825		
Subtransmission Lines Plan	205,582	157,913		0
Distribution Var Plan	12,953	12,953		
Distribution Plant Betterment	28,840	28,840		
Substation Monitoring Programs	400	400		
A-Bank Plan	64,728	64,728		0
Grid Reliability Projects	406,248	406,248	347,248	
Subtransmission VAR Plan	2,653	2,653		
Policy Driven Transmission Projects	260,134	260,134		
Right of Way	1,063	1,063		
Generation Interconnection RAS	25,766	25,766		
Total Capital - System Planning	**2,040,601**	**1,777,893**		

[71] SCE-18, Vol. 3, at 5: Table I-4 "Summary of System Planning Capital Expenditures, SCE and SEIA-Vote Solar Forecasts, Total Company – Nominal $000)" with SCE forecast revisions incorporated from SCE-18, Vol. 3A, at 3: Table I-2.

4.3.1. Photovoltaic (PV) Dependability and Capacity-Driven Capital Expenditures

We depart from the order of topics in the parties' mutually agreed-upon common briefing outline in order to address what we consider a threshold recommendation by SEIA-Vote Solar, who contend that the peak load forecast that serves as the basis for SCE's system planning forecast is fundamentally flawed. Specifically, SEIA-Vote Solar find fault with the PV dependability study that SCE used to determine how PV generation could be relied upon to offset peak load conditions. SCE uses "PV dependability" in its distribution planning process to determine how much of existing and forecast PV would be available to serve load during the system peak.[72] SCE applies the PV dependability curve at two different stages of its planning process: (1) adjustment of recorded load and (2) development of forecast PV.[73] According to SEIA-Vote Solar, SCE is underestimating PV dependability and overestimating peak loads, and thereby overestimating the need for capacity-related capital expenditures. Based on its contention that SCE's study was flawed, SEIA-Vote Solar conclude that SCE's request for $878 million of projected capacity-related costs is not adequately supported and therefore cannot be approved by the Commission. Instead, SEIA-Vote Solar recommend that SCE be required to develop a new load forecast using a revised PV dependability curve, and then submit a new request for capacity-related projects based on that forecast.

SEIA-Vote Solar explain their concerns by noting that

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[72] SEIA-Vote Solar-01, at 34-35, citing SCE response to SEIA-Vote Solar Data Request Question 1.13.

[73] *Id.* at 35.

> The Commission is undergoing a thoughtful process in the Distribution Resources Planning proceeding, the Integrated Distributed Energy Resources Proceeding and other forums, following a path and a vision outlined in the Commission's DER Action Plan. We believe this vision is aligned with that held by SEIA and Vote Solar. SCE argues that its need for the first of several multi-billion-dollar, grid modernization applications requires jumping ahead of this deliberative process. The Commission need not deliberate over the timing of this case, however. Under any of SCE's rationales, the application shows itself to not only be premature, but simply unjustified. The bulk of SCE's grid modernization investments should be rejected and its distribution capacity investments should be revisited with greater scrutiny. SCE's next rate case, filed towards the end of the activities outlined in the DER Action Plan in 2019, will provide the utility with an opportunity to present a proposal more in line with what the Commission determines is in the interest of ratepayers.[74]

In rebuttal, SCE contends that SEIA-Vote Solar's assessment of SCE's PV growth forecast and PV dependability study is incorrect. SCE makes the following points in response to SEIA-Vote Solar.

First, SCE asserts that it appropriately applies different PV output estimates in its studies, because the studies have different purposes:

> For system planning purposes, SCE uses minimum PV output to account for varying solar intermittency; this is appropriate because for system planning purposes, it is important to determine how much solar output the SCE system can rely on. SCE's conservative approach is designed to help ensure SCE can provide adequate substation and distribution circuit capacity to serve forecast maximum (peak) loads.[75]

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[74] SEIA-Vote Solar Opening Brief at 5.

[75] SCE-18, Vol. 3, at 34.

> Conversely, for reverse power flow analysis, SCE appropriately uses maximum PV output and daytime minimum loads to reflect the highest level of solar output at times when reverse power flow is at its maximum. Again, this conservative approach is appropriate to help ensure SCE can plan for and mitigate adverse conditions including impacts to voltage, protection, and thermal limits.[76]

Second, SCE responds to SEIA-Vote Solar's contention that "SCE's forecast of PV growth is significantly higher than what market analysts expect in California in the 2018-2020 period" by noting that SCE's cumulative total of approved net energy metering (NEM) as of June, 2017 was 1,864 MW, "well above" SEIA-Vote Solar's reference point that estimated 1,658 MW in 2017.[77]

Third, SCE faults SEIA-Vote Solar's proposal because SCE's PV dependability analysis considers circuit and substation peak load; this contrasts with SEIA-Vote Solar's PV dependability curve, which utilizes SCE's top ten load days in 2010 and 2011, "which only includes a limited data set and may not account for circuit peaks occurring on different days and under different conditions, such as cloud cover."[78] SCE contends that its own PV dependability curve "includes more data points that span across its typical peaking period, which appropriately represents the variability of SCE's PV output during peak periods."[79] SCE states that this data includes 15 minute interval data from June to September, for all generators across SCE's system, to estimate daily PV output.

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[76] *Ibid.*

[77] *Id.* at 35.

[78] *Ibid.*

[79] *Id.* at 35-36.

Finally, SCE responds to SEIA-Vote Solar's criticism that SCE did not properly account for Demand Response (DR) and Energy Storage. SCE states that "the impact of DR is taken into consideration during the adjustment to our annual summer peaks on SCE's substations and circuits."[80] SCE agrees that storage plays a significant role in meeting its requirements for Local Capacity Requirements (LCR), "but these resources are procured to meet bulk system requirements, not distribution. Because these resources are largely dispatched by the California Independent System Operators (CAISO), SCE cannot rely on these resources for distribution reliability and hence, are not included in the forecast."[81]

Based on our review of SEIA-Vote Solar's critiques of SCE's PV dependability study, and SCE's rebuttal of those criticisms, we find that it is reasonable to accept SCE's use of its study for the purpose of preparing its GRC forecast. However, we do not discount SEIA-Vote Solar's motivation for conducting its analysis: "SEIA and Vote Solar share SCE's objective of creating new opportunities for DERs [Distributed Energy Resources], but our vision diverges substantially from that … manifested in this application."[82] SEIA and Vote Solar go on to explain that they "envision new benefits being created by DERs beyond the benefits they provide directly to host customers by reducing utility expenditures on the distribution system while also improving customer electric services. In this regard, we support a number of investments that SCE proposes, which we have determined are truly needed to facilitate DER

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[80] *Id.* at 36.

[81] *Ibid.*

[82] SEIA-Vote Solar Opening Brief at 4.

deployment. However, the scale of these resources is modest, particularly in comparison to SCE's dramatic proposal."[83]

We acknowledge SEIA-Vote Solar's concerns regarding the scale and timing of SCE's requests, but we disagree that simply rejecting SCE's application is the correct solution. For that reason, we proceed with our review of each specific request made by SCE and decide each of them on their merits.

4.3.2. Distribution Circuit Upgrades

SCE considers distribution circuit upgrades when it forecasts any portion of its distribution system to be overloaded and if existing distribution equipment cannot meet the needs of the system. Typical work under this category includes installing new switches, upgrading cable or conductor, or installing new conductor to create circuit ties to facilitate load transfers between substations and circuits.

TURN recommends reducing SCE's 2017-18 capital expenditure forecast by $8.247 million, from $100.485 million to $92.238 million. TURN contends that SCE's DER forecast should exclude circuit upgrades driven by wholesale DERs because SCE should seek recovery of the costs to accommodate wholesale DERs through Tariff Rule 21. In rebuttal, SCE affirms that wholesale DER interconnection customers met the requirements of Tariff Rule 21 at the time they connected to SCE's system, including paying for all upgrades triggered by their interconnection at the time of the connection. Furthermore, regardless of installed wholesale DERs, SCE must upgrade the circuits identified in its testimony to be able to accommodate its forecast of future retail DER. Thus,

[83] *Id.* at 5.

"SCE cannot and should not require wholesale DERs, already connected to SCE's system, to pay for circuit upgrades triggered by new retail DER."[84] We authorize SCE's requested 2017-2018 capital expenditure forecast of $100.485 million for Distribution Circuit Upgrades.[85]

4.3.3. New Distribution Circuits

If Distribution Circuit Upgrade projects cannot meet the need of a forecasted overload on SCE's distribution system, or the Distribution Circuit Upgrade solution is economically unfeasible and does not meet the long-term needs of the area, SCE will consider new distribution circuit solutions in the Distribution Substation Plan (DSP). SCE builds new distribution circuits as part of three types of projects: (1) new substation projects, (2) substation capacity increase projects, and (3) as standalone projects.

ORA recommends reducing SCE's 2017-18 capital expenditure forecast from $90.137 million to $67.463 million, based on SCE's 2016 actual recorded costs and then escalating SCE's 2016 forecast for 2017 and 2018.[86]

In rebuttal, SCE states that it developed the New Distribution Circuit forecast on a project-specific basis to meet needs identified during SCE's planning process. ORA's methodology did not address SCE's project-specific forecast and ORA does not contest the need for any specific projects SCE identified as necessary, so we will not rely upon ORA's formulaic

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[84] SCE-18, Vol. 3, at 12-13, emphasis added.

[85] SCE-18, Vol. 3A, at 12, Table 111-7 (Distribution Circuit Upgrades Capital Expenditures).

[86] Exhibit ORA-09, at 74.

recommendation here. We authorize SCE's requested 2017-2018 capital expenditure forecast of $90.137 million for New Distribution Circuits.[87]

4.3.4. Substation Expansion Projects

Substation expansion projects are undertaken when a distribution substation is expected to exceed its planning limits and cannot transfer load to a neighboring substation, and the expansion project is the most cost effective solution when compared against others, such as adding a new distribution circuit.[88] These projects fall into three categories: (1) substation capacity projects located within scope in the existing substation footprint; (2) substation expansion that includes projects where the substation perimeter fence requires expansion; and (3) new substations.

ORA stated in testimony that it expects one of SCE's projects, the new "Safari" substation located in Irvine, will be delayed due to community discontent and will not be completed in this GRC cycle. In rebuttal, SCE states that it plans to complete the project in 2018: as of April, 2017 approximately 55% of the project scope had been completed, with an estimated 12 months of construction work remaining.[89]

Based on the additional information provided by SCE in its rebuttal testimony, we decline to adopt ORA's recommendation. We authorize SCE's requested 2017-2018 capital expenditure forecast of $224.101 million for Substation Expansion Projects Capital Expenditures.[90]

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[87] SCE-18, Vol. 3, at 10: Table 111-6 "New Distribution Circuits Capital Expenditures."

[88] SCE-02, Vol. 3RA, at 40.

[89] Exhibit SCE-18, Vol. 3, at 14-15.

[90] SCE-18, Vol. 3, at 14, Table 111-8 (Distribution Circuit Upgrades Capital Expenditures).

4.3.5. Substation Equipment Replacement Program

SCE's Substation Equipment Replacement Program (SERP) is one of three programs within the company's "System Improvement Planning Process" (the others are the Distribution VAR (reactive power) plan and the Substation Monitoring Programs).[91] SCE states that "these programs include upgrades to the distribution system that involve protection, reactive power support, and monitoring substation loading and duct bank temperatures…"[92]

The SERP "evaluates the adequacy of substation terminal equipment and system protection equipment, and proposes upgrades when deficiencies are identified. The SERP identifies substations where available fault current, or short-circuit duty, exceeds safe equipment ratings essential to the provision of safe, reliable service."[93]

ORA recommends reducing SCE's 2017-18 capital expenditure forecast by $28.96 million, from $49.785 million to $20.825 million. That amount is equal to 2015 authorized capital expenditures, with escalation, for 2017 and 2018. ORA contends that SCE has not demonstrated the need for more funds than authorized in 2015, has not supported its capacity to do more work, did not provide a supportive study referenced in its direct testimony, and did not acknowledge or explain the unit cost increases that underlie its forecast.

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[91] SCE explains that "Volt-ampere reactive power (VAR) is the unit used to measure reactive power in alternating current electric systems. Because alternating current systems have varying voltage, these systems must vary the current with the voltage to maintain stability. VARs measure the lead or lag between synchronization of voltage and current." SCE-02, Vol. 3, at 44.

[92] SCE-02, Vol. 3RA, at 43.

[93] *Ibid.*

SCE addressed each of ORA's contentions in rebuttal testimony and clarified where its support for its requested expenditures can be found in the proceeding record. SCE also re-emphasized that its forecast spending "is required to replace overstressed circuit breakers on SCE's system."[94] Based on SCE's support for its proposal, we authorize SCE's requested amount for 2017-2018 of $49.785 million.[95]

4.3.6. Subtransmission Lines Plan

The objective of SCE's Subtransmission Lines Plan is to provide adequate 66 kV or 115 kV line capacity in each of its subtransmission networks to serve forecast peak loads at its B-substations.[96] SCE requests approval of its forecast 2017-2018 capital expenditures of $205.582 million, of which $205.127 million is CPUC-jurisdictional.[97]

ORA notes that SCE's recorded spending in 2016 for these projects totaled $25.571 million lower than its forecast, and questions whether SCE's new forecast is accurate. ORA recommends approval of $157.913 million for 2017-2018, which is the simple average of SCE's recorded and forecast values for 2016-2020. In rebuttal, SCE explains that its forecast is based on project-specific requirements, and that it expended less than forecast in 2016 due to construction permitting and other unexpected delays on specific projects.

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[94] SCE-18, Vol. 3, at 17.

[95] *Id.*, Table 111-9 (Substation Equipment Replacement Program Capital Expenditures).

[96] SCE-02, Vol. 3RA, at 93.

[97] SCE-02, Vol. 3R, at 57, Table IV-14 (Distribution & Subtransmission Planning Capital Expenditure Summary).

We find that SCE's rebuttal testimony addressed the concerns raised by ORA, and we therefore authorize SCE's requested amount for 2017-2018 of $205.582 million.[98]

4.3.7. 4 kV Programs

SCE requests funding for two separate 4 kV programs: its 4 kV Cutover Program converts portions of 4 kV circuits to higher voltages in order to reduce load and foster reliability; its 4 kV Substation Elimination Program involves conversion of the entire 4 kV circuitry from a substation to higher voltage. SCE states that most of its circuits operate at voltages of 12 kV, 16 kV, or 33 kV but over 25% of its circuits and roughly 20% of its substations operate at voltages of 4 kV or lower.[99] SCE contends that this system poses several challenges in system operations that impact its ability to reliably serve customers due to age, obsolescence, and increased load and DER growth.[100] SCE also notes that while 26% of households in SCE's service territory are in disadvantaged communities, 44% of households served by 4 kV circuits are in those communities.[101]

SCE summarizes the drivers for its 4 kV program as (1) mitigating safety and reliability risks of old and obsolete equipment; (2) alleviating space constraints that prevent expansion of existing 4 kV substations; (3) providing operational flexibility and mitigating power quality concerns; (4) preventing future circuit overloads due to insufficient capacity; (5) minimizing energy losses

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[98] SCE-18, Vol. 3, at 18, Table 111-10 (Subtransmission Lines Plan Capital Expenditures).

[99] SCE-18, Vol. 3, at 20.

[100] SCE-02, Vol. 3RA, at 76.

[101] *Ibid.*

because the overall cost to provide electricity at 4 kV is greater than at either 12 kV or 16 kV; and (6) DER integration.[102]

SCE explains why it decided in this GRC to include DER integration as a factor when identifying the need for conversions and eliminations of 4 kV substations:

> As customers adopt more DERs, the reliability and capacity issues associated with 4 kV systems are expected to be exacerbated, absent modernization of SCE's distribution system:
>
> - Many 4 kV systems lack sufficient DER hosting capacity because they operate with lower overall capacity;
> - 4 kV systems lack existing automation and impede the future addition of automation technology;
> - Without the automation technology to give operators visibility and control, coupled with outdated voltage regulation schemes, problems with capacity and voltage quality will continue if not increase; and

SCE contends that the lack of automation in SCE's 4 kV systems prevents grid operators from quickly identifying, troubleshooting, and restoring power.[103]

4.3.7.1. 4 kV Cutover Program

SCE states that when circuits and substations experience overloads that require immediate attention, it will cutover partial circuits sufficiently to reduce the loading below the established planned loading limits.[104] SCE states that this approach will ameliorate the problem in the short run and is a cost-effective solution until larger portions of the substation or circuit must be upgraded.

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[102] SCE-02, Vol. 3RA, at 76-83.

[103] *Id.* at 84.

[104] *Id.* at 86.

SCE's 2017-2018 forecast of capital expenditure for this program is $72.618 million.[105]

ORA recommends a reduction in SCE's forecast capital spending of $16.303 million to $56.315 million. ORA developed its own 2017-2018 forecasts using 2015 GRC authorized amounts, stating that SCE has not provided reasoning and justification for (1) SCE's spending pattern in 2014-2015, and (2) SCE's decision to change the basis for its forecast from a methodology based on "amps cutover" to one based on "transformers removed." ORA asserts that SCE's forecast unit cost is 2.5 times higher than the historical average and therefore recommends that the Commission authorize the same budget approved in D.15-11-021.

TURN supports the 4 kV cutover program because its witness found that cutovers of 4 kV circuits due to overloads is "reasonable and effective."[106] TURN recommends that the Commission authorize the program but disallow $8.388 million from SCE's 2018 test year forecast of $36.663 million, finding that ORA's analysis demonstrates that SCE's forecast unit cost per circuit is more than double the historical average for 2006-2016.

In rebuttal, SCE defends its change in methodology by explaining that "while Amps are used to measure the overload on a circuit, the mitigation is achieved by removing and replacing transformers."[107] SCE explains that it updated its forecast methodology to use the count of transformer replacements as the cost unit because the number of transformers replaced is a better indicator

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[105] SCE-18, Vol. 3, at 18: Table III-11 "4 kV Cutover Program Capital Expenditures."

[106] TURN-06, at 33 and 40.

[107] *Id.* at 22.

of the scope of work needed. According to SCE, the number of transformers that needs to be replaced on a circuit to cutover a certain number of Amps can vary significantly depending on the specific characteristics of the circuit.[108] Finally, SCE finds flaws in ORA's methodology for reconciling the differences between Amps-based unit costs and transformer-based unit costs and concludes that "for these reasons, ORA's per-circuit unit cost analysis should not be used for comparison or forecasting purposes."[109]

We find that SCE has demonstrated that its methodology for estimating the scope and cost of its 4 kV cutover program is reasonable. We approve SCE's requested levels of 2017 and 2018 funding ($35.955 million in 2017 and $36.663 million in 2018, for a 2017-2018 total equal to $72.618).[110]

4.3.7.2. 4 kV Substation Elimination Program

SCE describes complete elimination of 4 kV substations as the best long-term option when drivers such as aging infrastructure, costs, reliability, and high penetration of DERs require a longer-term solution.[111] SCE cites benefits including avoidance of additional costs to replace obsolete equipment, improved operational flexibility and reduced maintenance costs, improved safety, reliability and power quality, and enabling higher penetration of DERs. SCE's 2017-2018 forecast of capital expenditures for this program is $317.765 million.[112]

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[108] *Id*. at 23.

[109] *See* SCE-18, Vol. 3 at 23-24.

[110] SCE-18, Vol. 3, at 21: Table III-11 "4 kV Cutover Program Capital Expenditures."

[111] SCE-02, Vol. 3RA, at 85.

[112] SCE-18, Vol. 3, at 21: Table III-12 "4 kV Elimination Program Capital Expenditures."

CUE supports the substation elimination program, but recommends that the Commission require SCE to remove these substations at a faster pace than requested by SCE.[113]

ORA recommends a reduction in the 2017-2018 forecast to $180.21 million. ORA bases its proposal on the expenditures authorized in the 2015 GRC, arguing that SCE did not present evidence in its application or workpapers to support the forecast increase or provide data to allow reviewers to accurately compare the 4 kV Substation Elimination Program across rate cases.[114]

TURN opposes continuation of the substation elimination program, other than providing limited test year 2018 funding of $4.9 million to enable elimination of one substation per year to address specific substations that have unusual reliability problems. TURN estimates this would reduce SCE's test year 2018 capital forecast of $178.556 million by $173.659 million.[115] TURN agrees that the Commission has previously approved this program, but contends that the Commission has never evaluated the drivers cited by SCE in support of its proposal. TURN reviewed SCE's rationale for the program and conducted a cost-benefit analysis of SCE's proposed expenditures and concluded the following:

- The age of 4 kV substations and circuits does not in itself justify wholesale preemptive replacement
- SCE's contention that 4 kV circuits exhibit declining reliability conflicts with the available evidence, which demonstrates 4 kV

[113] CUE-01, at 8.

[114] *See* ORA-09, at 85.

[115] TURN Opening Brief at 9.

circuits have the same, if not better, reliability as higher voltage circuits

- SCE's elimination program fails a basic benefit-cost analysis
  - It is not cost-effective to preemptively replace 4 kV substations
  - There is no basis to assume SCE would need to rebuild all the 4 kV substations targeted for elimination
- SCE's equity concerns regarding 4 kV circuits are not supported by the data
  - There is no valid environmental justice issue regarding 4 kV circuits
  - There is no existing or forecast problem with DER capacity on 4 kV circuits

TURN also claims SCE has exaggerated the risk associated with retaining 4 kV substations, and suggests that SCE undertake cutovers instead of substation elimination as capacity problems arise. TURN acknowledges the reliability benefits associated with 4 kV upgrades, but contends that all customers should not pay for costs that benefit 12% of the customers.[116] Based on the same cost-benefit analysis, TURN expresses its concerns that SCE could be harming low-income customers by expanding what TURN calls SCE's "non-cost-effective 4 kV Substation Elimination Program."[117]

In rebuttal, SCE reiterates its position that the drivers of the elimination program, in combination, warrant its requested level of funding; SCE faults TURN for dismissing each driver in turn, without considering their combined effects. SCE also contends that TURN's proposal "translates to a run-to-failure

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[116] *See* Exhibit TURN-06, at 33.

[117] *See* Exhibit TURN-10, at 33-36.

model for 4 kV substation equipment, in which breakdown replacement is infeasible as spare parts are not available and physical constraints at the substations will hinder upgrades or equipment replacement."[118] SCE, on the other hand, "believes it is necessary to proactively remove obsolete substation equipment that has reached the end of its useful life. 4 kV Substation Elimination is consistent with other preemptive infrastructure replacement programs that replace obsolete and failing equipment prior to in-service failure."[119]

We find TURN's thorough analysis of SCE's proposal to be convincing. As TURN observes, the Commission authorized $85 million for this program in 2015, less than 50% of SCE's current request, and in this rate case ORA recommends continuing with the same level of funding authorized in the Test Year 2015 rate case. TURN further observes "in the last rate case, it does not appear that any party actually contested the spending."[120] Now that SCE proposes to expand the pace of the program, a closer look is warranted. TURN conducted the necessary analysis and demonstrated that the program provides questionable benefits. On this basis, we find that SCE's request for full funding of the program in the 2018-2020 period should be denied. Instead, we approve the level of funding recommended by TURN for the 2018 test year, which we calculate to be $4.897 million ($178.556 million minus $173.659 million).

4.3.8. Grid Reliability Projects

SCE explains that Grid Reliability Projects are planned on the portion of SCE's system that is under operational control of the CAISO. SCE forecasts

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[118] SCE-18, Vol. 3, at 25.

[119] *Ibid.*

[120] TURN Opening Brief at 10.

Test Year 2018 capital expenditures of $185.128 million on a Total Company basis, of which $77.98 million is CPUC-jurisdictional.

TURN contends that the Cerritos Channel Transmission Line Relocation project is unlikely to be used and useful during the 2018-2020 rate case period, and recommends that the entire $57.904 million forecasted amount (2016-2020, CPUC jurisdictional) be disallowed.

In rebuttal, SCE contends that the project is on an "expedited" track to completion and that SCE does not expect any delay in receiving its permit to construct or in completing construction on this project.

The Commission granted SCE a permit to construct the Cerritos Channel Transmission Tower Replacement Project in D.18-08-021. In that decision, the Commission noted that construction of the project is scheduled to begin September 1, 2018 and to be completed by the fourth quarter of 2020.[121] On this basis, we agree with TURN that the project is unlikely to be used and useful during the 2018-2020 rate case period. Therefore, we disallow the inclusion of all spending prior to 2016 and the $57.904 million forecasted amount (CPUC jurisdictional) requested by SCE for the 2016-2020 period. For Test Year 2018, the disallowed amount is $34.048 million (CPUC jurisdictional).[122]

4.4. T&D – Distribution Maintenance and Inspection

SCE states that its Distribution Maintenance and Inspection organization performs maintenance and inspection activities associated with SCE's

[121] D.18-08-021 at 3.

[122] SCE-02, Vol. 3R, at 53, Table IV-8, line 3 (Grid Reliability Projects Capital Expenditure Summary).

distribution grid, including planned and unplanned work.[123] SCE developed its forecast by using its 2015 recorded adjusted expenses as a basis for proposed Test Year projects and activities. For Test Year 2018, SCE forecasts $273.955 million in capital costs[124] and $159.968 million for O&M expenses.[125] SCE's requests are unopposed. We authorize SCE's undisputed Test Year 2018 forecasts.

4.5. T&D – Distribution Construction & Maintenance

SCE states that its Distribution Construction & Maintenance organization performs all activities associated with installing, maintaining, replacing, and removing distribution electrical equipment, structures, and other facilities.[126]

For Test Year 2018, SCE forecasts $203.700 million in capital costs[127] and $70.491 million for O&M expenses.[128] SCE's capital request is unopposed, and we approve it based on our own review of SCE's forecast.

ORA recommends O&M expense reductions totaling $4.544 million.

First, for Street Lighting Operations and Maintenance (Federal Energy Regulatory Commission (FERC) sub-account 585.170), ORA recommends a Test Year O&M reduction from $6.936 million to $4.543 million. In rebuttal

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[123] Ex. SCE-2, Vol. 4, at 1.

[124] SCE-18, Volume 04, at 1, Table I-1 (Distribution Maintenance and Inspection Capital Summary).

[125] SCE-18, Volume 04, at 2, Table I-2, (Summary of Distribution Maintenance and Inspection O&M Expense).

[126] Ex. SCE-2, Vol. 5, at 1.

[127] SCE-18, Volume 05, at 1, Table I-1 (Summary of Distribution Construction and Maintenance Capital Expenditures).

[128] SCE-18, Volume 05, at 2, Table I-2 (Summary of Distribution Construction and Maintenance O&M Expenses).

testimony, SCE suggests that ORA's recommendation appears to reflect a mistaken reading of SCE's streetlight model (which produces the forecast), by omitting one of the four categories of costs from the calculation.[129] ORA did not respond to SCE's observation, which SCE documents with reference to data responses provided to ORA.[130] SCE's explanation is reasonable. We adopt SCE's Test Year 2018 forecast for FERC sub-account 585.170, equal to $6.936 million.[131]

Second, ORA opposes SCE's request regarding Service Guarantees #2 and #3 (FERC sub-account 587.170). SCE provides two T&D-related service guarantees to its customers: (1) that SCE will restore power within 24 hours of learning of an unplanned outage, and (2) that SCE will provide affected customers with a three-day advance notice of any planned outages. Currently, the guarantee payouts ($30 per incident to each impacted customer) are shareholder funded. SCE proposes that the Commission depart from its long-standing historical practice of having shareholders be responsible for the costs of credits paid out for missing service guarantees. ORA notes that the Commission rejected SCE's proposal in D.15-11-021 and recommends that Commission continue to assign all of the costs of these credits to shareholders.[132] We agree with ORA. SCE has not made a persuasive argument that ratepayers should fund SCE's service guarantees. That responsibility shall continue to fall on SCE's shareholders.

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[129] SCE-18, Vol. 5, at 8.

[130] *Ibid.*

[131] *Id.* at 7, Table I-6 (Streetlight Operations and Maintenance, Constant 2015 $000).

[132] ORA-07, at 15-17.

Third and finally, for Distribution Storm O&M (FERC sub-account 598.170), ORA proposes a reduction in SCE's forecast from $9.388 million to $7.814 million and proposes to implement a one-way balancing account. SCE and ORA disagree over whether SCE's forecast should be based on recorded data from 2012-2016 (ORA) or 2011-2015 (SCE). However, we find more compelling ORA's testimony showing that SCE significantly underspent the budgets authorized by the Commission in its 2012 GRC and its 2015 GRC.[133] For this reason, we authorize Test Year 2018 O&M for FERC sub-account 598.170 equal to the amount recommended by ORA, $7.814 million.[134]

Regarding its proposed one-way balancing account, ORA contends that it will benefit ratepayers because unspent funds will be returned to them, rather than directed to other uses by SCE. SCE responds that a one-way balancing account would unfairly penalize shareholders for acts of nature that are outside of SCE's control, given the unpredictability of the weather. SCE notes that such an account would lead to an unbalanced outcome where ratepayers would receive refunds in years when the weather was mild, but shareholders would likely fund part of storm-related repairs in years when the weather was more severe.

We denied a similar request by ORA in our decision on SCE's 2015 GRC. We deny ORA's request again in this decision. While we generally share ORA's concerns regarding underspending of amounts authorized in previous GRC decisions, in this specific instance we agree with SCE that storm-related spending

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[133] *Id.* at 18.

[134] SCE-18, Vol. 5, at 3, Table I-3 (Distribution Storm O&M, Constant 2015 $000).

will vary with the weather. We anticipate that ORA's more reasonable forecast will result in less underspending, thus making ORA's proposed balancing account unnecessary.

4.6. T&D – Substation Construction & Maintenance

SCE states that its Substation Construction & Maintenance O&M expense forecast supports activities such as inspection and maintenance of SCE's substation equipment, substation and grid control center operating activities, and other substation activities, including inspecting, maintaining, and replacing protection and control equipment, spare parts, tools and work equipment, improving the physical security of substations, and modernizing outdated grid control rooms.

For Test Year 2018, SCE forecasts $78.15 million for O&M expenses.[135] For capital, SCE's direct testimony presented its 2016-2020 capital forecast (CPUC jurisdictional) of $590 million, of which $83.7 million, $92.3 million, and $136.5 million are forecast for 2016, 2017, and 2018, respectively.[136] In its rebuttal testimony, SCE made the following changes to its capital forecast:

- SCE agreed with ORA to use 2016 recorded costs (as opposed to 2016 forecast cost) for capital expenditures.
- In alignment with the testimonies of ORA, TURN, and SEIA-Vote Solar, SCE is no longer seeking costs for the Subtransmission Relay Upgrade in 2018-2020.

[135] *See* Table I-1, at 2, of Exhibit SCE-18, Vol. 6.

[136] *See* Table I-3, at 2, of Exhibit SCE-02, Vol. 6.

TURN originally opposed one aspect of SCE's request regarding SCE's Substation Protection and Control System Replacement program, but withdrew that opposition in its opening brief.[137]

After these agreements, one capital issue remains disputed. Regarding Substation Physical Security, SCE proposes to upgrade eight substation projects per year from 2016-2020.[138] ORA proposes that SCE be allowed to upgrade only five substations per year in 2017-2018, based on its view that only those substations that experienced four thefts have a "high frequency" of incidents. SCE contends that "[d]epending on the circumstances, it would not be safe or prudent for SCE to wait until a substation experiences four copper thefts before SCE makes upgrades" so ORA's proposal leaves too many sites vulnerable, thus placing SCE employees and members of the public at risk. We find that SCE's rebuttal testimony effectively refuted ORA's recommendation to reduce SCE's requested funding for Substation Physical Security. We authorize SCE's requests for $8.321 million in 2017 and $8.530 million in 2018.[139]

Having resolved this disputed item, we adopt SCE's capital expenditure forecast for Test Year 2018, $176.329 million.[140] We also adopt SCE's undisputed Test Year 2018 O&M forecast of $78.15 million.[141]

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[137] TURN Opening Brief at 20.

[138] Exhibit SCE-02, Vol. 6, at 46. See Table I-17 on p. 46, which shows the nominal costs of the enhancements for the eight substations/year to be approximately $1 million/substation.

[139] Exhibit SCE-29, at 228.

[140] SCE-18, Vol. 6, at 3, Table I-2 (Summary of Substation Construction & Maintenance Capital Expenditures). This table includes SCE's 2018 total forecasted amount of $217.917 which includes $41.589 million for the Substation Relay Upgrade project that SCE subsequently agreed to remove (see SCE-18, Vol. 6, at 17-19). Removal of the $41.589 results in the adopted forecast expenditures, $176.329 million.

4.7. T&D – Transmission Construction & Maintenance

SCE states that its Transmission Construction & Maintenance forecast supports its transmission inspection, maintenance, and construction activities. Transmission inspection activities include routine annual patrols and inspections of SCE's overhead and underground transmission lines and additional inspections during and after storms or other emergencies. Transmission maintenance activities include transmission line maintenance, insulator washing, and road and right-of-way maintenance. SCE's capital expenditure request supports transmission relocations, claims, and maintaining a spare parts inventory. Finally, SCE's request also includes costs to inspect and maintain the company's fiber-optic communications network, which includes over 5,000 miles of fiber-optic cable.[142]

For Test Year 2018, SCE forecasts $40.918 million for O&M expenses.[143] SCE's Test Year 2018 capital forecast equals $216.793 million.[144]

ORA opposes a portion of SCE's O&M forecast for FERC Account 571.150: (1) Transmission Overhead and Underground Line Maintenance, (2) Transmission Vegetation Management. Regarding SCE's capital forecast, ORA recommends reductions of $616,000 in 2016 and $519,600 in 2017 for transmission tools and work equipment activities.

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[141] *Id.,* at 2, Table I-1 (Summary of Substation Construction & Maintenance O&M Expenses).

[142] SCE-02, Vol. 7, at 1.

[143] SCE-18, Vol. 7, at 2, Table I-1 (Transmission Construction and Maintenance Summary of O&M Expenses, Constant 2015 $000).

[144] *Id.* at 3, Table I-2 (Transmission Construction and Maintenance Summary of Capital Expenditures, Total Company – Nominal $000).

4.7.1. Transmission Overhead and Underground Line Maintenance – FERC Account 571.150 (partial)

SCE's Test Year 2018 forecast for Transmission Overhead and Underground Line Maintenance is $6.840 million, which is equal to the last recorded year for this expense, 2015. ORA recommends $5.786 million, which is based on a 4-year average of recorded costs (2011-2013 and 2015; both ORA and SCE agree that 2014 recorded costs are an outlier). In rebuttal testimony, SCE explains that the T&D division changed its overhead accounting methodology in 2014, which renders the 2011-2013 non-labor expenses unrepresentative of test year expenses.[145] ORA did not challenge SCE's rebuttal testimony in hearings or briefs. We find SCE's support for its forecast to be reasonable and adopt SCE's Test Year 2018 forecast of $6.840 million.[146]

4.7.2. Transmission Vegetation Management – FERC Account 571.150 (partial)

SCE states that Transmission Vegetation Management includes 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 proximity to high voltage transmission and distribution lines located in high-fire designated areas. These expenses also include costs of planting different species of trees as replacements and undertaking preventive soil treatment. SCE states that the majority of costs are from a fixed price

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[145] Exhibit SCE-18, Vol. 7, at 5-6.

[146] *Id.* at 24, Table I-1 (Transmission Construction and Maintenance Summary of O&M Expenses) and SCE-02, Vol. 7, at 14, Table II-6 (Transmission Overhead and Underground Line Maintenance, Portion of GRC Account 571.150, Recorded and Adjusted 2011-2015/Forecast 2016-2018Transmission and Overhead Underground Line Maintenance).

contract with SCE's tree trimming contractors, which requires them to maintain compliance for the approximately 1.5 million trees that exist in proximity to energized conductors throughout SCE's service territory.[147] SCE's Test Year 2018 forecast for Transmission Vegetation Management is $10.443 million, which is equal to the last recorded year for this expense, 2015. SCE explains that it took this approach to best reflect "the work expected in the Test Year and the new vendor contract term implemented in May 2014."[148] ORA recommends $9.474 million, which is based on a two-year average of recorded expenses (2014-2015). In rebuttal testimony, SCE contends that the use of the most recent recorded year is reasonable because (1) the new vendor contract covered only part of 2014 and (2) the Commission has previously found that "if costs have shown a trend in a certain direction over three or more years [as is the case here], the last recorded year is an appropriate base estimate."[149] ORA did not challenge SCE's rebuttal testimony in hearings or briefs. We find SCE's explanation reasonable and authorize SCE's Test Year 2018 forecast of $10.443 million.[150]

4.7.3. Transmission Tools and Work Equipment

SCE states that Transmission Tools and Work Equipment include the costs for acquiring and retiring portable tools and work equipment that cost more than

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[147] SCE-02, Vol. 7, at 24. SCE further explains "SCE must comply with many vegetation regulations including General Order (GO) 95 Rules 35 and 37; Public Resources Code §§ 4292 and 4293; and FERC FAC-003-2, which require SCE to manage vegetation near its wires. SCE engages a contractor to trim and remove trees and weeds, and other activities, to facilitate compliance with these requirements." *Ibid.*

[148] *Id.* at 25.

[149] SCE-18, Vol. 7, at 8, citing D.89-12-057 and D.04-07-022.

[150] *Id.* at 4, Table I-3 (Transmission and Overhead Underground Line Maintenance, Constant 2015 $000).

$1,000, such as electric generators, cable pulling equipment, gas monitors, air compressors and compression tools for making high voltage electrical connections.[151]

SCE used a five-year average (2011-2015) to develop its 2016 – 2018 forecasts due to the unpredictability of equipment retirements and external drivers.[152] ORA proposes to use SCE's recorded adjusted capital expenditure for 2016, and SCE agrees. For 2017, ORA recommends reducing SCE's 2017 forecast to 70% of SCE's 2015 recorded expenditures to be consistent with SCE's forecast for Transmission Planned Capital Maintenance, which SCE has separately reduced to 70% of prior levels, due to resource constraints. ORA bases its adjustment on what it states appears to be a correlation between increased expenditures on Transmission Tools and Work Equipment and the increased workload starting in 2013 in the Transmission Planned Capital Maintenance program.

In rebuttal testimony, SCE contends that ORA's proposed reduction is based on incorrect assumptions and analysis: (1) the tools and equipment in question are used to support all activities in Transmission Construction and Maintenance, not just Transmission Planned Capital Maintenance; and (2) there is not, in fact, a statistically strong correlation between Transmission Tools and Work Equipment and Transmission Planned Capital Maintenance.[153]

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[151] SCE-02, Vol. 7, at 33-34.

[152] *Id.* at 34.

[153] SCE-18, Vol. 7, at 10-13, providing SCE's statistical analysis.

SCE's reasoning and analysis convincingly support its position. We authorize the following SCE capital expenditure forecasts: for 2016, $1.274 million; for 2017, $1.917 million; and for 2018, $1.953 million.[154]

4.8. T&D – Infrastructure Replacement

SCE's distribution and substation infrastructure includes major equipment such as transformers, switches, circuit breakers, capacitors, automatic reclosers (ARs), cable, and conductors.[155] SCE states that its Infrastructure Replacement programs reduce the impact of aging infrastructure on the reliability and safety of SCE's distribution and substation systems by replacing equipment before it fails in service.[156]

SCE's proposed 2017-2018 capital expenditures in its 11 Infrastructure Replacement programs total $964.532 million.[157] ORA recommends reductions totaling $68.803 million; TURN recommends reductions totaling $182.823 million; and CFC recommends reductions totaling $23.214 million. Parties' positions are summarized in the table below.

[154] SCE Opening Brief at 32. SCE clarifies that it is in agreement with ORA regarding the 2016 and 2018 forecasts.

[155] SCE-02, Vol. 8, at 1.

[156] *Id.*, Summary.

[157] SCE-18, Vol. 8A, at 2, Table I-1 (Summary of Infrastructure Replacement Capital Expenditures).

SCE Requested
Infrastructure Replacement Capital Expenditures
Total Company – Nominal $000

Activity	2017	2018	Total 2017-2018
Distribution Infrastructure Replacement Program			
Worst Circuit Rehabilitation	123,106	126,207	249,313
Cable Life Extension	23,402	23,991	47,393
CIC Replacement	31,142	41,643	72,785
Overhead Conductor Program	136,087	139,514	275,601
Underground Oil Switch Replacement	11,150	12,701	23,851
Capacitor Bank Replacement[158]	13,674	14,018	27,692
Automatic Recloser Replacement	2,310	2,368	4,678
Substation Infrastructure Replacement Program			
PCB Transformer Replacement	1,413	1,449	2,862
Substation Transformer Bank Replacement	66,349	68,003	134,352
Substation Circuit Breaker Replacement	43,875	44,943	88,818
Substation Switchrack Rebuilds	18,362	18,825	37,187
Total Request	470,870	493,662	964,531

Parties that Proposed Reductions

Activity	ORA 2017-2018	TURN 2017-2018	CFC 2017-2018
Distribution Infrastructure Replacement Program			
Worst Circuit Rehabilitation	~	YES	
Cable Life Extension	~		
CIC Replacement	~		
Overhead Conductor Program	YES	YES	YES
Underground Oil Switch Replacement			
Capacitor Bank Replacement	~	YES	
Automatic Recloser Replacement			
Substation Infrastructure Replacement Program			
PCB Transformer Replacement			
Substation Transformer Bank Replacement			
Substation Circuit Breaker Replacement			
Substation Switchrack Rebuilds			
Total			

[158] Per agreement with TURN, SCE reduced its request to these amounts in SCE-18, Vol. 8, at 19-21.

4.8.1. Worst Circuit Rehabilitation Program

SCE describes its Worst Circuit Rehabilitation (WCR) program as "an ongoing effort to manage system reliability by dealing with the challenge of infrastructure aging."[159] The program's objective is to both improve system reliability by replacing distribution circuit infrastructure before it fails, thereby avoiding unplanned outages to SCE's customers, and making circuits more resilient to future failures. The program focuses on circuits that disproportionately contribute to system SAIDI and SAIFI, as well as circuits where average customers are receiving relatively lower service reliability.[160]

SCE further explains that "because cable failure is the largest equipment contributor to poor system reliability, circuit rehabilitation typically involves replacement of each circuit's most risk-significant mainline cable. This program also replaces infrastructure that has a lower reliability record and adds circuit enhancements such as automation, automatic reclosers (ARs), branch line fuses, and fault indicators wherever determined to be cost-effective."[161]

TURN proposes reducing SCE's WCR forecast by $39.057 million in 2017 and 2018, based on its argument that SCE's reliability modeling forecast may be

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[159] Exhibit SCE-02, Vol. 8, at 13.

[160] *Ibid.* System Average Interruption Duration Index (SAIDI) measures the total duration of interruption for the average customer during a given year. SCE's 2015 SAIDI, with Major Event Days (MEDs) excluded, was 100.2 minutes of interruption. Outages recorded as cable, elbow/junction bar, or cable splice contributed 22.7 minutes, or approximately 23% of the system total.

System Average Interruption Frequency Index (SAIFI) measures the total frequency of sustained interruption for the average customer during a given year. SCE's 2015 SAIFI, with MEDs excluded, was 0.86 interruptions. Outages recorded as cable, elbow/junction bar, or cable splice contributed 0.18 interruptions, or approximately 21% of the system total.

[161] *Ibid.*

flawed.[162] In rebuttal testimony, SCE defends its modeling by stating that it has compared the model results to available data as a means of validating the reasonableness of the underlying assumptions, with the model differing from actual total cable failures in the sample by less than 1%.[163] Finally, SCE explains that TURN's proposal would reduce SCE's pace of replacement from 350 miles of mainline cable per year to 295 miles per year; SCE contends that its requested pace is necessary to maintain existing reliability levels.[164]

We approve SCE's requested amount for its WCR program, a total of $249.313 million for 2017-2018.[165] SCE's rebuttal testimony and the testimony of its witness at hearing justify the requested amounts.

TURN also makes three policy recommendations: (1) the Commission should direct SCE to begin recording cable failures by cable type; (2) the Commission should direct SCE to change the minimum age used to select mainline-cable replacements; and (3) SCE should be directed to begin piloting cable injections (instead of replacements) on mainline cable, and report on quantitative and qualitative findings from the pilot in the next GRC.

SCE agrees with TURN that it is prudent to explore if cable injection would be beneficial for mainline cable. However, instead of going directly to a pilot as TURN suggests, SCE recommends a cost-benefit analysis be performed first to determine if a pilot is necessary. Overall, SCE suggests that the

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[162] SCE-18, Vol. 8A, at 1.

[163] Exhibit SCE-18, Vol. 8, at 5.

[164] SCE Opening Brief at 34, citing testimony of SCE witness Goizueta, at Reporter's Transcript (RT) 1839.

[165] SCE-18, Vol. 8, at 3, Table I-2 (Worst Circuit Rehabilitation Program Capital Expenditures).

Commission should adopt TURN's recommendation with SCE's proposed modification, i.e. to perform a cost-benefit analysis before undertaking a potential pilot.[166] We adopt TURN's recommendation, as modified by SCE.

4.8.2. Cable Life Extension Program

SCE states that its Cable Life Extension program "does not directly replace infrastructure but provides information to target cable segments to be replaced by the Cable-in-Conduit Replacement Program." The difference between SCE and ORA appears to be due to be minor rounding adjustments.[167] We authorize SCE's requested amount for this program, a total of $47.393 million for 2017-2018.[168]

4.8.3. Cable-In-Conduit Replacement Program

SCE states that its cable-in-conduit (CIC) Replacement program "preemptively replaces segments of SCE's cable-in-conduit population approaching the end of their service lives. The objective of the program is to reduce the number of in-service failures of CIC cable and thus drive down the number of unplanned outages to SCE customers."[169] The difference between SCE and ORA appears to be due to be minor rounding adjustments. We authorize

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[166] *Id.* at 6-7.

[167] SCE-29, at 192.

[168] SCE-18, Vol. 8, at 2, Table I-1 (Summary of Infrastructure Replacement Capital Expenditures).

[169] SCE-02, Vol. 8, at 44.

SCE's requested amount for this program, a total of $72.785 million for 2017-2018.[170]

4.8.4. Overhead Conductor Program

SCE developed and implemented its OCP following the Commission's decision in the 2015 rate case. SCE states that the goals of the OCP are to reduce the frequency and impact of "wire down" events by proactively replacing overhead conductors as well as reactively performing emergency wire down work during events or performing planned conductor work coincident with these events. SCE identifies necessary work by ranking overhead circuits based on criteria such as increased likelihood of wire down events.[171]

SCE initiated the OCP in 2013 by collecting data and conducting research. In 2014, SCE's analysis determined that "the safety risk of electrocution caused by energized wire down events is considerable relative to other system risks." In 2015, SCE started scoping and executing work to address that safety risk. Although the Commission had not authorized any funding for OCP in D.15-11-021, once the program became operational SCE replaced 74 circuit-miles in 2015 and 202 circuit-miles in 2016, with recorded capital expenditures for the program equal to $58 million in 2015 and $97 million in 2016.[172]

For 2017 and 2018, SCE originally forecasted annual replacement of 300 circuit-miles. SCE then analyzed 2015 historical cost data to develop unit costs, resulting in its request for authorization of $136.087 million in capital

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[170] SCE-18, Vol. 8, at 2, Table I-1 (Summary of Infrastructure Replacement Capital Expenditures).

[171] SCE-02, Vol. 8, at 47.

[172] SCE-02, Vol. 8, at 49, Table III-12, "Historical and Forecast Spend for OCP."

expenditures for 2017 and $139.514 million for 2018, a two-year total of $275.601 million.[173] SCE revised its request in rebuttal testimony, stating "[b]ased on 2016 results, SCE believes that for the same amount of money SCE requested in its original GRC capital forecast, SCE can replace approximately 434 miles of small wire versus the originally-forecast 300 miles in each of 2017 and 2018."[174]

For the same period, ORA recommends $206.986 million, while TURN recommends $148.305 million, and CFC recommends $252.387 million.

ORA recommends that SCE be authorized to replace 200 circuit-miles in 2017 and 250 circuit-miles in 2018. ORA agrees that the OCP is a worthwhile program, but questions whether SCE can complete all the work it forecasts for 2017 and 2018. First, ORA notes that SCE provided no support for its original forecast of 300 circuit-mile replacements per year. Second, ORA notes the importance of "remaining cognizant of the fact that the OCP is a new program, and that SCE is continuing to refine its criteria for selecting OCP projects.[175]

TURN recommends that SCE replace 120 circuit miles per year. TURN faults SCE's forecast for three reasons: (1) SCE has not sufficiently supported its proposed rate of 300 circuit-miles per-year; (2) SCE has not justified its reliance on reconductoring to the exclusion of alternative mitigations; and (3) SCE has failed to incorporate the possibility of infrared testing as part of a full suite of options. TURN recommends that the Commission authorize a reduced pace of OCP activity "until SCE is able to provide a well-conceived, well-tested and comprehensive solution to wire-down prevention." Finally, TURN analyzed the

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[173] *Ibid.*

[174] SCE-18, Vol. 8, at 13.

[175] ORA Opening Brief at 60.

underlying causes of the "wire down" events targeted by the OCP and recommends that the Commission direct SCE to record 10% of these costs below-the-line "due to the adverse impacts associated with its past practice of installing oversized branch line fuses." SCE would have an opportunity in the 2021 GRC to make a showing that demonstrates the steps it is taking to address this problem associated with its own past engineering practices, and the Commission could then re-visit whether below-the-line treatment continues to be appropriate.

CFC also supports SCE's OCP but, like ORA and TURN, observes that because the program is in its early stages of development a slower pace of work should be authorized. CFC highlights SCE's statement in its opening T&D testimony (Exhibit SCE-02, vol. 1, Operational Overview and Risk-Informed Decision-Making) that given the early stages of the OCP, SCE is still evaluating the benefits from existing mitigations (i.e. reconductoring and fusing) and from potential future mitigations (i.e. protection and automation device installations).[176] SCE further explained that because empirical data is not yet available on the effectiveness of these mitigations, subject matter experts estimated the effectiveness "based on their judgment of how they would prevent melt and break wire downs."[177] SCE's testimony forms the basis for CFC's recommendation that the Commission authorize OCP expenditures for 2018 equal to $116.3 million, which CFC estimates would fund replacement

[176] SCE-02, Vol. 1, at 41.

[177] *Ibid.*

250 circuit-miles. CFC proposes to increase the limit on replacement miles by 2.5% each year thereafter.

In rebuttal, SCE finds fault with the methodologies relied upon by ORA, TURN and CFC to develop their recommendations. SCE also opposes TURN's recommendation for a 10% disallowance due to the adverse impacts associated with SCE's past practice of installing oversized branch line fuses.

We find that SCE has not met its burden to prove that its requested levels of OCP funding are reasonable. We agree with ORA that SCE provided no explanation of how it determined that annual replacement of 300 circuit-miles would be optimal.[178] Regarding program costs, SCE states that it completed all "forecast" work in 2016 while recording $97.330 million for OCP compared to its 2016 "forecast" of $142.203 million. SCE claims that "this lower cost was achieved due to SCE's continued efforts to look for ways to improve processes and lower costs for our customers" but this Commission did not authorize either SCE's forecast pace of work in 2016 or SCE's forecasted costs. The fact that SCE bettered its own forecast is not persuasive. CFC's analysis of the implications of SCE's experience to-date is more accurate:

> CFC does not dispute SCE's need to replace overhead conductor. However, due to the non-trivial, last-minute changes in the numbers presented, and the variety of objectives the program serves, CFC recommends ramping-up OCP over the GRC years. The significant changes in some important program numbers, particularly late in the GRC application process, support CFC's contention that OCP

[178] SCE asserts in its Reply Brief that its forecast was "well supported by the record evidence" (SCE Reply Brief at 18, citing Exhibit SCE-18, Vol. 8, at 7-19) but that Exhibit provides no support for SCE's forecasted level of replacements in 2017 and 2018.

> remains in a pioneering phase. Recent revisions suggest a program whose fundamental details remain somewhat in flux.[179]

In this decision, we authorize the same level of annual expenditures for 2017-2018 that SCE recorded in 2016: $97.330 million (subject to the adjustment we order below). SCE states that this level of spending supported replacement of 202 circuit-miles in 2016, so we expect that SCE will continue replacements at that level, if not a higher level in the event that SCE continues to find ways to improve processes and lower costs.

We also adopt TURN's recommendation that we impose a 10% disallowance, to be paid for by shareholders, to recognize the role that the incorrect engineering had in creating circumstances where some wires may have more extensive damage than they would have otherwise. First, for OCP recorded costs in 2015 and 2016 totaling $155.456 million, the disallowance equals $15.54 million. Second, for the annual OCP capital expenditures we have approved for 2017 and the remainder of this GRC period (2018-2020), SCE shall record 10% of its recorded costs in a below-the-line account.[180] On a forecast basis, this amount would equal $9.733 million annually.

4.8.5. Underground Oil Switch Replacement Program

SCE's Underground Oil Switch Replacement program replaces oil-filled switches in underground structures which SCE believes are approaching the end of their service lives and pose a threat to both system reliability and public and

[179] CFC Opening Brief at 15.

[180] TURN Opening Brief at 31, citing Exhibit TURN-04-A, at 35.

employee safety.[181] We authorize SCE's unopposed requested amount for this program, a total of $23.851 million for 2017-2018.[182]

4.8.6. Capacitor Bank Replacement Program

Capacitor banks are used in SCE's distribution system to regulate the voltage to usable levels by compensating for load inductance. SCE's Capacitor Bank Replacement program replaces failed and obsolete capacitor banks and their appurtenant capacitor switches.[183]

In its opening brief SCE explains that it originally forecast $34.744 million in capital expenditures for 2017-2018, based on a forecast annual replacement volume higher than the historical five-year average, albeit "significantly" lower than the steady state replacement rate; SCE also agreed to accept TURN's proposal to use 2014 unit costs, which reduces SCE's forecast to $27.692 million.[184]

TURN goes beyond the changes accepted by SCE and recommends a forecast of 231 replacements per year (based on the 2011-2016 average replacement rate), which would reduce 2017-2018 capital expenditures to $18.274 million.

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[181] SCE-02, Vol. 8, at 52.

[182] SCE-18, Vol. 8, at 2, Table I-1 (Summary of Infrastructure Replacement Capital Expenditures).

[183] SCE-02, Vol. 8, at 57.

[184] SCE-18, Vol. 8, at 20-21.

We decline to impose the additional reductions proposed by TURN. We adopt the reduced forecast proposed by SCE, totaling $27.692 million for the 2017-2018 period.[185]

4.8.7. Automatic Recloser Program

SCE's Automatic Recloser program replaces ARs which have been identified as being obsolete and/or unreliable. We approve SCE's unopposed requested amount for this program, a total of $4.678 million for 2017-2018.[186]

4.8.8. PCB Transformer Replacement Program

SCE's PCB Transformer Replacement program replaces distribution line transformers suspected of being contaminated with polychlorinated biphenyl (PCB) oil. We approve SCE's unopposed requested amount for this program, a total of $2.862 million for 2017-2018.[187]

4.8.9. Substation Infrastructure Replacement Program

SCE states that its Substation Infrastructure Replacement program preemptively replaces major pieces of aging or obsolete substation equipment to minimize the negative effect of aging on system reliability, safety, and operability/maintainability. SCE requests approval of 2017-2018 capital expenditures for the three functions within this program as follows:[188]

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185 *Id*. at 21, Table I-5 (Revised Capacitor Bank Replacement Program Capital Forecast, 100% CPUC Jurisdictional – Nominal $000).

186 *Id.* at 2, Table I-1 (Summary of Infrastructure Replacement Capital Expenditures, Total Company – Nominal $000).

187 *Ibid.*

188 *Ibid.*

1. Transformer Replacement: $134.352 million
2. Circuit Breaker Replacement: $88.818 million
3. Substation Switchrack Rebuild: $37.187 million

We approve SCE's unopposed requested amounts for this program.

4.8.10. Conclusion: Adopted Infrastructure Replacement Program Capital Expenditures

Adopted Infrastructure Replacement
Capital Expenditures
Total Company – Nominal $000

Activity	2017	2018	Total 2017-2018	2017	2018	Total 2017-2018
Distribution Infrastructure Replacement Program						
Worst Circuit Rehabilitation	123,106	126,207	249,313	123,106	126,207	249,313
Cable Life Extension	23,402	23,991	47,393	23,402	23,991	47,393
CIC Replacement	31,142	41,643	72,785	31,142	41,643	72,785
Overhead Conductor Program	136,087	139,514	275,601	87,597	87,597	175,194
Underground Oil Switch Replacement	11,150	12,701	23,851	11,150	12,701	23,851
Capacitor Bank Replacement[189]	13,674	14,018	27,692	13,674	14,018	27,692
Automatic Reclosure Replacement	2,310	2,368	4,678	2,310	2,368	4,678
Substation Infrastructure Replacement Program						
PCB Transformer Replacement	1,413	1,449	2,862	1,413	1,449	2,862
Substation Transformer Bank Replacement	66,349	68,003	134,352	66,349	68,003	134,352
Substation Circuit Breaker Replacement	43,875	44,943	88,818	43,875	44,943	88,818
Substation Switchrack Rebuilds	18,362	18,825	37,187	18,362	18,825	37,187
Total Adopted Expenditures	**470,870**	**493,662**	**964,532**	**422,380**	**441,745**	**864,125**

4.9. T&D – Poles

SCE states that its pole programs address major safety and reliability risks and the compliance requirements of General Order (GO) 165 (GO 165) and

[189] Per agreement with TURN, reduced to these amounts in SCE-18, Vol. 8, at 19-21.

General Order 95 (GO 95).[190] SCE states that these forecasts are primarily driven by regulatory requirements and are based on the amount of work that SCE estimates will be required to comply with these rules. SCE's pole-related forecasts include funding for its Deteriorated Pole Program, its Pole Loading Program (PLP), its Joint Pole Organization, and other items such as joint pole credits and wood pole disposal. SCE requests authorization of 2018 Test Year revenue requirements of $37.041 million in O&M expenses and $322.891 million in capital expenditures.[191]

4.9.1. O&M Expenses

SCE prepares its O&M forecast separately for transmission poles and distribution poles. Its common methodology involves (1) estimating the per-unit cost for each activity and (2) estimating the expected activity for the period. SCE then multiplies the two values by each other in order to calculate the forecast O&M expenses. ORA disputes both terms in this equation for Distribution and Transmission Pole Loading Assessments as well as Distribution Pole Loading Program Repairs; ORA also disputes SCE's forecast expenses for its Joint Pole Organization. TURN accepts SCE's estimated levels of activity, but disputes SCE's per-unit costs for Distribution and Transmission Pole Loading Assessments as well as Distribution and Transmission Pole Loading Program

[190] Exhibit SCE-18, Vol. 9, at 1.

[191] *Id*., at 3, Table I-1 (Summary of Pole O&M Expenses); at 4, Table I-2 (Summary of Pole Capital Expenditures); SCE-29A at 41, 160, 161, 163; and SCE-59 at 40, Table VIII-15 (Joint Pole Organization, Portion of GRC Account 583.125, Recorded and Adjusted 2011-2015/Forecast 2016-2018).

Repairs. The table below summarizes SCE's poles-related O&M request and the recommendations of ORA and TURN.[192]

Summary of
Pole O&M Expense Recommendations
Constant 2015 $000

		2018 Forecast				
GRC Account	**Description**	**SCE**	**ORA**	**ORA Variance**	**TURN**	**TURN Variance**
566.125	Transmission Deteriorated Pole Inspections	685	685	-	685	-
	Transmission Pole Loading Program Assessments	2,441	1,866	(575)	2,208	(233)
	Total Account 566.125	**3,126**	**2,551**	**(575)**	**2,893**	**(233)**
571.125	Transmission Pole Loading Program Related Expense	199	199	-	199	-
	Transmission Pole Loading Program Repairs	386	386	-	351	(35)
	Total Account 571.125	**585**	**585**	**-**	**550**	**(35)**
583.125	Distribution Deteriorated Pole Inspections	4,983	4,983	-	4,983	-
	Joint Pole Organization	3,649	7,442	3,793	3,649	-
	Joint Pole O&M Credits	(3,140)	(3,140)	-	(3,140)	-
	Distribution Pole Loading Program Assessments	21,966	16,792	(5,174)	19,872	(2,094)
	Total Account 583.125	**27,458**	**26,077**	**(1,381)**	**25,364**	**(2,094)**
593.125	Distribution Pole Loading Program Related Expense	2,403	2,403	-	2,403	-
	Distribution Pole Loading Program Repairs	3,469	2,182	(1,287)	3,154	(315)
	Total Account 593.125	**5,872**	**4,585**	**(1,287)**	**5,557**	**(315)**
	Total	**37,041**	**33,798**	**(3,243)**	**34,364**	**(2,677)**

As explained below, this decision adopts SCE's uncontested requests for (1) Transmission and Distribution Pole Loading Program Related Expenses and (2) Transmission and Distribution Deteriorated Pole Inspections. SCE's forecast for Joint Pole Organization expenses is also adopted. This decision adopts TURN's recommendations for (1) Distribution and Transmission Pole Loading Assessments and (2) Distribution and Transmission Pole Loading Program Repairs.

Regarding the Joint Pole Organization, ORA prepared its own forecast by starting with SCE's 2015 recorded costs, and adding one-third of the annual

[192] *Ibid.*

increase requested by SCE. However, ORA did not take the next step and complete its analysis by determining whether its recommended funding level would be sufficient to support the activities that serve as the basis for SCE's own forecast. We adopt SCE's more directly estimated forecast, equal to $3.649 million for the 2018 Test Year. SCE calculated this amount by starting with its 2015 recorded costs, and adding the specific costs of the additional personnel it determined would be needed to support its forecasted activity levels.[193]

Regarding TURN's recommendations, as noted above TURN accepts SCE's forecast rate of work. However, TURN then provides a detailed analysis of SCE's estimated unit costs and concludes that SCE's estimates should be adjusted downward.

First, regarding SCE's unit costs for assessments, TURN demonstrates that SCE's estimates have been a "moving target" in this proceeding, having been modified by SCE three times since it filed its application. TURN reviews the recorded 2016 costs provided by SCE in its rebuttal testimony and recommends a per-assessment cost equal to $100 per pole. TURN then calculates a 2018 O&M forecast of $22.08 million, which is $2.327 million lower than SCE's request.[194] We adopt TURN's estimate as shown below for the relevant GRC Accounts:

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[193] SCE-59 at 40, Table VIII-15 (Joint Pole Organization, Portion of GRC Account 583.125, Recorded and Adjusted 2011-2015/Forecast 2016-2018).

[194] TURN Opening Brief at 42, relying on values provided in SCE-18, Vol. 9, Appendix A, Table XII-42 (Appendix A is SCE's testimony in A.17-04-004, its 2016 Energy Resource Recovery Account (ERRA) compliance review proceeding. Table XII-42 presents SCE's 2016 recorded costs for Pole Loading and Deteriorated Pole O&M Expense.

Adopted Transmission and Distribution
Test Year 2018
Pole Loading Program Assessments
O&M Forecast
Constant 2015 $000

GRC Account	Description	2018 Approved
566.125 (partial)	Transmission Pole Loading Program Assessments	2,208
583.125 (partial)	Distribution Pole Loading Program Assessments	19,872
	Total Adopted	**22,080**

Second, regarding SCE's unit costs for repairs, TURN recommends use of 2016 data to estimate costs, rather than the 2015 data used by SCE, because SCE conducted 1,034 repairs in 2016 versus only 424 repairs in 2015. After what appears to have been a fairly collegial exchange of views and corrected calculations, TURN and SCE agree that averaging the 2015 and 2016 data produce a per-unit repair cost of $1,562 per repair, while using only the 2016 data results in a per-unit repair cost of $1,420 per repair. TURN states that it "continues to believe that the $1,420 per repair unit cost derived from 2016 is the more reasonable figure under the circumstances" and we agree. Using that estimate, we adopt TURN's recommended forecast as shown below:

Test Year 2018
Adopted Transmission and Distribution
Pole Loading Program Repairs
O&M Forecast
Constant 2015 $000

GRC Account	Description	2018 Approved
571.125 (partial)	Transmission Pole Loading Program Repairs	351
593.125 (partial)	Distribution Pole Loading Program Repairs	3,154
	Total Adopted	**3,505**

4.9.2. Capital Expenditures

ORA did not contest SCE's pole-related capital forecasts.

TURN recommends reductions to four components of SCE's pole-related capital forecasts, as shown in the table below:

TURN Recommended
Pole Capital Expenditures[195]
Total Company – Nominal $000

Activity	SCE 2017-2018	TURN 2017-2018	Reduction 2017-2018
Distribution Deteriorated Pole Replacement and Restorations	370,757	330,972	(39,785)
Pole Loading Distribution Pole Replacements	232,100	207,128	(24,972)
Pole Loading Transmission Pole Replacements	40,744	37,595	(3,149)
Transmission Deteriorated Pole Replacement and Restorations	140,812	130,003	(10,809)
Totals	**784,413**	**705,698**	**(78,715)**

In testimony, TURN recommends downward adjustment of the unit costs for the categories shown above by removing SCE's reported increase in contractor costs from 2012 to 2015. TURN shows that these costs increased by amounts "above and beyond" general inflation.[196] In rebuttal, SCE asserts that because SCE uses a competitive process to determine contractor costs, the costs are reasonable and the Commission should reject TURN's argument.[197]

We find that SCE has not affirmatively demonstrated that its contractor costs are reasonable. SCE's circular argument that, because SCE uses a

[195] SCE-18, Vol. 9, at 4, Table I-2 (Summary of Pole Capital Expenditures), with 2016 forecast removed.

[196] TURN-12, at 30-32.

[197] SCE-18, Vol. 9, at 21.

competitive process, the results of that process must be reasonable, is insufficient. TURN asks reasonable questions regarding the reasons SCE's contractor costs increased much faster than the rate of inflation, and SCE has not responded with a fact-based explanation. For this reason, we authorize SCE to spend the amounts recommended by TURN and summarized in the table above.

4.9.3. Pole Loading and Deteriorated Pole Programs Balancing Account

TURN requests that the Pole Loading and Deteriorated Pole Programs Balancing Account (PLDPBA) only be continued on the condition that it becomes a one-way balancing account. SCE proposes that the current cap on the PLDPBA be removed. We find that no changes in the structure of the PLDPBA are warranted at this time.

4.10. T&D – Grid Modernization

SCE's "grid modernization" proposal is the central contested issue in this proceeding. SCE's opening testimony reviews recent technological and policy trends that SCE asserts will "require a paradigm shift whereby generation can be optimized no matter where it is on a distribution circuit and power can flow in either direction without hindering reliability or the safety of customers, utility workers, or the public."[198]

In its reply brief, SCE observes that "the issues surrounding Grid Modernization have coalesced around whether SCE needs to improve reliability through grid modernization, and whether the level of automation and supporting technology SCE proposes is a reasonable path to achieve this."[199]

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[198] SCE-02, Vol. 10, at 3.

[199] SCE Reply Brief at 21.

SCE's framing of the issues is on point. We summarize the range of parties' positions and recommendations below.

- CUE takes no position on grid modernization for the purposes of facilitating DER, but supports SCE's proposals regarding system reliability improvements.[200]
- ORA contends that SCE's request for Grid Modernization investments is premature, mainly because relevant Commission guidance from the Distribution Resources Plan proceeding is pending. Instead, ORA recommends that for this 3-year rate case cycle the Commission continue funding certain historical programs. [ORA-9A at 2-4]. That said, ORA does support funding of circuit specific Distributed Energy Resource-related upgrades if they are properly justified [ORA-9A at 57].[201]
- TURN contends that reliability and DER-related benefits derive from creating additional visibility and flexibility for grid operators, not from full grid reconfiguration automation.[202] TURN concludes that "there is little demonstrated 'need' for SCE's grid modernization proposal, and TURN's more modest proposed investment provides an amount of reliability improvement more in line with customers' value of service, and would allow grid operators to accurately estimate circuit loading conditions for reconfigurations."[203] TURN asserts that its recommended alternative level of investments would achieve 55% of the reliability benefits that SCE claims its own proposal would deliver, but at 25% of the costs.[204]
- SEIA and Vote Solar contend that SCE has failed to meet its burden of demonstrating that the costs associated with its

[200] CUE Reply Brief at 34.

[201] ORA Reply Brief at 1, Summary of Recommendations.

[202] TURN Opening Brief at 49.

[203] TURN Reply Brief at 5.

[204] TURN Opening Brief at 51.

proposed grid modernization program are just and reasonable. Accordingly, the Commission should deny SCE's request and instead authorize distribution automation expenditures consistent with historical spending.

- CFC references SCE's grid modernization proposal as it contends that "when viewed in the context of affordability, however, the application's proposed increases are less reasonable"[205] and suggests that "while CFC acknowledges SCE's need to replace infrastructure, those replacements must be done at a pace ratepayers can actually afford."[206]

SCE prefaces its detailed grid modernization proposals by explaining that its distribution system has historically been structured to accommodate power flows running in one direction – from central station generation to the end-use customer. The design of SCE's distribution system – the capacity along the circuit, the automation and switches installed to detect and manage faults, and the placement of circuit ties – has hinged on this one-way flow of power.

SCE then suggests that the "modern grid" envisioned by the Commission in its Distributed Resources Plan (DRP) proceeding, as well as other state and federal policies, requires a "paradigm shift" whereby generation can be optimized no matter where it is on a distribution circuit and power can flow in either direction without hindering reliability or the safety of customers, utility workers, or the public.

Finally, separate and apart from the paradigm shift described above, SCE asserts that its distribution grid is aging and is facing new strains in the form of greater cybersecurity risks, nearing capacity limits on certain circuits and

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[205] CFC Opening Brief at 5.

[206] *Id.* at 6.

telecommunications wires, and technology obsolescence. SCE states that its field area network is at 90% capacity: with a growing number of grid devices being deployed each year, and future plans to interact with smart inverters, SCE expects to exceed capacity in 2018. SCE also suggests that its customers are coming to expect more reliability: as their reliance on new technology grows, they have less tolerance of outages, security breaches, and communications issues.

Based on the above, SCE concludes that grid modernization is needed to keep pace with this new technology and customer expectations. Even without DER growth, grid modernization is needed to maintain SCE's aging distribution grid and improve its reliability.

SCE states that it has assessed (1) traditional drivers such as accommodating increased capacity needs while meeting system reliability and (2) emerging drivers such as technology changes and emerging policy goals. As a result, SCE has developed and submitted its grid modernization proposal with the intention of achieving the three benefits for SCE's customers listed below:

- Enhance safety and reliability: improve system reliability and outage restoration while supporting increasing levels of DERs and two-way flows of energy;
- Enable DER integration and adoption: support customer choice of new technologies and services in an expedient and cost-efficient manner; and
- Realize DER benefits: enable opportunities to obtain optimal value from DERs through wholesale and distribution grid services.[207]

[207] SCE-02, Vol. 10, at 5.

SCE originally requested $637 million in capital in Test Year 2018 for new or expanded programs to improve the performance of its grid, and address concerns regarding integration of DERs. SCE subsequently revised its request to approximately $539 million. SCE's current request is summarized in the table below.

SCE Grid Modernization
Summary of Requested Capital Expenditures
(100% CPUC Jurisdictional – Nominal $000)

Activity	2017	2018	2019	2020	**Total 2017-2020**
Distribution Automation	65,393	221,348	228,293	234,600	**749,634**
Communications	72,283	173,751	248,366	268,939	**763,339**
Tools for Data Analysis and Decision-Making	20,595	45,564	48,665	33,854	**148,678**
Total Grid Modernization	**158,271**	**440,663**	**525,324**	**537,393**	**1,661,651**

SCE Grid Modernization
Detail of Requested Capital Expenditures
(100% CPUC Jurisdictional – Nominal $000)

Activity	2017	2018	2019	2020	Total 2017-2020
Historical Circuit Automation	4,607				4,607
WCR Enhanced Distribution Automation		142,696	147,173	151,852	441,721
DER-Focused Enhanced Distribution Automation	60,786	78,652	81,120	82,748	303,306
Sub-Total: Distribution Automation	**65,393**	**221,348**	**228,293**	**234,600**	**749,634**
Substation Automation (SA-3)	46,418	106,761	103,116	103,980	360,275
Common Substation Platform (CSP)	3,933	7,513	18,929	19,445	49,820
New Field Area Network (FAN)	11,697	14,650	82,698	101,652	210,697
Existing FAN Support, Distribution System Efficiency Enhancement Program (DSEEP)	5,327	6,180	5,328	4,573	21,408
Wide Area Network (WAN)	4,908	38,647	38,295	39,289	121,139
Sub-Total: Communications	**72,283**	**173,751**	**248,366**	**268,939**	**763,339**
System Modeling Tool (SMT)	6,457	2,467			8,924
Distribution Resource Plan External Portal (DRPEP)	1,836	3,641			5,477
Grid Management System (GMS)	12,302	39,456	48,665	33,854	134,277
Sub-Total: Tools for Data Analysis and Decision-Making	20,595	45,564	48,665	33,854	148,678
Total Request	**158,271**	**440,663**	**525,324**	**537,393**	**1,661,651**

4.10.1. Grid Modernization Capital Expenditures

SCE's capital request for Grid Modernization can be separated into three sub-groups: (1) distribution automation programs, (2) communications and control equipment, and (3) planning tools. We review each sub-group below.

4.10.1.1. Distribution Automation Programs

The first sub-group of SCE's grid modernization program is its "Enhanced Distribution Automation" program (Enhanced DA). SCE states that this

program will continue, but expand the scale and scope of, its historical circuit automation program as follows:

Current ("Historical") DA Program

Purpose:

- respond to reliability objectives
- basic circuit automation efforts

Technology:[208]

- about three-quarters of SCE's circuits include some level of automation:
  - one or two remote-controlled mid-point switches
  - one remote-controlled circuit tie switch
  - rudimentary telemetry

Outcomes:

> SCE states that "the deployed equipment enables only basic automation and limited visibility to circuit-level data, not well suited for circuits integrating DERs. As more DERs connect to distribution circuits, information about conditions along the circuit, (e.g., load, power flow, voltage) needed by grid operators to manage reliability, is becoming distorted."[209]

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[208] SCE provides the following definitions in SCE-02, Vol. 10 (footnotes 57-58):

Switches are electrical components that enable the flow or interruption of electricity along a conductor as needed for circuit operation.

Circuit ties provide the pathway through which power can be re-routed from one circuit to another.

Telemetry is an automated communications process by which measurements and other data are collected at remote or inaccessible points and transmitted to receiving equipment for operations monitoring in near-real time.

[209] SCE-02, Vol. 10, at 34-35.

Enhanced Distribution Automation Program

Purpose:

To support reliability and enables DERs by:

1. increasing situational awareness with more near real-time telemetry data points throughout the circuits that will help identify issues quickly and accurately,
2. facilitating remote isolation and restoration and therefore decreased outage duration and area of impact, and
3. increasing operational flexibility with appropriately-sized line sections for circuit switching, which will minimize de-energized sections during planned and unplanned outages.

Technology:

- three mid-point switches
- three circuit-ties[210]
- improved telemetry and communication devices

Outcomes:

> SCE states that "the increase in switches and circuit-ties will provide operators with significantly more 'switching' options, therefore providing more operational flexibility to isolate faults, minimize outages to customers, and restore customers faster. The Distribution Automation program will also enable grid operators to obtain critical visibility and optimize DERs."[211]

If approved by the Commission, SCE's Enhanced DA program would replace its Historical DA program beginning in 2018. The proposed Enhanced

[210] TURN Opening Brief at 47: In rebuttal testimony SCE reduced its capital cost forecast for the distribution automation program by $50 million for 2018, and by $172 million for 2018-2020, by eliminating the Circuit Tie Upgrades component, citing SCE-18 Vol. 2, at 5:3-12 and at 6, Table I-2.

[211] SCE-02, Vol. 10, at 36.

DA program is divided into two sub-programs: a WCR DA program and a DER-focused DA program.

First, the proposed WCR DA program would install new technology on 200 circuits per year over this GRC period. Each circuit would be automated in two stages, for two different purposes: stage one automation would be intended to maintain reliability as part of the aging infrastructure replacement program, for which SCE seeks separate funding in this GRC; stage two automation would be intended to augment the circuits to make them capable of fully integrating DERs and improving system reliability.[212]

Second, the proposed DER-focused DA program would identify an average of 88 circuits per year "using a prioritization methodology that considers the opportunity to contribute to grid services, deferral pilot locations, and locations of high DER penetration where there may be reverse power flow on multiple circuits at the same substation."[213] More specifically, SCE expects to automate 263 circuits in the 2018-2020 period due to three different DER-related causes: 1) 63 circuits that are forecast to have relatively high levels of DER growth due to organic adoption of rooftop solar and/or planned wholesale projects; 2) 126 circuits that are classified as optimal DER locations; and 3) 74 circuits that will be impacted by DER procurement through deferral pilots.[214]

Based on the above, SCE requests approval of its forecast 2017-2018 distribution automation capital expenditures shown below:

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[212] SCE-02, Vol. 10, at 42.

[213] *Ibid.*

[214] SCE-18, Vol. 10, at 37; TURN-06, at 72.

SCE Grid Modernization
Distribution Automation
Capital Expenditures Request[215]
(100% CPUC Jurisdictional – Nominal $000)

Activity	2017	2018	Total 2017-2018
Historical Circuit Automation (CA)	4,607		4,607
WCR Enhanced Distribution Automation		142,696	142,696
DER-Focused Enhanced Distribution Automation	60,786	78,652	139,438
Total Distribution Automation	**65,393**	**221,348**	**286,741**

As noted above regarding SCE's overall grid modernization proposals, CUE takes no position on SCE's DER-related requests but supports SCE's requests to fund system reliability improvements. ORA recommends only continued funding for certain historical programs and funding for properly justified circuit-specific DER-related upgrades. SEIA and Vote Solar also recommend only funding levels consistent with historical spending. CFC recommends replacements only at a pace ratepayers can afford.

TURN provides the most detailed recommendations among the intervenors, and offers a "primary" and a "secondary" recommendation. TURN's primary recommendation is that the Commission authorize an annual budget of $22 million for distribution automation, based on a tripling of SCE's recorded annual budgets for traditional distribution automation.[216] TURN's secondary recommendation is that, if the Commission concludes that additional reliability or grid flexibility benefits are needed, the Commission should authorize a total Test Year 2018 budget for grid modernization of

[215] *Id.*, at 38, Table II-4 (Distribution Automation Capital Expenditures).

[216] TURN Opening Brief at xxiii: "This amount of spending should achieve close to 50% of the reliability benefits of SCE's program at about one-twentieth of SCE's forecast cost of $440 million per year."

$116.474 million, a reduction of $324.194 million from SCE's proposal. TURN recommends funding for a reduced number of remote fault indicators (RFIs) and remote controlled switches (RCS), funding for the Common Substation Platform (CSP), funding for 50% of the cost of the Grid Management System (GMS), and funding for software decision-making tools. TURN recommends zero funding for the new field area network (FAN) and the new wide area network (WAN), since those are only necessary to provide complete switching automation.[217]

We find that the approach proposed by TURN in its "secondary" recommendation will result in the proper balance between SCE's need to maintain and upgrade aging infrastructure while also accommodating realistic levels of DER growth in the 2018-2020 GRC period. For the Distribution Automation component, TURN recommends $64.675 million for WCR Enhanced DA and $11.178 million for DER Focused Enhanced Distribution Automation, totaling $75.853 million of capital expenditures in 2018.[218]

First, regarding the WCR portion of distribution automation, TURN recommends as follows:

> ...if the Commission determines that additional spending for reliability improvements and grid flexibility is warranted, TURN recommends the Commission authorize $64.675 million per year for the WCR portion of distribution automation.

[217] TURN Opening Brief at xxiii-xxiv: "The Commission should find that TURN's secondary recommendation achieves over 55% of the reliability benefits of SCE's program at about 25% of the costs, and provides grid operators with the visibility and flexibility to address any DER-related operational problems."

[218] TURN Opening Brief at 52, Table 6.

> This amount includes funding for: (1) five Remote Fault Indicators (RFIs) on the 600 WCR circuits; (2) one tie switch and (3) up to two RCS switches on the 110 WCR circuits that have no existing ties.[219]

Second, regarding the DER portion of distribution automation, we adopt TURN's recommendation to fund the installation RCSs and RFIs on approximately 54 of the 264 circuits targeted by SCE, at a cost of $11.178 million.[220] We find reasonable TURN's analysis and conclusion that beyond this number of installations there is insufficient value to installing more advanced Remote Intelligent Switches to achieve full switching automation.

SCE Grid Modernization
Distribution Automation Capital Expenditures
Requested and Adopted Amounts[221]
(100% CPUC Jurisdictional – Nominal $000)

	Requested			Approved		
Activity	2017	2018	Total 2017-2018	2017	2018	**Total 2017-2018**
Historical Circuit Automation (CA)	4,607	-	4,607	4,607	-	**4,607**
WCR Enhanced Distribution Automation	-	142,696	142,696	-	64,675	**64,675**
DER-Focused Enhanced Distribution Automation	60,786	78,652	139,438	60,786	11,178	**71,964**
Total Distribution Automation	**65,393**	**221,348**	**286,741**	**65,393**	**75,853**	**141,246**

[219] TURN Opening Brief at 51, citing TURN-04R, at 63:4-8; TURN-04A2, at 42, Table 10. As explained by Mr. Jones on the stand, the $23.752 million for switches and ties was an error but TURN does not change its recommended level 2018 funding.

[220] TURN Opening Brief at 50. As discussed later in this decision, TURN also recommends increased funding for the Distribution System Efficiency Enhancement Program (DSEEP) to increase the capacity of the existing NetComm mesh network.

[221] SCE-18 Vol. 10, at 38, Table II-4 (Distribution Automation Capital Expenditures).

4.10.1.2. Communications

The second sub-group of SCE's grid modernization program involves installation of communications and control equipment. SCE requests approval of its forecast 2017-2018 communications capital expenditures shown below.

SCE Grid Modernization
Communications
Capital Expenditures Request[222]
(100% CPUC Jurisdictional – Nominal $000)

Activity	2017	2018	**Total 2017-2018**
Substation Automation (SA-3)	46,418	106,761	**153,179**
Common Substation Platform (CSP)	3,933	7,513	**11,446**
New Field Area Network (FAN)	11,697	14,650	**26,347**
Existing FAN Support, Distribution System Efficiency Enhancement Program (DSEEP)	5,327	6,180	**11,507**
Wide Area Network (WAN)	4,908	38,647	**43,555**
Total Communications	**72,283**	**173,751**	**246,034**

TURN's corresponding recommendations are summarized below.[223]

Activity	2017	2018	**Total 2017-2018**
Substation Automation (SA-3)	46,418	0	46,418
Common Substation Platform (CSP)	3,933	7,513	11,446
New Field Area Network (FAN)	0	0	0
Existing FAN Support, Distribution System Efficiency Enhancement Program (DSEEP)	7,000	7,000	14,000
Wide Area Network (WAN)	0	0	0
Total Communications	**57,531**	**14,513**	**71,864**

[222] SCE-18, Vol. 10 A4, at 4, Table I-1 (Summary of Grid Modernization Capital Expenditures).

[223] TURN Opening Brief at 52, Table 6 (TURN's Secondary Recommendation for Grid Modernization Capital Spending), footnotes omitted.

We authorize the following capital expenditures for the communications and control subgroup:

- Substation Automation (SA-3): we do not authorize SCE's proposal for this program and therefore deny SCE's request for funding over the 2018-2020 period. We find that SCE has not demonstrated the need to proactively update substations at this time. However, SCE's request for 2017 ($46.418 million) was uncontested, and we approve that amount.
- Common Substation Platform (CSP): we approve SCE's uncontested proposal for this program and therefore approve SCE's request for $11.446 million over the 2017-2018 period. We find that the CSP will deliver cybersecurity and interoperability benefits.
- Field Area Network (FAN): we approve SCE's proposal for this program and therefore approve SCE's request for $ 26.347 million over the 2017-2018 period. We find that the FAN is needed now, based on expected cybersecurity benefits and in order to ensure that distribution devices have sufficient communications.
- Distribution System Efficiency Enhancement Program (DSEEP) and support for the existing FAN: because we approve SCE's FAN proposal, we also approve SCE's related request for DSEEP and support for the existing FAN, a total of $11.507 million over the 2017-2018 period.
- Wide Area Network (WAN): we do not authorize SCE's proposal for this program because SCE's showing did not demonstrate why WAN expenditures were necessary during this GRC period.

The table below summarizes our determinations regarding the communications-related components of SCE's grid modernization proposal.

SCE Grid Modernization
Communications
Capital Expenditures Requested and Authorized
(100% CPUC Jurisdictional – Nominal $000)

	Requested			Authorized		
Activity	2017	2018	Total 2017-2018	2017	2018	**Total 2017-2018**
Substation Automation (SA-3)	46,418	106,761	153,180	46,418	-	**46,418**
Common Substation Platform (CSP)	3,933	7,513	11,446	3,933	7,513	**11,446**
New Field Area Network (FAN)	11,697	14,650	26,347	11,697	14,650	**26,347**
Existing FAN Support, Distribution System Efficiency Enhancement Program (DSEEP)	5,327	6,180	11,507	5,327	6,180	**11,507**
Wide Area Network (WAN)	4,908	38,647	43,555	-	-	**-**
Total Communications	**72,283**	**173,751**	**246,034**	**67,375**	**28,343**	**95,718**

4.10.1.3. Tools for Data Analysis and Decision-Making

The third sub-group of SCE's grid modernization program involves capital spending for a number of tools to support and enable improved data analysis and decision-making. SCE requests approval of its forecast 2017-2018 s capital expenditures for Tools for Data Analysis and Decision Making shown in the table below.

SCE Grid Modernization
Tools for Data Analysis and Decision-Making
Capital Expenditures Request and Authorized
(100% CPUC Jurisdictional – Nominal $000)

Activity	2017	2018	**Total 2017-2018**
System Modeling Tool (SMT)	6,457	2,467	**8,924**
Distribution Resource Plan External Portal (DRPEP)	1,836	3,641	**5,477**
Grid Management System (GMS)	12,302	39,456	**51,758**
Total Tools	**20,595**	**45,564**	**66,159**

As we explain below, we authorize each of SCE's requests.

4.10.1.3.1. System Modeling Tool (SMT)

The SMT is a set of software applications that will enable SCE engineers to perform more precise and near-real-time power-flow and capacity analyses of the electric system. The SMT replaces SCE's current software tools for capacity analyses throughout its grid, which are inadequate because they require significant manual effort and rely upon conservative assumptions that limit their precision. The added functionality in SMT will facilitate capacity planning, interconnection studies, and the DRP's Integration Capacity Analysis (ICA).

SCE requests $2.467 million for Test Year 2018 capital expenditures and we approve that amount.[224] SCE's request is compliant with the DRP proceeding.

4.10.1.3.2. DRP External Portal

The DRPEP, will create an interactive website for customers and potential DER applicants to access current circuit interconnection capacities anywhere on SCE distribution grid. DRPEP will be the public interface for SCE's ICA results, which will be generated through SMT.

SCE requests $3.641 million for Test Year 2018 capital expenditures and we approve that amount.[225] SCE's request is compliant with the DRP proceeding.

4.10.1.3.3. Grid Management System

SCE requests $39.456 million for Test Year 2018 capital expenditures for the GMS and we approve that amount.[226] The GMS will provide cybersecurity benefits, enable DERs, and integrate SCE's distribution software.

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[224] SCE-18, Vol. 10, at 4, Table I-1 (Summary of Grid Modernization Capital Expenditures).

[225] *Ibid.*

4.10.2. Grid Modernization O&M Expenses

SCE's request for 2018 O&M expenses related to grid modernization include costs for Organizational Change Management (OCM), grid modernization employee training, inspections of Programmable Capacitor Controls (PCC) for Distribution Volt/VAR Control, and establishment of a Program Management Office (PMO). SCE estimated specific needs based on number of employees requiring training and consultant costs. SCE requests approval of $4.135 million in 2018 O&M expenses.[227]

4.10.2.1. Intervenors' Positions

ORA recommends no funding for O&M costs associated with the Grid Modernization activities. Instead, all Grid Modernization costs should be reviewed and authorized by the Commission once the pending parallel proceedings related to the Grid Modernization proposal have reached a decision. SEIA-Vote Solar supports ORA's recommendation[228] and TURN does not provide testimony on O&M.

4.10.2.2. SCE's Rebuttal to Intervenors' Positions

SCE notes that ORA did not oppose the reasonableness of the scope or the cost forecast methodology of SCE's Grid Modernization O&M expenditures. Therefore, if capital funding for Grid Modernization is approved, the related O&M is required to implement SCE's Grid Modernization plan.

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[226] *Ibid.*

[227] *Id.* at 6, Table I-3 (Grid Modernization O&M Expenses, Constant 2015 $000).

[228] SEIA-Vote Solar does not specifically mention O&M, but generally agrees with ORA's Grid Modernization funding proposals.

We agree with SCE's logic and find SCE's forecast 2018 O&M expenses to be reasonable. We adopt SCE's forecast.

4.11. T&D – Grid Technology

In its testimony on grid technology, SCE describes its Advanced Technology Division, the work it performs, and the associated cost of the work. SCE states that its Advanced Technology Division "tests, evaluates, and pilots new and emerging technologies to meet the evolving needs of customers and to comply with many new federal and state energy policies."[229] SCE requests approval of $16.505 million in O&M expenses[230] and $52.985 million in capital expenditures for Test Year 2018.[231] We review the contested items in SCE's request below.

4.11.1. Distribution Volt VAR Control

SCE explains that the Distribution Volt VAR Control (DVVC) program centralizes control of the field and substation capacitors, so that SCE can coordinate and optimize voltage and VARs across all circuits that are fed by a substation. SCE explains that the program will reduce energy consumption and foster reliability by limiting voltage fluctuations, and that this should provide a 1% actual savings in energy costs for customers for every 1% reduction in voltage.[232]

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[229] SCE-02, Vol. 11, Summary.

[230] SCE-18, Vol. 11, at 4, Table I-3 (Summary of Grid Technology O&M Expenses, Constant 2015 $000).

[231] *Id.* at 3, Table I-1 (Summary of Grid Technology Capital Expenditures, 100% CPUC Jurisdictional – Nominal $000).

[232] SCE Opening Brief at 83, citing SCE-02, Vol. 11, at 45-46 and SCE-18, Vol. 11, at 22.

ORA opposes funding for SCE's DVVC program on the basis that the program is actually a "grid modernization" program, and ORA opposes funding the latter program in this GRC. In rebuttal, SCE asserts that DVVC predates the Commission's DRP proceeding, and in any case "fits squarely within the Energy Division's definition of projects that 'can be proposed and authorized through IOUs' GRCs separate from Grid Modernization Guidance.'"[233] SCE states that it had proposed DVVC-type projects, and been laying the foundations for this project with its new Distribution Management System application in the both the 2012 and 2015 GRC, long before DERs were an issue of focus for the Commission.

We find SCE's explanation that the DVVC program is being proposed for its reliability benefits and the benefits of reduced energy costs that it will bring to SCE's customers to be reasonable. We approve SCE's requested level of funding for Test Year 2018, $4.414 million.

4.11.2. Equipment Demonstration & Evaluation Facility

This item is addressed in Section 19 of this decision, "Rate Base – Other Issues."

4.11.3. Energy Storage Pilots

SCE requests funding of capital expenditures for its Distributed Energy Storage Integration (DESI) pilot program. SCE explains that in order to integrate energy storage, it "plans to conduct pilots to better understand energy storage performance and cost competitiveness, and making sure electric service remains

[233] SCE-18, Vol. 11, at 24.

safe and reliable as more energy storage is integrated onto the grid."[234] SCE forecasts capital expenditures totaling $22.499 million in 2018.

ORA and TURN oppose SCE's DESI pilot funding request.

ORA opposes SCE's proposed DESI pilots because ORA believes the pilots violate a Commission order in its Electric Program Investment Charge (EPIC) proceeding that ORA believes prohibits SCE and other investor-owned utilities from seeking funding for research, development and demonstration (RD&D) proposals in GRCs. ORA asserts that the DESI pilots should instead be proposed as technology demonstration and deployment (TD&D) projects in the EPIC program.

SCE addresses ORA's assertions in rebuttal testimony. SCE contends that the types of projects eligible for funding in GRCs and the EPIC program are mutually exclusive, and the DESI pilots fit the criteria for GRC funding, and not EPIC funding. The Commission has defined an EPIC-eligible RD&D project as one that supports research into:

> the installation and operation of pre-commercial technologies or strategies at a scale sufficiently large and in conditions sufficiently reflective of anticipated actual operating environments to enable appraisal of the operational and performance characteristics and the financial risks.[235]

SCE contends that, while it is correct that the energy storage technologies that SCE proposes to implement in its DESI pilots are in the early stages of the technology maturity cycle, these technologies are already commercially

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[234] SCE-02, Vol. 11, at 34.

[235] D.12-05-037, Ordering Paragraph 3.

available.[236] As such, they would not qualify for EPIC funding, which only supports research into pre-commercial technologies. Furthermore, the DESI pilots involve expenditure for capital projects that will be "used and useful" for the duration of their service lives, and "will provide energy services to customers for the useful life of the asset, rather than for a particular project or demonstration."[237] This contrasts with EPIC projects that are only funded for a three-year period.

TURN opposes funding for the DESI pilots for four reasons:

1. The majority of proposed costs should be directed through the EPIC program;
2. The proposed energy storage projects do not provide ratepayer benefits that could not be obtained with existing pilots or SCE-owned storage facilities;
3. The energy storage pilots do not meet fundamental requirements of the Commission's Energy Storage Mandate Program and are not needed for other pilot proceedings; and
4. The energy storage pilots are not needed for the DRP or Integrated Distributed Energy Resources (IDER) Programs.

As it did in response to ORA's contentions, SCE provides extensive rebuttal testimony that refutes each of TURN's contentions.

Based on our review of the extensive record regarding SCE's proposed DESI pilots, we find that SCE's forecast level of capital expenditures in 2018 is reasonable, and we authorize the $22.499 million requested by SCE.

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[236] SCE-18, Vol. 11, at 12: "the energy storage technologies we seek funding for are commercially available and fully supported as commercial products by vendors."

[237] *Id.* at 13.

Based on the discussions of the disputed items above, we approve SCE's request for Grid Technology capital expenditures and O&M expenses in Test Year 2018 as shown in the tables below.

Adopted Grid Technology
Capital Expenditures
(100% CPUC Jurisdictional – Nominal $000)

Activity	2017	2018	Total 2017-2018	2018 Adopted
Distribution Volt VAR Control	2,651	4,414	7,065	4,414
Capacitor Automation Program	2,854	0	2,854	0
Advanced Technology Laboratories	8,676	5,928	14,604	3,567
Advanced Outage Detection and Analytics Program (withdrawn in SCE-18, Vol. 11)	0	0	0	0
Energy Storage Pilots	14,518	22,499	37,017	22,499
Total	**28,699**	**32,841**	**61,540**	**32,841**

Adopted Grid Technology
2018 O&M Forecast
(Constant 2015 $ Millions)

GRC Account	Activity	Requested	Adopted
560.260	Grid Technology Expenses – Transmission	2,598	2,598
580.260	Grid Technology Expenses – Distribution	13,317	13,317
Total		**15,915**	**15,915**

4.12. T&D – Safety Training & Environmental Programs

In its testimony on Safety, Training & Environmental Programs SCE requests the O&M expenses it considers necessary for its T&D operating unit to provide safety programs; develop and deliver training programs; environmental programs; and disposal of hazardous waste. SCE requests $62.081 million for

O&M expenses in Test Year 2018.[238] ORA challenges SCE's forecasts in two areas, which we discuss below.

4.12.1. Environmental Program – Transmission (Acct. 565.281)

SCE requests $4.608 million in Test Year 2018 for its transmission-related environmental program. This program supports restoration activities on transmission projects after construction is complete. SCE's request is based on the environmental remediation work forecasted for specific transmission projects in 2018-2020. ORA forecasts $2.898 million for 2018, which is the amount that SCE recorded in 2015. In rebuttal, SCE explains that its project-specific forecast uses the same methodology the Commission adopted for SCE in D.15-11-021. We agree that SCE's current forecasting method, based on work that is likely to be required rather than an analysis of historical costs, is reasonable. We adopt SCE's forecast of $4.608 million in Test Year 2018 O&M for Account 565.281.

4.12.2. Hazardous Waste Management & Disposal – Distribution (Acct. 598.250)

SCE requests $3.551 million in Test Year 2018 for its distribution waste management program. SCE states that its waste management services include the lab expenses and cost to dispose of equipment and material removed from the field such as transformers, oil and oil-filled equipment, hazardous materials, non-hazardous materials, wood poles, and universal waste. SCE forecast its 2018 expenses by calculating the average of four years of recorded expenses (2012-2015). SCE based its forecast on this four-year average because "the

[238] SCE-18, Vol. 12, at 2, Table I-1 (Safety, Training and Environmental Programs O&M, Constant 2015 $000).

frequency and likelihood of occurrence of the events requiring waste removal fluctuate from year-to-year and are difficult to predict."[239]

ORA forecasts $2.359 million for 2018, which is the amount that SCE recorded in 2015. ORA bases its recommendation on the fact that SCE's recorded costs have declined each year between 2011-2015.

In rebuttal, SCE agrees that its costs for this account show a downward trend through 2015, but notes that 2016 recorded costs were 66% higher than 2015 costs "primarily due to the types of costs that appear intermittently and may vary significantly from year to year" such as a lead paint remediation project at a distribution substation, and an increase in clean-up of transformer oil spills.[240]

We agree that the level of recorded costs during the 2011-2016 period is "indicative of the unpredictable nature of this account" and supports the use of a multi-year average as the forecasting methodology.[241] We also find that SCE properly excluded two years showing unusually high activity, which would have otherwise inflated its forecast. We adopt SCE's forecast of $3.551 million in Test Year 2018 O&M for Account 598.250.

Based on the discussion above, we approve SCE's request for $62.081 million for O&M expenses in Test Year 2018 as shown in the table below.

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[239] SCE-02, Vol. 12, at 30. For the same reason, SCE excluded 2011 costs from its calculation because of the unusually high expenses to perform waste clean-up after the windstorms.

[240] SCE-18, Vol. 12, at 8-9.

[241] *Id.* at 9.

T&D Safety, Training
and Environmental Programs
2018 O&M Forecast
(Constant 2015 $ Millions)

GRC Account	Description	SCE Forecast	ORA Differences	Adopted
565.281	Environmental Programs – Transmission	4,608	2,898	4,608
566.250	Employee Safety - Transmission Personnel	2,734		
	Training Delivery - Transmission Personnel	3,284		
	Training Seat-Time - Transmission Personnel	6,368		
	Informational Meetings - Transmission Personnel	520		
	Employee Recognition - Transmission Personnel	151		
	Total 566.250	13,057		13,057
573.250	Waste Management - Transmission	246		246
582.250	Environmental Programs – Distribution	2,012		2,012
588.250	Employee Safety - Distribution Personnel	9,065		
	Training Delivery - Distribution Personnel	9,244		
	Training Seat-Time - Distribution Personnel	17,589		
	Informational Meetings - Distribution Personnel	2,591		
	Employee Recognition - Distribution Personnel	117		
	Total 588.250	38,607		38,607
598.250	Waste Management - Distribution	3,551	1,192	3,551
Total		62,081	59,179	62,081

4.13. T&D – Other Costs, Other Operating Revenues

SCE requests approval of two distinct forecasts in SCE-02, volume 13.

One requested approval is for SCE's forecast of Other Operating Revenues (OOR). SCE receives OOR from transactions not associated with the sale of electric energy. Tariffed OOR is based on CPUC or FERC-approved rates. Tariffed OOR offsets the revenue requirement SCE would otherwise collect from

general ratepayers. SCE forecasts $126.426 million in 2018 for tariffed OOR for T&D activities.[242]

No party disputes SCE's 2018 forecast for T&D OOR. We find SCE's undisputed forecast of total OOR reasonable and adopt it.

The second requested approval is for SCE's forecast of O&M costs for operational support groups within the T&D organization. SCE forecasts the Test Year 2018 costs of the activities performed by a number of support groups:

- Grid Interconnection Contract Development;
- Reliability Standards Compliance;
- Grid Contract Management;
- Distribution Construction Contract Management; and
- Real Properties.

SCE also forecasts the costs for related activities such as T&D work order write-offs and claims; line rents; underground locating; and related expenses. SCE requested approval of its forecast for $130.944 million in O&M expense for Test Year 2018 for these areas.[243]

TURN and ORA contested a number of line items in SCE's forecast.

TURN recommended a methodological change to SCE's calculation of its forecast for underground locating services (Account 588.281). SCE accepts the change recommended by TURN. This results in a test year forecast equal to

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[242] In SCE-02, Vol. 13, at 40, Table III-19 (Other Operating Revenue (OOR) Request Test Year 2018 Forecast) SCE forecast $130.703 million in OOR. SCE subsequently reduced this forecast by $4.277 million in SCE-60, Tax Update at 16-17, Appendix A at 57.

[243] *Id.* at 5, Table III-1. SCE notes that this amount is effectively reduced by the forecast OpX savings of $10 million identified in Table I-3 of Exhibit SCE-02, Vol. 1. On that basis, SCE's 2018 O&M request becomes $120.944 million.

$8.227 million, which is $363,000 lower than SCE's original request ($8.590 million). We approve the mutually-agreed upon lower value.

ORA contested the following line items in SCE's forecast:

1. Transmission Work Order Write-Offs
2. Distribution Work Order Write-Offs
3. Transmission Capital-Related Expense
4. Distribution Capital-Related Expense

Regarding the first and second items, write-offs for Transmission work orders (Account 560.281) and Distribution work orders (Account 588.281), SCE's forecasts are based on five-year averages of recorded data. ORA proposes to use the most recent recorded year (2015) because ORA finds a downward trend in costs in recent years. In rebuttal, SCE noted that the Commission has approved the five-year average methodology in SCE's two most recent GRC proceedings. For example, in D.15-11-021 the Commission agreed that using a five-year average to forecast accounts that are influenced by forces outside SCE's control, such as these accounts. We see no reason to change our precedent at this time, so we approve SCE's forecasted amounts as shown in the table at the end of this section.[244]

Regarding the third and fourth items, Transmission/Substation Capital-Related Expense (Account 560.281) and Distribution Capital-Related Expense (Account 594.281), in both instances ORA objects to the methodology that SCE used to calculate its forecasts. SCE's rebuttal testimony provided a detailed explanation of the logic underlying SCE's calculations, as well as a detailed critique of ORA's method. SCE's explanation showed why its approach

[244] We will be open to revisiting this methodology in SCE's next GRC if additional data is presented that shows a more established downward trend.

is reasonable. Therefore, we approve SCE's forecasted amounts, as shown in the table below:[245]

T&D Operational Support and Other Costs
2018 O&M Forecast
(Constant 2015 $ Millions)

GRC Account	Description	SCE	ORA	ORA Variance	TURN	TURN Variance	Adopted
560.221	Reliability Standards Compliance	1,407	1,407				1,407
560.281	Transmission Work Order Write-Offs	2,404	966	(1,438)			2,404
	Transmission Capital Related Expense	12,637	12,471	(166)			12,637
Total	560.281	15,042	13,437	(1,604)			15,042
566.280	Grid Contract Management	2,041	2,041	0			2,041
	Grid Interconnection Contract Development	5,530	5,530	0			5,530
Total	566.28	7,571	7,571	0			7,571
567.150	Transmission Line Rents	17,203	17,203	0			17,203
570.281	Transmission Participant Share	14,082	14,082	0			14,082
583.281	Distribution Claims Write-Offs	11,413	11,413	0			11,413
588.280	Distribution Construction Contract Management	1,294	1,294	0			1,294
588.281	Distribution Work Order Write-Offs	7,389	6,490	(899)			7,389
	Distribution Line Rents	2,889	2,889	0			2,889
	Underground Locating Service	8,590	8,590	0	8,227	(363)	8,227
Total	588.281	18,868	17,969	(899)		(363)	18,505
594.281	Distribution Capital Related Expense	40,725	34,923	(5,802)			40,725
920.220	Real Properties	3,339	3,339	0			3,339
	Total*	**130,944**	**122,638**	**(8,305)**		**(363)**	**130,581**

*Due to rounding, subtotals may not sum to totals.

[245] SCE-18, Vol. 13, at 3, Table I-2 (T&D Operational Support and Other Costs, 2018 O&M Forecast, (Constant 2015 $ Millions)).

5. Customer Service

5.1. Customer Service – O&M

For Test Year 2018, SCE forecasts $198.871 million (constant 2015 $) in operation and maintenance (O&M) expenses for Customer Service. This request is $9.07 million below SCE's 2015 recorded adjusted base. Of the total, SCE forecasts $7.15 million in O&M costs related to SCE's proposed Customer Service (CS) Re-Platform project based on an $8.90 million expense and benefits of $1.75 million.[246] The adopted O&M forecast follows:[247]

Description ($ in millions)	SCE	ORA	TURN	ADOPTED
Meter Reading Operations (FERC 902)	10.165	10.165	9.909	9.909
Test, Inspect & Repair Meters (FERC 586.400)	15.511	15.511	14.407	15.438
Turn-On and Turn-Off Services (FERC 586.100)	4.875	4.875	4.761	5.164
Installation and Energy Theft (FERC 587)	6.932	6.932	6.353	6.506
Meter Services Operations and Management (FERC 580)	5.826	5.826	5.671	5.671
Billing Services (FERC 903.500)	27.084	25.190	23.548	23.645
Credit and Payment Services (FERC 903.200)	16.125	15.792	14.418	15.477
Postage (FERC 903.100)	15.496	15.309	14.371	14.371
Uncollectible Expenses (FERC 904)	0.216%	0.216%	0.211%	0.211%
Customer Contact Center (FERC 903.800)	46.289	39.489	37.754	43.779
Business Customer Division (FERC 908.600)	18.520	18.432	18.316	18.790
Customer Programs and Services Division (FERC 905.900)	24.442	24.442	24.326	24.656
Operating Unit Management and Support (FERC 901,907.6)	7.609	7.609	0	6.887
Total	198.871	189.572	173.834	190.293

5.1.1. The Impact of Customer Growth

Although there is a link between the number of customers SCE serves and the cost of its Customer Service activities, the link between the growth of the number of customers and costs is less apparent. Based on 2016

[246] SCE-03 RA2, at 8:7-10.

[247] See, SCE-19, at 3, Table I-4.

recorded/unadjusted expenses for 2016 which were below forecasts, TURN recommends against upward adjustments based on growth. We have recognized a link between customer growth and increased expenses in the past; however, due to automation and increasing efficiency, the link appears far more tenuous.

5.1.2. Metering Services

5.1.2.1. Meter Reading Operations – FERC Account 902

Based on a downward trending expense, TURN recommends a reduction of $256,000 from SCE's proposal of $10.165 million by removing the projected increase due to growth.[248] SCE criticizes TURN's use of unadjusted 2016 expenses but does not present concrete, countervailing evidence.[249] We accept the proposed reduction and authorize $9.909 million.

5.1.2.2. Test, Inspect, and Repair Meters – FERC Account 586.400

Again based on downward trending activity and expense, TURN recommends a reduction of $362,000 from SCE's proposal of $15.511 million by eliminating the projected increase for customer growth.[250] SCE has not established a clear correlation between customer growth and meter testing, inspection, and repair.

TURN further recommends a reduction of $1.01 million[251] based on a reduction of costs demonstrated by a comparison of adjusted 2015 data to

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[248] TURN-03, at 11.

[249] SCE-19, at 10-11.

[250] TURN-03, at 13.

[251] *Ibid.*, less a $25,000 offset for Operational Excellence.

unadjusted 2016 data.[252] SCE established however, that on an adjusted basis, 2015 recorded expenses would be similar to 2016 and we do not accept the additional reduction. Therefore, we eliminate the projected increase for customer growth of $362,000, and we exclude the CS Re-Platform benefit of $289,000. We authorize $15.438 million.

5.1.2.3. Turn-On and Turn-Off Services – FERC Account 586.100

SCE forecasts $4.875 million in Test Year 2018 for this account, after adding $114,000 for customer growth and subtracting $289,000 due to CS Re-Platform benefits.[253] Although there is merit to TURN's argument that a decline in activity is inconsistent with customer growth, SCE notes the decline is insignificant.[254] We find SCE's forecast to be reasonable and authorize it, however, we adjust it to $5.164 million to remove the CS Re-Platform benefit.

5.1.2.4. Customer Installation and Energy Theft Expense – FERC Account 587

SCE bases its $6.932 million forecast in FERC account 587 on 2015 recorded adjusted expenses of $6.779 million. SCE adjusted this base cost to include $153,000 in customer growth.[255]

TURN again argues declining recorded expenses support eliminating the adjustment for customer growth. We, however, recognize there may be a direct correlation between installations and other contributors to this account and

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[252] *Ibid.*

[253] *Id.*, at 15:4-11.

[254] *Id.*, at 16-17.

[255] *Id.*, at 17:12-17.

customer growth. The adjustment for customer growth proposed by SCE is reasonable.

TURN proposes a further reduction based on significant reductions in the level of activity for pick-up reads and exception orders. On this basis, TURN recommends using 2016 as the base year, resulting in a reduction of $426,000.[256] The proposed reduction is consistent with declining recorded expenses for this account. Based on this reduction we authorize $6.506 million for this account in 2018.

5.1.2.5. Meter Services Operations and Management – FERC Account 580

SCE forecasts $5.826 million for this account based on 2015 recorded adjusted expenses of $6.852 million and adding $155,000 for customer growth and subtracting $1.181 million for savings from Operational Excellence.[257]

TURN proposes to eliminate the increase for customer growth based on declining costs in 2016 for this account.[258] SCE argues TURN does not acknowledge SCE's improving operational excellence and productivity which has led to declining costs and offset increases due to customer growth.[259] Although the impact from improvements in operational excellence and productivity is apparent, SCE has not established the impact of customer growth on this account. We authorize $5.671 million.

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[256] TURN-03, at 14.

[257] SCE-03 R, at 66-68

[258] TURN-03, at 15.

[259] SCE Opening Brief, at 100.

5.1.3. Revenue Services Organization

5.1.3.1. Billing Services – FERC Account 903.500

The Revenue Services Organization conducts all billing, payment, credit, collection, and program operations.[260] SCE's 2015 recorded adjusted expenses for Billing Services were $27.420 million. SCE adjusted this base cost to include $619,000 in customer growth, $1.886 million for program changes (including policy adjustments, service guarantees, NEM, and community choice aggregator (CCA) programs), and $1.760 million for CS Re-Platform expenses. SCE also adjusted the base cost to remove $4.178 million in savings achieved through Operational Excellence initiatives and $423,000 in CS Re-Platform benefits. These adjustments result in SCE's forecast for 2018 of $27.084 million for FERC account 903.500.[261]

ORA and TURN oppose $249,000 for service guarantees.[262] SCE has – repeatedly over the span of several GRCs – sought to place this expense on ratepayers and we have – repeatedly – denied the request.[263] In the most recent GRC we repeated a statement from SCE's Test Year 2006 GRC Decision:

> Regarding the payments to customers, these are payments that result from the company not meeting its commitments to individual customers. If the company is unable to meet its commitments, the

[260] SCE-03 R, at 69:6-7.

[261] SCE-03 RA2, at 87, Table IV-22.

[262] $244,000 for Service Guarantee Program and $5,000 for MSO Missed Appointments. SCE-03 R, at 81:18-21. *See*, ORA-12, at 14-18; TURN-03, at 16-19.

[263] D.06-05-016 at 122; D.09-03-025 at 108; D.12-11-051 at 228; D.15-11-021 at 194.

> shareholders and not the ratepayers should be responsible for reimbursing the inconvenienced customer.[264]

Not only does the service guarantee provide some compensation to customers who are inconvenienced by SCE's failure to meet its service goals, the service guarantee creates an incentive for SCE to meet these goals. That incentive is most effective when it is paid by the shareholders, not ratepayers. Therefore, we deny SCE's request of $249,000 for the Service Guarantee Program.

TURN proposes eliminating an increase of $619,000 for customer growth based on a decline of two percent in 2016 recorded costs from forecast costs. TURN contends this shows customer growth does not drive costs for this account. SCE counters that TURN fails to acknowledge SCE's continuing productivity improvements and operational excellence and that these successes offset customer growth and other drivers of cost. We see no indication that TURN disregards the impact these improvements have on reducing SCE's costs. SCE however, has not established that costs due to growth will not continue to be limited as a benefit of its productivity improvements and Operational Excellence. The increase of $619,000 for customer growth is not allowed.

TURN recommends removing $40,000 from the forecast for policy adjustments for Net Energy Meeting expenses on the basis that SCE does not expect these expenses to recur. Although SCE acknowledges it does not expect these specific issues to recur, SCE contends it is "reasonable to assume that other unique events could occur."[265] We see this as an argument for speculation and do not agree it meets SCE's burden for including the expense. Furthermore,

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[264] D.06-05-016 at 122.

[265] SCE Opening Brief at 102.

SCE's request for policy adjustments forecasts a total of $366,000. Policy Adjustments include "billing adjustments that may address customer issues related to field errors" and "can vary significantly."[266] SCE has established that the forecast amount is highly variable, but like the service guarantee, SCE has not established that ratepayers should pay for its errors. We do not authorize any amount for policy adjustments.

SCE's forecast also includes an increase of $568,000 for NEM application processing. These applications have experienced a downward trend both in number and expense. SCE has not established these costs will rise and we exclude the $568,000.

TURN recommends reducing the forecast by $300,000, which it attributes to declining costs associated with the growth in e-bill enrollments during 2019 and 2020.[267] Although continuing growth in e-bill enrollment may be expected, SCE has not established continuing growth is adequately reflected in its forecast and we accept TURN's proposal to add $300,000 in savings to SCE's forecasted savings of $1.257 million.

Within this account SCE also proposes $1.760 million for CS Re-Platform expenses and $423,000 in CS Re-Platform benefits. TURN and ORA recommend denying the requests for CS Re-Platform and allowing SCE to track those costs in a memorandum account. We agree, in part, as is more fully discussed in Section 6.3 of this decision.

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[266] SCE-03 R, at 77:14-16.

[267] TURN-03, at 19.

Based on the foregoing, and including the anticipated benefits of Operational Excellence of $4.178 million and an increased expense of $1.163 million for CCA account processing,[268] we approve $23.645 million for FERC account 903.500.

5.1.3.2. Credit and Payment Services – FERC Account 903.200

SCE forecasts $16.125 million for FERC account 903.200 based on 2015 recorded adjusted expenses of $16.348 million. SCE adjusted this base to include $368,000 in customer growth, $333,000 for CS Re-Platform expenses and to remove $871,000 in savings achieved through Operational Excellence initiatives and $53,000 in CS Re-Platform benefits.[269]

As is more fully discussed in Section 6.3 of this decision we exclude the expenses and benefits of CS Re-Platform.

We recognize SCE's contention that the expenses recorded to this account are driven by customer growth; however, SCE has not fully supported its forecast in light of the declining costs for these services. We therefore, exclude the increase for customer growth and with the exclusion of CS Re-Platform expenses and benefits and the inclusion of savings for Operational Excellence, we approve $15.477 million for this account.

5.1.3.3. Postage – FERC Account 903.100

SCE forecasts $15.309 million in FERC account 903.100 following adjustments for program changes and Operational Excellence to 2015 recorded

[268] SCE-03 RA2, at 80, Table IV-19.

[269] SCE-03 at 97-103.

expenses of $20.486 million.[270] TURN recommends a further reduction to SCE's forecast of $1.168 million due to an anticipated increase of three million electronic bills.[271] SCE acknowledges its forecasted savings are through 2018 and "will continue to occur in the attrition years."[272] Although SCE acknowledges the savings which occur as of 2018 will continue into the future, SCE has failed to forecast any continued growth in electronic billing and the corresponding savings. We accept TURN's proposed reduction.

SCE, in its updated testimony, proposes an additional increase of $187,000 for a 2018 postal rate increase.[273] TURN correspondingly adjusted their proposed reduction to $1.125 million; we adopt TURN's proposed adjusted forecast of $14.371 million.[274]

5.1.3.4. Uncollectable Expenses – FERC Account 904

SCE recommends an Uncollectible Factor forecast of 0.216% based on a five-year recorded adjusted average from 2011 – 2015.[275] In this instance we are persuaded to use 2016 unadjusted data as is proposed by TURN as it is consistent with the downward trend of the data.[276] Therefore, based on a five-year average of 2012 – 2016, we adopt a forecast of 0.211%.

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[270] SCE-19, at 33.

[271] TURN-03, at 21.

[272] SCE-19, at 28:18, 28:10-21.

[273] SCE-59, at 30:1-14.

[274] TURN-15, at 6.

[275] SCE-03, at 113-117.

[276] TURN-03, at 23-24.

5.1.4. Customer Contact Center – FERC Account 903.800

SCE forecasts $46.289 million for FERC account 903.800 based on 2015 recorded adjusted expenses of $43.457 million. SCE adjusted this base to include $980,000 in customer growth, $579,000 in program changes (to support CCAs, time-of-use rates, and critical-peak-pricing programs), $6.8 million for CS Re-Platform expenses, and to remove $5.429 million in savings achieved through Operational Excellence initiatives and $98,000 in CS Re-Platform benefits.[277]

Due to the steadily declining expenses since 2011 for this account, we decline to include the adjustment of $980,000 for customer growth. We remove $5.429 million in savings achieved through Operational Excellence initiatives. We also accept $322,000 for program changes (to support CCAs). We do not accept, at this time, adjustments for time-of-use rates, and critical-peak-pricing programs of $257,000 as it is anticipated implementation of these programs will be delayed, pending the CS Re-Platform. As discussed elsewhere, we also do not include $6.8 million for CS Re-Platform expenses and $98,000 in CS Re-Platform benefits. Therefore, we accept $43.779 million for this account.

5.1.5. Business Customer Division – FERC Account 908.600

SCE forecasts $18.520 million for the Business Customer Division following adjustments to 2015 recorded adjusted expenses for customer growth, program changes, Operational Excellence, and CS Re-platform.[278] ORA proposes a reduction of $88,000 based on the difference between forecast costs and

[277] SCE-03, at 126-133.

[278] SCE-03, at 167-169.

recorded costs for Outage Communications.[279] Due to recent activity, which is consistent with the forecast, we deny the ORA proposal.[280] We find the increase of $204,000 for customer growth to be reasonable. We adjust the forecast to remove the benefit of $270,000 for the CS Re-Platform and therefore accept a forecast of $18.790 million.

5.1.6. Customer Programs and Services – FERC Account 905.900

SCE forecasts $24.442 million for this account based on 2015 recorded adjusted expenses of $24.483 million. SCE adjusted this base expense to include $4.44 million in program changes and remove $4.151 million in savings achieved through Operational Excellence initiatives and $330,000 in CS Re-Platform benefits.[281]

We accept TURN's proposal for a 50% reduction of the new product opportunities forecast in the amount of $116,000. These costs are properly placed on shareholders as they result in non-tariffed products and services for which related costs are not chargeable to customers.[282] Accepting this reduction and removing the benefits of the CS Re-Platform, we adopt the forecast of $24.656 million for Customer Programs and Services.

We find the recommendations of the NDC to be laudable, but we do not accept their recommendations to (1) dedicate at least 40% of SCE's major marketing campaign budgets for targeting minority groups, (2) increase SCE's

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[279] ORA-12, at 31.

[280] SCE-19, at 45:1-16.

[281] SCE-03RA, at 50.

[282] See TURN-03, at 25.

use of community-based organizations (CBOs), and (3) include an overview of SCE's marketing planning process in testimony.[283] SCE has demonstrated a commitment to outreach to its diverse communities which is consistent with NDC's recommendations;[284] we will not impose greater requirements.

5.1.7. Operating Unit Management and Support – FERC Accounts 901 and 907.600

SCE's 2018 forecast for its Operating Unit Management and Support (OUMS) is $7.609 million ($5.122 million in FERC Account 901 and $2.487 million in FERC Account 907.600) based on 2015 recorded adjusted expenses of $8.817 million ($6.330 million in FERC Account 901 and $2.487 million in FERC Account 907.600).[285] Account 901 non-labor expenses grew by over 460% from 2012 through 2015 reportedly due to the increased use of consultants for Operational Excellence activities.[286] SCE's forecast removes $1.208 million from Account 901 based on the reduced use of consultants.[287]

SCE uses the adjusted last recorded year for its forecasts due to the "trend" of the historic recorded expenses.[288] We accept the forecasts for Account 907.600 and the labor forecast for Account 901 on this basis. SCE notes however, "If … expenses had exhibited significant fluctuations, an Averaging method is the

[283] See NDC, at 24.

[284] SCE-19, at 52.

[285] SCE-03 R, at 216, Figure X-42.

[286] SCE-03 R, at 216:8-217:2.

[287] SCE-03 R, at 219:18-220:2.

[288] SCE-03 R, at 218:5-220:13.

appropriate basis for estimating Test Year expenses."[289] Therefore, due to the significant fluctuation in the non-labor expense for Account 901, we authorize a forecast of $4.4 million for Account 901, based on the average of the five-year non-labor expense of Account 901 of $2.669 million.[290] This results in a further reduction for these accounts of $0.722 million and we adopt for FERC Accounts 901 and 907.600 a forecast of $6.887 million.

5.2. Customer Service – Capital

SCE forecasts capital expenditures of $22.79 million in 2016, $28.04 million in 2017 and $38.84 million for Test Year 2018.[291]

ORA recommends capital expenditures of $16.328 million in 2016, $28.04 million in 2017, and $38.84 million for Test Year 2018. ORA relies on actual recorded capital expenditures for 2016. ORA does not dispute SCE's 2017 and 2018 forecast.[292]

SCE has agreed to use the 2016 recorded capital expenditure of $16.328 million for 2016;[293] it is adopted.

TURN, like SCE, recommends using a three-year average to forecast meter replacements, but recommends using the most recent data available, averaging 2014-2016 instead of the average of 2013-2015 used by SCE to forecast the number of replacements. We agree use of the 2016 data is reasonable and reduce the capital forecast for replacement meters. These reductions reduce the 2017

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[289] SCE-03 R, at 219, fn. 225, citing D.04-07-022 and D.89-12-057.

[290] SCE-03 R, at 216.

[291] SCE-03 R, at 11, Table I-2.

[292] ORA-12, at 34-35.

[293] SCE-29, at 48, Issue title: SCE-002, ORA-SCE-TXB-108 Q2 Supplemental Revised.

amount by $3.788 million to $24.251 million and 2018 by $3.883 to $34.956 million.[294]

5.3. Customer Service – Other Operating Revenue

OOR are derived from service connection charges for the establishment of service and reconnecting service following disconnection for nonpayment of bills, returned check charges to offset costs associated with the processing of checks that are returned from the bank due to insufficient funds, other services associated with Direct Access and Community Choice Aggregation, and other special services.

SCE estimates OOR to be $27.981 million in Test Year 2018 based on its proposed service fees, compared to $32.255 million in 2015 recorded OOR.[295] We adopt the undisputed forecast.

5.4. Customer Service – Additional Issues

SCE and SBUA entered into two joint exhibits and stipulations, SCE-SBUA–1 and SCE-SBUA-2. Pursuant to SCE-SBUA–1:

> SCE will continue to have a group of Business Customer Division ("BCD") Account Managers who are available and responsible for consulting with Small Business customers and assist them on various programs, services, and provide support for SCE's integrated demand-side management offerings. SCE will assign one Manager as the primary supervisor with the title and core responsibility to oversee SCE's operations to engage and serve SCE's small commercial customers with programs and services that meet their needs and enable them to be knowledgeable and involved in managing their energy usage. The parties recognize that this manager may engage in matters that serve to benefit other customer

[294] TURN-03, at 27, Table 25.

[295] SCE-03RA, at 12-13.

classes as well. In addition, SCE's call center energy advisors are also trained and available to handle commercial and industrial ("C&I") calls that relate to the different C&I rate schedules and programs, and resolve concerns related to customers' electricity usage.

…

SCE and SBUA agree that SCE will create a webpage specifically dedicated for Small Businesses (the "Small Business Webpage") during the 2018 GRC Period. SCE will work in good faith to make the "Small Business Webpage" easily accessible and will identify SCE's internal resources for Small Businesses, including training materials to educate small businesses on energy efficiency, distributed generation, and energy storage, and may also direct small business customers to third-party or external resources. SCE may leverage information and links from sce.com/business and the Economic Development Services resources page online.

…

SCE will work with local, regional and state officials and economic development organizations to enhance economic development programs that support and promote Small Business customers.

SCE will provide testimony in its 2021 GRC on its efforts to promote the interests of Small Business customers through its business customer economic development program and services.

SCE's involvement in the above-described business customer Economic Development activities is contingent on CPUC-authorized funding for SCE's forecast business customer economic development organization and activities.

…

Unless stated otherwise, for purposes of this Agreement, "Small Businesses" shall mean those businesses that are either on a GS-1 rate or, for purposes of aligning with SCE programs, who employ

fewer than 500 employees (as defined by the United States Small Business Administration).[296]

Pursuant to SCE-SBUA-2:

SCE will commit to sponsoring or attending at least four events per year and to promote outreach to small businesses as defined above. Further, SCE will notify SBUA of the above-referenced events at least 30 days in advance for sharing with its constituents who may wish to participate. Participation or registration will be managed on a first come first served basis, and may be limited due to event size or venue capacity restrictions.

…

SCE will commit to offering a variety of payment options that can help small businesses maintain positive cash flow to sustain their operations:

i. SCE agrees to provide options of varying periods and discount values based on the particular needs of the small business suppliers and subject to SCE's business requirements.

ii. SCE agrees to offer potential electronic disbursement options, such as Automated Clearing House (ACH) and credit card, to expedite the timing of payment for small business suppliers upon request and subject to SCE's business requirements.

iii. SCE shall evaluate potential modifications of insurance requirements for small business suppliers, subject to the specific project requirements, the capabilities of the supplier, and the risk inherent to the work.

iv. SCE shall post information concerning the foregoing matters on its dedicated Supplier page and include a link to the dedicated Supplier page on its new Small Business Webpage at SCE.com. The Small Business Webpage is the webpage specifically dedicated for Small Businesses (the "Small Business Webpage") that SCE will create during the 2018 GRC Period and was

[296] SCE-SBUA-1, Joint Exhibit Resolving Various Customer Service Issues [excerpts].

previously described in the Joint Exhibit and Stipulations Resolving Various Customer Service-Related Issues between SCE and SBUA (entered on the record on July 21, 2017).

…

SCE shall dedicate a section [of Testimony in 2021 GRC] detailing its compliance with the SCE-SBUA 2018 GRC settlement.

…

OUTREACH INITIATIVES FOR SMALL BUSINESS CUSTOMERS

A. Education and Outreach on CPP[Critical Peak Pricing]. SCE agrees to meet and confer with SBUA after the Commission approves changes to SCE's CPP and TOU [Time of Use] programs and at least 90 days (or as soon as practically possible in the case of accelerated outreach activities) in advance of implementing new outreach and education efforts on CPP for small commercial customers. The parties shall meet and confer around a CPP outreach plan and SCE agrees to reasonably consider SBUA's requests for improvements or changes to CPP outreach.

B. Spend for TOU and CPP. SCE agrees that at least half of the requested $1.98M for CPP and TOU initiatives, if approved by the CPUC, will be dedicated to initiatives to primarily serve small businesses, which includes customers designated on SCE's GS-1 rate schedule. The parties recognize that the CPUC may issue compliance directives subsequent to this Agreement, which may impact SCE's ability to meet this term. In the unexpected event this occurs, SCE will notify SBUA within 60 days of receiving such compliance requirements, including a revised amount SCE agrees to dedicate to customers designated on SCE's GS-1 rate schedule.

…[297]

[297] SCE-SBUA-2, Joint Exhibit And Stipulations Resolving Various Small Business Contracting And Customer Service-Related Issues Between Southern California Edison Company And Small Business Utility Advocates.

The commitments agreed to by SCE within these stipulations are reasonable and further the interests of ratepayers generally and small business customers of SCE specifically; they are adopted.

6. Information Technology

SCE's Information Technology Operating Unit (IT) is responsible for managing SCE's computing applications and technology infrastructure. SCE contends its IT O&M and capital expenditure request would support the safe and reliable planning and operation of the electric system, defend against growing cybersecurity threats, maintain and improve customer and IT service desk functions, and deploy critical enabling software applications for core business processes.[298]

Intervenors have proposed reductions to SCE's O&M request. These recommendations include: (1) reducing SCE's Hardware/Software License & Maintenance agreements forecast, (2) eliminating expenses related to Grid Modernization and grid planning and analytics efforts, and authorizing the tracking of these costs in a memorandum account, (3) eliminating expenses related to the HR Platform Modernization project, and (4) removing IT O&M expenses related to the CS Re-Platform project and tracking in a memorandum account.

Intervenors have also proposed reductions to SCE's capitalized software request. These include reductions to, and in some cases the complete elimination of: (1) contingency costs for capitalized software projects, (2) cybersecurity expenditures, (3) projects related to the improved planning and analysis of the

[298] SCE Opening Brief, at 114.

grid, and (4) the Vegetation Management, Comprehensive Situational Awareness Tool, and Enterprise Content Management applications.

6.1. Information Technology – O&M and Hardware

6.1.1. Hardware/Software Licenses & Maintenance

The Hardware & Software Licenses & Maintenance account includes the costs to maintain SCE's IT hardware and software assets through license and maintenance agreements.

SCE forecasts $70.73 million for this account.[299] ORA and TURN recommend we adopt the 2016 recorded expense for this account of $62.77 million, a reduction of nearly $8 million.[300] SCE has met its burden to establish the forecast based on software support moving from capital to O&M and new and increased expenses for software support. Furthermore, SCE's Operational Excellence savings for this account are significant – over $13 million – and undisputed, and SCE argues, if taken with ORA's and TURN's proposed reduction, would result in double counting.

We adopt SCE's forecast of $70.73 million and associated Operational Excellence savings of $13.10 million.

6.1.2. Business Integration & Delivery

SCE's forecast for Business Integration & Delivery (BID) is $44.643 million, based on 2015 recorded costs plus incremental O&M expenses for five project areas: (1) CS Re-Platform; (2) New Grid Planning & Analytics; (3) Grid

[299] SCE-20, Vol. 1, at 8.

[300] ORA-13, at 16; TURN-04, at 65.

Modernization; (4) HR Platform Modernization; and (5) Digital Experience SAS.[301]

As discussed below, O&M expenses for the CS Re-Platform shall be tracked by a memorandum account; we exclude the expenses of $7.682 million here.

SCE states New Grid Planning and Analytics will provide required support for the Grid Interconnection Processing Tool, Grid Analytics Application, Long Term Planning Tool, and Grid Connectivity Model. We do not adopt the capital projects associated with these expenses of $2.547 million; therefore, we exclude the expenses here.

By contrast, we adopt the SMT and the DRPEP projects[302] associated with Grid Modernization and therefore approve the O&M expense of $1.3 million associated with these projects.

SCE has reduced its original forecast from $2.9 million to $0.930 million for HR Platform Modernization based on the intention to implement only one module at this time.[303] ORA's contention that SCE may use funding for the existing SAP system O&M (eliminating the allocation entirely) is not persuasive. We find the existing system must continue to be supported in conjunction with incremental funding of the new system. We accept the adjusted estimate of $0.930 million.

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301 SCE-20, Vol. 1, at 16.

302 *See*, Section 4.10.

303 SCE-20, Vol. 1, at 20-21; SCE-04, Vol. 1A2, at 47-48.

SCE proposes $0.167 million for its Digital Experience project. This expense is for cloud software enabling customers to perform secure online transactions. The expense is not disputed and we adopt it.

We recognize SCE contends the CS Re-Platform will enable SCE to avoid costs of $3.01 million relating to legacy software and that if CS Re-Platform is not approved these costs should be added to this account.[304] Although we do not approve the expenses for CS Re-Platform, we, also, have not disapproved of them. We have required the expenses be tracked in a memorandum account. We expect SCE will continue with the CS Re-Platform as planned, and that the costs relating to legacy software will continue to be avoided. Therefore, we do not allow them.

Based on the foregoing, we adopt a 2018 forecast for BID of $37.196 million.

6.1.3. Grid Services

SCE proposes a base forecast of 2015 recorded O&M of $29.456 million with increased funding of $14.85 million to support Grid Modernization capital projects, for a total of $44.304 million.[305]

Intervenors do not object to the base forecast; however, ORA and TURN object to Grid Modernization projects. Since we have approved Grid Modernization capital projects elsewhere, we approve the associated O&M of

[304] SCE-04, Vol. 1, at 41, footnote 41.

[305] SCE-04, Vol. 1, at 60-61; SCE-04, Vol. 1A, at 59; SCE-20, Vol. 1, at 21, Table II-6.

$5.046 here.[306] Therefore, our total adopted amount for Grid Services for 2018 is $34.5 million.

6.2. Information Technology – Capitalized Software

ORA proposed using SCE's recorded capital expenditures in place of forecast expenditures for 2016 for several capitalized software projects. SCE did not object, provided "2016 recorded costs are used for *all* IT capital projects and cherry-picking is not utilized."[307] Except as noted below, we agree and adopt the 2016 recorded capital expenditures.

6.2.1. Contingency Amounts in Capitalized Software Forecasts

SCE requests a total of $152.3 million in capital expenditures for Capitalized Software projects in 2016, $212.8 million for 2017, and $201.1 million for 2018.[308]

SCE has included contingencies on its capitalized software forecasts of up to 20%.[309] SCE requests contingency funding for 2017 of $24.75 million and $23.86 million for 2018[310] and "corrects" TURN's testimony to reflect proposed contingencies of $23.94 million for 2017 and $22.763 for 2018.[311]

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306 O&M is authorized based on the percentage of O&M requested with the percentage calculated from the associated capital authorized to capital requested. *See e.g*. SCE-20, Vol. 1, at 25:6-14.

307 SCE Reply Brief at 77.

308 SCE-04, Vol. 2 A2, at 1, Table I-1.

309 SCE-20, Vol. 1, at 27:11-12. *See* fn. 68, *ibid.*, proposed contingency of 24% for the Customer Service Re-Platform is addressed separately.

310 SCE-20, Vol. 1, at 32, Table III-10.

311 SCE-20, Vol. 1, Appendix C-34.

SCE argues that the inclusion of contingency amounts in project cost estimates for information technology is "routine" and in line with industry practices and that the contingency is used to "account for uncertainties and variables that are unknown at the time SCE estimates the cost of a project."[312] ORA contends the full amount of the contingency sought by SCE has not been supported, but concedes some level of contingency may be needed to cover unknown risks.[313] TURN, by contrast, urges we disallow all contingency allowances in the forecasts as these costs are speculative and place the risks of all cost overruns on ratepayers.[314]

We recognize, as SCE argues, that budgeting for contingencies may be routine for software projects. We, however, do not agree that budgeting for contingencies for software projects is necessarily appropriate in a general rate case. SCE's contention that TURN is wrong and there is nothing different about a regulated utility reflects a lack of acknowledgement that this entire proceeding is taking place because SCE is a regulated utility. TURN aptly notes we have stated, "[i]n a normal general rate case, the utility must demonstrate the reasonableness of every dollar in its revenue requirement."[315] When considering these contingencies, SCE's argument is that contingencies are necessary for the "uncertainties and variables that are unknown" demonstrates that the amounts are unpredictable and we therefore find SCE has not established these costs are reasonable. SCE further contends that it would be "unfair" and "results in poor

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[312] SCE Reply Brief, at 73.

[313] ORA Opening Brief, at 171.

[314] TURN Opening Brief, at 145-146.

[315] *Id.*, at 145, quoting D.96-12-066.

ratemaking policy" "[i]f TURN's proposal prevails, and SCE cannot recover any of its forecast contingencies, it would lose the revenue requirement associated with that legitimate business expense."[316] As its witness testified,

> [i]n the three-year cycle when the utility spends above authorized levels, it forgoes earning the authorized rate of return from the time the capital additions were made until the next test year. To the extent the assets cost more than what the utility was authorized to collect between test years, the utility would effectively be providing free service to customers from these assets between GRC test years.[317]

> This is, however, always the risk for SCE.

> By examining one test year out of every three, the Commission offers the utility an incentive to improve its productivity. Any savings the utility can generate between general rate cases belong to the shareholders. In exchange for this opportunity, the shareholders take on the burden of added expenses it may incur during a rate case cycle.[318]

SCE is required to forecast what it projects to be a reasonable expense. To the extent the forecast is high, SCE can be confident it will recover on its capital expenditures and benefit its shareholders; to the extent the forecast is low, SCE's recovery may be deferred for review of the next test year.

We have said before,

> Ratemaking is not, nor has it ever been, an exact science that guarantees perfect results from all perspectives. Ratemaking, whether in a general rate proceeding or by an attrition mechanism, is essentially the art of estimating future events based on judgment

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316 SCE Reply Brief, at 75.

317 SCE-25, Vol. 3, at 3-4.

318 D.96-12-066, 69 CPUC2d 691, at 695.

> that is as fully informed as possible. We know in prospective test year ratemaking that our adopted estimates of revenues and expenses may be at variance with actual hindsight experience. But we do not view this as a problem, because we are extending to utility management an opportunity and incentive to find ways to conduct operations for less than projected. When it can do this it flows the benefit to the utility's bottom line, which means profit. In the short term, between general rate proceedings, the shareholders benefit when the company's management can 'do it for less,' and correspondingly, ratepayers ultimately benefit because the productivity improvement will be reflected periodically when there is a comprehensive review of the utility's revenue requirement. Keeping this incentive for utility management is a cornerstone of ratemaking, which leads us to look askance at proposals for immediate 'give backs' of all cost savings to ratepayers. If ratemaking ever becomes so conceptually upside down that utility management loses the economic incentive to exercise its business acumen, California will be in a sad posture and will suffer under utility management which is lethargic with a 'cost plus' mentality. Accordingly, we are not as concerned as some parties are about having ratemaking that is always perfect from the hindsight perspective. Rather, we will continue our practice of adopting sound, informed estimates with the hope that utility management accepts the challenge and can somehow 'do-it-for-less'.[319]

We see no benefit to the ratepayers in this instance of carving exceptions and creating ratemaking policy which is only applicable to software projects. We do not allow SCE's request for 2017 of $24.75 million and $23.86 million for 2018 software contingencies. These reductions are reflected on a project basis in Table I of Appendix B to this decision. Consistent with ratemaking policy, disallowing these contingencies should motivate SCE to remain within its

[319] D.85-03-042, 17 CPUC2d 246, at 254.

forecast budgets for these projects. If additional funds become necessary, SCE may seek to establish that necessity in the next GRC.

6.2.2. Cybersecurity and Compliance

SCE recorded $22.590 million for 2016 Cybersecurity and Compliance capitalized software (not including Grid Modernization Cybersecurity).[320] These cybersecurity and compliance projects include: (1) Perimeter Defense, (2) Interior Defense, (3) Data Protection, (4) SCADA [Supervisory Control and Data Acquisition Cybersecurity, (5) Common Cybersecurity Services for Generator Interconnection, and (6) NERC CIP [North American Electric Reliability Corporation Critical Infrastructure Protection] Compliance for IT.[321]

SCE forecast, including contingencies, $42.170 million for 2016, $52.570 million for 2017, and $48.440 million for 2018. ORA proposed and SCE agrees to use the 2016 recorded expense of $22.590 million.[322] ORA did not oppose the forecasts for 2017 and 2018 (excepting contingencies discussed above). Therefore, we adopt as reasonable and exclusive of contingencies, $22.590 million for 2016, $52.003 million for 2017, and $47.457 million for 2018.[323]

TURN recommends cybersecurity capital expenses be booked to a memorandum account and we establish a process to obtain information sufficient to review SCE's expenditures.[324] SCE argues, in response, that their showing is adequate, but that due to the importance of cybersecurity, a separate

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[320] SCE-20, Vol. 01, at 34, Table III-12.

[321] SCE-20, Vol. 01, at 33, Table III-11 and at 34, Table III-12.

[322] SCE Opening Brief, at 125.

[323] *See*, SCE-20, Vol. 1, at C-29.

[324] TURN-09, at 2-10.

proceeding could provide a forum so that interested parties may have the opportunity to address how cyber-related information is shared during a GRC. We agree with SCE that their showing is adequate and a memorandum account is not needed. We also agree further review of how to address cyber-related information would be appropriate in another forum.

6.2.3. Grid Modernization Cybersecurity

SCE forecast $5.250 million for 2016, $16.050 million for 2017, and $24.230 million for 2018. Recorded expenses in 2016 were $2.901 million.[325] SCE argues at least 40-50% of its request must be authorized now, no matter how the Commission decides grid modernization issues generally.[326] SCE has established the need for at least a portion of the proposed investment. We adopt the 2016 recorded expense of $2.901 million and authorize 40% of the forecasted expenses (less contingencies) for 2017 and 2018, $5.35 million and $8.076 million, respectively.

6.2.4. Other Capitalized Software

6.2.4.1. Vegetation Management Project

In the 2015 GRC, the Commission authorized $9.7 million for SCE's Vegetation Management Software project for 2014-2016.[327] This project is intended to replace paper intensive management of 1.5 million trees and 600,000 to 700,000 annual tree trim records with a digitized map based system.[328] Despite authorization in the last GRC, SCE revised its implementation approach. This

[325] SCE-20, Vol. 01, at 43, Table III-13.

[326] SCE Opening Brief, at 132.

[327] SCE-04, Vol. 2, at 95, Table V-29.

[328] SCE-04, Vol. 2, at 96:4-20.

revision resulted in a reduced forecast of $2.0 million for 2016 and $5.7 million for 2017. SCE recorded $916,000 for 2016.[329] The delay in implementation has resulted in a significant reduction in the proposed expense.[330] We adopt the recorded expense for 2016 of $916,000 and the forecast (less contingency) for 2017 of $4.75 million for the Vegetation Management Project.

6.2.4.2. Comprehensive Situational Awareness for Transmission

Comprehensive Situational Awareness for Transmission (CSAT) was known as Advanced Phasor Data Analytics when approved by D.15-11-021. The program is intended to provide Grid Control Operators the ability to assess the status of the entire transmission system at a glance and provide quick access to detailed data and robust analytics to make more informed decisions during critical operational periods.[331] Although the Commission authorized $13.1 million for 2014-2016, the project was delayed and none of the authorized funding was used.[332] SCE states the delay was necessary to ensure extended deployment and stabilization of the Phasor project which provides the wide area situational awareness data needed to make CSAT functional.[333]

The importance of real-time situational awareness is not questioned. ORA's opposition to the project is only that funding was authorized in the 2015 GRC, none of the authorized funding was spent, and now SCE seeks $22 million

[329] SCE-20, Vol. 01, at 52, Table III-14.

[330] SCE-20, Vol. 01, at 53:3-21.

[331] SCE-04, Vol. 2, at 111:1-4.

[332] *Ibid.*, at 110, Table V-36; SCE-20, Vol. 01, at 55, Table III-15.

[333] SCE-04, Vol. 2, at 111:5-11.

for 2017-2020 (an increase of $8.9 million from the original request) for the same project.[334] ORA raises reasonable questions, but the delay in the project and the increased scope and forecast are not sufficient to controvert SCE's showing in support of the project. SCE's lack of transparency for how the previously approved funding was spent, however, does lead us to find the revised forecast is not fair and reasonable for ratepayers. Therefore, we approve only the additional $8.9 million (less contingency), but not the entire request of $22 million, and adopt $0 for 2016, $0.476 million for 2017, $0.951 million for 2018, $3.236 million for 2019, and $3.236 million for 2020.

6.2.4.3. Grid Planning & Analytics Software

These projects consist of the Grid Interconnection Processing Tool (GIPT), Grid Analytics Application (GAA), Long-Term Planning Tools (LTPT), and Grid Connectivity Model (GCM).[335] Each of these projects will aid SCE, it states, in planning and operation of the grid. SCE forecast $8.062 million for 2016 and recorded $9.371 million. It requests a total of $48.3 million going forward, which consists of $30.7 million for 2017 and $17.6 million for 2018.[336]

ORA suggests SCE should wait for open DER (Distributed Energy Resource) proceedings to conclude before implementing these projects. Although DER proceedings may provide guidance, it is during the GRC that SCE must demonstrate its proposed investments are reasonable and necessary. We find SCE has demonstrated a need for these various grid planning and operating

[334] ORA-13, at 33-34. See, SCE-04, Vol. 2, at110, Table V-36.

[335] SCE-20, Vol. 1, at 57-59.

[336] SCE-20, Vol. 01, at 59, Table III-16.

tools, but the question remains as to whether SCE has demonstrated that it needs these tools now.

SEIA/Vote Solar are persuasive. SCE's forecast of residential PV growth is significantly higher than what may be expected for the forecast period and it has underestimated the positive and exaggerated the negative impacts of DER resulting in unnecessary proposed capital expenditures, overstated need, and proposed grid modernization that is costly and fails to deliver net benefits.[337] SEIA/Vote Solar however, have not established the link between these deficiencies and a lack of need for any of the Grid Planning & Analytics Software at issue here. Therefore, we find SCE has established some of these investments are reasonable and necessary but reduce the amount authorized based on SEIA/Vote Solar's showing. We accept the recorded expense for 2016 for these projects of $9.371 million, and authorize 50% of SCE's request (the forecast less contingencies), $12.796 million for 2017 and $7.332 million for 2018.[338]

6.2.4.4. Enterprise Content Management Project

SCE requests $3.400 million for 2017 and $5.200 million for 2018 for the Enterprise Content Management (ECM) project. The project, SCE states, will implement a set of eight solutions: (1) Digital Signatures, (2) Centralization of Critical Records, (3) Records Management Enhancements, (4) Management of Email Records, (5) Automate Records Management, (6) Preserve Digital Records with Extended Retention, (7) Enterprise Search and (8) Manage Structured Data

[337] SEIA/Vote Solar–01, at 6:17-26.

[338] *See*, SCE-20, Vol. 1, at C-29.

Lifecycle, thereby "improving SCE's capabilities to manage a diverse and complex set of business records."[339]

ORA questions the need for this project and the overlap with the previously new system of Electronic Document Management Records Management (eDMRM). SCE has established the distinctions between ECM and eDMRM and that the ECM project is reasonable and necessary. We authorize the requests (the forecast less contingencies) of $2.833 million for 2017 and $4.333 million for 2018.

6.2.5. Operating System Software

SCE was authorized $15.67 million for Operating System Software for 2015. It spent $29.93 million, $14.27 million more than authorized.[340] SCE reports the overspend occurred due to a need to upgrade database software and avoid increased O&M and hardware expenses which would have resulted from extending the life of its current system. We accept the expense.

The projects included in this account are: Operating System Software, Database Platform Upgrade, Business Intelligence Tools Upgrade, Enterprise Integration Tools Upgrade, and Enterprise Platform Core Refresh. The forecast capital expenditure for this account for 2016 is $8.75 million, $14.55 million for 2017, and $21.50 million for 2018.[341] ORA does not object to these forecasts.

SCE recorded $42.973 million for the overall Operating System Software account during 2016.[342] Despite a lack of acceptance by ORA of this recorded

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[339] SCE-04, Vol. 2, at 192-193.

[340] SCE-04, Vol. 02, at 12, 1-6, Figure II-2.

[341] SCE-04, Vol. 02 A2, at 6, Table II-2 [column totals].

[342] SCE-29, at 48, Issue title: SCE-002, ORA-SCE-TXB-108 Q2 Supplemental Revised.

expense,[343] SCE acquiesced to the use of "*all*" its 2016 recorded IT capital expenditures.[344]

Although SCE provided testimony supporting spending $14.27 million more than authorized during 2015 for Operating System Software,[345] it provided no explanation for spending $34.223 million more than forecast in this same account during 2016. We cannot accept this overspend based solely on an argument by SCE against "cherry-picking."[346] We accept the forecast capital expenditure for this account for 2016 of $8.75 million, and the forecast, less contingencies, of $13.113 million for 2017, and $19.80 million for 2018.

6.3. Information Technology – Customer Service Re-Platform

SCE forecasts capital expenditures of $58.2 million for 2017 and $71.1 million for 2018 (and a total of $208.7 million from 2017 to 2020).[347] SCE also forecasts Test Year 2018 O&M costs of $17.4 million to implement the CS Re-Platform.[348] SCE's total capital cost forecast includes $11.0 million for Program Complexities and $29.6 million for Delivery Contingencies. SCE makes the Program Complexities forecasts because "[w]e know [changes] will come, but we do not know when or the extent of impact on the project."[349] Similarly, a

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343 ORA-13, at 28:1-3 and Table 13-14.

344 SCE Reply Brief at 77.

345 SCE-04, Vol. 02, at 12: 1-6 and Table II-2.

346 SCE Reply Brief at 77.

347 SCE-20, Vol. 2, at 2, Table I-1.

348 SCE-20, Vol. 2, at 9, (Table I-3).

349 SCE-4, Vol. 3, at 35:8-9.

Delivery Contingency is forecast because "there are many variables that cannot be predicted at the earliest stages of project planning that will affect project costs."[350]

Despite acknowledging these variables and the impact they may have on forecasting costs, SCE has not similarly accounted for these variables in forecasting its schedule. SCE's witness acknowledged the schedule may slip.[351] Therefore and as discussed in section 6.2.1, above, concerning software projects generally, we find the projected O&M and capital forecasts and schedule to present numerous variables which call into question the reliability of SCE's attempt to forecast either the costs, investments, or schedule. Similar criteria have been recognized for the establishment of a memorandum account in other proceedings.

We have found a memorandum account may be warranted if the following factors are present: expenditures are caused by an event of an exceptional nature outside of the utility's control; not reasonably foreseen in the utility's last GRC; substantial in the amount of money involved; and, beneficial to the customers.[352] SCE's forecasted O&M and capital expenditures will be incurred due to the undertaking of an exceptional project. SCE's request for a 24% contingency as well as contingencies relating to the capital expenditures establish that this project is outside of the utility's control and the anticipated costs and timing cannot be reasonably foreseen. It is also established there is a substantial amount of money involved and the project is anticipated to be beneficial to customers.

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[350] *Id.* at at 35:13-15.

[351] Webster, SCE, 8 RT at 890: 25 – 891: 16.

[352] D.02-07-011 at 7.

Therefore, SCE shall establish a memorandum account to track these costs for review in the next GRC. For these same reasons and to avoid presenting an expense to ratepayers now for a project which may face changes and delays, we find it reasonable and proper for SCE to track its capital expenditures in the memorandum account as well.

SCE projects $1.75 million in Customer Service O&M benefits related to CS Re-Platform process improvements and $3.63 million in IT O&M benefits. SCE contends these benefits should be removed from the forecast if the costs of the CS Re-Platform are removed to a memorandum account. SCE argues "[r]emoving these benefits is necessary to equitably account for SCE's delayed cost recovery under ORA's and TURN's proposal."[353] We agree with SCE that the incremental benefits should be treated the same way as the incremental costs. Therefore, we require, in addition to tracking in a memorandum account the O&M and capital expenditures for CS Re-Platform, SCE shall track the corresponding benefits.

6.4. Information Technology – SCE's Use of Managed Services Providers

SBUA criticized SCE's decision to transition to a new IT operating model involving the use of Managed Services Providers (MSPs) to provide day-to-day IT operations. SBUA argued that outsourcing these IT functions has had several harmful effects and that the Commission should require SCE to hire SCE employees or local businesses to provide IT service desk support before approving SCE's request for this account.[354] SBUA and SCE entered into a

[353] SCE Opening Brief at 144.

[354] SBUA, Michael Brown, at 35-37.

stipulation resolving the issues between them during evidentiary hearings.[355] SCE also explained in rebuttal testimony that SBUA's criticisms were unfounded.[356] No other party challenged SCE's use of MSPs, and there is no evidence before the Commission that SCE's use of MSPs has produced any harmful effects. The Commission approves SCE's request for this account.

7. Generation

SCE's generation O&M expenses are, exclusive of Catalina, forecast for 2018 to be $186.364 million. These are expenses for SCE's share of the Palo Verde Nuclear Generating Station and its own Energy Procurement, Hydropower, Peaker and other power generation, Solar Photovoltaic, and Fuel Cells. These expenses were not disputed.[357] We find they are reasonable and approve them.

ORA proposed using SCE's recorded capital expenditures in place of forecasted expenditures for 2016 for SCE's generation capital expenses. SCE has agreed with this recommendation. Except as noted below, we agree and adopt the 2016 recorded capital expenditures.

7.1. Generation – Nuclear Generation (Palo Verde)

Excepting ORA's recommendation to use 2016 recorded capital expenditures, to which SCE agreed, no party disputed SCE's O&M expenses or capital expenditures. We find they are reasonable and adopt them.

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355 SCE-SBUA-1; SCE-SBUA-2.

356 SCE-20, at 6-7.

357 SCE-21, at 13-14.

7.2. Generation – Energy Procurement

Excepting ORA's recommendation to use 2016 recorded capital expenditures, to which SCE agreed, no party disputed SCE's O&M expenses or capital expenditures. We find they are reasonable and adopt them.

7.3. Generation – Hydro Generation

Excepting ORA's recommendation to use 2016 recorded capital expenditures, to which SCE agreed, no party disputed SCE's O&M expenses or capital expenditures. We find they are reasonable and adopt them.

7.4. Generation – Catalina

7.4.1. Catalina – O&M

SCE's Pebbly Beach Generating Station (PBGS) in Avalon on Santa Catalina Island provides electric service to the island's permanent residents and visitors via a closed electric system relying on six diesel generators, twenty-three micro-turbines, and one battery.[358] SCE's 2018 forecast for O&M for this account is $4.374 million.[359] ORA accepts this forecast. It is reasonable and we approve it.

7.4.2. Catalina- Pebbly beach Generating Station Automation

SCE proposes for its PBGS Automation Project capital expenditures of $3.4 million for 2016 and $3.249 million for 2017. There are no additional forecast expenditures after 2017. Consistent with its other recommendations concerning generation capital expenses, ORA urges adoption of the recorded expense for

[358] SCE-05, VOL. 5, Pt. 2, at 1:21-23.

[359] SCE-05, VOL. 5, Pt. 2, at 2: Table I-1.

2016 of $3.386 million and does not oppose the forecast for 2017 of $3.249 million.[360]

TURN contends SCE should not be permitted to recover any additional funds for this project. In the last GRC we "largely" agreed with TURN and found that SCE was responsible for delay with the project and had not justified the project at the proposed level of expense. On that basis we approved $5.1 million in capital expenditures through 2013 and only allowed certain capital loadings through 2013, while denying any additional capital expenditures for 2014 and thereafter. At that time the proposed project expense totaled $9.261 million.[361]

SCE reports the project was initially estimated in 2007 to cost $2 million.[362] By 2009, the cost was revised to $4.6 million and the scope expanded due to changes for Air Quality Management District compliance and other updates.[363] By 2013, SCE had spent $5.1 million and reports that it had completed most physical installation of equipment and 90% of equipment purchases.[364]

SCE then put the "project on hold when we discovered drawing inconsistencies with existing field conditions."[365] Field surveys and verifications have resulted in over 6,000 drawing changes at an expense of $3.2 million from

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360 ORA-14, at 34:3-6.

361 D.15-11-021 at 32-33; TURN-03, at 27.

362 SCE-05, Vol. 5, Pt. 2, at 8:6-8.

363 *Id.* at 8:8-11.

364 *Id.* at 8:12-17.

365 *Id.* at 8:18-19.

2015 through 2017.[366] After a 2 ½ year break, the project was "restarted in 2015 under a fresh engineering management team. A new scope of the Distributed Control Systems (DCS) was added …"[367] SCE now projects the project, at completion in 2017, would have a total cost of $17.196 million (nearly double the $9.261 million projection made in 2013, nearly four times the $4.6 million projection made in 2009, and nearly eight times the $2 million projection made in 2007). The current projection is based on $5.08 million recorded prior to 2013 and additional expenditures of $.074 million in 2014, $5.404 million in 2015, $3.386 million in 2016, and a forecast of $3.249 million for 2017.[368]

SCE has established the need for this project and the benefits of it, including eliminating obsolete technology, reducing the frequency, duration, and probability of outages, reducing complexity, improving efficiency and reduced diesel emission, and others.[369] We recognize these are laudable goals and necessary accomplishments. We however, find that SCE's application also establishes the project has suffered gross mismanagement, extensive delays, and significant cost overruns. SCE has correctly framed the discussion: "Whether a project should be included in rate base should be based on a determination of whether the facilities are used and useful, and whether the spending is warranted at the level forecast…"[370] In these circumstances, although the spending may have resulted in used and useful facilities, we cannot agree that

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366 SCE-21, at A-1.

367 SCE-05, Vol. 5, Pt. 2, at 8:21-24.

368 *Id.* at 14:1-4 and Figure II-3.

369 *Id.* at 7:16-8:2.

370 SCE-25, Vol. 3, at 8-9.

the spending is warranted at the level it was forecast and is recorded and we do not allow it.

We note TURN suggests recovery of $3.2 million for new drawings may be warranted. We recognize the drawings are necessary, and therefore consider them to be used and useful. No party contested whether the spending was warranted at the level forecast and recorded. SCE's supporting testimony states,

> (2) Unavailability of As-built Documentation
>
> Another problem with the maintenance of equipment of this vintage is the need to draw and document system configuration accurately. About 4,600 station drawings reside on withering 70-year-old paper, upon which the hand-drawn information is fading and becoming illegible. Until the recent equipment upgrade projects, many have not been updated since their creation prior to SCE's acquisition of the Catalina system six decades ago. This presented an immense challenge to the SCE design and construction team, and is one of the main drivers of the prolonged project and increased project cost over time. Additional field-verification, design modification, field change, as-build, and redrawing of these drawings using modern Computer Aided Design software were necessary for each system upgrade. Field verification and design is especially challenging throughout the entire process as workers have to constantly deal with energized equipment and wiring, and unknown field conditions.
>
> SCE is redrawing and updating approximately 900 drawings as part of the PBGS Automation project's scope of work. This documentation cleanup effort will also lower design and construction contractor bidding prices and field change orders for future maintenance, which are high due to difficulty matching field conditions to hand drawn plans from the 1960s.

Although this testimony supports a finding that the new drawings are used and useful and supports the significant expense required to create these new and updated drawings, whether or not the expense for these drawings is

warranted is far less clear. SCE's testimony establishes that after planning this project approximately a decade earlier, after making forecasts in multiple GRCs, and spending several million dollars, it was not until 2015 that SCE recognized the need to replace "4,600 station drawings resid[ing] on withering 70-year-old paper, upon which the hand-drawn information is fading and becoming illegible." Although the expense may have been warranted if incurred in what would likely have been lesser amounts over time as earlier upgrades were made and equipment was maintained, SCE's lack of care in maintaining usable plans will not be rewarded by approving this expense now.

The costs for the PBGS Automation Project have not been established to be just and reasonable and therefore, we do not allow them.

7.4.3. Catalina – Other Capital Projects Under $3 Million

SCE's 2016-2018 forecast for all other capital projects on Catalina, under $3 million, is $7.1 million. These are various capital projects and include facility resurface paving, fence and gate replacements, air compressor replacements, PBGS plant seawall improvement, unit overhauls, and others. SCE's forecast is $1.450 million for 2016, $3.2 million for 2017, and $2.450 million for 2018.[371]

ORA proposes the actual recorded expense of $.007 million be used for 2016 and that $0.448 million be adopted for 2017 and for 2018.[372] The recommendation for 2017 and 2018 is based on using a five-year average of 2012-2016.

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[371] SCE-05, Vol. 5, Pt. 2, at 16, Figure II-4.

[372] ORA-14, at 34.

SCE agrees to use the actual recorded expense for 2016.[373] For 2017 and 2018, SCE proposes using a six-year average of 2011-2016, modified by removing costs of $1 million each for 2013 and 2014 associated with overhauling two diesel generator units (8 and 14) and adding the 2017 forecast expense for overhauling unit 15. This would result in a 2017 forecast of $2.207 million and $0.213 million for 2018.[374]

The use of averaging is consistent with Commission precedent, particularly when, as in this instance, the recorded costs fluctuate significantly (from $0.756 million in 2011 to $0.007 million in 2016). Modifying the average to account for capital intensive projects (the unit overhauls) would, however, be contrary to the purpose of averaging and SCE has not established this would improve the accuracy of its forecast. We rely on a forecast based on average recorded costs to account for historical fluctuations rather than trying to predict annual expenditures. Therefore, we find ORA's recommendation is just and reasonable and adopt the 2016 actual recorded expense of $.007 million and the forecast of $0.448 million for each of the years 2017 and 2018.

7.5. Generation - Other

7.5.1. Mountainview

Excepting ORA's recommendation to use 2016 recorded capital expenditures, to which SCE agreed, no party disputed SCE's O&M expenses or capital expenditures. We find they are reasonable and adopt them.

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[373] SCE-21, at 9.

[374] SCE-21, at 10-12.

7.5.2. Peakers

Excepting ORA's recommendation to use 2016 recorded capital expenditures, to which SCE agreed, no party disputed SCE's O&M expenses or capital expenditures. We find they are reasonable and adopt them.

7.5.3. Mohave Closure

Excepting ORA's recommendation to use 2016 recorded capital expenditures, to which SCE agreed, no party disputed SCE's O&M expenses or capital expenditures. We find they are reasonable and adopt them.

7.5.4. Solar Photovoltaic

SCE owns and operates 25 solar generating plants with a total capacity of 67.5 MW (Alternating Current).[375]

SCE submits its 2013 and 2014 O&M expenses for reasonableness review in this GRC.[376] SCE incurred $8.286 million for 2013 and $4.270 million for 2014.[377] These expenses are not disputed and we find them reasonable and recoverable.

SCE's 2018 O&M forecast for Account 549 (labor and other expenses) is $1.510 million[378] and $2.332 million in Account 550 (rent).[379] SCE's 2016-2020 capital forecast is $1.480 million based on a forecast of $0.680 million for 2016 and $0.2 million annually for 2017-2020.

Excepting ORA's recommendation to use 2016 recorded capital expenditures, no party disputed SCE's O&M expenses or capital expenditures.

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[375] SCE-05, Vol. 5, Pt. 1, at 1.

[376] D.09-06-049, at 57, Conclusions of Law 9 and 12.

[377] SCE-05, Vol. 5, Pt. 1, at 19:8-10 and Figure VI-8.

[378] SCE-05, Vol. 5, Pt. 1, at 13.

[379] SCE-05, Vol. 5, Pt. 1, at 16.

We find they are reasonable and adopt SCE's 2018 O&M forecast of $2.842 million and its 2016 recorded capital expenditure of $0.004 million and its forecasts of $0.2 million each for 2017 and 2018.

7.5.5. Fuel Cells

SCE's O&M forecast for its fuel cell program is $0.379 million. SCE did not make a capital request for this program. This amount was not disputed by any party. We find it is reasonable and adopt it.

8. Human Resources

SCE's human resources-related O&M forecast covers the costs of hiring, retaining, and managing SCE's workforce. This includes the administrative costs of the human resources function, plus the costs of benefits and other non-base pay compensation for SCE employees across the utility.

SCE presents its Human Resources (HR) testimony in three volumes:

- Volume 1 presents SCE's Test Year 2018 O&M forecast for its Human Resources Operating Unit, which includes salaries and a short-term incentive program for executive officers.
- Volume 2 presents SCE's Test Year 2018 forecast for its total compensation programs, other than base pay. Those programs include short-term incentives for non-officer executives, long-term incentives for executives, employee recognition awards, and other benefits such as pensions and health insurance.
- Volume 3 presents SCE's Total Compensation Study (TCS)

As shown in the table below, SCE's total forecasted HR O&M expenses for Test Year 2018 equal $582.370 million.

Human Resources
Test Year 2018
O&M Forecast[380]
Constant 2015 $000 and Nominal $000

Activity	2018
Human Resources Department and Executive Officers	64,950
Benefits and Other Compensation[381]	517,420
Total	582,370

We note at the outset that we review SCE's HR request in the context of several legislative developments that occurred after SCE filed this application. First, in October 2015 Assembly Bill (AB) 1266 became law and added Section 706 to the Public Utilities Code.[382]

Pub. Util. Code § 706(b) provides as follows:

> For a five-year period following a triggering event, no electrical corporation or gas corporation shall recover expenses for excess compensation from ratepayers unless the utility complies with the requirements of this section and obtains the approval of the commission pursuant to this section.[383]

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[380] SCE-22, at 1, Table I-1 (Human Resources/Executive Officers, O&M Forecast by FERC Account) and SCE-22, at 8, Table II-3 (Benefits and Other Compensation, Forecast by FERC Account). Activity 926 forecasts are presented in nominal $000 dollars. All other activity forecasts are presented in constant 2015 $000 dollars.

[381] This benefits and other compensation amount is from SCE's June 2017 rebuttal testimony (SCE-22). Subsequent to rebuttal testimony, in December 2017 (SCE-59, at 32-35), SCE updated the forecasts for certain elements of benefits, including an accounting change.

[382] Stats. 2015, ch. 599.

[383] The terms in this Section are defined as follows:

> Pub. Util. Code § 706(a)(2) provides: "A 'triggering event' occurs if, after January 1, 2013, an electric corporation or gas corporation violates a federal or state safety regulation with respect to the plant and facility of

Footnote continued on next page

Pub. Util. Code § 706(f) mandates that

> in every decision on a general rate case, [the Commission] shall require all authorized executive compensation to be placed in a balancing account, memorandum account, or other appropriate mechanism so that this section can be implemented without violating any prohibition on retroactive ratemaking.

The Legislature directed the Commission to implement these provisions in GRC proceedings such as this one. However, we issued our decision in SCE's 2015 GRC in November 2015, which left insufficient time to implement the legislation. Instead, SCE proposed in the instant application to establish a "SCE Officer Compensation Memorandum Account" (SOCMA) to track the amounts authorized by the Commission in SCE's 2018 GRC decision over the GRC period related to all officer compensation including annual salary, bonus, benefits, or other consideration of any value.

During the pendency of this proceeding, the requirements adopted in AB 1266 have already been superseded by legislation passed in 2018, Senate Bill (SB) 901.[384] SB 901 repeals the language in Public Utilities Code § 706, and adds new language prohibiting an electrical or gas corporation from recovering from ratepayers any annual salary, bonus, benefits, or other consideration of any value, paid to an officer of the electrical corporation or gas corporation, and

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> the utility and, as a proximate cause of that violation, ratepayers incur a financial responsibility in excess of five million dollars ($5,000,000)."
>
> Pub. Util. Code § 706(a)(1) provides: "'Excess compensation' means any annual salary, bonus, benefits, or other consideration of any value, paid to an officer of an electrical corporation or gas corporation that is in excess of one million dollars ($1,000,000)."

[384] Stats. 2018, ch. 626.

requires that compensation instead be funded solely by shareholders of the utility. Revised § 706 states:

> (a) For purposes of this section, "compensation" means any annual salary, bonus, benefits, or other consideration of any value, paid to an officer of an electrical corporation or gas corporation.
>
> (b) An electrical corporation or gas corporation shall not recover expenses for compensation from ratepayers. Compensation shall be paid solely by shareholders of the electrical corporation or gas corporation.

The Commission implemented these requirements in Resolution E-4963.[385] This Resolution ordered affected utilities, including SCE, to establish "Officer Compensation Memorandum Accounts" (OCMA) with an effective date of January 1, 2019. SCE complied by filing Advice Letter (AL) 3927-E, which was approved by the Commission's Energy Division on January 29, 2019. The OCMA established by SCE includes SCE's description of the disposition and review procedures for the account: "SCE anticipates that the officer compensation amounts authorized by the Commission in the 2018 GRC decision, for 2019, will be refunded to customers when SCE implements the 2019 Post-Test Year revenue requirement in rates either on a stand-alone basis or through its first consolidated revenue requirement and rate change advice letter submitted in 2019."[386]

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[385] Resolution E-4963, December 13, 2018. Commission Resolution to Establish Memorandum Accounts to Track Compensation Paid to an Officer of an Electrical or Gas Corporation Pursuant to SB 901.

[386] Revised Cal. PUC Sheet No. 65678-E, Section N.20.c. (OCMA), Disposition and Review Procedures).

Our review of the legislative events recounted above and our review of the OCMA section of SCE's Preliminary Statement confirms that only the Test Year 2018 officer compensation amounts adopted in this decision shall be collected from SCE's ratepayers, and not the 2019 and 2020 compensation. This decision implements the provisions of SB 901 as follows: (1) we have removed the funding for 2019 and 2020 revenue requirements that would otherwise collect from ratepayers "salaries, bonuses, benefits, and all other consideration of any value paid to officers;" and (2) consistent with the disposition and review procedures described by SCE in its Preliminary Statement, we have included an Ordering Paragraph directing SCE to refund to customers any amounts tracked in the OCMA, as part of SCE's revenue requirement and rate change advice letter implementing this decision.

8.1. Human Resources Department and Executive Officers

The first portion of SCE's Test Year 2018 forecast is for $64.950 million for administrative and general (A&G) expenses to support its HR department and for certain costs related to executive officers, primarily SCE's Executive Incentive Compensation (EIC) Plan. The table below presents the details of SCE's request.

Human Resources and Executive Officers – Combined
Summary of 2018 Forecast
(Constant 2015 $000)

FERC ACCOUNT	ACTIVITY	2018
920/921	Human Resources A&G Salaries / Office Supplies and Expenses	31,729
923	Human Resources Outside Services Employed	6,954
926	Human Resources Employees (Pensions and Benefits-related) Salaries / Office Supplies and Expenses	5,109
	Subtotal: Human Resources Operating Unit	43,792
920/921	Executive Officers A&G Salaries / Office Supplies and Expenses	19,611
923	Executive Officers Outside Services Employed	1,547
	Subtotal: Executive Officers	21,158
	Total O&M Expense	64,950

8.1.1. Human Resources Operating Unit

For Test Year 2018, SCE forecasts $43.792 million of expenses for the Human Resources Operating Unit (HR Department) in FERC accounts 920, 921, 923 and 926. The HR Department consists of four groups: (1) Talent Solutions; (2) Business Partners; (3) Total Rewards & Services; and (4) Strategy & Workforce Insights.

No parties contested the reasonableness of SCE's forecast for HR Department O&M expenses, and we approve SCE's Test Year 2018 forecast of $43.792 million, as summarized in the table above.

8.1.2. Executive Officers

For Test Year 2018, SCE forecasts $21.158 million for executive officer cash compensation (salaries and short-term incentives), non-labor expenses, and outside services. SCE's forecast is based on the five-year average of recorded costs from 2011 to 2015. As shown in the table below, most of the forecast costs consist of funds for the executive officer portion of the EIC Plan, which is included in FERC Account 920 (other non-officer executive EIC costs are

included in SCE's Short-term Incentive Program (STIP), which we discuss below).

Executive Officers
Salaries and Short-term Incentives
Summary of 2018 Forecast
(Constant 2015 $000)

FERC ACCOUNT	ACTIVITY	2018
920	Executive Officers A&G Salaries/EIC Plan	17,222
921	Office Supplies and Expenses	2,389
923	Executive Officers Outside Services Employed	1,547
	Subtotal: Executive Officers	21,158

SCE describes its EIC Plan as "part of the market-competitive total compensation package for SCE's executive workforce."[387] Payouts are based on SCE's annually-determined performance goals, which are the same as the goals for the STIP. Individual executives' performance ratings vis-a-vis these goals are determined at the end of the year, with each executive's "target bonus" subject to modification by the officer to whom that executive reports, as well as at the corporate level by the Chief Executive Officer of Edison International.

TURN makes two recommendations to reduce the Test Year 2018 EIC forecast. First, TURN recommends that the Commission base SCE's forecast on a five-year average of target incentive levels, rather than the historically higher actual payouts. This reduces the test year labor forecast by $0.979 million. Second, TURN recommends that the Commission deny rate recovery of 40% of the resulting forecast, in order to remove the costs of incentives tied to "core

[387] SCE-06, Vol. 2, at 29.

earnings" and utility financial performance. This reduces the forecast by an additional $1.694 million, for a total reduction of $2.673 million.[388]

NDC recommends a $4.249 million reduction by calculating the average of SCE's 2013-2015 EIC expenses and then applying a 62.5% EIC goal-related reduction.

In rebuttal, SCE contends that the level of EIC payouts fluctuates significantly from year to year due to the relatively small number of employees in the executive officer population and the varying performance levels on a year- to-year basis, and that its five-year averaging methodology followed Commission guidance to provide the most reasonable estimate of labor costs in the Test Year.[389]

In D.15-11-021 we reached a number of findings regarding SCE's EIC payouts:

> We agree with SCE that financial performance may benefit ratepayers, however, the ratepayer benefit is much less direct than the shareholder benefit. Further, in some instances, financial performance may be achieved at the detriment of ratepayers. Accordingly, we adopt 40% of SCE's EIC forecast for rate recovery and approve the non-EIC portions of SCE's executive compensation request.[390]

We also suggested that "if SCE seeks rate recovery of higher portions of the EIC in its next GRC, it should provide substantially more evidence that the

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[388] SCE-22 at 2, Table I-2 (Executive Officers – FERC Account 920/921, Recorded 2011-2015/2018 Forecast, Summary of SCE, ORA, TURN and NDC Positions, Constant 2015 $000) and SCE-29 at 308.

[389] SCE Opening Brief at 152, citing D.89-12-057, 34 CPUC2d 199.

[390] D.15-11-021 at 261, and Findings of Fact 337-339.

EIC awards incent executives to achieve ratepayer benefits."[391] In the instant proceeding, SCE included testimony asserting that EIC awards will lead to customer benefits, because 60% of the performance metrics relate to results such as operating in a safe and reliable manner and improved customer satisfaction (the other metric, accounting for 40% of results, is tied to whether SCE meets its Core Earnings Target for the year). SCE's additional testimony, while informative, is not evidence that the EIC awards incent executives to achieve ratepayer benefits. We remain unconvinced that ratepayers should fund 100% of SCE's EIC program.

To calculate this adjustment to our adopted revenue requirement, we begin with TURN's recommended starting point for SCE's forecast, the five-year average of target incentive levels, rather than actual payouts. This value is $4.235 million.[392] It would be illogical to base our forecast on SCE's recorded above-target payouts, as this ignores the very fact that the payouts were more than we authorized. We then subtract 40% of TURN's forecast, or $1.694 million, from that amount. As shown in the table below our authorized amount for FERC Account 920, Executive Officers A&G Salaries, in Test Year 2018 is $14.549 million.

8.1.3. Adopted Forecasts for SCE's Human Resources Department and Executive Officers

The table below summarizes our adopted forecasts for SCE's HR Department and Executive Officers:

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[391] *Id.*, at 261.

[392] TURN-01, at 16.

Human Resources and Executive Officers – Combined
Adopted 2018 Forecast
(Constant 2015 $000)

FERC Account	Activity	Requested	Authorized	Variance
920/921	Human Resources A&G Salaries / Office Supplies and Expenses	31,729	31,729	0
923	Human Resources Outside Services Employed	6,954	6,954	0
926	Human Resources Employees (Pensions and Benefits-related) Salaries / Office Supplies and Expenses	5,109	5,109	0
	Subtotal: Human Resources Operating Unit	**43,792**	**43,792**	**0**
920	Executive Officers A&G Salaries /	17,222	14,549	**(2,673)**
921	Office Supplies and Expenses	2,389	2,389	0
923	Executive Officers Outside Services Employed	1,547	1,547	0
	Subtotal: Executive Officers	**21,158**	**18,485**	**(2,673)**
	Total O&M Expense	**64,950**	**62,277**	**(2,673)**

8.2. Benefits and Other Compensation

The second portion of SCE's Test Year 2018 forecast is for $517.420 million for Benefits and Other Compensation.[393] As noted earlier, SCE's total compensation program comprises base pay, short-term incentives, long-term incentives, recognition awards, and benefits. We addressed base pay for SCE's executive officers in the preceding section of this decision. Base pay for non-officer executives is included in SCE's testimony regarding the respective Operating Units of those executives. The remainder of this section, therefore, addresses SCE's forecast for all other benefits and compensation programs.

SCE states in testimony that its compensation programs "target the market median and reward employees for individual, Operating Unit and Company

[393] This amount for benefits and other compensation is from SCE's June 2017 rebuttal testimony (SCE-22). Subsequent to rebuttal testimony, in December 2017 (SCE-59, at 32-35), SCE updated the forecasts for certain elements of benefits, including an accounting change.

performance. To attract and retain the workforce essential to the Company's operations, SCE offers a market-competitive compensation package."[394] The table below presents the details of SCE's request.

Benefits and Other Compensation – Combined[395]
Summary of 2018 Forecast
(Constant 2015 $000 and Nominal $000)

FERC Account	Activity	2018
920/921, 905, 500, 588	Short-term Incentive Program	132,905
920/921	Long-term Incentives	13,726
926	Pension Costs	97,474
926	401(k) Savings Plan	79,190
926	Medical Programs	110,719
926	Dental Plans	15,035
926	Vision Service Plan	3,443
926	Post-Retirement Benefits Other Than Pensions (PBOP) Costs	36,823
926	Group Life Insurance	1,426
926	Miscellaneous Benefit Programs	5,592
926	Executive Benefits	21,087
926	Third Party Billing & Non-Utility Affiliates P&B Credits	0
	Total O&M Expenses	517,420

Specific items within SCE's requests are opposed by ORA and TURN. ORA, having reviewed the entirety of SCE's request, noted in testimony that it does not oppose SCE's Test Year 2018 forecasts for the following programs:[396]

- Pension Costs

[394] SCE-06, Vol. 2, at 1.

[395] SCE-06, Vol. 2A2, at 3, Table I-1 (Benefits and Other Compensation – Combined, Summary of 2018 Forecast).

[396] ORA-15, at 17.

- 401(k) Savings Plan
- Dental Plans
- Vision Service Plan
- Post-Retirement Benefits Other Than Pensions (PBOP) Costs
- Group Life Insurance
- Miscellaneous Benefit Programs (with the exception of Recognition Programs)

We address parties' recommendations on the remaining contested items in the following sections.

8.2.1. Short-Term Incentive Program

SCE states that its Short-term Incentive Program (STIP) is the company's "annual variable pay program that provides employees an opportunity to earn a cash bonus based on achieving Company goals"[397] related to public and workplace safety, customer service, system reliability, cost control, and productivity.[398]

The STIP bonuses were historically awarded with respect to goals and budgets of the overall company and each individual Operating Unit. In 2015 SCE modified the basis for STIP funding to include a company-wide safety goal based upon a "Days Away, Restrictions and Transfers" (DART) injury rate target, with a no fatalities requirement. Initially, this metric was tied to 10% of STIP funding. In 2016, SCE revised the STIP again to remove any Operating Unit-specific goal component from the payout calculation. SCE states that this

[397] SCE-06, Vol. 2, at 23.

[398] *Ibid.*

aligned the STIP and the EIC by using the same set of measurable performance goals.

The current goals for STIP (and for EIC) are provided in the table below, along with the respective weights assigned to each goal (totaling 100, or 100%):

Company Goals Included in STIP
2016 Plan Year[399]

Strategic Focus Area	Goal Category	Goals	Target
Safety	Safety & Compliance	• Employee, Worker and Public Safety • Compliance (No significant non-compliance events)	10
Customer Relationship/ Operational & Service Excellence	Operational & Service Excellence	• Improve customer satisfaction through improving ranking in J.D. Power Customer Satisfaction Survey • Achieve Grid Reliability three-year rolling average targets for SAIDI, SAIFI and MAIFI • Protect critical infrastructure that supports SCE's ability to safely and effectively serve customer needs and protects customer information • Control costs in support of affordable customer rates • Achieve capital spending target that supports safe, reliable and affordable infrastructure and also lays the groundwork for a modernized grid that enables customer technology choices • Achieve Diverse Business Enterprise (DBE) Spend greater than/equal to 40%	20
Grid of the Future	Strategic Initiatives	• Advance SCE's Grid Modernization effort in order to support customer choices regarding technology and the manner in which they interact with the grid • Advance key regulatory proceedings that support customer rates and the safe and cost-effective retirement of SONGS	20
High Performance Organization	People and Culture	• Diversify our leadership pipeline including the representation of historically under-represented groups to further broaden our perspectives and better reflect our customers' viewpoints • Advance a High Performance Organization by enhancing the decision-making process and encouraging employee engagement	10
Affordability	Financial Performance	• Achieve Core Earnings target	40
Total			100

SCE forecasts $132.905 million of expenses for the STIP for Test Year 2018.[400] SCE states STIP costs are driven by a combination of factors, including

[399] SCE-06, Vol. 2A2, at 22.

[400] SCE-22, at 9, Table II-4 (Short-term Incentives (STIP)).

the number of eligible employees, target award levels, labor expense, and Company performance. SCE prepared its 2018 forecast using an "itemized forecast" methodology, starting with 2015 recorded costs, then escalating that value to adjust for various factors intended to reflect the current composition of SCE's labor force.[401]

ORA recommends $70.672 million for the STIP in the 2018 Test Year, a reduction of $62.233 million. First, ORA recommends full funding for the portions of the STIP that ORA views as directly tied to goals that benefit ratepayers (i.e., safety, customer relationships and operational excellence, and "Grid of the Future"). Second, ORA recommends equal sharing between shareholders and ratepayers of the funding related to "High Performance Organization," because ORA finds that some of these goals either do not clearly provide ratepayer benefits or do not appear to be transparent or readily quantifiable. Finally, ORA recommends no ratepayer funding for the portion of the STIP related to financial goals, contending that these incentives are clearly shareholder-oriented.[402]

TURN recommends $57.592 million for the STIP in the 2018 Test Year, a reduction of $75.313 million. First, TURN adjusts SCE's forecast of total STIP spending to equal 12.11% of labor expense, rather than the 15.97% SCE proposes (TURN's recommendation is the same ratio authorized by the Commission in the 2015 GRC decision). This reduces SCE's forecast by $37.861 million. Second, TURN joins ORA in recommending no ratepayer funding for 40% of the

[401] SCE-06, Vol. 2, at 28.

[402] ORA-15, at 10.

resulting forecast, in order to remove the costs of incentives tied to "core earnings" and utility financial performance. This reduces SCE's forecast by an additional $38.395 million, to the level of $57.592 million recommended by TURN.[403]

In its rebuttal testimony, SCE faults ORA and TURN for their failure to properly acknowledge the results of the 2018 TCS.[404] SCE notes that the Commission has directed SCE to submit the TCS and has relied upon these studies in past GRCs to show how SCE's workforce compensation compares to the market. SCE further notes that SCE's variable pay programs (including STIP and long-term incentives) are all included in the 2018 TCS, and the TCS results show SCE's total compensation is 1.9% below market. Based on these TCS results, SCE concludes that its STIP forecast should be adopted in full.

In our decision on the STIP in SCE's 2015 GRC application, we noted that in recent GRCs for all utilities we adopted reductions to short term incentives to account for payouts that are driven by shareholder benefits rather than ratepayer benefits. We found that "significant portions of the payout criteria are directly related to shareholder benefits," including achieving decisions in Commission proceedings (GRC, cost of capital) with outcomes or adopted policies that may or may not provide secondary benefits to ratepayers.[405] We also found that although SCE bears the burden of proving that incentive programs are a

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[403] TURN-01, at 10-12.

[404] SBUA served testimony critical of SCE's STIP (*see* SBUA-02 at 46-47) and SCE submitted rebuttal testimony addressing SBUA's recommendations (*see* SCE-22 at 11-12). However, SBUA and SCE entered into stipulations resolving the issues between them during the evidentiary hearings (see Exhibits SCE-SBUA-1 and SCE-SBUA-2).

[405] D.15-11-021 at 264.

reasonable cost-of-service, it had not demonstrated that costs related to these criteria are reasonable.[406] Nevertheless, we also stated that we do place weight on the results of the TCS, and we declined to adopt what we described as "deep cuts proposed by TURN and ORA." Our decision adopted a STIP forecast based on labor factors consistent with ORA and TURN recommendations, as well as an overall reduction of 10% "to account for STIP payout criteria that are not appropriate to charge to ratepayers."

Turning to the instant proceeding, TURN observes in its opening brief that the Commission acted somewhat inconsistently in the 2015 GRC decision: "it is not clear to TURN why the Commission only adopted a 10% reduction for the authorized STIP amount in the 2015 GRC based on the financial performance metric, given the recognition in the same decision that a 40% reduction was warranted for the Executive Incentive Compensation associated with the same financial performance metric."[407] We remedy that inconsistency in this decision: we adopt a forecast equal to $57.592 million[408] using TURN's recommended methodology to calculate that level of Test Year 2018 STIP expenses. We agree with TURN's use of the same ratio of total STIP spending to labor expense (12.11%) as we adopted in D.15-11-021. We also agree that 40% of the resulting value should be removed from SCE's 2018 STIP expenses in order to remove the costs of incentives tied to "core earnings" and utility financial performance.

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406 *Id.*, at 264-265.

407 TURN Opening Brief at 172.

408 This adopted amount is illustrative and may not match the final amount because it is dependent on the number of employees/labor expenses approved by this decision.

8.2.2. Long-Term Incentives

SCE describes its Long-Term Incentives (LTI) program as "an integral part of the total compensation package for executives, […] provided in the form of non-qualified stock options, restricted stock units, and performance shares."[409] SCE states that the LTI target for each executive is determined based upon the market data applicable for that executive's position, and is targeted at the market median.[410]

SCE forecasts expenses of $13.73 million for LTI compensation costs in Test Year 2018.[411] SCE prepared its forecast using the same itemized forecast methodology it used with the STIP, by starting with recorded costs, then escalating that value to adjust for various factors intended to reflect the current composition of SCE's executive population.[412]

In presenting its forecast, SCE also "acknowledges that the Commission has not viewed with favor past requests for rate recovery of its LTI program and has admonished SCE for continuing to do so."[413] SCE states that it "has buttressed its showing to reinforce the benefits to customers of funding this essential component of the total market-based compensation package for SCE's leadership team."[414]

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409 SCE-06, Vol. 2, at 34.

410 *Ibid.*

411 SCE-22, at 16, Table II-5 (Long-term Incentives).

412 SCE-06, Vol. 2, at 37.

413 *Id.*, at 33.

414 *Id.*, at 33.

ORA, TURN, NDC and SBUA all recommend that the Commission continue its practice of denying ratepayer funding for LTI. Each party contends that SCE has offered no material evidence that ratepayers benefit from the program.

In rebuttal, SCE defends the LTI program on bases similar to its defense of the STIP, citing the results of the 2018 TCS and its conclusion that overall compensation (including LTI) is at market.

The positions of both sides of this issue are essentially unchanged since SCE's 2015 GRC. In our decision in that proceeding, we concluded that LTI does not align executives' interests with ratepayer interests, and continued "our consistent practice" and denied SCE recovery for its LTI program. Our review of the record in the instant proceeding leads us to conclude that our approach should remain unchanged, and we again deny SCE recovery of its Test Year 2018 forecast LTI program expenses.

8.2.3. Recognition Programs

SCE describes its recognition programs as "low-cost tools that reward individual and team achievement." SCE has two recognition programs: Spot bonuses and Awards to Celebrate Excellence (ACE). Spot bonuses are cash awards for achievements such as promoting safety or leading programs that improve efficiency. ACE is a points-based program for participants in safety efforts. SCE requests approval of its 2018 forecast of $1.456 million for Recognition Program expenses.

In our decision on SCE's 2015 GRC, we agreed with SCE that the types of behaviors (e.g., a focus on safety) that these programs reward do further the provision of safe and reliable service at just and reasonable rates, and that program costs appear reasonable relative to the benefits. However, we also

noted that we shared ORA's concern regarding the lack of transparency in SCE's forecast. We declined to specifically authorize SCE's request, and considered these programs in our review of individual Operating Unit budgets.[415] We also directed SCE to "present a clear and coordinated showing on its forecast for these recognition programs in its next GRC direct testimony."[416]

ORA served testimony opposing approval of SCE's Test Year 2018 request, concisely demonstrating that SCE had again failed to provide the transparency needed to justify ratepayer funding of these programs.[417] We have reviewed SCE's direct testimony as well, and we also find that SCE failed to heed our direction.

However, clearly in response to ORA's critique of its direct showing, SCE did provide thorough support for its forecast in its rebuttal testimony. Based on our review of that information, we approve SCE request for $1.456 million in Test Year 2018 Recognition Program expenses.

8.2.4. Pension Costs

SCE's Retirement Plan provides eligible employees with income after their employment has ended. In its September 2016 application, SCE forecast $97.474 million for pension costs in the Test Year 2018 and $161.726 million and $162.895 million, respectively, for the 2019 and 2020 attrition years.[418]

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[415] D.15-11-021 at 267. We did not, as SCE suggests in its Opening Brief in this proceeding, "approve" SCE's 2015 request (SCE Opening Brief at 161: "Other recent Commission decisions have also approved rate recovery of similar recognition programs offered by other utilities with short-term incentive programs." Emphasis added.)

[416] *Ibid.*

[417] ORA-15, at 14-15.

[418] SCE-22, at 44.

ORA supported SCE's 2018 forecast in testimony, but recommended that the Commission deny SCE's request for the 2019 and 2020 increases. Instead, ORA recommended authorization of the 2018 amount, $97.474 million, annually for 2019 and 2020 as well.[419] ORA cited SCE's testimony regarding upcoming Retirement Plan changes, which SCE stated will reduce the plan's long-term cost structure. ORA also supported the continuation of the two-way Pensions Cost Balancing Account in order to protect both ratepayers and SCE from pension cost volatility.

In rebuttal testimony, SCE states that while it "respectfully disagrees with ORA and maintains the material reduction in the pension plan's cost structure will not be fully realized until years after the current GRC cycle" it accepts ORA's proposal regarding 2019 and 2020.[420]

In December 2017, SCE updated its Test Year 2018 request to $57.741 million based on a three-year average of the updated Pension forecast costs for 2018, 2019, and 2020 of $57.0 million, $57.4 million, and $58.819 million, respectively.[421] We approve SCE's updated proposal and authorize an annual pension cost forecast equal to $57.741 million for 2018, 2019 and 2020.

8.2.5. Medical Programs

SCE states that its medical program includes costs for the Company's medical programs for active employees, as well as a Preventive Health Account, and an Employee Assistance Program.

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[419] ORA-21, at 11, citing ORA-15 for general support.

[420] SCE-22, at 27.

[421] SCE-59, at 33.

SCE forecasts $110.719 million for medical programs costs for Test Year 2018.[422] SCE's forecast is based on applying escalation rates (0% for 2016, 7% for 2017, and 7% for the 2018 Test Year) to the 2015 recorded/adjusted costs.

ORA's Test Year 2018 forecast is $101.478 million, $9.241 million less than SCE's forecast. Although ORA did not challenge SCE's forecast methodology, ORA uses a medical escalation rate of 4.58% in the Test Year 2018 (vs. SCE's 7%). ORA also recommends using the same escalation rate for post-test year escalations.[423] ORA relied upon three sources of healthcare cost statistics to calculate its recommended medical escalation rate: (1) the 2016 Milliman Medical Index; (2) the California Employer Health Benefits Survey; and (3) the Kaiser Family Foundation's Medical Expenditure Panel Survey. ORA calculated the average of the three insurance premium rate increases cited in these three sources – 4.7%, 5.6%, and 3.45%, respectively – to arrive at a proposed medical escalation rate of 4.58%.[424]

In rebuttal, SCE faults ORA's use of general survey data to determine SCE's medical escalation rate. SCE states that its own estimates are based on cost increase projections that it requested directly from its medical plan carriers' underwriters, with a trend rate lower than what its medical carriers projected. SCE emphasizes that these underwriters used data that is specific to SCE's actual population demographics and the health conditions and plan utilization patterns of that population.

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[422] SCE-22, at 63.

[423] ORA-21, at 11.

[424] ORA-15, at 18-20.

In our decision addressing medical escalation in SCE's 2015 GRC, we stated that "we give significant weight to SCE's reference to escalation rates provided by its plan administrators, and find this preferable to relying on a broader public study as proposed by ORA." ORA has not demonstrated that a different approach is warranted in this proceeding, and we again adopt SCE's forecast based on SCE's escalation rate, $110.719 million for Test Year 2018. In future GRCs we will reconsider this approach if presented with evidence that SCE's forecast resulted in a significant over- or under-collected balance in the Medical Programs Balancing Account.

8.2.6. Executive Benefits Program

SCE states that its Executive Benefits Program offers a non-qualified Executive Retirement Plan that provides benefits to certain highly-paid management employees who are subject to federal compensation and contribution limits in the retirement plans which are offered to all other SCE employees.[425] For the Test Year 2018, SCE forecasts Executive Benefits Program costs of $21.087 million.[426]

ORA recommends disallowing 50% of SCE's Test Year 2018 forecast for Executive Benefits based on past Commission precedent and ORA's position in prior GRCs that ratepayers should not bear the full cost of these supplemental benefits, which are in excess of federal limits and which serve to further enhance benefits to already highly-compensated employees.[427]

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[425] ORA-15 at 20, citing SCE-06, Vol. 2, at 101.

[426] SCE-22 at 32.

[427] ORA-15, at 21.

We continue to follow the precedent established in SCE's 2009, 2012 and 2015 GRCs,[428] and allow 50% rate recovery of SCE's forecast. As we noted in D.15-11-021, these Executive Benefits are, in part, based on bonuses received by the executives. As discussed above, these bonuses may not be appropriate for rate recovery. Accordingly, benefits based on those bonuses are also not appropriate. We adopt ORA's recommended amount for Executive Benefits, $10.135 million.[429]

8.2.7. Adopted Forecasts for Benefits and Other Compensation

The table below summarizes our adopted forecasts for Benefits and Other Compensation:

[428] D.12-11-051 at 476-477.

[429] ORA's forecast is not equal to one-half of SCE's forecast because ORA relies on its own reduced labor forecast. SCE notes that differences between ORA's and SCE's forecast labor expense will be addressed when the authorized labor expense is determined and reflected in the Results of Operation model. *See* SCE-22, at 32, footnote 91.

Benefits and Other Compensation – Combined[430]
Illustrative Adopted 2018 Forecast
(Constant 2015 $000 and Nominal $000)

		SCE Proposed	Adopted	Difference
Short-term Incentive Program 920/921, 905, 500, 588	Short-term Incentive Program	132,905	57,592[431]	(75,313)
920/921	Long-term Incentives	13,726	0	(13,726)
926	Pension Costs	97,474	57,741	(39,733)
926	401(k) Savings Plan	79,190	79,190	0
926	Medical Programs	110,719	110,719	0
926	Dental Plans	15,035	15,035	0
926	Vision Service Plan	3,443	3,443	0
926	PBOP Costs	36,823	32,973	(3,850)
926	Group Life Insurance	1,426	1,426	0
926	Miscellaneous Benefit Programs	5,592	4,136	(1,456)
926	Executive Benefits	21,087	10,135	(10,952)
926	Third Party Billing & Non-Utility Affiliates P&B Credits	0	0	0
	Total O&M Expenses	517,420	344,723	(172,697)

[430] SCE-06, Vol. 2A2, at 3, Table I-1 (Benefits and Other Compensation – Combined, Summary of 2018 Forecast) for SCE proposed amounts. SCE updated the forecasts for certain elements of benefits, including an accounting change in SCE-59 at 32-35. The adopted amounts are illustrative and may not match the final amounts because they are dependent on the number of employees/labor expenses approved by this decision.

[431] TURN-01, at 15.

8.3. Human Resources – Total Adopted Forecast

Human Resources
Test Year 2018
Illustrative Adopted O&M Forecast
Constant 2015 $ 000

	SCE Request	Adopted	Variance
Human Resources Department and Executive Officers	64,950	62,277	(2,673)
Benefits and Other Compensation	517,420	344,273	(172,697)
Total	582,370	407,000	(175,370)

9. Operational Services

SCE's testimony on Operational Services presents its Test Year 2018 forecasts for a number of organizations that support the utility's operations on a daily basis. As summarized in the tables below, SCE requests approval of Test Year 2018 capital expenditures totaling $230 million and O&M expenses totaling $113 million.

Operational Services

Operating Unit	2018 Capital Expenditure Forecast (Excluding IT) (CPUC Jurisdictional Nominal $000)	2018 O&M Expense Forecast (Total Company 2015 Constant $000)
Business Resiliency	17,301	7,964
Corporate Environmental Services	672	12,120
Corporate Real Estate	180,215	50,987
Corporate Health and Safety	0	5,470
Corporate Security	22,380	26,906
Supply Management	365	9,475
Transportation Services	9,257	0
Total	230,190	112,904

*Due to rounding, subtotals may not sum to totals.

9.1. Business Resiliency

SCE states that its Business Resiliency organization provides company-wide governance and program management for business continuity, disaster recovery, assessment and mitigation, and emergency planning and

response programs. SCE forecasts $7.964 million in O&M expenses for the organization in Test Year 2018.[432] ORA contests $74,000 of that amount, which SCE requests to fund one analyst position to better support Emergency Management Operations training and exercise activities. SCE explains that it has added approximately 300 new members to Incident Support Teams and Incident Management Teams and the existing analyst could not support the expanded teams. We find SCE's request reasonable and we approve SCE's Test Year O&M forecast of $7.964 million.

SCE forecasts $17.3 million (CPUC Jurisdictional) for Test Year 2018 capital expenditures.[433] No party opposes SCE's request. We approve SCE's unopposed request.

9.2. Corporate Environmental Services

SCE states that its Corporate Environmental Services (CES) organization is responsible for coordinating activities involving various public, private, and governmental agencies and organizations on environmental matters and issues that affect company operations, including legislative, regulatory, compliance trends, and policies. CES also supports non-capitalized project services such as environmental siting, licensing, permitting, project construction mitigation, monitoring, and reporting activities.

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[432] SCE-23, Vol. 1 at 2, Table I-1 (Business Resiliency 2018 O&M Forecast by FERC Account, Constant 2015 $000).

[433] SCE-206, SCE Response to ALJ-Verbal-005 Q.01 (Second Supplemental response to ALJ Verbal-001): "The number in [SCE-23, Volume 01, Page 7, Table I-5, Summary of Business Resiliency Capital Expenditures] shows $33.921 million for 2018 which includes FERC jurisdictional capital. The forecast was not jurisdictionalized in testimony.

SCE forecasts $12.120 million in Test Year 2018 O&M expenses.[434] SCE's request is unopposed, and we approve this amount.

SCE's CES forecast for capital expenditures consists of a project on well decommissioning.[435] SCE's 2016-2018 forecast originally included $651,000 for 2016. In its rebuttal testimony, SCE accepted ORA's recommendation to adjust the 2016 value to correspond with 2016 recorded capital expenditures of $532,000 which results in a downward adjustment of $119,000. We approve that updated value for 2016. We approve SCE's otherwise unopposed CES capital expenditure forecast for 2016-2018 equal to $1.864 million.

Finally, SCE also supports the request made by SDG&E in this proceeding for recovery of SDG&E's costs relating to the San Dieguito Wetlands and Wheeler North Reef.[436] We approve SDG&E's proposed calculation of its 20% share and overhead costs for marine mitigation with escalation, which is $991,000, $1.015 million, and $1.038 million (all nominal dollars) in 2018, 2019, and 2020, respectively.[437]

9.3. Corporate Real Estate

SCE states that its Corporate Real Estate (CRE) organization plans, manages, and maintains SCE's electric and non-electric real estate assets across SCE service territory. Prior to 2014, CRE's area of responsibility included only

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[434] SCE-23, Vol. 1, at 12, Table II-8 ("Summary of Corporate Environmental Services O&M by FERC Account").

[435] SCE-07, Vol. 2, at 21, Table V-2 (Well Decommission Project 2016-2020 Forecast).

[436] Pursuant to a Coastal Development Permit granted by the California Coastal Commission SCE must mitigate environmental impacts on marine life and maintain and monitor the San Dieguito Wetlands and Wheeler North Reef.

[437] SDG&E-01, at 4-5.

non-electric facilities, approximately 229 buildings. Beginning in 2014, CRE's scope expanded to planning and managing buildings at electric facilities as well. Today, the CRE-managed portfolio includes approximately 1,300 buildings covering more than 7.3 million square feet across SCE's 50,000 square mile service territory.[438]

9.3.1. CRE O&M

SCE forecasts $50.987 million in CRE O&M expenses for Test Year 2018, for labor, rents, and maintenance activities.[439] No parties contested SCE's forecast. We approve SCE's request.

9.3.2. CRE Capital

SCE forecasts Test Year 2018 capital expenditures for three major programs within CRE: (1) Service Center Modernization Program, (2) Operational Support Program, and (3) Blanket Capital Program. As shown in the table below, SCE requests authorization of a total 2016-2020 forecast equal to $448.049 million.[440]

[438] SCE-07, Vol. 3, at 17.

[439] SCE-23, Vol. 2, at 1, Table I-1 (Corporate Real Estate 2018 O&M Forecast by FERC Account, Summary of SCE, ORA, and TURN Positions, Constant 2015 $000)

[440] SCE-23, Vol. 2, at 2, Table I-2 (Corporate Real Estate 2016-2018 Capital Expenditures Forecast Summary of SCE, ORA, and TURN Positions, Nominal $000) Line Nos. 1-3 exclude 2016 recorded capital expenditure update (See ORA-SCE-108-TXB, Q2 Supplemental Revision 2 and SCE-29 at 49.

Corporate Real Estate
2016-2018 Capital Expenditures Forecast
Summary of SCE, ORA, and TURN Positions[441]
Nominal $000

Description	Forecast			Variance from SCE Forecast		SCE Rebuttal Position
	SCE Application	ORA	TURN	ORA	TURN	
Service Center Modernization Program	121,826	79,271	46,768	(42,555)	(75,058)	108,756
Operational Support Program	205,381	151,179	153,950	(54,202)	(51,431)	160,315
Blanket Capital Program	164,244	118,806	106,700	(45,438)	(57,544)	155,847
IT Infrastructure and Equipment	25,713	22,296	10,628	(3,417)	(11,669)	23,131
Total	517,164	371,552	318,046	(145,612)	(195,701)	448,049

ORA recommends a uniform 29% reduction of SCE's CRE capital forecast for 2017 and 2018, resulting in CRE capital forecasts of $117.164 million in 2017 and $156.903 million in 2018. ORA recommends this reduction because SCE spent 29% less than forecast on CRE capital projects in 2016. ORA also notes that the highest level of CRE capital expenditures from 2011-2016 was $125.505 million in 2014.[442]

SCE describes ORA's approach as an arbitrary blanket reduction that "fails to address the particular needs for the projects that SCE discusses in its testimony."[443] SCE notes that ORA takes no issue with SCE's justification for CRE capital projects or the reasonableness of the forecasts for those projects, nor does ORA dispute that the SCE's proposed CRE capital projects are necessary to

[441] SCE-23, Vol. 2, at 2, Table I-2 (Corporate Real Estate 2016-2018 Capital Expenditures Forecast Summary of SCE, ORA, and TURN Positions, Nominal $000)

[442] ORA-16 at 30 and SCE-23, Vol. 2, at 5.

[443] SCE Opening Brief at 167.

support occupant safety, business and operational needs, compliance requirements, and facility preservation.[444]

The Commission has at times found an approach such as ORA's proposed across-the-board reductions to SCE's request to be appropriate (e.g., when a request has no explainable relationship to well-established and stable recorded costs). In this instance, however, that is not the case for recorded costs, and we have the benefit of TURN's testimony on the same matters. TURN reviewed each of the four major programs in the CRE organization, and conducted a project-specific analysis of SCE's numerous proposals. That analysis informs our decisions below.

9.3.2.1. Service Center Modernization Program

SCE operates 37 service centers across the SCE service territory. Each service center houses multiple Operating Units, with T&D being the primary occupant. SCE states that depending on the location of the site, the service center can also host multiple other SCE occupants, such as Customer Service, Regional Public Affairs, and Transportation Services. Service centers function as the operational base for crews in steady-state, storm, and emergency conditions.

The facilities at each service center include the following:

- general administrative offices,
- logistics buildings (i.e., shop),
- materials storage areas and structures (such as paved surface lots, canopied areas, and warehouses),
- vehicle maintenance facilities (i.e., garages), and
- interior and outside training areas.

[444] *Ibid.*

SCE states that it considers the dependability and operability of SCE's service centers to be critical to safely and efficiently delivering reliable service to SCE's customers.[445]

In support of its forecast capital expenditures, SCE explains that its CRE organization employs an Asset Management Methodology to prioritize facility and capital work based on evaluation of three widely used and standardized metrics:[446]

1. **Facility Condition Index (FCI)**: assesses conditions (e.g., age and wear of the building and its systems), and compares the cost to improve them against the cost to replace the building or site. The lower the FCI, the better condition of the asset.
2. **Asset Priority Index (API)**: rates the relative importance of a facility among the network of facilities required to service SCE's customer base.
3. **Fitness for Purpose**: where the FCI and API focus on the condition and criticality of a facility, this factor considers how the facility supports changes to business operations, such as regulatory pressures, work functions, staff levels, work processes, and equipment (e.g., data processing equipment, vehicles, and storage systems).

Using this methodology to prepare its forecast for this GRC cycle, SCE identified 10 of its 37 service centers as having priority for modernization. SCE states that those locations have FCI values between 13% and 35%. SCE further contends that the building configuration, property size, and other physical site limitations of those service centers do not properly support current work processes and equipment.

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445 SCE-07, Vol. 3, at 51.

446 *Id.*, at 38, and accompanying footnotes.

SCE's requested expenditures are summarized in the table below. SCE forecasts $176.306 million in 2017-2020 capital expenditures for this program (excluding associated IT Infrastructure and Equipment forecasts where applicable). TURN recommends reduced funding for five projects, no funding for two projects, and does not oppose three of the projects on SCE's list. TURN's recommendations result in proposed capital expenditures totaling $55.429 million, a reduction of $120.877 million from SCE's requested amount.

Corporate Real Estate
Service Center Modernization
Capital Expenditures 2017-2020 Forecast (Contested Service Centers)
Summary of SCE and TURN Positions (excluding IT)
Nominal $000

Service Center Modernization	SCE Application 2017-2020	TURN Forecast 2017-2020	Variance	SCE Rebuttal Position
Barstow Service Center	6,036	6,036	0	6,036
Bishop Service Center	12,789	7,527	(5,262)	12,789
Blythe Service Center	7,992	7,992	0	7,992
Kernville Service Center	13,608	8,264	(5,344)	13,608
Redlands Service Center	24,801	4,435	(20,366)	24,801
Ridgecrest Service Center	15,627	6,500	(9,127)	15,627
San Joaquin Service Center	21,108	12,527	(8,581)	21,108
Santa Ana Service Center	26,612	0	(26,612)	26,612
Santa Barbara Service Center	45,585	0	(45,585)	45,585
Shaver Lake Service Center	2,148	2,148	0	2,148
Total*	176,306	55,429	(120,877)	176,306

*Due to rounding, subtotals may not sum to totals.

As we explain in detail below, in this decision we direct SCE to proceed with each of the Service Center Modernization projects proposed in its testimony: SCE shall complete each project as scoped in that testimony and, we hope, within its forecasted budgets. However, SCE shall record all the costs of the 6 projects discussed below (including the IT Infrastructure and Equipment), from their dates of inception through completion, below the line. It is our intent

that SCE's shareholders pay all costs of these projects, and ratepayers pay nothing.

Based on the table above, the total projected responsibility for shareholders for the 2017-2020 period is $114.546 million for the projects (excluding IT).

We take this action based on TURN's meticulously researched and documented testimony, which shows that for the past ten years, over the course of three GRC cycles, SCE has repeatedly requested and received significant funding to modernize its service centers, but has not used significant portions of those funds for that purpose. Instead, SCE explains that the funds were "reallocated at the corporate level to projects that were deemed more critical for the delivery of safe and reliable service to SCE's customers."[447] The purpose, need for, and cost of those projects remains a mystery to this Commission because SCE declined to provide this information in response to pointed challenges by TURN in SCE's 2012 rate case, its 2015 rate case, and now in this 2018 rate case as well. Instead, SCE provides one or two sentences that invoke the general principal that "utilities must retain flexibility in spending funds authorized in GRC decisions." In support of this oversimplified concept, SCE cites the testimony of its policy witness in its 2012 GRC, which is more of a rebuke to the Commission for its decision in the 2009 GRC than the promised explanation of the workings of "forecast test year ratemaking" that would justify SCE's repeated diversion of modernization funds. We have repeatedly authorized these funds to address what we believed to be significant modernization needs, on the basis of SCE's testimony that the funding was

[447] SCE-23, Vol. 2 at 16.

"critical to fostering safe and effective environments for its workforce"[448] and would address "severe and pressing needs."[449] Given that SCE finds it unnecessary to explain to this Commission its management of the funds that we authorized in our prior decisions, we order SCE to complete its list of prioritized projects, but deny cost recovery from ratepayers.

Like TURN, we "agree that Edison service centers should be appropriately maintained to be functional and in good condition."[450] We have no evidence in this proceeding that "corporate level" executives at SCE share that commitment. Ironically, as we discuss below, SCE's justification of the need to modernize its identified service centers is generally sound, which is consistent with our willingness to fund these projects in the past. That said, SCE's explanations for its failure to initiate and/or complete these supposedly urgent projects that have previously received funding are completely unconvincing and unsupported.

9.3.2.1.1. General Disagreements between SCE and TURN

This section summarizes TURN's program-wide critiques, and SCE's responses in rebuttal.

First, TURN extends its analysis of SCE's past spending to SCE's 2016 recorded costs. TURN lists the projects included in SCE's 2015 GRC request and

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448 *See* for example SCE-23, Vol. 2 at 7.

449 D.15-11-021 at 346-347. In that decision, we stated that we remained doubtful that SCE will implement funding at the full level requested, particularly based on SCE's past re-prioritization practices. We "quantified" our caution by approving only 50% of SCE's requested funding, explaining "[i]n this manner, while we provide some funding for a worthwhile program, we mitigate the risks that ratepayers may be charged for funding programs that are not implemented as planned."

450 TURN-02, at 10.

questions SCE's commitment to these projects based on SCE's minimal recorded spending in 2016. In rebuttal, SCE acknowledges TURN's observation but explains that it is renewing these requests because SCE did not receive authorized funding at the level requested in the 2015 GRC.

Next, TURN and SCE engage in a dispute over the proper definition, meaning and interpretation of the FCI scores used by a consultant engaged by SCE in 2013 to prepare an assessment of SCE's facility conditions, Parsons Environment and Infrastructure Group (Parsons). In that report, Parsons provides FCI estimates that are calculated using the standard methodology. However, Parsons recommended that SCE interpret those results in a different manner:

> Although current industry "standards" consider a building with an FCI of 0 to 5% good; 6 to 10% fair and 10% and above poor, in practice few, if any, inventories of public buildings ever achieve an overall rating of 10% or below.
>
> These FCI guidelines are general guidelines that are under almost constant debate within the building ownership communities because they do not take into account either modernization improvements, or expired systems' capital renewal costs; they only address ordinary maintenance items that have been deferred through a normal funding cycle. **Parsons has routinely found existing average building conditions throughout the United States to fall within the range of 25%-35% FCI**, and we propose the following guides used in this report:[451]

[451] TURN-2-A-1 (Attachment 1 to TURN Testimony on Corporate Real Estate, and Local Public Affairs Issues in Southern California Edison's 2018 General Rate Case – Corporate Real Estate) at 23 of 187, emphasis added.

Rating	Industry Standards	Parsons Standards Recommended to SCE
Good	0 — 5%	0 — 15%
Fair	5 — 10%	15 — 30%
Poor	10 — 30%	30 — 100%
Critical	30 — 100%	Not Used

We understand that the characterization of an identical FCI value of, for example, 35% as indicating that a facility's condition is either "poor" or "critical" may be used to strategic advantage by TURN or SCE, respectively. However, the salient point made by Parsons is that average building conditions throughout the United States fall within the range of 25%-35% FCI. SCE does not rebut this, nor does SCE explain why it disregards the advice of its own chosen expert. As will be seen below, the projects that SCE seeks to prioritize in this GRC cycle have FCIs either at the low end of Parson's "average" building condition range of 25%-35%, or lower than 25% and are therefore in better than average condition.

Next, TURN demonstrates that SCE has significantly increased its forecasts for previously proposed service center projects, compared to the levels in SCE's 2015 GRC application. This is illustrated in the table below from TURN's testimony:

TURN-02, Figure 8
Service Center Modernization Project
2015-2018 Cost Evolution[452]
Nominal $000

Service Center	2015 GRC Forecast	2018 GRC Forecast
Bishop	8,400	20,054
San Joaquin	11,000	22,415
Redlands	3,400	36,059
Kernville	8,000	19,638
Ridgecrest	6,500	25,015
Santa Ana	4,170	28,167
Total	**41,470**	**151,348**

In its rebuttal testimony, SCE responds that its current service center modernization forecasts consider current levels of building deterioration and requirements to support long term operational needs. As we will discuss below, for various reasons SCE's new cost estimates are essentially consistent with the significantly broader scopes of work that SCE has developed for each project for this GRC.

TURN also faults SCE because SCE began incurring costs on the costlier versions of these projects before the Commission published its 2015 GRC decision. Again, as discussed below for various projects, while we don't find SCE's explanations to be very clear or direct, given that shareholders will be funding these expanded projects, to the benefit of SCE's front-line employees and

[452] 2015 GRC forecast values from TURN-02, at 9, citing 2015 GRC SCE-08, Vol 3, Pt. 2, at 69, 2018 GRC SCE-07, Vol. 3 at 62, 66, 68, 70, 72, 74. 2018 GRC forecast values from SCE-23, Vol. 2. These values have been updated from SCE-07, Vol. 3 to include final 2016 recorded expenditures, rather than the estimates in SCE-07.

SCE's customers, we will not fault SCE across the board for acting prior to receiving authorization. We note exceptions to this approach below.

Finally, TURN states that it is unclear which parts of SCE's service center design standards have changed and indicates that SCE began using certain standards contained in the revised service center design standards before they were adopted at the corporate level. TURN also contends that SCE does not provide sufficient evidence that the new standards are necessary or provide benefit to customers. In its rebuttal testimony, SCE responds that its revised Service Center Design Standards reflect efforts to meet current operational needs, and will better support safe and productive operations.

As noted above, TURN's careful review of SCE's past spending and its forecasts for this GRC, including SCE's justifications for its approach to this program, have been extremely helpful in our own review of SCE's request. We return to TURN's critiques in our review of each proposed modernization project below. For each project, we review SCE's reasons for prioritization, then TURN's analysis and recommendation, and finally SCE's rebuttal to TURN. For those "repeat" projects where TURN recommends reduced funding (rather than outright denial of funding), it will be seen that TURN typically recommends approval of expenditures equal to the sum of recorded amounts through 2016 plus the lower level that SCE forecast in its 2015 GRC for 2017 and 2018.

9.3.2.1.2. Bishop Service Center

SCE states that the Bishop Service Center is 66 years old, is located on a "very small" 1.42 acre site with an unsatisfactory garage facility, and has a FCI score of 35%. SCE began construction of a new service center on nearby SCE-owned property in 2013. As noted above, total project cost has increased

from $8.4 million in the 2015 GRC to a forecast of $20.054 million in this proceeding.

TURN agrees that the Bishop Service Center must be relocated, but recommends reducing SCE's request because SCE did not spend funds on this project after it was authorized in SCE's 2015 GRC, and because SCE's direct testimony provided no explanation for the three-fold increase in SCE's funding request. TURN recommends authorization of $13.7 million for all past and future spending.[453] This represents the sum of SCE's recorded spending through 2016 plus the amount SCE requested in the 2015 GRC, escalated for inflation.

SCE responds in rebuttal that although spending on the Bishop Service Center project began in 2013, "SCE's 2015 capital expenditures exceeded the authorized service center modernization funding levels and were insufficient to complete the additional work necessary."[454] SCE also states that the increased costs reflect its recent actual experience with other service center modernization projects as well as "fitness for purpose deficiencies and regulatory requirements" identified after the 2015 GRC.[455] The expanded scope of the project now includes the following:

- Constructing a pre-fabricated logistics building for efficient pre-assembly of parts and materials;
- Constructing a vehicle garage, a wash bay, a fuel station, and a metal truck canopy for the safety of SCE crews while loading and preparing vehicles; and

[453] As calculated and explained by SCE in SCE-23, Vol. 2, at 23.

[454] SCE-23, Vol. 2, at 25.

[455] *Id.*, at 24.

- Installing a canopied hazardous material storage area to meet safety and compliance requirements.[456]

The table below shows the total Bishop-related expenditures requested by SCE and recommended by TURN.

Bishop Service Center Modernization Capital Expenditures
Prior and 2016 Recorded, and 2017-2020 Forecast[457]
Nominal $000

Line No.	Bishop Service Center	Recorded		Forecast				Total
		Prior	2016	2017	2018	2019	2020	
1	Service Center	4,042	1,213	12,789	0	0	0	18,044
2	IT Infrastructure and Equipment	194	229	1,483	104	0	0	2,010
3	Total	4,236	1,442	14,272	104	0	0	20,054
4	TURN	4,236	1,070	8,400	0	0	0	13,706

We find that SCE's proposed modernization of the Bishop Service Center is necessary for worker safety, regulatory compliance, and operational efficiency. We direct SCE to proceed with the project as described in its testimony, and at the funding levels shown on lines 1-3 in the table above. SCE shall record all the costs of this project, from the date of inception through completion, below the line.

9.3.2.1.3. Kernville Service Center

SCE states that the Kernville Service Center is 65 years old, is located on a small site in a residential neighborhood, and has an FCI score of 18% which as

[456] *Id.*, at 24.

[457] *Id.* at 23, Table II-9 (Corporate Real Estate, Bishop Service Center Modernization Capital Expenditures, Prior and 2016 Recorded / 2017-2020 Forecast, Summary of SCE and TURN Positions, Nominal $000) and Appendix A at A-81.

we noted above, SCE labels as "poor" while Parsons considers this "fair" condition. SCE began construction on nearby SCE-owned property in 2013. As noted above, total project cost has increased from $8.0 million in the 2015 GRC to a forecast of $19.638 million in this proceeding.

TURN recommends reducing SCE's request because SCE did not spend funds on this project after it was authorized in SCE's 2015 GRC, and because SCE's direct testimony provided no explanation for the significant increase in SCE's funding request. TURN recommends authorization of $12.074 million for all past and future spending. This represents the sum of SCE's recorded spending through 2016 plus the amount SCE requested in the 2015 GRC, escalated for inflation.

SCE's response to TURN in rebuttal is similar to its justification for the higher costs of the Bishop project. SCE states that the increased costs reflect the results of a post-2015 GRC Fitness for Purpose review such that the expanded scope of the project now includes the same projects listed above for Bishop:

- Constructing a pre-fabricated logistics building;
- Constructing a vehicle garage, a wash bay, a fuel station, and a metal truck canopy for the safety of SCE crews; and
- Installing a canopied hazardous material storage area.[458]

The table below shows the total Kernville-related expenditures requested by SCE and recommended by TURN.

[458] *Id.*, at 28.

Kernville Service Center Modernization Capital Expenditures
Prior and 2016 Recorded, and 2017-2020 Forecast[459]
Nominal $000

Line No.	Kernville Service Center	Recorded		Forecast				Total
		Prior	2016	2017	2018	2019	2020	
1	Service Center	3,601	598	13,607	0	0	0	17,806
2	IT Infrastructure and Equipment	15	229	1,483	104	0	0	1,831
3	Total	3,616	827	15,091	104	0	0	19,638
4	TURN	2,682	592	4,400	4,400	0	0	12,074

We find that SCE's proposed modernization of the Kernville Service Center is necessary for worker safety, regulatory compliance, and operational efficiency. We direct SCE to proceed with the project as described in its testimony, and at the funding levels shown on lines 1-3 in the table above. SCE shall record all the costs of this project, from the date of inception through completion, below the line.

9.3.2.1.4. Redlands Service Center

SCE states that the Redlands Service Center is 58 years old, is located on a small site, and has an FCI score of 20% which SCE considers "poor" while Parsons considers this "fair" condition. SCE began construction on nearby SCE-owned property in 2013. As noted above, total project cost has increased tenfold, from $3.4 million in the 2015 GRC to a forecast of $36.059 million in this proceeding (in fact, TURN notes that the Redlands project dates to SCE's 2012 GRC, where SCE requested $4.69 million for a combined service center and

[459] *Id.*, at 27, Table II-11 (Corporate Real Estate, Kernville Service Center Modernization Capital Expenditures, Prior and 2016 Recorded / 2017-2020 Forecast, Summary of SCE and TURN Positions, Nominal $000) and Appendix A at A-81.

garage modernization). This proceeding is the first instance where SCE has proposed relocating the service center instead of modernizing the existing facility.

TURN recommends reducing SCE's request because SCE has essentially presented the Commission with a *fait accompli*, having already purchased the land for the new service center and largely completed design work, at a combined cost of $8.6 million.[460] TURN faults SCE for neglecting to bring this to the Commission's attention while the 2015 GRC was still pending. TURN also questions SCE's assumptions about population growth in the region. TURN recommends authorization of $13.5 million for all past and future spending.[461] This represents the sum of SCE's recorded spending through 2016 plus the $4.9 million authorized in the 2015 GRC.

SCE's response to TURN in rebuttal focuses on defense of its forecast population growth and further explanation of the deficiencies of the current service center, which SCE states were still being evaluated during the 2015 GRC. SCE also asserts that the exiting service center has Fitness for Purpose deficiencies related to facility age, building condition, property size, and vehicle maintenance facility size.[462] SCE concludes by restating its firm belief that "the scope of work for the Redlands Service Center Modernization project is essential to support safe and reliable service to the Redland District."[463]

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460 TURN-02, at 16.

461 As calculated and explained by SCE in SCE-23, Vol. 2, at 30.

462 SCE-23, Vol. 2, at 32.

463 *Id.*, at 35.

The table below shows the total Redlands-related expenditures requested by SCE and recommended by TURN.

Redlands Service Center Modernization Capital Expenditures
Prior and 2016 Recorded, and 2017-2020 Forecast[464]
Nominal $000

Line No.	Redlands Service Center	Recorded		Forecast				Total
		Prior	2016	2017	2018	2019	2020	
1	Service Center	8,167	453	7,469	9,902	7,429	0	33,424
2	IT Infrastructure and Equipment	0	23	512	1,042	1,061	0	2,635
3	Total	8,167	476	7,980	10,945	8,491	0	36,059
4	TURN	8,176	429	1,633	1,633	1,633	0	13,504

We find that SCE's proposed modernization of the Redlands Service Center is necessary for worker safety, regulatory compliance, and operational efficiency. We direct SCE to proceed with the project as described in its testimony, and at the funding levels shown on lines 1-3 in the table above. SCE shall record all the costs of this project, from the date of inception through completion, below the line.

9.3.2.1.5. Ridgecrest Service Center

SCE states that the Ridgecrest Service Center is 59 years old, is located on a small site given its scope of work, and has an FCI score of 25% which once again SCE considers "poor" while Parsons considers this "fair" condition. As noted above, total project cost has increased from $6.5 million in the 2015 GRC to a forecast of $25.015 million in this proceeding. SCE has changed its position since

[464] *Id.*, at 30, Table II-13 (Corporate Real Estate, Redlands Service Center Modernization Capital Expenditures, Prior and 2016 Recorded / 2017-2020 Forecast, Summary of SCE and TURN Positions, Nominal $000) and Appendix A at A-81.

the 2015 GRC, when it described the existing site as "adequate" in size, such that SCE now proposes to expand the service center onto an adjacent site.

TURN recommends reducing SCE's request because SCE is well into the expansion but never informed the Commission of its new plans.[465] TURN faults SCE for neglecting to bring this to the Commission's attention while the 2015 GRC was still pending. TURN recommends authorization of $14.981 million for all past and future spending.[466] This represents the sum of SCE's recorded spending through 2016 plus the $6.5 million authorized in the 2015 GRC.

SCE's response to TURN in rebuttal contends that although SCE determined that there was a need for a larger site prior to the issuance of the 2015 GRC Decision, "the full scope of the expanded plan for the Ridgecrest Service Center modernization was still under consideration until after that time."[467] SCE also asserts that the need for a larger site is warranted by consideration of API and Fitness for Purpose evaluations and the deficiencies identified in those analyses. SCE concludes that "the combination of FCI, API and Fitness for Purpose analysis support the need to increase the size of the Ridgecrest site in support of safe and efficient service over the projected life of the facility."[468]

The table below shows the total Ridgecrest-related expenditures requested by SCE and recommended by TURN.

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[465] TURN-02, at 18.

[466] As calculated and explained by SCE in SCE-23, Vol. 2, at 36.

[467] SCE-23, Vol. 2, at 38.

[468] *Ibid.*

Ridgecrest Service Center Modernization Capital Expenditures
Prior and 2016 Recorded, and 2017-2020 Forecast[469]
Nominal $000

Line No.	Ridgecrest Service Center	Recorded		Forecast				Total
		Prior	2016	2017	2018	2019	2020	
1	Service Center	6,101	2,277	8,384	7,243	0	0	24,005
2	IT Infrastructure and Equipment	91	292	122	505	0	0	1,010
3	Total	6,192	2,569	8,506	7,748	0	0	25,015
4	TURN	6,192	2,289	3,250	3,250	0	0	14,981

We find that SCE's proposed modernization of the Ridgecrest Service Center is necessary to support of safe and efficient service over the projected life of the facility. We direct SCE to proceed with the project as described in its testimony, and at the funding levels shown on lines 1-3 in the table above. SCE shall record all the costs of this project, from the date of inception through completion, below the line.

9.3.2.1.6. San Joaquin Service Center

SCE states that the San Joaquin Service Center is 47 years old and has an FCI score of 25% which once again SCE considers "poor" while Parsons considers this "fair" condition. As noted above, total project cost has doubled from $11.0 million in the 2015 GRC to a forecast of $22.415 million in this proceeding. TURN notes that the San Joaquin project also dates to SCE's 2012 GRC, where SCE requested $10.54 million to modernize the facility. TURN states that the Commission authorized 90% of SCE's request, but the utility did not

[469] *Id*. at 36, Table II-17 (Corporate Real Estate, Ridgecrest Service Center Modernization Capital Expenditures, Prior and 2016 Recorded / 2017-2020 Forecast, Summary of SCE and TURN Positions, Nominal $000) and Appendix A at A-81.

spend the funds, then returned in the 2015 GRC with a new request for $11.9 million. TURN states that its analysis and discovery indicate that the significant increase in forecast expenditures since 2015 is due to expected population growth in the region.

TURN recommends reducing SCE's request because SCE has repeatedly failed to proceed with the project after being authorized to do so. TURN recommends authorization of $13.339 million for all past and future spending.[470] This represents the sum of SCE's recorded spending through 2016 plus the $6.5 million authorized in the 2015 GRC.

SCE's response to TURN in rebuttal repeats its defense that funds authorized in the 2012 GRC for the San Joaquin Service Center were reallocated at the corporate level to cover important T&D reliability expenditures, and the level of funding authorized by the Commission for the Service Center Modernization Program in the 2015 GRC was substantially less than the amount requested by SCE. SCE also defends its growth forecasts and states that the current scope of the project will address increased Fitness for Purpose operational requirements, such as adding a service bay at the existing garage and constructing new wash bays and new canopies to improve crew safety and meet compliance requirements.[471]

Altogether, SCE emphasizes that "the capital work identified in SCE's 2018 testimony for San Joaquin remains critical to foster a safe and effective work

[470] As calculated and explained by SCE in SCE-23, Vol. 2, at 39.

[471] SCE-23, Vol. 2, at 41.

environment and to addresses new operational methods and equipment requirements."[472]

The table below shows the total San Joaquin-related expenditures requested by SCE and recommended by TURN.

San Joaquin Service Center Modernization Capital Expenditures
Prior and 2016 Recorded, and 2017-2020 Forecast[473]
Nominal $000

Line No.	San Joaquin Service Center	Recorded		Forecast				Total
		Prior	2016	2017	2018	2019	2020	
1	Service Center	238	0	921	6,254	6,368	7,565	21,346
2	IT Infrastructure and Equipment	0	0	0	261	106	702	1,069
3	Total	238	0	921	6,515	6,474	8,267	22,415
4	TURN	238	0	921	4,060	4,060	4,060	13,339

We find that SCE's proposed modernization of the San Joaquin Service Center is necessary to foster a safe and effective work environment and to addresses new operational methods and equipment requirements. We direct SCE to proceed with the project as described in its testimony, and at the funding levels shown on lines 1-3 in the table above. SCE shall record all the costs of this project, from the date of inception through completion, below the line.

9.3.2.1.7. Santa Ana Service Center

SCE states that the Santa Ana Service Center is 56 years old and has an FCI score of 20% which once again SCE considers "poor" while Parsons considers

[472] *Id.*, at 40.

[473] *Id.*, at 39, Table II-19 (Corporate Real Estate, San Joaquin Service Center Modernization Capital Expenditures, Prior and 2016 Recorded / 2017-2020 Forecast, Summary of SCE and TURN Positions, Nominal $000).

this "fair" condition. As noted above, total project cost has increased almost seven-fold from $4.170 million in the 2015 GRC to a forecast of $28.167 million in this proceeding. TURN highlights that that the Santa Ana project dates back 10 years to SCE's 2009 GRC, where the Commission authorized $13.5 million for the project. After spending none of the authorized funds, SCE brought the project back in its 2012 GRC, where the Commission authorized $4.170 million for SCE to start again. SCE did not spend those funds on the project either, so it brought the project back for a third time in its 2015 GRC, again seeking $4.170 million to initiate the project.

TURN recommends that the Commission deny all requested funding because SCE has been repeatedly authorized funding for modernization of this service center in the past, and has never seen fit to undertake the project.

SCE's response to TURN asserts that "the Commission has acknowledged that utilities have flexibility in allocating authorized funding" and the funds authorized in the 2009 and 2012 GRC for the Santa Ana Service Center were reallocated for other urgent spending needs.[474] SCE also repeats that the reduced funding authorized by the Commission in the 2015 GRC "was insufficient to initiate all of the service center modernization work requested, including the modernization of the Santa Ana Service Center."[475] SCE also defends the significant increase in the cost of the project by noting that in this GRC SCE is proposing more extensive changes to the service center, including:

- Constructing a new Administration Building in a different location for safer, more efficient site circulation and parking;

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[474] *Id.*, at 45.

[475] *Ibid.*

- Constructing a new logistics building for assembly and staging of parts and materials that is currently performed outdoors;
- Constructing an improved outdoor laydown area, for safer, more effective staging of materials; and
- Installing building systems, furnishings, voice/data infrastructure, and security systems.[476]

The table below shows the total Santa Ana-related expenditures requested by SCE and recommended by TURN.

Santa Ana Service Center Modernization Capital Expenditures
Prior and 2016 Recorded, and 2017-2020 Forecast[477]
Nominal $000

Line No.	Santa Ana Service Center	Recorded		Forecast				Total
		Prior	2016	2017	2018	2019	2020	
1	Service Center	0	0	1,023	4,169	10,614	10,806	26,612
2	IT Infrastructure and Equipment	0	0	0	156	318	1,081	1,555
3	Total	0	0	1,023	4,326	10,932	11,886	28,167
4	TURN	0	0	0	0	0	0	0

Due to rounding, subtotals may not sum to totals.

We find that SCE's proposed modernization of the Santa Ana Service Center is necessary to foster a safe and effective work environment. We direct SCE to proceed with the project as described in its testimony, and at the funding levels shown on lines 1-3 in the table above. SCE shall record all the costs of this project, from the date of inception through completion, below the line.

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476 *Id.*, at 46.

477 *Id.*, at 44, Table II-23 (Corporate Real Estate, Santa Ana Service Center Modernization Capital Expenditures, Prior and 2016 Recorded / 2017-2020 Forecast, Summary of SCE and TURN Positions, Nominal $000).

9.3.2.1.8. Santa Barbara Service Center

The final contested project on SCE's list of service center proposals is SCE's request for funding to relocate its Santa Barbara Service Center. This proposal differs from the others on SCE's list because SCE believes it is necessary to relocate its service center from its present location to the north of Santa Barbara to a new location south of the city. SCE states that the new location will be closer to its customer base and the area where the majority of outages occur, and closer to the labor base from which SCE draws its own employees. SCE's forecasted cost of this relocation is $48.6 million.

TURN recommends that the Commission deny funding for SCE's proposed relocation. TURN contends that SCE has not provided clear evidence that relocating the service center would solve either problem that SCE cites as justification for the project, or even that the problems are severe enough to abandon the existing facility. TURN also believes that SCE did not adequately consider alternatives to relocation. Finally, TURN recommends that if the Commission approves SCE's request, it should nevertheless ensure that ratepayers do not pay for the abandoned plant that results by requiring SCE to write off the abandoned service center.

SCE responds to TURN in its rebuttal testimony by providing a more thorough explanation of its analysis and review of options than it provided in direct testimony.

The table below shows the total Santa Barbara-related expenditures requested by SCE and recommended by TURN. In this instance, we find that SCE has justified its proposal to relocate its Santa Barbara Service Center. We agree that the reduction in employee travel time will result in the dual benefits of shorter outages in the Santa Barbara area, as well as higher retention rates for

SCE's employees. We approve SCE's request and its forecasted levels of expenditures, as shown on lines 1-3 in the table below. That said, we emphasize that we expect this project to go forward as planned, without the diversion of funds that TURN documented in its testimony for other projects. In the event that SCE does divert these funds, we will consider whether the financial responsibility for this project should be placed on SCE's shareholders.

Santa Barbara Service Center Modernization Capital Expenditures
Prior and 2016 Recorded, and 2017-2020 Forecast[478]
Nominal $000

Line No.	Santa Barbara Service Center	Recorded		Forecast				Total
		Prior	2016	2017	2018	2019	2020	
1	Service Center	0	0	2,046	15,635	10,614	17,289	45,585
2	IT Infrastructure and Equipment	0	0	0	261	53	2,701	3,015
3	Total	0	0	2,046	15,896	10,667	19,991	48,600
4	TURN	0	0	0	0	0	0	0

9.3.2.1.9. Barstow Service Center

SCE's Barstow Service Center modernization proposal is uncontested, and we approve SCE's forecasted capital expenditures, as shown in the table below:

[478] *Id.*, at 47, Table II-25 (Corporate Real Estate, Santa Barbara Service Center Modernization Capital Expenditures, Prior and 2016 Recorded / 2017-2020 Forecast, Summary of SCE and TURN Positions, Nominal $000).

Barstow Service Center Modernization
Prior Recorded/2016-2020 Forecast Capital Expenditures[479]
Nominal $000

Line No.	Barstow Service Center		Forecast					Total
		Prior	2016	2017	2018	2019	2020	
1	Service Center	233	376	6,036	0	0	0	6,645
2	IT Infrastructure and Equipment	0	425	215	0	0	0	640
3	Total	233	801	6,251	0	0	0	7,285

9.3.2.1.10. Blythe Service Center

SCE's Blythe Service Center modernization proposal is uncontested, and we approve SCE's forecasted capital expenditures, as shown in the table below:

Blythe Service Center Modernization
Prior Recorded/2016-2020 Forecast Capital Expenditures[480]
Nominal $000

Line No.	Blythe Service Center		Forecast					Total
		Prior	2016	2017	2018	2019	2020	
1	Service Center	105	62	0	4,065	3,927	0	8,159
2	IT Infrastructure and Equipment	4	0	0	417	334	0	755
3	Total	109	62	0	4,482	4,261	0	8,914

9.3.2.1.11. Shaver Lake Service Center

SCE's Shaver Lake Service Center modernization proposal is uncontested, and we approve SCE's forecasted capital expenditures, as shown in the table below:

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[479] SCE-07, Vol. 3 at 60, Table V-18 (Barstow Service Center Modernization 2016-2020 Forecast Capital Expenditures) and SCE-23, Vol. 2, Appendix A at A-81.

[480] *Id*., at 64, Table V-20 (Blythe Service Center Modernization, Prior Recorded/2016-2020 Forecast Capital Expenditures) and SCE-23, Vol. 2, Appendix A at A-81.

Shaver Lake Service Center Modernization
Prior Recorded/2016-2020 Forecast Capital Expenditures[481]
Nominal $000

Line No.	Shaver Lake Service Center		Forecast					Total
		Prior	2016	2017	2018	2019	2020	
1	Service Center	3,733	2,424	2,148	0	0	0	8,305
2	IT Infrastructure and Equipment	125	234	358	0	0	0	717
3	Total	3,858	2,658	2,507	0	0	0	9,022

Due to rounding, subtotals may not sum to totals.

9.3.2.2. Operational Support Program

SCE states projects in the Operational Support Program address changing operational needs and the associated building deficiencies uncovered in Fitness for Purpose evaluations. These projects include improvements to building systems, reconfigurations of facilities, and improvements to sites, and fall within the four categories shown in the table below, which summarizes SCE's capital expenditure forecast:[482]

[481] SCE-07, Vol. 3A2, at 78, Table V-27 (Shaver Lake Service Center Modernization, Prior Recorded/2016-2020 Forecast Capital Expenditures) and SCE-23, Vol.02, Appendix A at A-81.

[482] SCE originally requested funding for a fifth category, "Future Anticipated Projects," with forecasted capital expenditures of over $100 million for the 2018-2020 period. TURN opposed SCE's request, and SCE withdrew its proposal in its rebuttal testimony. *See* SCE-23, Vol. 2, at 57-59.

Operational Support Program
Capital Expenditure Forecast
Prior and 2016 Recorded/2017-2020 Forecast
($000 Nominal)

		Recorded	Forecast					Total
Line No.		Prior	2016	2017	2018	2019	2020	
1	Infrastructure Upgrade Projects	35,345	15,537	11,868	43,779	44,577	23,233	174,339
1.1	IT Infrastructure & Equipment	2,981	2,025	614	2,199	3,725	2,172	13,716
1.2	Subtotal: Infrastructure Upgrades	38,326	17,562	12,482	45,978	48,302	25,405	188,055
2	Substation Maintenance and Test Buildings		1,162	30,465	8,176	3,160	5,592	48,555
2.1	IT Infrastructure & Equipment		61	2,184	78		81	2,404
2.2	Subtotal: Substations		1,223	32,649	8,254	3,160	5,673	50,959
3	Facility Repurpose Projects	350	27,960	1432	6,567	4,246		40,555
3.1	IT Infrastructure & Equipment	8	4,541	521	208	212		5,490
3.2	Subtotal: Facility Repurpose Projects	358	32,501	1,953	6,775	4,458		46,045
4	Projects less than $3 million	361	7,590	256	5,524		1,621	15,352
4.1	IT Infrastructure & Equipment		557	256			432	1,245
4.2	Subtotal: Projects less than $3 million	361	8,147	512	5,524		2,053	16,597
	Total Operational Support Programs	36,056	52,249	44,021	64,046	51,983	30,446	278,801
	Total IT Infrastructure & Equipment	2,989	7,184	3,575	2,485	3,937	2,685	22,855
	Total Program Request	39,045	59,433	47,596	66,531	55,920	33,131	301,656

Due to rounding, subtotals may not sum to totals.

9.3.2.2.1. Infrastructure Upgrade Projects

SCE states that infrastructure upgrade projects address deficiencies of existing facilities based on poor Fitness for Purpose evaluation outcomes with respect to new business operational requirements. SCE forecasts capital expenditures for nine projects during the 2018-2020 GRC period, including $45.978 million for Test Year 2018. SCE's request is unopposed, and we authorize SCE's requested spending levels for infrastructure upgrade projects, as shown in the table at the end of this section.

9.3.2.2.2. Substation Maintenance and Test Buildings (Substation Reliability Upgrades)

SCE states that the T&D crews that perform maintenance and testing at SCE's 900 substations are strategically located throughout the service territory, in order to best access these substations. SCE's Substation Maintenance and Test Building Program is designed to replace temporary and outdated facilities at certain substation locations, in order to improve the productivity of its crews. SCE forecasts $8.254 million in Test Year 2018 expenditures for this program, which will fund improvements at six substations identified as high priority projects. SCE's request is unopposed, and we authorize SCE's requested spending levels for these substation upgrades, as shown in the table at the end of this section.

9.3.2.2.3. Facility Repurpose Projects

SCE states that Facility Repurpose projects are major renovations of existing SCE facilities to address new or changed operational requirements. SCE lists five projects in its testimony, and forecasts $6.775 million in Test Year 2018 expenditures for this program. TURN opposes one program that accounts for most of the test year expenditures, the Storage of Critical Electrical Equipment Spares Project.

The scope of this project includes the construction of an environmentally controlled and secured warehouse at an existing storage location where equipment and materials are stored for the Chino Hills Underground segment of SCE's transmission system. SCE states that in addition to providing improved storage for Chino Hills equipment, the project will also respond to a broader need for "centralized, secure, and well-organized storage of spare equipment and material."[483] SCE states that this need was identified in a 2011 "Critical Spares Workstream" joint project of T&D and Supply Chain Management to evaluate improvements to SCE's storage and inventory control model.[484] SCE estimates total cost of the project is $11.314 million, including forecast 2018 Test Year expenditures of $6.775 million.[485]

TURN recommends no funding for this project, other than forecast IT infrastructure and equipment expenditures.[486] In Exhibit TURN-02, cross-examination at hearing, and in briefing, TURN effectively demonstrated that SCE's stated justifications for the project were not convincing. Therefore, we adopt TURN's recommendation to deny SCE's request to proceed with this project. Consistent with TURN's support for recovery of forecast IT

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[483] SCE-07, Vol. 3, at 122.

[484] *Ibid.*

[485] SCE-23, Vol. 2, at 54, Table II-28 (Corporate Real Estate, Storage of Critical Electrical Equipment Spares Capital Expenditures, Prior and 2016 Recorded / 2017-2020 Forecast, Summary of SCE and TURN Positions, Nominal $000).

[486] TURN-02, July 25, 2017 Errata at 28.

infrastructure and equipment expenditures, we authorize the spending shown below:[487]

Storage of Critical Electrical Equipment Spares Project
Requested and Authorized Capital Expenditures
($000 Nominal)

	Recorded		Forecast				
	Prior	2016	2017	2018	2019	2020	Total
Requested							
Project		81		6,567	4,246		10,893
IT				208	212		421
Total		**81**		**6,775**	**4,458**		**11,314**
Authorized							
IT				208	212		421
Total				**208**	**212**		**421**

9.3.2.2.4. Projects Less Than $3 Million

The fourth and final category in SCE's Operational Support Program is "Projects Less Than $3 Million." SCE states that this category consists of fifteen capital projects with a specifically-defined and planned scope, with total recorded and forecast expenditures that sum to under $3 million per project. SCE requests approval of total expenditures for 2016-2020 of $16.236 million, of which $5.524 million falls within the 2018 Test Year.[488] SCE's request is unopposed, and we authorize SCE's requested spending levels for Projects Less Than $3 Million, as shown in the introductory table above.

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[487] SCE-23, Vol. 2, at 54, Table II-28 (Corporate Real Estate, Storage of Critical Electrical Equipment Spares Capital Expenditures, Prior and 2016 Recorded / 2017-2020 Forecast, Summary of SCE and TURN Positions, Nominal $000).

[488] SCE-07, Vol. 3, at 131, Table V-50 (Operational Support Program – Projects Less Than $3 million, Prior Recorded/2016-2020 Forecast Capital Expenditures).

9.3.2.3. Blanket Capital Program

SCE's GRC applications typically include a request for a Blanket Capital Program. SCE describe the program as "an effective and efficient process for ongoing expenditures of similar types of work"[489] characterized by a high volume of relatively small, routine projects (e.g., fire systems, Heating, Ventilation and Air Conditioning (HVAC), roof, lighting, and furniture modifications).[490] These projects fall within the five categories shown in the table below, which summarizes SCE's capital expenditure forecast:

Blanket Capital Programs
SCE Requested
2016-2020 Forecast Capital Expenditures[491]
Nominal $000

	2016	2017	2018	2019	2020	Total
Non-Electric Capital Maintenance	21,588	22,303	23,140	24,093	24,962	116,086
Substation Capital Maintenance	8,070	13,300	15,635	15,920	16,209	69,135
Energy Efficiency	2,724	2,762	2,919	2,972	3,134	14,510
Ergonomic Equipment	1,311	1,330	1,355	1,380	1,405	6,781
Ongoing Furniture Modifications	2,018	3,172	3,961	4,776	5,619	19,545
Various Major Structures	807	15,960	21,889	22,288	22,692	83,637
Total	36,519	58,828	68,899	71,429	74,020	309,695

SCE requests authorization of $309.695 million for capital expenditures over the 2016-2020 period, including $68.899 million for the 2018 Test Year (prior to updating for recorded 2016 expenditures).

[489] SCE-07, Vol. 3, at 132.

[490] *Id.*, at 36.

[491] *Id.*, at 36, at 132, Table V-51 (Blanket Programs, 2016-2020 Forecast Capital Expenditures). This table excludes updated 2016 recorded amounts.

TURN opposes several of SCE's requests, and we review these disputed items below.

9.3.2.3.1. Non-Electric Capital Maintenance

This category of capital maintenance involves activities to "preserve the value of SCE's buildings, equipment, and grounds, making them as safe and productive as reasonably possible."[492] As shown in the table above, SCE requests authorization for 2016-2020 capital expenditures totaling $116.086 million, of which $23.140 million is forecast for the 2018 Test Year. SCE states that its forecast is based on historical expenditures.

TURN recommends using recorded 2016 expenditures of $14.305 million as the basis for the 2017 and 2018 forecasts, deriving values of $14.49 million for 2017 and $15.215 million for 2018. TURN supports its approach by reviewing SCE's recent history of SCE's Non-Electric Capital Maintenance program:[493]

- In SCE's 2012 GRC, the utility proposed increased funding for its capital maintenance activities for the stated purpose of reducing its overall FCI score.
- The overall score for SCE's facilities had worsened from 25% in 2006 to 31% in 2009, and SCE's goal was to achieve an FCI score of 16%.
- SCE's efforts proved successful, as the utility was able to bring its FCI score down, first to 19.8% based on a 2013 review, and then to 16% by the end of 2015.

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[492] SCE lists seven categories of maintenance work at SCE's non-electric facilities: (1) Electrical/Fire Systems, (2) Fencing and Walls, (3) Flooring, (4) HVAC, (5) Paving, (6) Roof Repairs, and (7) Other Repairs. SCE Opening Brief at 177.

[493] TURN Opening Brief at 186.

- SCE achieved that goal despite reducing its capital maintenance spending from the heights that were achieved in the 2013-2014 period.
- In 2015, SCE recorded $26.517 million.
- The forecast for 2016 spending in SCE's 2015 GRC direct testimony was $21.6 million, but SCE recorded $14.305 million.
- Thus from the high point of spending recorded in 2013, SCE has reported steadily declining spending levels, even as it marked the achievement of its target goal in 2015.

TURN concludes that its recommendation is "premised on the recognition that the added costs incurred while addressing deferred maintenance in order to improve the FCI score should not go on forever, particularly after SCE reported achieving its goal."[494]

In rebuttal, SCE asserts that the reduced level of funding recommended by TURN "would cause SCE's non-electric portfolio to deteriorate resulting in an increase to SCE's overall portfolio FCI, an increase in potential failures of facility systems and components and associated operational disruptions, and, ultimately, an increase in future maintenance and repair costs."[495] SCE notes that its annual average spending for the 2011-2015 period was $31.503 million, versus its average request in this application of $21.761 (2016 recorded and forecast 2017-2020) and TURN's lower annual average for 2016-2020, $15.251 million.

We find TURN's approach to be more logical and reasonable than SCE's request. SCE fails to explain why it would require $21 million annually for this program when it forecast the same amount for 2016 but only recorded

494 TURN-02, at 36.

495 SCE-23, Vol. 2, at 62.

$14 million.[496] As TURN observes in its reply brief, SCE's contentions here are at odds with its recent actions.[497]

We authorize TURN's recommended funding levels for Non-Electric Capital Maintenance, as shown in the table at the end of this section.

9.3.2.3.2. Substation Capital Maintenance

The category of substation capital maintenance involves maintenance of physical buildings and grounds at SCE's approximately 900 substations and 285 hydro facilities. As shown in the table above, SCE requests authorization for 2016-2020 capital expenditures totaling $69.134 million (prior to updating for recorded 2016 expenditures), of which $15.635 million is forecast for the 2018 Test Year. SCE's forecast for substation capital maintenance is a combination of historical expenditures and a zero-based budget, considering fluctuations in the maintenance activity.[498]

TURN recommends using recorded 2016 expenditures ($10.766 million) as the basis for the 2017 and 2018 forecasts. TURN supports its recommendation by reviewing the transition of responsibility for managing this program from the T&D organization to CRE, which generally took place in 2014 and 2015. Following several years of overlapping responsibilities where spending was higher than average, CRE assumed full responsibility in 2016 and recorded expenditures equaled $10.766 million, approximately $2.5 million below SCE's

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[496] Compare SCE-23, Vol. 2, Table II-32 (showing forecast 2016 expenditures) with Table II-33 (showing recorded 2016 expenditures).

[497] TURN Reply Brief at 32.

[498] SCE-07, Vol. 3, at 137.

forecast. Based on its observations and analysis, "TURN submits that the pattern reflects a substantial effort to address deferred maintenance in 2014, and the recorded costs since then indicate the remediation work is tailing off."[499] TURN calculates its recommended values for 2017 and 2018 by starting with the recorded 2016 figure, but reducing it by 20% to account for SCE's indication in a response to a TURN data request that the recorded figure includes unspecified and unquantified costs not related to this program.[500]

In rebuttal, SCE confirms that the 2014-2015 spending addressed initial planned capital maintenance work for SCE's occupied substations and emergent maintenance needs on the unoccupied portion of the substation portfolio. SCE then states that the below-forecast recorded expenditures in 2016 were due to a second transition in responsibilities, this time from SCE's CRE organization to an outside service provider. As such, SCE disagrees with TURN's suggestion that the lower spending indicated that the amount of necessary maintenance is "tailing off." SCE contends that as work increases on its 900 unoccupied substations its requested annual budget of $15.266 million per year from 2017-2020 will prove to be justified.

Just as we found for non-electric capital maintenance, we again find TURN's analysis to be thorough, logical, and convincing. We also conclude that a measured approach to SCE's forecasts in this area are warranted, given the multiple transitions in responsibility for SCE's capital maintenance programs. We adopt forecasts based on TURN's analysis, but we do not impose the 20%

[499] TURN Opening Brief, at 188, citing TURN-02, at 37.

[500] TURN-02, at 38.

reduction from 2016 recorded costs that TURN recommends, nor do we escalate the recorded 2016 value for future years. Both sides of this contested matter will have an opportunity to present a more stable forecast in SCE's 2021 GRC.

We authorize the 2016-2020 funding levels for Substation Capital Maintenance shown in the table at the end of this section.

9.3.2.3.3. Energy Efficiency

SCE states that its Energy Efficiency Program supports projects that improve the environmental impact of SCE facilities by reducing water or energy consumption. For the 2016-2020 period, SCE plans projects to upgrade exterior lighting, install smart irrigation controllers, and research and develop projects based on emerging technologies. As shown in the table above, SCE requests authorization for 2016-2020 capital expenditures totaling $14.510 million (prior to updating for recorded 2016 expenditures), of which $2.919 million is forecast for the 2018 Test Year. SCE's request is unopposed, and we authorize SCE's requested spending levels for energy efficiency projects, as shown in the table at the end of this section.

9.3.2.3.4. Ergonomic Equipment

SCE states that its Ergonomic Equipment Program addresses ergonomic furnishings and equipment prescribed by SCE's Disability Management program or recommended by SCE Corporate Health and Safety as a result of an ergonomic evaluation process. The program seeks to prevent and respond to work-related injuries. As shown in the table above, SCE requests authorization for 2016-2020 capital expenditures totaling $6.781 million (prior to updating for recorded 2016 expenditures), of which $1.355 million is forecast for the 2018 Test Year. SCE's request is unopposed, and we authorize SCE's requested spending

levels for ergonomic furnishings and equipment, as shown in the table at the end of this section.

9.3.2.3.5. Ongoing Furniture Modifications

SCE states that its Ongoing Furniture Modifications Program provides funding, outside of other capital projects, to provide adequate and efficient office furniture and equipment for employees in SCE's workspaces. As shown in the table above, SCE requests authorization for 2016-2020 capital expenditures totaling $19.545 million (prior to updating for recorded 2016 expenditures), of which $3.961million is forecast for the 2018 Test Year. SCE's request is unopposed, and we authorize SCE's requested spending levels for its Furniture Modifications Program, as shown in the table at the end of this section.

9.3.2.3.6. Various Major Structures

SCE states that its Various Major Structures (VMS) Program provides funding for projects that are unplanned, or emergent, and, therefore unpredictable. Such projects may include those triggered by regulatory changes, environmental changes, or significant facility failures. As shown in the table above, SCE requests authorization for 2016-2020 capital expenditures totaling $83.637 million (prior to updating for recorded 2016 expenditures), of which $21.889 million is forecast for the 2018 Test Year. SCE states that its forecast is based on historical spend, plus an increase to account for the additional facilities within CRE's area of responsibility.

TURN notes that SCE has not supported its significantly higher forecasts with evidence that unforeseen, necessary capital spending will rise to those

levels, or even is likely to do so.[501] TURN recommends authorization of an annual forecast based on the average of recorded spending from 2011-2016, $7.894 million.

As we have discussed elsewhere in this decision, we disagree with SCE regarding the extent of discretion its managers should have to redirect funds authorized for one purpose to an entirely different purpose. Given SCE's position that this discretion is near-absolute, we find it illogical to authorize significant additional funding here, for what is essentially another contingency fund. TURN demonstrated in its testimony that in the past SCE has used VMS funds for projects that could have been planned in advance and presented to us for our review and approval. We understand that CRE's responsibility has expanded since SCE's last GRC, but beyond that SCE has provided little actual analysis to back up its significantly higher expenditure forecasts for the 2017-2020 period.

We adopt TURN's recommendation to authorize an annual forecast based on the average of recorded spending from 2011-2016, $7.894 million. However, we see no reason to escalate what is essentially a rough estimate to begin with, and leave that amount constant through 2020.

9.3.2.3.7. Conclusion: Approved Recorded and Forecast Blanket Capital Expenditures

[501] TURN-02, at 40.

Blanket Capital Programs
Approved
2016-2020 Recorded and Forecast Capital Expenditures
Nominal $000

	2016	2017	2018	2019	2020	Total
Non-Electric Capital Maintenance	14,305	14,490	15,215	15,975	16,774	76,759
Substation Capital Maintenance	10,766	10,766	10,766	10,766	10,766	53,830
Energy Efficiency	1,175	2,762	2,919	2,972	3,134	12,962
Ergonomic Equipment	320	1,330	1,355	1,380	1,405	5,790
Ongoing Furniture Modifications	685	3,172	3,961	4,776	5,619	18,212
Various Major Structures	870	7,894	7,894	7,894	7,894	32,446
Total	28,121	40,414	42,110	43,763	45,592	199,999

9.4. Corporate Health and Safety

SCE states that its Corporate Health and Safety (CHS) organization provides guidance, governance, and oversight of the company's safety program and activities, including public, contractor, and worker safety activities. This includes developing and managing programs that meet regulatory requirements outlined in the Occupational Safety and Health Act (OSHA), leading all major safety incident investigations, tracking and analyzing the company's safety data and records, managing and implementing the Enterprise Safety Program, as well as managing all other office safety programs and standards. CHS also partners with other operating units (OUs) so that each OU's activity-specific safety programs meet the requirements outlined in OSHA. The primary objective of CHS is to mitigate safety risks based on observation, data collection, and analysis.[502]

[502] SCE-07, Vol. 4, at 1.

SCE forecasts $5.470 million in CHS O&M expenses for Test Year 2018. TURN did not contest CHS's O&M Forecast. ORA proposes a reduction of $700,000 associated with SCE's participation in the Electric Power Research Institute's (EPRI) Program 60 (Electric and Magnetic Fields and Radio-Frequency Health Assessment and Safety) research.[503]

ORA's proposal to exclude EPRI funding reflects its misunderstanding of D.15-04-020, which was the Commission's decision on SCE's application for approval of proposed research projects in the Commission's EPIC program. In that decision, the Commission denied SCE's request to fund EPRI Program 60 research using EPIC funds, but the Commission did not take any action that extended beyond the EPIC program. Here, SCE states that it seeks renewed GRC-authorized funding because it was denied EPIC-authorized funding in D.15-04-020. There is nothing improper about SCE's request. Indeed, the Commission previously approved SCE's request for EPRI funding in its 2012 GRC decision, D.12-11-051,[504] so it is logical and reasonable for SCE to seek this funding in this GRC proceeding.

We approve SCE's 2018 O&M forecast of $5.470 million for Account 925 expenses associated with SCE's Corporate Health & Safety organization.

9.5. Corporate Security

SCE states that its Corporate Security Operating Unit supports the reliability of the electric system by physically protecting SCE's workforce,

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[503] SCE-29 at 315.

[504] D.12-11-051 at 107, where the Commission approved SCE's request for RD&D funding that included working with EPRI, stating "the Commission finds that the role RD&D plays in facilitating the [Advanced Technology Organization's] mission justifies an expanded role [for RD&D]."

customers, facilities, and infrastructure from threats, disruptions, intrusions, theft, and property damage.

SCE forecasts $26.906 million in Corporate Security O&M expenses for Test Year 2018.[505] SCE's O&M forecast was uncontested, and we approve it here.

SCE's original capital expenditure forecast for the 2016-2018 period included a preliminary estimate for 2016 recorded expenditures of $24.414.[506] In its rebuttal testimony, SCE agreed with ORA to use final 2016 recorded capital expenditures of $19.261 million. This brings all parties into agreement. We approve the uncontested recorded and forecast capital expenditure values shown in the table below:

Adopted
2016-2020 Recorded and Forecast
Corporate Security Capital Expenditures
Nominal $000s

Project Title	Project No	2016	2017	2018	2019	2020	Total
NERC CIP-014	COS-00-CS-CS-782000	2,183	16,494				18,677
NERC CIP V6 Low BES Sites	COS-00-CS-CS-745700		8,525	811			9,336
Physical Security Systems - Non-Electric Facilities (Blanket)	COS-00-CS-CS-SS	17,066	9,477	9,755	10,034	10,320	56,652
	CIT-00-DM-DM-000067		1,000	1,000	1,000	1,000	4,000
Physical Security Systems - Electric Facilities (Blanket)	COS-00-CS-CS-745400	12	4,169	10,814	11,065	11,832	37,892
Asset Management	COS-00-CS-CS-745600						
Total		19,261	39,666	22,380	22,098	23,153	126,558

[505] SCE-23, Vol. 1, at 24, Table IV-16 (Corporate Security 2018 O&M Forecast by FERC Account, Summary of SCE, ORA, and TURN Positions, Constant 2015 $000).

[506] SCE-07, Vol. 5, Table V-2 (Corporate Security Capital Expenditures Forecast Summary, Nominal $000s).

9.6. Supply Management

SCE's Supply Management (SM) organization provides materials procurement, logistics, and support services for the utility. The organization also commissions a wide variety of services that directly or indirectly serve construction, generation, transmission, distribution, substation, customer service, administration and other support activities. SCE states that although most of the expenses associated with SM are allocated to the Operating Units via internal processes, several SM departments are supported through O&M.

SCE's 2018 Test Year O&M forecast for the SM organization is $6.1 million, which represents no change from 2015 spending levels (in constant 2015 dollars). This request is uncontested, and we adopt it here.

SCE's 2016–2020 capital expenditure forecast for the SM organization equals $2.2 million, of which $365,000 is for Test Year 2018. These expenditures will support warehouse improvements, technology application hardware, and more sustainable and economical materials-handling equipment.

SCE's original capital expenditure forecast for the 2016–2020 period included a preliminary estimate for 2016 recorded expenditures of $555,000.[507] In its rebuttal testimony, SCE agreed with ORA to use final 2016 recorded capital expenditures of $198,000. This brings all parties into agreement. We approve the uncontested recorded and forecast capital expenditure values shown in the table below:

[507] SCE-07, Vol. 6, at 18, Table VII-1 (Warehouse Equipment and Materials Management Capital Projections, 2016-2020 Forecast).

Adopted
2016-2020 Recorded and Forecast
Supply Management Capital Expenditures
Nominal $000s

Project No.	2016	2017	2018	2019	2020	Total
COS-00-SC-SC-FE	198	563	365	371	378	1,875

9.7. Supplier Diversity

SCE's Supplier Diversity and Development Department (SDD) manages the Company's efforts to procure materials and services from diverse business enterprises (DBEs). This encompasses women, minority, disabled veteran (WMDV), and lesbian, gay, bisexual and transgender (LGBT) owned business enterprises, as well as the Company's efforts to comply with the CPUC's General Order 156 (GO 156). The Department is also responsible for the Company's initiatives and programs to foster the success of DBEs.

SCE's 2018 Test Year O&M forecast for the SDD organization is $3.387 million.[508] This request is uncontested, and we adopt it here.

The NDC recommends that SCE set aspirational goals of 42.9% for outside contracting and procurement spend from DBEs and 25.5% for minority business enterprises (MBEs), based on SCE's three-year average (2013-2015) performance.[509]

SCE responded in rebuttal that pursuant to Section 8 of GO 156, each utility (rather than the Commission or another party) shall determine its short-,

[508] SCE-07, Vol. 8 for FERC Accounts 920/921 and 923.

[509] NDC-01, at 24-28.

mid-, and long-term goals for the use of DBEs.[510] We agree and therefore decline to direct SCE to set additional aspirational goals as NDC recommends.

9.8. Transportation Services

SCE's Transportation Services Department (TSD) manages the SCE vehicle and equipment fleet, which includes passenger cars, vans, pick-up trucks, forklifts, heavy-duty trucks with aerial equipment (buckets and cranes), loaders, tractors, stringing equipment, trailers, and helicopters.

9.8.1. Operating Costs

TSD's operating costs fall into four categories: Fleet Ownership, Fleet Maintenance, Fuel, and Aircraft Operations. These costs are charged back to other SCE OUs that require and utilize fleet support and embedded within the O&M and capital forecasts of those OUs. TSD's testimony does not separately request recovery for these costs.

9.8.1.1. Non-Fuel Operating Costs

SCE forecasts $109.381 million (nominal) in Test Year 2018 for TSD's non-fuel operating costs comprising the following categories: Fleet Ownership, Fleet Maintenance, and Aircraft Operations.[511]

TURN recommends a 2018 forecast of TSD's non-fuel operating costs by using a four-year average of SCE's recorded costs in nominal dollars from 2013-2016 as TSD's non-fuel operating costs have held relatively steady.

In rebuttal, SCE agreed to accept TURN's recommendation, subject to the use of constant dollars. TURN utilized nominal dollars to yield a forecast of

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[510] SCE-23, Vol. 1, at 31-32.

[511] SCE-23, Vol. 1A, at 37A (Table VII-25).

$102.420 million. As TURN's recommendation applies an averaging methodology to historical operating costs, such a methodology should be applied to constant dollar historical expenses because those costs are normalized for comparison. Specifically, converting the historical costs to 2015 constant dollars normalizes escalations in spend due to inflationary pressures. When TSD's historical non-fuel operating costs are normalized to constant dollars, a four-year average of $103.072 million (2015 constant dollars) is derived from years 2013-2016. SCE requests that the Commission conclude that SCE's modified forecast of $103.072 million in TSD non-fuel operating costs for Test Year 2018 is reasonable.

9.8.1.2. Fuel Operating Costs

TSD's fuel operating costs consist of costs to procure gas, diesel, oil, propane and fuel pumping services. These fuel costs are also charged back to other SCE OUs, and TSD's testimony does not separately request recovery for them.

In its direct testimony, SCE utilized the 2015 version of the Department of Energy's Energy Information Administration (EIA) Annual Energy Outlook to forecast gas and diesel fuel costs. This supported a total combined gas and diesel fuel cost forecast of $18.353 million.

In its rebuttal testimony, SCE accepted TURN's recommendation to use the 2016 version of the EIA Annual Energy Outlook to update projections of its forecast gas and diesel fuel costs. This reduced the total combined fuel cost forecast to $15.654 million.[512]

[512] SCE-23, Vol. 1A at 36A, Table VII-24.

TURN also recommends reduction of SCE's forecast Test Year 2018 fuel costs by the amount of outside fuel pumping service costs, $1.55 million, which would result in a total forecast equal to $14.101 million. We see no need to delve this deeply into SCE's day-to-day frontline operations, and approve SCE's forecast amount for outside fuel pumping service costs. Therefore, we approve the total value jointly calculated by SCE and TURN for Test Year 2018 fuel operating costs, $15.654 million.

9.8.2. Capital

SCE states that TSD's capital request is driven by the activities of vehicle electrification program, electric vehicle (EV) fleet chargers, vehicle leasehold capital improvements, garage tools and equipment, aircraft operations, and helicopter lease buyouts. SCE's capital expenditure forecast for those categories is summarized in the table below:

Transportation Services Department Capital Forecast[513]
(Nominal $000)

		2016	2017	2018	2019	2020	Total
Vehicle Electrification Program	COS-00-TS-TS-VP6943		384	339	292	216	1,230
Electric Vehicle Fleet Chargers	COS-00-TS-TS-FE0000	20	138	160	166	173	658
Vehicle Leasehold Capital Improvements	COS-00-TS-TS-VP6942	148	3,053	1,989	1,181	1,208	7579
Garage Tools and Equipment	COS-00-TS-TS-TS0001	410	781	464	482	502	2,639
Aircraft Operations Program	COS-00-TS-TS-AIR001	883	956	1,351	1,261	460	4,911
Helicopter Lease Buyout	COS-00-TS-TS-267202		1,614	4,955	3,185		9,754
Total		1,461	6,925	9,257	6,568	2,558	26,770

[513] SCE-07, Vol. 7, at 14, Table V-5 (Transportation Services Department Capital Forecast). This table includes updated recorded 2016 capital expenditures

SCE's original capital expenditure forecast for the 2016-2018 period included a preliminary estimate for 2016 recorded expenditures of $2.504 million. In its rebuttal, SCE agreed with ORA to use final 2016 recorded capital expenditures of $1.461 million. This brings all parties into agreement. We approve the uncontested recorded and forecast capital expenditure values shown in the table above.

10. Administrative & General

10.1. Ethics and Compliance

SCE forecasts A&G expenses for Ethics and Compliance for 2018 of $9.863 million.[514] ORA reviewed and analyzed SCE's proposed Ethics and Compliance A&G expense and has no objection to SCE's $9.863 million request. We find the request to be reasonable, and approve it.

10.2. Regulatory Affairs

10.2.1. Regulatory Affairs Labor: FERC Account 920/921

SCE forecasts $15.214 million of Test Year 2018 expenses for its Regulatory Affairs Department in FERC Accounts 920/921, a decrease of $0.881 million over recorded 2015 cost levels.[515] SCE contends the decrease results from SCE's efforts to achieve efficiencies, optimize spending, and reduce costs.[516]

TURN proposes an additional reduction of over $2 million based on removing funding for 18 purportedly vacant positions.[517] SCE however, has

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[514] SCE-24, Vol. 1, at 27, Table IV-13.

[515] SCE-24, Vol. 01, at 1-6.

[516] *Id.*

[517] TURN-07, at 5, lines 12-21.

established the forecast is based on actual, recorded costs, and does not include funding for vacant positions.[518]

We adopt as reasonable SCE's forecast of $15.214 million of Test Year 2018 expenses for its Regulatory Affairs Department in FERC Accounts 920/921.

10.2.2. Regulatory Affairs – Integrated Planning Power Procurement: FERC Account 557

SCE forecasts $10 million for Test Year 2018 for Integrated Planning Power Procurement, FERC Account 557.[519] SCE used the Last Recorded Year as the forecast method. TURN proposes to reduce the forecast by $1.590 million based on the contention these costs are associated with SCE's discontinued Project Development Division (PDD).[520] SCE, however, has established these costs are for continuing activity related to electric system modeling and not a discontinued division.[521] We adopt SCE's forecast.

10.3. Corporate Communications

10.3.1. Corporate Communications Operations Labor: FERC Account 920/921

SCE forecasts $5.071 million of Test Year 2018 expenses for its Corporate Communications Operations Department in FERC Accounts 920/921, a decrease of $2.684 million over recorded 2015 cost levels.[522]

TURN proposes an additional reduction of over $0.349 million based on removing funding attributed to four purportedly vacant positions.[523] SCE

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[518] SCE-24, Vol. 1, at 2:24-26 and at 6:14-16.

[519] SCE-24, Vol. 1, at 7:2-3.

[520] TURN-07, at 7-8.

[521] SCE-24, Vol. 1, at 8:13-26.

[522] SCE-24, Vol. 01, at 10, lines 3-6.

however, has established the forecast does not include vacant positions and we adopt it as reasonable.

10.3.2. Corporate Communications – Outside Services: FERC Account 923

SCE forecasts $1.689 million for FERC Account 923 for: 1) ethnic media services; 2) communications measurement; and 3) communications quality assurance.[524] The forecast is based on 2015 recorded costs, less a decrease of $1.134 million due to Operational Excellence reductions.[525]

After review and analysis of SCE's rebuttal, TURN withdraws its recommendation to disallow all costs in this account.[526] We find the forecast to be reasonable and approve it.

10.4. Local Public Affairs

10.4.1. Local Public Affairs – FERC Account 920/921

SCE forecasts $7.904 million for Test Year 2018 for Local Public Affairs, FERC Account 920/921. These activities include engagement with governments and stakeholders throughout SCE territory.[527] The amount is not disputed; we approve the forecast.

NDC however, urges we require SCE to host at least five capacity building workshops annually for community-based organizations. These workshops were intended to inform and educate customers and community organizations

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[523] TURN-07, at 5, lines 12-21.

[524] SCE-24, Vol. 01, at 12: 13-19.

[525] *Id.* at 13, lines 1-2.

[526] TURN Opening Brief, at 203.

[527] SCE-08, Vol. 2, at 53: 1-13.

about company programs and initiatives.[528] SCE discontinued these workshops in 2015 following a reorganization and determination that the workshops are not core to the Local Public Affairs' function.[529] Although NDC establishes the workshops were well attended and inexpensive and would likely continue to be,[530] NDC does not establish a basis for requiring these workshops; we decline to order them.

10.4.2. Corporate Membership Dues and Fees – FERC Account 930

SCE forecasts $1.920 million of non-labor expenses for FERC Account 930 for the ratepayer funded portion of dues and memberships costs, based on the last recorded year, after making limited concessions.[531] SCE's "concession" removed fees and memberships totaling $52,595 for California Foundation on the Environment and the Economy, California Small Business Association, and Committee Encouraging Corporate Philanthropy.[532]

ORA recommends $1.177 million, the same funding level adopted in the Test Year 2015 GRC, a 40% reduction from SCE's request, based on the last recorded year of membership fees and dues.[533] ORA's limited rationale does not undermine SCE's showing.

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528 NDC-01 Attachment, at 26, NDC-SCE-004, Question 02.

529 *Ibid.*

530 NDC-01, at 29-30.

531 SCE-24, Vol. 01, at 21:7-18 and Table III-11.

532 SCE-24, Vol. 01, at 21:9-18.

533 ORA-17, at 14-15.

TURN recommends a reduction of $1.805 million (to $168,701) based on eliminating funding of memberships dues and fees for: the Edison Electric Institute (EEI), California Taxpayer Association, Business Roundtable, California Small Business Association, and California Small Business Roundtable.[534]

SCE provides a description of EEI activities and relies on the EEI invoice to support its contention that SCE is properly seeking recovery of $1,552,609 from ratepayers of the EEI invoice which totals $1,916,700.[535] We agree with SCE that EEI may provide some beneficial services. We recognize the EEI invoice provides guidance to its members as to an allocation between shareholders and ratepayers for payment and that SCE allocated less to ratepayers than what is suggested by the EEI invoice. The EEI invoice however, is insufficient evidence to establish the portion of the invoice which should be recovered from ratepayers. SCE has failed to present supporting evidence which would enable us to determine how much EEI's beneficial services should cost ratepayers. We find SCE has not met its burden to establish any portion of the EEI dues are recoverable from ratepayers.

TURN also recommends removing funding for California Taxpayer Association, Business Roundtable, California Small Business Association, and California Small Business Roundtable. SCE has not established the ratepayer benefits of supporting these organizations and therefore we do not authorize ratepayer funding for them. Accordingly, we approve a forecast of $168,701

[534] TURN-02, at 42-47.

[535] SCE-24, Vol. 01, at 21-23.

FERC Account 930 for the ratepayer funded portion of dues and memberships costs.

10.5. Financial Services

SCE's 2018 forecast for the Financial Services Department includes: $43.3 million for Accounts 920/921 and $20.9 million for Accounts 923/930.[536] Generally, intervenors did not oppose SCE's forecasts for Financial Services, excepting TURN's proposals for these accounts.

SCE's Financial Services labor costs (Accounts 920/921) have been steadily declining, from $64.0 million in 2011 to $42.9 million in 2015. SCE forecasts a further decline to $38.5 million for its 2018 Test Year forecast.[537]

TURN proposes an additional reduction of $2.308 million. TURN bases this proposal on the value it proscribes to 22 purportedly vacant positions in the department.[538] Although SCE acknowledges there have been vacancies, SCE establishes that its forecasts are based on actual costs and reflect reductions that have already taken place from implementing its Operational Excellence efforts.[539]

Financial Services Accounts 923/930 encompass three primary functions: outside services in support of accounting, financial institution fees, and accounts payable vendor discounts. SCE's forecast of $20.9 million represents a 58% reduction from its 2015 recorded expense of $49.2 million.[540] SCE's reduced forecast is reportedly due to reduced consulting needs for Operational

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536 Table I-1, SCE-08, Vol. 3, at 2.

537 Table II-2, SCE-24, Vol. 2, at 3.

538 TURN-07, at 15-16.

539 SCE-24, Vol. 2, at 3-7.

540 Table II-4, SCE-24, Vol. 2, at 8.

Excellence, increasing internal expertise of the Tax department, and an increase in Accounts Payable vendor discounts.[541]

TURN proposes a further reduction of $7.665 million to $13.251 million, based on the five year average of expenses for this account and application of SCE's proposed reduction to TURN's forecast. TURN uses the five-year average due to the wide variation between the Outside Services entries for 2011-2015, from a low of $23.814 million in 2014 to a high of $56.025 million in 2015.[542] SCE insists its adjustment may only be applied to 2015 recorded expenses; however, SCE repeatedly discusses the variations in its historical expenses, averages and outliers.[543] SCE's arguments against a baseline based on the five-year average are not persuasive. Furthermore, averaging varying expenses is consistent with our practice. Therefore, we adopt TURN's recommendation of $13.251 million for Financial Services Accounts 923/930.

10.6. Audits

SCE forecasts $8.657 million for Account 920/921, which is based on $5.873 million for labor expenses and $2.784 million for non-labor expenses for the Audit Service Department in 2018.[544] The forecast includes a nominal increase in the labor forecast over 2015 recorded expenses of $5.617 million. TURN

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[541] SCE-24, Vol. 2, at 9:9-17.

[542] TURN-07, at 17; SCE-24, Vol. 2, at 9-10.

[543] SCE-24, Vol. 2, at 9:7-8, "Included in SCE's recorded amounts are consulting services to support our OpX program, which averaged $28.2 million over the last 5 years." *Id.*, at 9:12-15, OpX expenses of the past six years will not continue. SCE-08, Vol. 3, at 19:2-4, "Expenses related to outside consultants … were relatively flat from 2011-2014, with an increase of $5 million in 2015.

[544] SCE-08, Vol. 3, at 40, Figure III-10.

proposes a further reduction in the labor forecast of 50%, to $2.937 million. TURN, again, proposes this reduction based on eliminating 28 vacancies in a department of 56 employees. SCE, again, as it has in opposition to similar proposals from TURN, argues the forecast is based on recorded expenses and forecasted needs and not a "headcount." SCE has met its burden; TURN's argument is not persuasive. We adopt the SCE forecast of $8.657 million for the Audit Service Department in 2018.

10.7. Enterprise Risk Management

The Commission's Safety and Enforcement Division (SED) Staff analyzed and evaluated the risk-informed decision framework used by SCE to identify major risks and determine potential mitigation plans and programs and concluded that these methods and processes have not been particularly well described or effectively used to inform the 2018 GRC Test Year budget request.

SCE admitted in testimony that it did not use risk assessment in the identification of its top risks, or to select programs to address those risks, but mostly after-the-fact as a way to measure risk reduction associated with the programs or projects proposed. Further, the funding allocation for risk mitigations was not based on risk analysis.

These two admissions, by themselves, have made it very difficult for SED to provide a positive evaluation of risk assessment in this GRC application. At this time, it would be unwise to accept SCE's risk assessment methods as a basis for determining reasonableness of safety-related program requests; indeed, we have found that SCE is classifying major categories of spending as safety related, even though they relate to issues of customer satisfaction or electric service reliability than safety. Additionally, much more could be done in the future to

assist decision makers and intervenors in following the trail from risk assessment to budget request.

The current GRC, although partly subject to the new risk-informed decision-making approach, is essentially a transitional case. We anticipate the risk assessment in the next GRC cycle will reflect considerable improvement.

10.8. Legal

SCE proposes total costs for 2018 for SCE's Legal Organization of $104.331 million, an increase of $20.884 million over 2015 recorded costs. The legal expenses include: $44.791 million for the Law Department (including Corporate Governance), $24.373 million for the Claims Department, $14.594 million for the Workers' Compensation Department, and $20.573 million for Disability Management.[545]

10.8.1. Removal of Costs Resulting from Alleged Imprudence

TURN recommends removing over $12 million of Legal Organization costs in the Law Department forecasts purportedly relating to five incidents TURN identifies as involving alleged imprudence. These incidents are the San Onofre Nuclear Generating Station (SONGS) replacement steam generator project, the 2007 Malibu wildfire, 2015 outages in Long Beach, 2011 fatalities in San Bernardino (Acacia), and the 2011 San Gabriel windstorm.[546]

We agree conceptually that ratepayers should not be charged for the defense of claims involving imprudence.[547] Likewise, we are troubled by the idea

[545] SCE-24, Vol. 3, at 3, Table I-2.

[546] TURN-13, at 25-26.

[547] D.14-06-007, at 31-32.

of the utility being provided a blank check, paid by ratepayers, funding the defense of a claim, the defense of which is aimed, in part, at establishing the ratepayers are responsible. Nevertheless, we agree with SCE that we should not intrude "after-the-fact" into "matters that have already been finally resolved in Commission-approved settlements."[548] Each of these matters was resolved by an approved settlement.[549] The agreements concerning San Bernardino and San Gabriel, despite being "complete and final resolution" of the issues did not assess shareholders with responsibility for attorneys' fees. The Malibu settlement has been interpreted by SCE to require removal of outside counsel costs from its GRC but not in-house Legal or claims expenses and intervenors have not sought to exclude these costs.[550] Although we question the merit of that interpretation, these in-house expenses were largely included and approved as part of the 2015 GRC and therefore, we will not re-open review of these expenses now.[551] Likewise, a settlement of SONGS was adopted and legal expenses have been addressed separately. Given the status of the proceedings identified by TURN we do not agree (excepting regarding Malibu) that exclusion of those legal expenses would be proper at this time.

Whether or not these legal expenses should be part of a forecast going forward however, is a different question.[552] We find no benefit to ratepayers

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[548] SCE Opening Brief, at 193.

[549] SCE-04, Vol. 03, at 8:3-9:9 [re.: Malibu, San Bernardino, and San Gabriel]. D.17-09-024 [re.: Long Beach].

[550] SCE-04, Vol. 03, at 8-9, fn. 12.

[551] *See* SCE-04, Vol. 03, at 9:2-7 and fn. 13.

[552] We note SCE has made adjustments to remove at least some costs it recognizes as "not appropriately included in customer rates." SCE Reply Brief, at 123, fn. 849.

requiring they support the defense of litigation which seeks to impose shareholder liability due to imprudence. We agree with TURN that costs incurred due to imprudent operations are not just and reasonable and are therefore, not recoverable.[553] SCE criticizes TURNs methods but provides no alternative. We recognize TURN's proposal to deduct 18.2% from forecast expenses for Outside Counsel and one-third from the forecast for In-House Counsel may be more of a shave than a reasonable haircut. We also recognize that defense costs may arise in cases in which the allegations of imprudence are unfounded or are mixed with potential liability despite prudent management. Therefore, we approve as reasonable a 10% reduction of the forecast for Outside Counsel. As for In-House Counsel, we also note SCE has, in a number of instances, renewed previously denied arguments without providing an explanation as to what has changed to warrant a different outcome in the present case.[554] Therefore, we reduce the In-House forecast an additional 5% for a total of 15%.

TURN further proposes SCE modify its internal guidance to require removal of costs due to imprudence. Although we agree SCE should not seek recovery of costs incurred due to imprudence, we are neither certain that TURN's current proposal is an effective remedy nor do we find SCE to be persuasive in its discussion disavowing tracking attorney time and its refusal to consider anything other than incremental in-house costs.[555] Although we decline to order changes to SCE's internal guidance concerning the removal of costs for

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[553] TURN Opening Brief, at 215 and 220, citing D.14-06-007, at 31.

[554] *See*, e.g., section 10.8.2.3, below. See also, D.12-11-051 at 494 and D.15-11-021, at 306-307.

[555] SCE Opening Brief, at 197.

imprudent activities, we consider greater transparency to be warranted and recognize recalcitrance by SCE in regards to this issue may undermine its showing in meeting its burden of proof in future GRCs.

We therefore urge the parties meet and confer to explore this proposal further. During this process the parties should consider means to accurately determine the portion of In-House Counsel costs and other expenses which are incurred in connection with findings of utility imprudence. This consideration should include timekeeping or other means to accurately evaluate the allocation of expenses, notwithstanding our previous rejection of ORA's predecessor the Division of Ratepayer Advocate's suggestion that SCE be required to have a timekeeping system.[556]

10.8.2. Law

SCE forecasts $44.791 million for the Law Department, consisting of $25.397 million for In-House, $15.292 million for Outside Counsel, and $4.102 million for Corporate Governance.[557]

10.8.2.1. In-House, FERC Accounts 920/921

SCE forecasts $25.397 million for FERC Accounts 920 and 921 based on declining expenditures due to Operational Excellence.[558] ORA does not contest the forecast. TURN, as it has in other instances, recommends a reduction based on alleged vacancies and employee headcounts.[559] Again, as we have concerning similar arguments, we find SCE's forecast – regarding its basis on actual costs

[556] D.09-03-025, at 151.

[557] SCE-24, Vol. 03, at 4, Table II-3.

[558] SCE-24, Vol. 03, at 13:1-2 and Table II-8.

[559] TURN-13, at 19, in support of a $3.669 million reduction.

and forecasted needs as reduced by Operational Excellence achievements – to be reasonable and supported by the evidence. Therefore, we apply the 15% reduction discussed in section 10.8.1, above, and we adopt a forecast of $21.587 million for In-House.

10.8.2.2. FERC Accounts 923/925/928 Outside Counsel

SCE's adjusted forecast for Outside Counsel is based on a five-year average of recorded costs for 2011-2015.[560] ORA recommends removing 2013 costs as an outlier, and averaging the remaining four years, 2011-2012 and 2014-2015.[561] TURN proposes using the last recorded year based on an alleged downward trend. The past five years, however, demonstrate unpredictability and not a downward trend. As we have in the past, we find there is inadequate support for including the outlying year and consequently we regard 2013 as an outlier and exclude it.[562] Using SCE's updated recorded history (in millions) of $16.299 (2011), $13.087 (2012), $14.197 (2014), and $12.118 (2015), provides a four-year average of $13.925 million.[563] Applying the further 10% reduction discussed in section 10.8.1, above, we adopt a forecast of $12.532 million.

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[560] SCE-24, Vol. 03, at 4-5.

[561] ORA-17, at 16-18.

[562] D.15-11-021, at 306-307. ORA Opening Brief, at 211-212.

[563] SCE-24, Vol. 03, at 13, Table II-8.

10.8.2.3. FERC Account 930 Corporate Governance

SCE's forecast for this account is $4.1 million.[564] As it has in past rate cases, SCE includes in its forecast, equity compensation. Also, as in past rate cases, we deny that portion of the request.[565] TURN also challenges this forecast based on a misallocation of costs arising from unregulated activities.[566] SCE has established its allocation of costs is proper. On the foregoing bases, we adopt a forecast of $3.1 million.

10.8.3. Claims

SCE forecasts $24.373 million for the Claims Department. This forecast consists of $3.025 million for Administrative Expenses (FERC Accounts 920/921/924) and $21.348 million for Claims Reserves (FERC Account 925).[567]

The forecast for Administrative Expenses is based on the 2015 recorded costs. ORA does not dispute this forecast. TURN proposes a $0.957 million reduction due to imprudence.[568] Although we have recognized the merit of TURN's argument in other instances, we find the Claims Department responsibility for investigating and evaluating accidents and other events supports adopting the entirety of SCE's Administrative Expense forecast of $3.025 million.

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[564] SCE-24, Vol. 03, at 16:1-2 and Table II-9.

[565] D.15-11-021, at 308-309. D.12-11-051 at 494. See, ORA-17, at 16 recommending disallowance of $997,726.

[566] TURN-03, at 30.

[567] SCE-24, Vol. 03, at 18:1-8 and Table III-10.

[568] TURN-13, at 22-24, Tables 4 and 6.

The $21.348 million forecast for Claims Reserves is based on a five-year average of historical costs from 2011-2015. During that time the recorded costs have varied wildly (in millions): $8.750 (2011), $18.901 (2012), $36.869 (2013), $35.244 (2014), and $6.978 (2015). Given the wide variation, it is doubtful a simple average is a reliable predictor. SCE describes these reserves as representing "the Company's estimate of potential exposure on known events."[569] SCE has not established it is fair and reasonable to rely on a five-year average of historical costs to establish its forecast for Claims Reserves.

ORA recommends normalizing the average by eliminating large claims in 2013 and 2014, resulting in a forecast of $14.948 million.[570] TURN recommends using 2015, the last recorded year, and imposing an additional reduction for imprudence, resulting in a forecast of $4.978 million. This proposal generates a forecast less than any actual recorded expense from 2006 through 2015, except one.[571]

We find ORA's proposal to be the most fair and reasonable based upon the evidence presented, including consideration of a reduction for imprudence as advocated by TURN, and we adopt a forecast of $14.948 million for Claims Reserves.

10.8.4. Workers' Compensation

SCE forecasts $14.594 million for the Workers' Compensation Department. This forecast consists of $6.783 million in administrative expenses and $7.811

[569] SCE-08, Vol. 04, at 25:3-6.

[570] ORA-17, at 18.

[571] SCE-24, Vol. 3, at 22, Table III-13.

million in Workers' Compensation reserves.[572] Neither ORA nor TURN challenge the forecasted administrative expense.

SCE bases the reserve expense on a three-year average of 2013-2015. TURN agrees to the exclusion of 2011 and 2012 (recorded costs were significantly higher in those years) but recommends a four-year adjusted average which includes 2016.[573] The adjustment, a reduction of $.117 million for Four Corners is not objected to by SCE. SCE does contend the use of 2016 is inappropriate as the costs were unusually low and have not been adjusted. We accept SCE's contention and average the Workers' Compensation Reserve expense, as adjusted by TURN for 2013-2015 (in millions): $8.5, $9.641, and $5.178. Therefore, we adopt a forecast of $7.773 million.

10.8.5. Disability Program

SCE's forecast of $833,000 for Disability Administration is not disputed and is adopted.[574]

SCE forecasts $19.74 million for its Disability Program for 2018.[575] The disability program provides income protection if an employee becomes ill or injured and unable to work and assistance for employees who are not totally disabled but are unable to return to their prior positions. The program costs include payments made to employees and reserves for the Comprehensive

[572] SCE-24, Vol. 03, at 26:4-6 and Table IV-14.

[573] TURN-03, at 33.

[574] SCE-24, Vol. 03, at 29:1-30:6.

[575] SCE-08, Vol. 04A, at 35, Table V-11.

Disability Plan (short-term disability), Long-Term Disability Plan, the Return to Work Program, Paid Family Leave, and external administration costs.[576]

This forecast is based on forecast labor costs, employee counts, recorded benefit programs expenses and escalation rates following recognition of the reasonableness of this approach in the last rate case decision.[577]

ORA forecasts $16.9 million for the Disability Program, based on SCE's 2015 Recorded Year.[578] TURN's forecast is $17.6 million based on a five-year average.[579] TURN contends SCE's forecast for the disability program has not rendered accurate projections and we are inclined to agree. SCE's testimony establishes SCE has consistently overstated the number of its employees in its forecast.[580] From 2012-2016 SCE overstated its authorized number of employees over recorded by no less than 12%. Therefore, we accept SCE's methodology but we find a 10% reduction for the 2018 forecast for the Disability Program (due to the overstating of employees) to be reasonable and adopt a forecast of $17.766 million.[581]

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[576] *Id.* at 37-38.

[577] SCE-24, Vol. 03, at 32:1-5; D.15-11-021, at 274.

[578] ORA-17, at 20-21.

[579] TURN-07, at 27-28.

[580] SCE-24, Vol. 3, at 33, Tables V-20 and V-21.

[581] This adopted amount is illustrative and may not batch the final amount because it is dependent on the number of employees and labor expenses approved by this decision.

10.9. Property and Liability Insurance

10.9.1. Property Insurance

SCE accepts ORA's and TURN's recommended property insurance expense forecast of $14.070 million for Test 2018 (a reduction of $2 million from SCE's original forecast)[582] and we adopt it as reasonable.

10.9.2. Liability Insurance

SCE forecasts $92.427 million for total liability insurance expense in Test Year 2018. SCE states its forecast is based on premium estimates from its insurance broker and reflect expected market conditions and SCE's loss history.[583] ORA and TURN base their recommendations on the last year recorded. We find SCE's continuing reliance on an expert forecast is reasonable and adopt the forecast of $92.427 million.

11. Ratemaking Proposals

SCE requests approval of several GRC-related ratemaking proposals related to its Commission-jurisdictional base-related revenue requirement. We address the proposals contested by other parties here. In addition, SCE provided a list in its opening brief of its memorandum account and balancing account proposals that are uncontested, and requests approval of each of the uncontested proposals.

11.1. Establishment of the DER Deferred Project Memorandum Account (DERDPMA)

SCE has withdrawn its request to establish the DERDPMA.[584]

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[582] SCE-24, Vol. 4, at 4:1-6.

[583] SCE-24, Vol. 4, at 5:3-6.

[584] SCE-25, Vol. 1, at 6.

11.2. Establishment of the Public Utilities Code § 706 SCE Officer Compensation Memorandum Account (SOCMA)

As we discussed in the HR section of this decision, SCE's request to establish this memorandum account has been mooted by statutory changes enacted after SCE made this proposal in its September 2016 application.

11.3. Modification of the Pole Loading and Deteriorated Pole Programs Balancing Account (PLDPBA)

The PLDPBA is a two-way balancing account established pursuant to D.15-11-021. This account records the difference between: (1) recorded capital-related revenue requirements for the Pole Loading Program and the Deteriorated Pole Program, (2) Operation and Maintenance (O&M) expenses for the Pole Loading Program, and (3) the authorized Pole Programs revenue requirement as adopted in D.15-11-021. The level of expenditures to be recovered in the PLDPBA in 2016 and 2017 is capped at 15% above the authorized levels. SCE requests authorization to continue the two-way PLDPBA over the 2018 GRC period, but without a cap on expenditures. ORA opposed removing the cap, while TURN recommended eliminating the 15% headroom and changing the account to a one-way account.

We addressed SCE's request earlier in this decision, in the Poles sub-section of the T&D section. We determined that the current account structure should continue for this GRC cycle, with no changes in its structure.

11.4. Modification of the Safety and Reliability Investment Incentive Mechanism (SRIIM)

In its direct testimony, SCE proposed to maintain the SRIIM over the 2018 GRC cycle, with certain modifications to portions of the capital spending categories and staffing components. CUE proposed certain changes to SRIIM,

which SCE addressed in its rebuttal testimony. We resolved the differences between SCE and CUE in the T&D section of this decision, where we also authorized SCE to make the necessary modifications to Preliminary Statement Part LL to include the new authorized SRIIM program capital-related and staffing target amounts, besides other necessary changes to the tariff.[585]

11.5. ORA's Proposal to Establish a One-Way Storms Balancing Account

In the section of this decision addressing T&D Distribution Construction and Maintenance, we denied ORA's proposal to create a one-way balancing account for Distribution Storm Expenses (FERC Sub-Account 598.170).

11.6. ORA's Recommendation to Establish a Grid Modernization Memorandum Account

In this proceeding, ORA recommends that the Commission deny SCE's requests for Grid Modernization funding entirely. However, ORA also recommends that the Commission establish a Grid Modernization Memorandum Account whereby any related costs incurred by SCE would be tracked and could be funded in subsequent rate cases based on a determination that SCE's expenditures were reasonable.

We find that ORA's proposal is moot because this decision addresses the details of SCE's Grid Modernization proposals, specifically authorizing some while denying others, so there is no need to track SCE's expenditures for possible future recovery.

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585 *See* SCE-09, Vol. 1, at 40.

11.7. ORA's Recommendation to Establish a DER Memorandum Account

A recurring theme throughout ORA's testimony is that SCE's requests for funding for DER -related projects is premature because a number of open policy-making proceedings at the Commission have yet to provide definitive direction to the utilities to guide their investments. For this reason, ORA recommends that SCE's spending on DER-related projects be recorded in a memorandum account created for that purpose (ORA suggests that, alternatively, these costs could be tracked in its recommended Grid Modernization memorandum account).

We find that ORA's proposal is moot because we have addressee SCE's funding requests for DER-related projects directly, as part of our discussion of distribution automation, where we adopted TURN's recommendation for lower funding levels for DER-related distribution. Therefore, there is no need to order SCE to track these authorized expenditures in a memorandum account.

11.8. ORA's Recommendation to Establish a Customer Service (CS) Re-Platform Memorandum Account

ORA does not object to SCE's implementation of its CS Re-Platform project, but questions some funding requests as well as the overall timing for completion of the project. ORA recommends that that SCE be required to track costs for the CS Re-Platform in a memorandum account.

In the section of this decision addressing SCE's Information Technology forecasts, we directed SCE to establish a memorandum account to track its CS Re-Platform project costs for review in the next GRC.

11.9. CALSLA's Recommendation to Establish a Balancing Account to Record Tax Losses and Profits from Street Light Sales

In section 24 of this decision, we address all the contested issues between SCE and CALSLA, including CALSLA's recommended balancing account.

11.10. Uncontested Proposals for Memorandum Accounts and Balancing Accounts

SCE provided a list in its opening brief of its memorandum account and balancing account proposals that are uncontested, and requests approval of each of the uncontested proposals. We approve each of the proposals listed below.

Southern California Edison
2018 GRC
Uncontested Balancing and Memorandum Account Proposals

Line	Account	SCE Proposal	ORA Position
1	Medical Programs Balancing Account (MPBA)	Retain 2-way account	Uncontested
2	Pension Costs Balancing Account (PCBA)	Retain 2-way account	Supports continuation of the account (ORA-21)
3	Post-Employment Benefits Other than Pensions Costs Balancing Account (PBOP BA)	Retain 2-way account	Uncontested
4	Results Sharing Memorandum Account (RSMA)	Retain 1-way account / rename "STIPMA" and Capitalize using SCE's proposed P&B capitalization rate	Uncontested
5	Tax Accounting Memorandum Account (TAMA)	Retain 2-way account through 2018 GRC period	Does not oppose continuation of the account (ORA-02)
6	Residential Rate Implementation Memorandum Account (RRIMA) for TOU Pilot	Recover 12/31/17 balance; 2018-2020 annual recovery in ERRA Review proceeding	Does not object to SCE's proposal (ORA-22)
7	Energy Data Request Program Memorandum Account (EDRPMA)	Eliminate account and recover 12/31/17 balance	Does not object to SCE's proposal (ORA-22)
8	Marine Corps Air Ground Combat Center Memorandum Account (MCAGCCMA)	Eliminate account and allocate $1M after-tax gain to shareholders	Does not object to SCE's proposal (ORA-22)
9	Project Development Division Memorandum Account (PDDMA)	Eliminate account	Does not object to SCE's proposal (ORA-22)
10	Residential Service Disconnection Memorandum Account (RSDMA)	Eliminate account and recover 12/31/17 balance	Does not object to SCE's proposal (ORA-22)
11	SmartConnect Opt-Out Balancing Account (SOBA)	Eliminate account and recover 12/31/17 balance	Does not object to SCE's proposal (ORA-22)
12	Bark Beetle CEMA	Recover $10M in 2012- 2014 costs	Does not object to SCE's proposal (ORA-22)
13	Customer Data Access (CDA) Costs	Cease entries to BRRBA	Does not object to SCE's proposal (ORA-22)

12. Jurisdictional Issues

In GRC proceedings such as this one, SCE presents its forecasts and spending requests at either a "total company" or "CPUC-jurisdictional" level. Total company costs include some FERC-jurisdictional transmission-related operating and capital costs, which are recovered through rates authorized by the FERC.[586] In order to determine the CPUC-jurisdictional revenue requirement to be recovered through CPUC-authorized rates, SCE uses a Commission-approved methodology to calculate factors to allocate total company costs between CPUC and FERC jurisdiction.[587] SCE presents those allocation factors in SCE-09, Table IV-6. SCE's calculations are unopposed. We adopt SCE's uncontested jurisdictional allocation factors.

13. Sales and Customer Forecast

SCE provides three separate but related forecasts for the 2016-2020 period in its testimony: retail electricity sales, customer accounts, and new meter connections.[588] The Commission's determination regarding the appropriate level of these forecasts indirectly affects a number of SCE's revenue requirement requests.

In SCE's Test Year 2015 GRC, the Commission adopted a reduction to SCE's forecast for new meter connections. The Commission then applied that

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[586] The FERC has jurisdiction over the California Independent System Operator (CAISO) controlled portion of SCE's T&D system. The CPUC has jurisdiction over the remaining T&D system as well as all the generation facilities owned by SCE. *See* ORA-02 at 1.

[587] D.04-07-022. The Commission subsequently adopted jurisdictional factors derived from this methodology in the four SCE GRC proceedings prior to the instant proceeding (SCE-09, Vol. 1, citing D.06-05-016, D.09-03-025, D.12-11-051, and D.15-11-021).

[588] SCE-09.

reduced meter forecast to SCE's original forecast of customers, thereby reducing that forecast as well. Finally, the Commission stated "assuming that energy sales per customer are the same as in SCE's retail sales forecast, we calculate [a reduced] forecast of energy sales, based on [our adopted] forecast of customers. We adopt [that] forecast."[589]

13.1. Retail Electricity Sales

SCE provides the following sales forecast in its direct testimony.[590]

Annual Retail Sales by Customer Class (GWh)						
	2015	2016	2017	2018	2019	2020
Residential	30,093	29,100	28,527	27,722	27,245	26,584
Agricultural	1,869	1,416	1,466	1,499	1,542	1,565
Commercial	42,396	41,039	41,567	42,086	42,705	42,826
Industrial	7,623	8,054	8,059	7,888	7,731	7,498
Public Authorities	4,875	4,702	4,634	4,377	4,248	4,094
Total Retail Sales	86,856	84,312	84,253	83,572	83,470	82,567

SCE states that the forecast decline in sales between 2015 and 2016 is primarily due to (1) an assumption of normal weather in 2016, compared to the hotter-than-normal weather experienced in much of SCE's service area during summer 2015; and (2) increased behind-the-meter (BTM) solar PV generation. SCE also states that "the economy has recovered slowly following the 2007-2009 Great Recession but is projected to pick up with the anticipated housing recovery over the next few years within SCE's service territory" however "the rapid

[589] D.15-11-021 at 380.

[590] SCE-09, Vol. 1, Table V-21: "Annual Retail Sales by Customer Class."

increase in customer adoption of BTM solar PV systems has reduced customer need for utility-supplied energy."[591]

No party disputes SCE's sales forecast.

13.2. Customer Accounts and New Meter Connections

All parties agree that SCE's forecast "of new customers and new meter connections follows closely the housing market cycle."[592] SCE's forecast of new residential meters is primarily driven by forecasted new housing starts, which are considered to be a leading economic variable with respect to new customers. SCE obtains housing start data from Moody's Analytics. In turn, SCE's forecast of new commercial customers is assumed to be influenced by changes in the number of residential customers. Finally, SCE's forecast of the costs of its customer-driven programs are driven by (1) the forecast of new meter sets and (2) SCE's forecast of the associated unit costs. We addressed SCE's cost forecasts in Section 4 of this decision, where we noted that those forecasts depended upon our determinations here regarding SCE's customer and new meter forecasts.

SCE provides the following forecast of customer account growth in its direct testimony.[593] Neither ORA nor TURN contest SCE's forecasts.

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[591] *Id.* at 62.

[592] TURN-11, at 21, citing SCE-9, Vol. 1, at 69.

[593] *Id.,* Table V-22: "Year-End Customers by Customer Class."

Year-End Customers by Customer Class						
	2015	2016	2017	2018	2019	2020
Residential	4,393,150	4,420,391	4,451,253	4,486,121	4,521,495	4,556,502
Agricultural	21,306	21,180	21,065	20,948	20,830	20,708
Commercial	561,475	568,091	575,324	582,516	589,761	596,975
Industrial	10,811	10,766	10,718	10,651	10,556	10,439
Public Authorities	46,588	46,548	46,551	46,606	46,703	46,828
Total Customers	5,033,330	5,066,977	5,104,911	5,146,843	5,189,344	5,231,452

SCE provides the following forecast of new meter connections in its direct testimony.[594] Both ORA and TURN recommend alternative forecasts.

Comparison of New Meter Connections Forecasts from SCE, ORA, and TURN						
	SCE		ORA		TURN	
	Residential	Commercial	Residential	Commercial	Residential	Commercial
2016	29,895	6,092	27,892	5,354	31,142	6,092
2017	33,532	6,666	34,069	5,904	34,013	6,697
2018	41,702	6,825	39,912	6,135	36,388	7,045
2019	43,438	7,665	41,378	6,210	37,955	7,350
2020	42,801	8,188	42,229	6,274	37,729	7,534

ORA, like SCE, bases its forecast on a regression model, but differs from SCE regarding the proper structure of the model. ORA argues that because its model is more methodologically sound, the resulting forecast should be adopted by the Commission.

TURN's forecast was produced by SCE's regression model, with inputs requested by TURN. TURN's recommendation reflects those modeling results as

[594] *Id.,* Table V-23: "New Meter Connections."

well as TURN's analysis of the accuracy of SCE's forecasts in previous GRC proceedings.

TURN states that it has analyzed SCE's forecasts, and the resulting actual, customer-driven costs over the last two GRC cycles and found that the company's forecasts contain a relatively consistent upward bias:

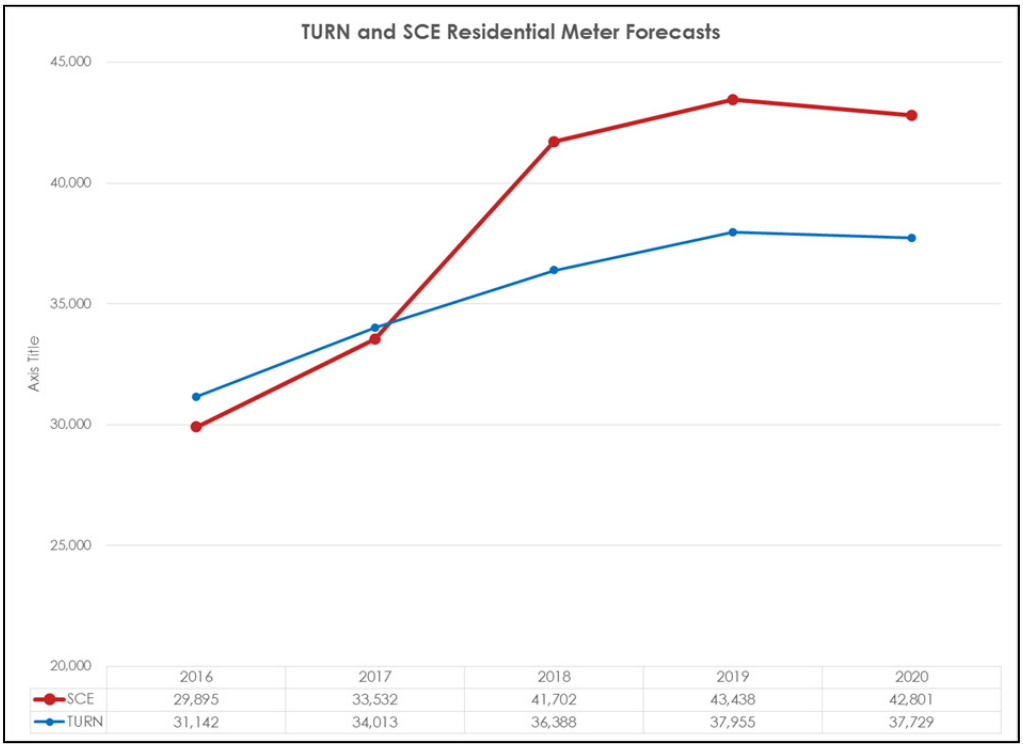
- In the Test Year 2012 GRC, SCE over-forecast actual costs by around $50 million for 2011-2012.[595]
- For 2014-2015, SCE over-forecast actual costs of residential connections by $143 million.
- For 2014-2015, SCE over-forecast actual commercial customer-driven costs by around $41 million.[596]

Based on this analysis, TURN concludes that while it recognizes the overall growth trend in housing starts, it recommends adjusting the housing start input to SCE's regression model to reflect the average growth rate in actual housing starts from 2014-2016.[597] At TURN's request SCE made this single change to its regression model to calculate new residential meter sets, which allows us to compare SCE's forecast with TURN's modification to that forecast in the chart below:

[595] TURN-11, at 25.

[596] *Id.* at 26.

[597] *Id.* at 31.



SCE responds to ORA and TURN in its rebuttal testimony and briefs.

SCE faults ORA's modeling results, contending that ORA's model not only significantly under-forecasts SCE's new residential meters in 2016 but also performs worse than SCE's model.[598] SCE primarily objects to ORA's underlying assumption that it takes 36 months from the start of home construction to the meter connection date, twice as long as SCE assumes in its model. As an example, SCE contends that this caused ORA to use housing starts data from 2013 to forecast new meter connections in 2016. SCE suggests that "incorporating actual 2016 meter data will produce a more realistic forecast for the rest of the forecast period."[599]

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[598] SCE-25, Vol. 1, at 26 (discussion and Table III-6).

[599] SCE Opening Brief at 208.

SCE faults TURN's analysis of the outcomes from prior GRCs because they do not acknowledge that in this GRC, SCE changed its methodology to use only the Moody's housing starts forecast, instead of averaging the forecasts of both Moody's and IHS Global Insights as in the previous GRC, "primarily because the IHS Global Insight's forecast produced an overly optimistic housing recovery."[600] Despite acknowledging that IHS Global Insights produced an inaccurate forecast in the Test Year 2015 GRC, SCE then faults TURN for offering what SCE considers "an arbitrary projection with no economic or demographic foundation."[601] More substantively, SCE contends that TURN's reduction of residential housing starts will lead to a significant under-forecast of residential meters: "while it does not represent a substantial reduction in residential housing starts for 2017, TURN's forecast downplays economic and housing-related factors assumed in Moody's forecast for the outer years" such as an accelerated pace of new home construction as the SCE service territory enters into a full economic expansion and economic headwinds such as weak income growth dissipate.

In its opening brief, SCE alleges with no proof that "TURN's recommendation is based purely on its subjective goal of creating a lower meter forecast."[602] SCE further alleges that TURN's method of "[s]electively" relying on Moody's housing starts data in certain years, and not in others, "is unprincipled and should be rejected."[603] SCE also faults TURN for including

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600 *Id.* at 30.

601 *Ibid.*

602 SCE Opening Brief at 208.

603 *Ibid.*

more recent data in its forecast.[604] Finally, SCE faults TURN's suggestions in its testimony that SCE has a motive to over-forecast, stating that SCE "earned excess profit for no ratepayer benefit." SCE references TURN's witness' testimony at hearings: "when asked at hearings whether TURN had any evidence to support this statement, Mr. Borden admitted that he had none."[605] That said, SCE provided no evidence that the unspent funds did not go toward excess profit. As we have noted elsewhere in this decision, we are troubled by SCE's inability to explain where funds that, once approved by this Commission for purposes forecast by SCE, in fact are not spent for that purpose. In short, the key takeaway from TURN's analysis is that "SCE has consistently over-forecasted these costs in recent GRCs" and SCE has neither demonstrated otherwise, nor explained the financial consequences for ratepayers of its inaccurate forecasts.

More broadly, we find TURN's approach to forecasting new meters, as well as its analysis of prior GRC outcomes, to be carefully conceived and executed, and then explained clearly and transparently. TURN demonstrated that SCE has consistently over-forecasted new meters in recent GRCs. For that reason, we are reluctant to adopt SCE's forecast in this proceeding. Instead, we adopt the results of TURN's analysis as the forecast of SCE's new meters for residential and commercial accounts. We summarize our adopted forecast in the table below.

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[604] SCE Opening Brief at 210.

[605] *Ibid*., citing RT at 2960 (redacted volume).

New Meter Connections Adopted Forecast					
	Residential		Commercial		Agricultural
	# Requested	# Adopted	# Requested	# Adopted	# Adopted
	SCE	TURN	SCE	TURN	Uncontested
2016	29,895	31,142	6,092	6,092	349
2017	33,532	34,013	6,666	6,697	321
2018	41,702	36,388	6,825	7,045	321
2019	43,438	37,955	7,665	7,350	321
2020	42,801	37,729	8,188	7,534	321

TURN did not develop its own forecasts for Streetlights. However, since the number of streetlights is directly related to the number of new residential meter connections, and since we adopt TURN's forecasts for new residential meters, our adopted 2017 and 2018 forecasts for Streetlights reflect revisions to SCE's request to align those values with our adopted residential forecasts.

No party disputed SCE's forecast of new meters for agricultural accounts, and we adopt that forecast in this decision.

14. Other Operating Revenues

OOR are the revenues received by SCE from transactions not directly associated with the sale of electric energy. OOR is subtracted from total operating costs to determine the test year revenue requirement because it reduces the revenue that must be collected through customer rate levels. SCE forecasts a total of $203.992 million for OOR in Test Year 2018.[606] ORA examined

[606] SCE-60 at A-35, line 16.

SCE's forecasts and does not oppose them.[607] We adopt SCE's uncontested forecast.

15. Cost Escalation

As is typical in general rate cases, SCE utilizes a variety of escalation rates to account for the effects of inflation when developing its forecast labor, non-labor, and capital costs. SCE filed this application in September 2016 so its forecasts were developed using 2015 dollars. These values are subsequently escalated to 2018, 2019 and 2020 dollars by applying the escalators discussed here. We summarize SCE's methodologies briefly below.

First, SCE bases its labor cost escalation index on the actual labor escalation rates SCE incurred during the recorded period (2011–2015). For the forecast period (2016–2020), SCE bases its labor cost escalation forecast on SCE's represented employees contractual wage increase and Global Insight Power Planner labor cost forecasts.[608]

Second, to escalate non-labor expenses and capital costs, SCE relies on published indices that are commonly accepted by this Commission: the Handy-Whitman Index of Public Utility Construction Costs and IHS Global Insight forecasts of O&M and capital cost escalation.[609]

SCE's proposed cost escalation methodology and escalation rates are unopposed, but ORA and SCE agree that SCE should update the labor, non-labor, and capital-related escalation rates using the most recent information

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[607] ORA-07 (Transmission and Distribution Expenses and Other Operating Revenues) at 55; ORA -12 (Customer Service Costs) at 3.

[608] SCE-09, Vol. 1, at 87.

[609] *Id.*, at 86-87.

available at the time of the update hearings in this proceeding.[610] SCE's method and its agreement with ORA are reasonable and are adopted.

16. Post Test Year Ratemaking

Under the Commission's long-standing Rate Case Plan, large energy utilities such as SCE are required to file general rate case applications every three years. The applications are required to include detailed support of the applicant's forecasted revenue requirement for the test year (e.g., 2018 in this proceeding), and those forecasts provide the basis for the Commission's decision. The Rate Case Plan also provides that applicants may request an attrition allowance as part of their application for the test year revenue requirement: "[i]f applicant requests an attrition allowance, it shall include in its required supporting materials evidence supporting the requested attrition allowance."[611] The Commission adopted the term "attrition" to capture the truism under cost-of-service regulation that if a utility's costs increase in the years between its test years, and if those costs are not offset by additional revenue from increased rates or due to higher sales, the utility's earnings will, mathematically, decline. This possibility posed a serious concern during past periods of high inflation, but even after economic conditions stabilized, attrition requests remained a routine feature of the GRC applications of the large energy utilities. Nevertheless, the Commission retains the discretion to grant or deny such requests.[612] SCE's

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[610] SCE Opening Brief at 211.

[611] D.07-07-004, Opinion Modifying Energy Rate Case Plan, Attachment A at A-19 ("Rate Case Plan--Edison Only").

[612] We note here that SCE's testimony is incorrect on this point: "Annual cost increases can be triggered by inflation and by plant additions used to maintain and provide service.

Footnote continued on next page

attrition increases have been implemented through what the Commission terms a "Post-Test Year Ratemaking" (PTYR).

16.1. Summary of SCE's Proposals

SCE proposes a PTYR mechanism with the following features:

1. An annual advice letter providing notice of the revenue requirement change for the following year.
2. O&M escalation using the escalation rate methodology adopted in this decision for escalating 2015 dollars to 2018 dollars, but updated at the time of the advice letter filing and incorporating known labor cost increases at the time of the GRC decision.
3. Capital-related cost increases using SCE's Board-approved capital budget or based on reasonable increases in capital additions from test-year levels, updated for changes in SCE's authorized cost of capital.
4. A "Z-Factor" mechanism that allows SCE to seek recovery of costs associated with exogenous events (Z-Factors) that result in a major cost impact for SCE.

The first, second and fourth items listed by SCE represent continuations of SCE's current Commission-adopted PTYR mechanism (although SCE's proposal to incorporate known labor cost increases in its O&M escalation is new). SCE's third item, a budget-based capital cost increase, is SCE's primary proposal for attrition year capital increases. SCE also offers an alternate request, which is to escalate SCE's 2018 test year capital additions by five percent in both 2019 and 2020, plus an adjustment for one project, the Customer Service Re-Platform capitalized software project. SCE's proposed five percent escalation rate is

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Cost-of-service ratemaking principles require some means to recognize these increases in the authorized revenue requirement." SCE-09, Vol. 1, at 115, emphasis added. TURN's testimony in this proceeding cites several Commission decisions that denied attrition increases requested by the applicant utility.

roughly double the escalation that results from projected changes in capital-good prices.[613]

For O&M expense escalation, intervenors do not oppose authorizing SCE to escalate its 2019 and 2020 O&M expenses from the 2018 level, but recommend specific escalation factors that result in smaller increases of O&M expenses for 2019 and 2020. Those proposals are summarized in the table below.

[613] In our decision on SCE's 2015 GRC application, we adopted ORA's recommendation to escalate adopted Test Year 2015 capital additions by 2.0% per year, since the increase in SCE's forecast of capital additions from 2016 to 2017 was approximately 2.0%

Intervenors' Proposals for Post-Test Year O&M Escalation

Intervenor	Proposal
ORA	• SCE has agreed to ORA's lower 2019-2020 pension cost estimate. • ORA proposes to escalate medical benefits costs at 4.58% in 2019 and 4.58% in 2020, compared to SCE's proposal to escalate medical benefits costs by 7.0% per year in 2019 and 2020. • ORA does not oppose SCE's proposed labor escalation rates of 2.89% for 2019 and 2.94% for 2020, but does oppose SCE's proposal to update the labor escalation rates.[614]
TURN--Primary Proposal	CPI-U[615]
TURN--Alternate Proposal	CPI-U + no more than 50 basis points if the Commission finds it necessary to more closely reflect anticipated SCE-specific cost increases[616]
CFC	Limit rate increases to the recorded median income growth rates in the SCE service area.
SBUA	Limit PTYR revenue requirement increases to 3% in 2019 and 2020.

For capital-related attrition, SCE's primary proposal is that the Commission authorize 2019 and 2020 capital costs equal to SCE's budget-based forecast of capital additions. However, SCE acknowledges that in its GRCs for

[614] SCE originally proposed labor escalation rates equal to 2.79% for 2019 and 2.74% for 2020 (SCE-09, Vol. 1 at 79, Table VII-28, Labor Escalation Rates) but updated these values to those shown here in its December 2017 Update Testimony (SCE-59 at 11, Table III-4). ORA did not object to these updates.

[615] TURN-06 at 12. The CPI is the "Consumer Price Index" published monthly by the U.S. Bureau of Labor Statistics (BLS). As described on the BLS website, "indexes are available for two population groups: a CPI for All Urban Consumers (CPI-U) which covers approximately 93 percent of the total population and a CPI for Urban Wage Earners and Clerical Workers (CPI-W) which covers 29 percent of the population." *See* https://www.bls.gov/cpi/overview.htm.

[616] *Id.*, at 13.

Test Years 2006, 2012 and 2015 the Commission did not adopt this approach. Instead, the authorized PTYR capital additions were calculated by applying an escalation factor to the adopted capital additions in SCE's test year. SCE informs us that "that approach is acceptable here, provided that the capital escalation rates are sufficient to allow for real increases in capital additions, beyond the increases that result from pure escalation in capital goods prices."[617] Indeed, SCE recommends an annual 5% escalation rate, which is twice SCE's estimate of the average forecast capital cost escalation rates for 2019 and 2020 for seven different categories of plant, 2.49%.[618] SCE's calculation of the average escalation rate is shown in the table below. SCE describes this additional increment to capital cost escalation as "a reasonable 'down payment' on the capital additions required to build the next-generation grid that the Commission and other policymakers want and California needs."[619]

[617] SCE-09, Vol. 1, at 121. Emphasis in the original.

[618] *Ibid*. The calculation is reproduced from WP SCE-09, Vol. 1, Chapter X at 8-9. In turn, the source values are found in SCE-09, Vol. 1, at 86, Table VII-32 (Capital Escalation Rates). SCE explains those values at pages 84-85 of that Exhibit.

[619] *Id.*, at 121-122.

SCE Calculation of
Unweighted Average of Capital Escalation Rates

	Year	
	2019	2020
Total Steam Production Plant	2.51%	2.54%
Total Hydraulic Production Plant	2.45%	2.40%
Total Other Production Plant	2.11%	2.64%
Total Transmission Plant	2.63%	2.62%
Total Distribution Plant	3.14%	3.18%
General Plant	1.82%	1.81%
Total Nuclear Palo Verde	2.55%	2.46%
Unweighted Average Across 2019-2020		**2.49%**

Intervenors do not oppose some form of PTYR increases for capital, but indicate a preference for an escalation-based mechanism versus SCE's budget-based proposal. As shown in the table below, the intervenors propose lower escalation rates than those proposed by SCE:

Intervenors' Proposals for Post-Test Year Capital Escalation

Intervenor	**Proposals**
ORA	Authorize plant addition increases of 2.4% for 2019 and 2.8% for 2020
TURN	Forecast capital expenditures that resulted from trending seven years of recorded capital expenditures (2010-2016)
CFC	Limit rate increases to the recorded median income growth rates in SCE's service area
SBUA	Limit PTYR revenue requirement increases to 3% in 2019 and 2020

16.1.1. Discussion

Neither SCE nor the intervenors provide convincing reasons for us to change the approach to PTYR that we adopted in D.15-11-021. Therefore, we adopt the following PTYR mechanism for SCE:

1. Non-labor O&M expenses shall be escalated as proposed by SCE, using the same pricing methodology and pricing indices that we adopt for test year escalation. This includes benefits escalation.
2. For labor escalation we adopt SCE's proposed labor escalation rates of 2.89% for 2019 and 2.94% for 2020, but we also adopt ORA's recommendation to deny SCE's request to incorporate known labor cost increases at the time of this GRC decision.
3. Capital-related revenues shall be escalated by increasing gross capital additions in the post test years at a rate of 2.49% per year above the 2018 authorized capital additions.
4. SCE's Z-factor recovery mechanism shall continue for 2019 and 2020.
5. SCE shall continue to file an advice letter to implement the post-test year revenue requirement. SCE must file an advice letter by November 1st of 2019 and 2020. As we directed in D.15-11-021, SCE must include the following information in these advice letters:
    a. Its updated post-test year revenue requirement, calculated by using the latest IHS Global Insight escalation rates for the following attrition year. In addition, we direct SCE to augment the information currently provided in these advice letters to include the formulae used to calculate each escalated value, so that the reader can verify SCE's calculations without having to request additional workpapers from the Company.
    b. For the second attrition year of 2020, SCE shall use the latest Global Insight escalation rates to escalate 2018 authorized level of O&M expenses to 2019 and 2020 levels, but the 2019 authorized level of O&M expenses will not be trued up to reflect the actual escalation factor for 2019.

Our adopted escalation rates are summarized in the table below. These are the rates that SCE shall update as part of its annual attrition year advice letter filing.

Post-Test Year Escalation Rates
Adopted in This Decision[620]

Category	2019	2020
O&M: Labor Escalation Rates[621]	2.89%	2.94%
O&M: Benefits Escalation Rates		
Medical Programs	7.00%	7.00%
Dental Programs	4.20%	4.20%
Vision Service Plan	3.00%	3.00%
Disability Programs (=updated labor escalation rates)	2.89%	2.94%
Group Life Insurance	0.00%	0.00%
Misc. Benefit Programs[622]	2.20%	2.27%
Executive Benefits	0.00%	0.00%
401 (k) (=updated labor escalation rates)	2.89%	2.94%
Capital Additions (applied to 2018 capital additions, based on the 2018 authorized capital expenditures authorized in this decision)	2.49%	2.49%

17. Rate Base Components

Rate Base represents the depreciated value of assets used to provide service to customers. The product of the Rate Base and the authorized rate of return equals a utility's return on its shareholders' investment. The key categories comprising shareholder investment in Rate Base are: Fixed Capital, Adjustments, Working Cash, and Deductions for Reserves. SCE's fixed capital forecast is set forth throughout their application. By this decision, we have authorized less capital spending than SCE requested and Fixed Capital and SCE's Rate Base will be adjusted accordingly.

620 SCE-09, Vol. 1 except where noted.

621 SCE-59 at 11, table III-4.

622 SCE-59 at 12, table III-5.

17.1. Electric Plant

SCE states Electric Plant forecasts are developed by starting with 2015 recorded plant balances and then adding forecast plant additions. Plant additions are based on forecast capital expenditures, such as those for Generation, T&D, and CS, which are addressed separately in this decision. The authorized 2018 Electric Plant will be computed through the Results of Operations model based on authorized capital expenditures and capital additions.[623]

17.2. Depreciation Expense

The authorized depreciation expense will be calculated through the Results of Operations model based on the authorized depreciation rates (discussed in Section 18), applied to Electric Plant balances. The depreciation expense is part of the revenue requirement and accrues to accumulated depreciation which is offset against Rate Base.

17.3. Taxes

17.3.1. The Tax Cuts and Jobs Act

On December 22, 2017, Public Law 115-97, the TCJA, was signed into law. SCE reports this legislation includes three changes that directly affect the computation of regulatory tax expense and rate base in SCE's Test Year 2018 GRC. SCE also proposes to return excess accumulated deferred income taxes beginning in 2018. SCE's updates to the RO model reflect the following:[624]

1. Change in the federal income tax rate from 35% to 21%;

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[623] See SCE Opening Brief, at 219.

[624] SCE-60, at 6:1-14.

2. Loss of Internal Revenue Code (IRC) Section 199 manufacturing deduction;
3. New IRC Section 168(k) Bonus Depreciation rules do not apply to public utility property; and
4. The return of excess tax reserves on historical normalized tax differences using the average rate assumption method (ARAM) as reportedly prescribed by the Internal Revenue Service (IRS), to return these benefits to customers beginning in 2018.

The change in the Federal income tax rate from 35% to 21% reportedly affects the revenue requirement in five distinct ways:[625]

1. Equity return on rate base;
2. Debt return on rate base;
3. Current year flow-through tax benefits generated and returned to customers;
4. Recovery of prior year flow-through tax benefits from customers; and
5. Deferred income taxes impact on rate base.

17.3.2. SCE Testimony: Impact of the Tax Cuts and Jobs Act

SCE served testimony addressing the impact of the TCJA on February 16, 2018.[626]

17.3.2.1. Revenue Requirement

With its updated testimony, SCE requests a 2018 GRC revenue decrease of $22 million, 0.38% less than the 2017 authorized GRC revenue requirement.[627]

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[625] *Id.* at 6:15-22.

[626] SCE-60.

[627] *Id.* at 5:1-2 and Table IV-3.

The update reduces SCE's Test Year 2018 Revenue Requirement by $139 million compared to the revenue requirement request stated in SCE's December 8, 2017 update testimony.[628] SCE reports the key drivers of the reduction are changes in: the Federal Income Tax Rate, IRC Section 199 Deduction, Bonus Depreciation, ARAM, and Added Facilities OOR.[629]

SCE now, following the updates, requests that the Commission adopt a 2018 revenue requirement of $5.534 billion. The proposed revenue change takes into account a requested $106 million decrease in ABRR, a $43 million increase to account for a decline in 2018 forecast GWh sales, and a $41 million increase related to the recovery of the December 31, 2017 balances in five balancing and memorandum accounts proposed in prior testimony.[630] Attrition years 2019 and 2020 would follow with increases to the ABRR of $431 million and $503 million, respectively.[631]

SCE explains that prior to the TCJA, SCE needed to collect $1,781 from customers to recover $1,000. With the tax legislation, the amount it now needs to collect from customers to recover $1,000 drops to $1,425. This decrease is reflected in the lower "gross-up factor" and reduces the test year revenue requirement.[632]

In addition to tax benefits for SCE and its ratepayers, the change in tax rates has two unfavorable effects on the revenue requirement. First, the lower

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628 *Id.* at 1:8-10 and p. 3 Table III-1.

629 *Id.* at 1:12-16.

630 *Id.* at 4-5.

631 *Id.*, Table IV-3.

632 *Id.* at 7:1-8 and Table V-4.

tax rate reduces the after-tax benefit of tax deductions. That means a tax deduction which formerly provided a 35% benefit and a corresponding decrease in the revenue requirement will now provide a 21% benefit with a correspondingly reduced decrease in the revenue requirement. Second, the lower tax rate, through the gross-up factor, reduces the value of the benefit when converted into the revenue requirement.[633]

17.3.2.2. Accumulated Deferred Income Taxes

The reduction in the corporate income tax rate also results in a reduction in the amounts which need to be held for Accumulated Deferred Income Taxes (ADIT). ADIT results from SCE normalizing the benefit of accelerated depreciation, as required by the IRS.[634] When SCE takes accelerated depreciation it receives a current tax benefit. For ratemaking purposes however, SCE's capital expenditures for its plant is depreciated on a straight-line, or "book" basis, over the life of the asset, in accordance with IRS normalization requirements. This means the ratepayers receiving the benefit of an asset share equally in the cost of that asset over the life of the asset. Included in book depreciation is the initial cost of the asset and the "cost of removal" of the asset or "negative net salvage." The difference between the accelerated "tax depreciation" and the "book depreciation" multiplied by the tax rate is the ADIT balance.

Under IRS normalization rules, while the utility is allowed to claim the benefit of accelerated depreciation in its tax filings, thereby lowering its taxable income, the utility is not allowed to flow through these tax benefits to ratepayers.

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633 *Id.* at 8:1-7 and Table V-7.

634 *See*, IRC Section 168(f)(2).

Instead, the IRS requires the creation of the ADIT balance which reduces rate base. The ADIT ensures the ratepayers share in the tax benefit of accelerated depreciation through the ADIT reduction from rate base, while tracking the annual changes between tax and book depreciation.

The ADIT, by not allowing the flow through of the tax benefits of accelerated depreciation, also ensures the ratepayers share equally in the tax benefit of accelerated depreciation. Under "normalization" rules all ratepayers over the life of an asset receive the tax benefits of accelerated depreciation; the money saved now due to accelerated depreciation (the income taxes) is deferred for payment of the taxes later so that today's ratepayers share equally with tomorrow's ratepayers in the payment of taxes relating to the assets which generated the accelerated depreciation.

ADIT was formerly calculated based on a payment of deferred income taxes at the rate of 35%. Due to the reduction in the tax rate to 21%, the amount of ADIT needed to pay the deferred tax is reduced. The excess deferred income taxes which result from the reduced income tax rate will be returned to customers; however, this return will not be immediate. The IRS requires these excess deferred income taxes be "normalized" pursuant to the ARAM.[635] When the excess deferred income taxes are returned, ARAM ensures the excess is returned to ratepayers over the remaining life of the underlying asset. Since the deferred income taxes are offset against ratebase, when the excess deferred income taxes are returned, there is a corresponding increase in ratebase.[636]

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[635] Public Law 115-97, section 13001(d)(3)(B).

[636] SCE-60, at 10:12-12:16.

SCE historically has included Cost of Removal in its Book Depreciation for ratemaking purposes.

> Removal costs are deductible for income tax purposes when they are incurred. For financial reporting and ratemaking purposes, removal costs are estimated and accrued in book depreciation expense. Removal costs associated with assets depreciable under IRC Section 168 are subject to normalization tax treatment, whereas removal costs associated with assets not depreciable under IRC Section 168 (generally, pre-1981 vintages and California tax treatment) are subject to flow-through tax treatment.[637]

Prior to the TCJA, SCE included Cost of Removal when it calculated its ADIT.[638] SCE, by including Cost of Removal in the calculation of ADIT, normalized the Cost of Removal and ensured all ratepayers over the life of the asset shared in that expense. Now, following passage of the TCJA however, SCE contends Cost of Removal must be excluded from Book Depreciation before calculating ARAM.[639]

TURN questions whether SCE has properly excluded the cost of removal of assets from its calculations of ARAM. Rather than recommending a change to SCE's calculations, TURN recommends SCE should request a private letter ruling from the IRS concerning the use of the entirety of book depreciation for computing ARAM as opposed to excluding net salvage.[640] TURN also recommends this difference be tracked in a memorandum account. SCE, by their rebuttal testimony, agrees with TURN that it should request a Private Letter

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[637] SCE-09, Vol. 2, at 25:8-13.

[638] RT, March 19, 2018, Vol. 24, at 3258:26-3259:6.

[639] SCE-60, at 12:4-16

[640] TURN-15, at 2-3.

Ruling to address whether or not cost of removal should be included in book depreciation when computing ARAM.[641]

17.3.2.3. The Return to Ratepayers of Excess Deferred Income Taxes Does Not Violate IRS Normalization Rules

The normalization rules are provided by IRC section 168(i)(9), Treasury Regulations § 1.167(l)-1, and pertinent IRS rulings.

The TCJA has adopted normalization requirements at section 13001(d) which are consistent with the normalization rules previously present in the IRC and regulations. Section 168(f)(2) of the IRC provides that a deduction for depreciation expense shall not be available for public utility property, as defined by IRC section 168(i)(10), if the utility does not employ a normalization method of accounting as described in IRC section 168(i)(9). Similarly, section 13001(d)(4) provides that if a taxpayer does not use a normalization method of accounting for corporate rate reductions, the taxpayer's tax for the taxable year shall be increased by the amount by which it reduces its excess tax reserve more rapidly than permitted under a normalization method of accounting, and (B) such taxpayer shall not be treated as using a normalization method of accounting for purposes of subsections (f)(2) and (i)(9)(C) of section 168 of the Internal Revenue Code of 1986.

IRC section 168(i)(9) states, in part,

> **(A) In general**
> In order to use a normalization method of accounting with respect to any public utility property for purposes of subsection (f)(2)–

641 SCE-61, at 1:17-22.

> i. The taxpayer must, in computing its tax expense for purposes of establishing its cost of service for ratemaking purposes and reflecting operating results in its regulated books of account, use a method of depreciation with respect to such property that is the same as, and a depreciation period for such property that is no shorter than, the method and period used to compute its depreciation expense for such purposes…

Under IRC section 168(i)(9)(A)(ii), if the deduction under IRC section 168 is a different amount from the allowable deduction under section 167 when applying the same calculation method as under IRC section 168(a)(9)(A)(i), then the taxpayer must reflect that difference in a tax deferral reserve. This is the ADIT discussed above in section 17.3.2.2.

IRC section 168(i)(9)(B)(ii) precludes using:

> any procedure or adjustment for ratemaking purposes which uses an estimate of the taxpayer's tax expense, depreciation expense, or reserve for deferred taxes … unless such estimate or projection is also used, for ratemaking purposes, with respect to the other 2 such items and with respect to the rate base.

Treasury Regulation § 1.167(l) provides the normalization regulations. These regulations do not relate to other book-tax timing differences other than federal accelerated depreciation.[642] Treasury Regulation § 1.167(l)-1(h)(2)(i) requires that deferred income tax based on actual tax liability shall be credited to a reserve for deferred taxes. Treasury Regulation § 1.167(l)-1(h)(1)(iii) provides that the amount of deferred income tax is the "excess . . . of the amount the tax liability would have been had a subsection (l) method been used over the

[642] Treasury Regulation § 1.167(l)-1(a)(1) ("The normalization requirements . . . pertain only to the deferral of Federal income tax liability resulting from the use of an accelerated method of depreciation").

amount of the actual tax liability." A subsection (l) method includes the straight-line method of depreciation used here for ratemaking purposes.

The deferred taxes reflected on SCE's regulatory books of account are based on the differences between SCE's regulatory tax liability, including Cost of Removal, and its actual tax liability, as calculated on its actual depreciable basis and consistent with IRC section 168(i)(9)(A)(i). This is consistent with Treasury Regulation § 1.167(l)-1(h)(1)(iii). SCE should continue to calculate its excess deferred income taxes and the consequent redistribution of those funds under ARAM, in the same manner.

SCE is receiving the full benefits of accelerated depreciation, as calculated on its actual depreciable basis. The depreciable basis under IRC section 167(c) is the adjusted basis of IRC section 1011, following application of IRC section 1016 adjustments. These adjustments must be made pursuant to section 1016(a)(1) for "expenditures, receipts, losses, or other items, properly chargeable to capital account…" and "… for exhaustion, wear and tear, obsolescence, amortization, and depletion …"

SCE has consistently normalized the benefits of accelerated depreciation derived from its depreciable basis. It is our intention that SCE continues to normalize the benefits of the TCJA.[643] Historically SCE has included Cost of Removal in its calculation of ADIT. Excluding Cost of Removal from the ARAM calculation increases the tax expense for current customers in excess of the benefit received from the asset. The effect is the Cost of Removal is not

[643] Taxpayers have a duty to treat items consistently. See *Unvert v. Commissioner*, 72 T.C. 807, 814 (T.C. 1979) ("'there is a duty of consistency as to [tax] treatment, and one should be held to the consequences of the initial treatment.'").

normalized, despite it being a cost which should be shared equally by all ratepayers. Accordingly, we believe our approach is consistent with the IRC normalization rules by requiring SCE continue to comply with normalization of the Cost of Removal by including it in its calculation of ADIT and consequently ARAM.

We fully intend SCE continues to comply with the normalization rules and consider the requirements of this decision to meet those rules. While we believe we have reached the correct result, and though SCE has not cited to any written determination, case, regulation, or statute to support its position, we recognize that SCE has requested[644] and may receive a private letter ruling from the IRS. Accordingly, SCE may track changes in revenue resulting from the application of ARAM in accordance with this decision in the Tax Memorandum Account adopted in Section 25.1, below.

In the event that SCE receives a relevant IRS ruling contradicting this decision, stating normalization rules do not apply to Cost of Removal/Negative Net Salvage in the ARAM calculation for the return of excess deferred taxes to ratepayers, then it shall comply with the IRS's interpretation of the applicable tax laws by filing a Tier 2 advice letter with this Commission to seek an appropriate adjustment to its revenue requirement and/or rate base.

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[644] On June 8, 2018, SCE filed and served a copy of its draft private letter ruling request to the IRS as a Tier 1 Advice Letter (AL 3813-E). The draft request seeks a private letter ruling in response to the following questions, "Do Normalization Rules apply to Cost of Removal?", "If Normalization Rules apply to Cost of Removal, should Cost of Removal be treated as a discrete 'protected' method/life difference?, and "If the Normalization Rules do not apply to Cost of Removal, would those rules require that both the Cost of Removal component of book depreciation accruals and future Cost of Removal payments be removed from consideration in the computation of the ARAM to be applied to the 'protected' Excess Deferred Federal Income Taxes (EDFIT)?"

17.3.2.4. Unprotected Assets

Some other assets are not subject to normalization rules. These assets are typically referred to as "unprotected" assets.[645] SCE identifies the unprotected assets as: Accrued Vacation, ITCC (Income Tax Component of Contributions), Mixed Service Costs, AFUDC (Allowance for Funds Used During Construction), Other Historical Basis Differences, and Cost of Removal.[646] In past GRCs normalization rules have been applied to them, even though not required, again to ensure that ratepayers over the life of the asset are treated equally. This is consistent with Public Utilities Code § 454.8 which requires, in part, "the commission shall consider a method for the recovery of these costs which would be constant in real economic terms over the life of the facilities, so that ratepayers in a given year will not pay for the benefits received in other years."

Although we agree that when taxes are deferred the benefit of the deferral should be normalized so that ratepayers are treated equally, we do not agree with deferring the return of excess funds if the deferral is not required by statute or regulation. SCE acknowledges ARAM does not apply to these funds since the IRS normalization rules do not apply.[647] We find that funds that are excess funds now and not subject to other limitations, should be returned to ratepayers now. Unlike requiring all ratepayers share equally in the expense of an asset over its life, returning excess funds to current ratepayers does not impose a greater burden on future ratepayers. Rather, repayment now returns the excess funds to ratepayers who are the closest in time to the recent ratepayers who contributed

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[645] RT, Vol. 24, at 3257:1-14.

[646] RT, Vol. 24, at 3264:28-3265:18.

[647] SCE-60, at 12:25-26.

those funds to these accounts. Therefore, we require the net excess deferrals relating to the unprotected assets consisting of: Accrued Vacation, ITCC, Mixed Service Costs, AFUDC, and Other Historical Basis Differences, be returned to ratepayers. Consistent with the return of other funds due to implementation of the TCJA, we require these funds be returned on an amortized basis over 2018-2020.

17.3.3. Other Tax Issues

TURN contends SCE has incorrectly calculated its operational cash requirement by applying the new tax rate only to the 2018 year-end balance and not to the entire year.[648] Applying the new tax rate to the entire year reduces the estimate for workers' compensation reserves by $12.144 million as opposed to SCE's proposed reduction of $5.297 million.

Similarly for the unfunded pension reserve, TURN, applies the 21% tax rate to the entire year of 2018, reducing the unfunded pension estimate by $16.413 million, in contrast to SCE's reduction to $8.430 million.

SCE agrees with TURN's proposal to apply the 21% tax rate to the entire year and use average deferred tax balances for Workers' Compensation and Unfunded Pension Reserves rather than year-end balances.[649]

In addition to a differing method of calculation, when one considers other accounts receivable, TURN relies on a different forecast. In this case, SCE's revision results in an adjusted number of $73.323 million and TURN's revised amount is $50.778 million (See Section 17.11.2).

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[648] TURN-15, at 4-5.

[649] SCE-61, at 3:7-14.

TURN does not dispute SCE's calculation of the TCJA impact on long-term incentives; TURN advocates against any recovery of long-term incentives. Consistent with our longstanding position in prior decisions and this decision at section 8.2, we do not permit recovery of long-term incentive compensation.

SCE also agrees with ORA and TURN that it should have a broadened Tax Memorandum account.[650] The requirements for a Tax Memorandum Account are discussed below at section 25.1.

SCE filed an advice letter (AL 3817-E) on June 27, 2018 to address non-rate base impacts of other deferred tax amounts affected by the change in tax rates.

17.3.4. The Impact on Rates

SCE presents two proposals for implementing the impact of the TCJA. First, SCE proposes amortizing the balance of the 2018 GRC Revenue Requirement Memorandum Account (RRMA) over 2019 and 2020. SCE suggests this would benefit customers by promoting rate stabilization. If SCE's application is approved without change, this would result in no change to rates in 2018, followed by a $272 million increase in 2019 and a $503 million increase in 2020.[651]

Alternatively, SCE proposes placing any tax related savings in a balancing account dedicated to wildfire related risk mitigation.[652] ORA is opposed to setting aside the tax benefits to support wildfire-related risk mitigation.[653]

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650 SCE-61, at 2:3-10.

651 SCE-60, at 19.

652 *Ibid.*

653 ORA-02-T, at 2-8:12-16.

ORA states if the initial benefits of TJCA are realized in 2018, the 2018 revenue requirement will be $5.359 billion, a reduction of $281 million from the current revenue requirement of $5.640 million. This would then be followed by attrition year increases of $309 million to $5.668 million for 2019 and an additional $374 million to $6.042 million for 2020.[654] ORA however, proposes the benefits be amortized over three years, providing rate stabilization and ensuring some benefits of TJCA flow to ratepayers now, during 2018.[655] This would result in a reduction in the revenue requirement for 2018 of $93 million, to $5.547 million, followed by an increase for 2019 of $27 million, to $5.574 million, and for 2020 of $374 million to $5.948 million.[656]

SCE is not opposed to amortizing the tax benefit over 2018-2020, depending on timing of the decision in this proceeding.[657] SCE also agrees it will not contest ORA and TURN's opposition to placing any tax benefit in an account to mitigate the risk of wildfire.

We agree the benefits of the TCJA should flow to the ratepayers. We recognize there will likely be costs associated with wildfires which will have to be paid but the questions of who bears responsibility and thus who should bear the expense, as well as the amount of the expense, may depend on the circumstances and may not be answered for some time. Meanwhile, the TCJA was effective January 1, 2018; the cost of service for SCE has been reduced as of January 1, 2018. SCE has stated it is not opposed to three-year amortization over

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654 *Id.*, at 2-2, Table 2-1.

655 *Id.*, at 2-8:5-11.

656 *Id.*, at 2-9:25-30 and Table 2.2.

657 SCE-61, at 3-15:4-9.

2018-2020 (if a decision is issued before September 30, 2018) as proposed by ORA and TURN (in the interest of rate stability).[658] Due to the timing of this decision however, we agree with SCE that amortization over two-years is practical. Therefore, we require the ratepayers begin receiving the benefit of the TCJA effective January 1, 2019 and continuing through the remainder of this GRC cycle, 2018-2020.

17.4. Rate Base

SCE's forecast 2018 rate base is presented in Exhibit SCE-09, Vol. 2, at 41-86. Authorized 2018 rate base is the net of several separate line items, many of which are contested in and resolved by this proceeding.

17.5. Customer Advances

Customer Advances represent funds provided by others, such as developers, to construct new distribution facilities to be served by the utility. Customer Advances do not bear interest since they are funded by developers, not shareholders. Customer Advances are subtracted from Rate Base and investors do not earn a rate of return on them.[659]

SCE forecast Customer Advances based on a three-part analysis of: (1) estimated net advances for Electric Construction; (2) estimated refunds to customers; and (3) customer advances that will permanently offset rate base as a Contribution in Aid of Construction (CIAC).[660]

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[658] SCE-61, at 3:17-4:10.

[659] SCE-09, Vol. 2, at 42:4-43:2.

[660] SCE-09, Vol. 2, at 44; SCE-25, Vol. 2, at 2.

Both ORA and TURN dispute SCE's forecast for Customer Advances – Electric Construction. ORA disputes SCE's forecast of Customer Advances – Temporary Services. We discuss each in the following sections. No party challenges the CIAC forecast, and we agree it is reasonable.

17.5.1. Customer Advances – Electric Construction

SCE's forecast for Customer Advances – Electric Construction is driven by forecast meter sets. The meter sets forecast is discussed at section 13, Sales and Customer Forecast, *supra*. We find the meter sets forecast prepared by ORA to be reasonable and adopt it.

SCE forecasts 2018 Customer Advances for Electric Construction of $65.6 million based on a five-year average of advances per meter set.[661] ORA forecast (net of refunds) $84.7 million, a $19.1 million increase over SCE's forecast. ORA performed a linear regression analysis of six years of data (2010-2015).[662] We find convincing ORA's rationale for its forecast as well as its criticism that SCE's forecast is unreasonably low and spurious.[663] ORA's restriction to six years of data beginning with 2010 through 2015 is considered reliable as it avoids use of data from the depths of the Great Recession. We adopt ORA's forecast of $84.7 million.

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[661] SCE-09, Vol. 2A, at 45, Table IV-14.

[662] ORA-20P, at 6, Table 20-2.

[663] *Id.* at 9:9-14.

17.5.2. Customer Advances – Temporary Services

SCE averaged 2011-2015 recorded balances, then escalated that average by forecast non-labor escalation rates, to forecast Customer Advances – Temporary Services.[664] ORA based its forecast on escalation of the recorded 2015 balance.[665]

SCE's argument against ORA's forecast is not persuasive in light of the upwardly trending data; we adopt ORA's forecast for 2018 of $6.122 million.

17.6. Material and Supplies

SCE maintains an inventory of Materials and Supplies (M&S) for new plant construction and operating and maintenance needs. SCE separately forecast M&S balances for T&D, Generation, and IT. SCE forecast $226.965 million for its 2018 M&S. ORA proposed a reduced forecast of $224.476 million.[666] ORA challenges SCE's M&S forecasts for Generation and T&D, but does not challenge the M&S for Information Technology.

17.6.1. Generation M&S

SCE's forecast was based on recorded data excluding unpaid invoices for inventory maintained at the Palo Verde Nuclear Generating Station (PVNGS).[667] In rebuttal, SCE shows that its PVNGS adjustment is appropriate. The lag in receipt of detailed accounting information from Arizona Public Service, the operating agent of PVNGS, causes a lag in recording that inventory, which causes SCE to forgo a return on the inventory until the month it is recorded.

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[664] SCE-25, Vol. 2, at 7:2-3.

[665] ORA-20P, at 10.

[666] SCE-25, Vol. 2, at 7.

[667] SCE-29, at 408.

ORA's proposed adjustment for unpaid inventory is not appropriate; SCE's forecast of Generation M&S is adopted.

17.6.2. T&D M&S

ORA proposes a $391,000 reduction to SCE's T&D M&S balance based on a three-year moving average.[668] In rebuttal, SCE shows that its analysis already incorporated a three-year average, rendering ORA's second averaging step unnecessary.[669] SCE's forecast is reasonable and is adopted.

17.7. Working Cash

ORA proposes a $6.9 million reduction to SCE's working cash forecast, based on the proposition that the bank balances SCE maintains are not required under Standard Practice U-16, D.12-11-051, D.09-03-025, and D.06-05-016.[670] Although SCE contends in rebuttal that these balances are functionally required for operational purposes, SCE does not contest ORA's proposed adjustment.[671]

We eliminate the Cash Bank Balances of $6.9 million from the Working Capital forecast. The other Operational Cash Requirements are not contested.

17.8. Lead Lag Study

SCE's Lead-Lag Study seeks to quantify the amount of funds needed from investors to cover the timing difference between receipt of revenues and payment of expenses. SCE's analysis for this GRC shows, on average, SCE pays expenses 12.7 days before receiving corresponding revenues. Based on estimated

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668 SCE-25, Vol. 2, at 8:12-13.

669 SCE-25, Vol. 2, at 8:13-20.

670 ORA-20P, at 17:1-18:19.

671 SCE-25, Vol. 2, at 9:6-9.

daily expenses of $28.9 million, SCE estimates its Lead-Lag Working Cash requirement is $367 million.[672] Most of the components of SCE's Lead Lag Study are not contested; however, TURN and ORA do contest a few items which are discussed in the following sections.

17.8.1. Revenue Lag Days

Revenue Lag is the number of days between delivery of service to the customer (measured from the midpoint of the service period) and availability of payment for the service in SCE's bank account. SCE calculated a 45.01 day Revenue Lag in accordance with Standard Practice U-16.[673]

TURN proposes adjusting SCE's Revenue Lag days to account for the return of Green House Gas revenue to customers, and SCE agrees, reducing the estimated Revenue Lag by 0.94 days.[674]

ORA proposes to reduce SCE's requested Revenue Lag days by 2.66 days to 43.29 to "smooth out the fluctuations caused by SCE recalculating annual estimates every GRC." The proposal is based on an average from the 2012 and 2015 GRCs and the study for this GRC.[675] ORA's rationale is insufficient to warrant deviating from Standard Practice U-16. We adopt a Revenue Lag Day estimate of 45.01 days, accepting SCE's proposal as adjusted by TURN.

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[672] As a result of the tax update filed in SCE-60, the RO model dynamically updated the numbers provided in SCE-09, Vol. 2, at 61.

[673] SCE-09, Vol. 2A, at 62-A and SCE-29 at 39.

[674] SCE-25, Vol. 2, at 10.

[675] ORA-20P, at 18:25-28, at 19, Table 20-7.

17.8.2. Income Tax Lag

The Income Tax Lag represents the period from when current tax expenses are accrued to the time they are due by statute.[676] SCE's 2018 estimated Income Tax Lag day calculation is based on a July 13th midpoint accrual date and the quarterly due dates prescribed by Federal and California tax law resulting in a proposed Federal Income Tax lag of 25.50 days and a proposed California Income Tax Lag of 8.60 days.[677] ORA proposes 96.98 days and 117.20 days, respectively.[678] ORA's proposal is based primarily on estimated tax payments recorded over an eight-year period (2008-2015), a period during which SCE made no estimated tax payments half of those years, in part due to large bonus depreciation deductions that are set to expire during this rate cycle.[679]

SCE's "statutory" based approach results in proposals for a dramatically lower number of Tax Lag days compared to ORA's proposal or prior GRC decisions. The 2015 decision adopted 85.98 days for the Federal Income Tax lag and 56.34 for the California Income Tax lag, based on TURN's five-year weighted average (SCE proposed a five-year average).[680] For the 2012 GRC, ORA proposed a four-year average, SCE proposed five, and we used a three-year average based on facts and regulations leading to the exclusion of earlier years as not being

[676] SCE-09, at 68:18-19.

[677] SCE-09, at 69:3-20, Table IV-28 and at 69, Table IV-29.

[678] ORA-20P, at 20, Table 20-8.

[679] SCE-25, Vol. 2, at 13-14.

[680] D.15-11-021, at 469.

representative. This resulted in the Commission adopting a Federal Income Tax lag of 83.28 days and a California Income Tax lag of 61.59 days.[681]

SCE contends its "statutory" approach avoids relying on using subjective analysis and judgment to select the recorded data to produce the best estimate. It also argues that there is no tax payment history for the end of rules on bonus depreciation. Curiously, SCE does not argue the methods used in the past to determine the Federal Income Tax lag days and California Income Tax lag days produce results that are not supported by the evidence.

SCE has not established that its proposal to base Income Tax Lag Days on statutory payment dates rather than historical data is reasonable. ORA's proposal is consistent with prior decisions and results in Income Tax Lag Day calculations which are representative and we adopt it.

17.8.3. Fuel and Purchased Power Expense Lag

Fuel and Purchased Power are two components of the overall Expense Lag calculation. Fuel costs represent the natural gas, diesel, propane and nuclear fuel amounts used by SCE generating stations. Although SCE initially relied on data from earlier forecasts, SCE is not opposed to TURN's proposal using the more recent Fall 2016 forecast to compute Fuel and Purchased Power expense lags, providing the use is consistent.[682] This results in proposals of 36.4 lag days for purchased power, $206.3 million for fuel, $4,574.2 million for purchased power, and working cash requirements of $7.2 million for fuel, and $107.8 million for purchased power as adjusted for use of the United States Postal Service for 31%

[681] D.12-11-051, at 641-642.

[682] SCE-25, Vol. 2, at 16.

of payments.[683] ORA's testimony is unclear and inconsistent. Therefore, we find TURN's proposal to use the more recent Fall forecasts reasonable, as is SCE's proposal to consistently use forecasts from the same period. We adopt the proposals as stated above.

17.8.4. Other O&M Expense Lag (ISO Charges)

Other O&M Expense Lag is intended to compensate investors for the time between the recording of utility costs and payment of those costs for non-labor expenses associated with balancing accounts.[684]

SCE asserts its analysis showed 12.1 expense lag days for this category. Although ORA initially proposed an alternative value, ORA has since agreed the ISO charges are correctly calculated at 12.1 expense lag days.[685] We adopt it.

17.8.5. Depreciation & Deferred Income Tax Lag

SCE's Expense Lag Day calculation is included in the lead lag study to compensate investors for the timing difference between the receipt of revenues and the accrual of depreciation expense and deferred income taxes.[686]

Although TURN implicitly acknowledges depreciation and deferred taxes are recognized categories of working cash under Commission Standard Practice U-16 (SP U-16), TURN asserts this recognition is an element of SP U-16 which may no longer be aligned with principles of working capital based on the principal they are "non-cash" items which do not affect utility cash balances.[687]

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[683] *Ibid.* and SCE-25, Vol. 2, at 17, Table I-3 and SCE-29 at 38 and 410.

[684] SCE-09, Vol. 2, at 66.

[685] ORA Opening Brief, at 242.

[686] SCE-09, Vol. 2, at 68:4-9; SCE-25, Vol. 2, at 19:7-20:17.

[687] TURN-11, at 44:5-45:27.

TURN provides no authority for the proposition that accounting for depreciation and deferred taxes has changed since Standard Practice U-16 was adopted, but supports its argument by citing to a rule from Texas.[688]

SCE's rebuttal establishes, although these two items are both accrued, the other side of the accounting entry lowers the rate base on which the utility earns a rate of return. The utility reduces rate base at the midpoint of the service period during which depreciation and deferred income taxes are accrued, but, on average, customers do not render payment until 46 days after the service is rendered, creating a lag between the date rate base is lowered and the revenues are received.[689] We agree, consistent with long-standing practice, it is appropriate to continue to compensate for this lag.

17.9. Customer Deposits

SCE is required to offset rate base by the amount of its customer deposits as an adjustment for working cash. This requirement recognizing customer deposits as a source of permanent working capital has been in effect since SCE's 2003 GRC.[690]

In every GRC since 2003, SCE has urged the Commission revisit this decision and recognize customer deposits as debt which is not offset against rate base. In each decision for each GRC the Commission has reached the same conclusion.[691]

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[688] *Id.*

[689] SCE-25, Vol. 2, at 19:7-23:15.

[690] D.04-07-022, at 249-255.

[691] D.06-05-016, (SCE 2006 GRC), at 279-282; D.09-03-025 (SCE 2009 GRC), at 278-290; D.12-11-051 (SCE 2012 GRC), at 627-629; D.15-11-021 (SCE 2015 GRC), at 470-473.

Although SCE may have presented an approach in its current testimony to depart from this longstanding requirement, SCE has failed to introduce a different argument supporting its request. We are faced once again with the repeated arguments against offsetting rate base with customer deposits that we previously rejected.[692] In the face of the same arguments, we reach the same conclusion: we do not agree with SCE. Absent an indication of a policy change by this Commission or a new (and preferably irrefutable) argument, we direct SCE to resist the temptation to argue these same points again.

Beginning with its 2012 GRC, the Commission has granted SCE permission to use a portion (up to 10%) of its customer deposits to promote the Company's use of minority and community banks.[693] This policy was continued in SCE's 2015 GRC,[694] and SCE proposes that it continue in this GRC.[695] No party opposes this proposal, and we again adopt it. We direct $231.9 million, less 10% devoted to the community bank program, be used as a rate base offset.[696] We also grant an offsetting interest expense based on the three-month commercial paper interest rate.

17.10. AFUDC

SCE's proposed AFUDC rates through the post-test year period have not been opposed by any party. AFUDC is the standard way of capitalizing equity and debt costs incurred for financing Construction Work in Progress (CWIP).

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[692] SCE-25, Vol. 2, at 24-31.

[693] D.12-11-051, at 628-630, COL 534, at 877.

[694] D.15-11-021, at 474, FOF 567, at 533, COL 148, at 550.

[695] SCE-09, Vol. 2, at 83-84.

[696] SCE-25, Vol. 2, at 25:3-5.

Capitalizing these costs helps ensure that full construction costs are paid by customers who received the services provided by the capital projects. It also helps ensure that investors' costs incurred during construction are fully recovered after the capital projects enter service.[697] The Commission adopts SCE's proposed AFUDC rates.

17.11. Rate Base Components – Additional Issues

17.11.1. Long-Term Incentives

We discuss and have adopted the proposed disallowance of Long-Term Incentives in Section 8.2.2. of this decision. The authorized rate base is correspondingly increased by $4.3 million.

17.11.2. Other Accounts Receivable

SCE estimates 2018 Accounts Receivable rate base of $73 million. SCE's estimate is based on 2015 recorded data, the same approach followed in prior GRCs.[698] TURN makes a revised proposal of a $22.5 million reduction to SCE's forecast, based on recorded 2016 data.[699] SCE has conceded concerning other accounts as to the greater reliability of recorded 2016 data over 2015 when making forecasts. We adopt TURN's recommendation, based on 2016 recorded data as reasonable and adopt $50.8 million for this account.

18. Depreciation Study

SCE's recorded 2015 depreciation expense at authorized rates was $1.656 billion. The proposed change due to plant growth from 2016-2018 is

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[697] SCE Opening Brief, at 230.

[698] SCE-29, at 409.

[699] SCE-60, at 14, Table VI-9 and TURN-15 (Marcus Update), at 4 and 6.

$266 million. The additional newly proposed amount following SCE's Depreciation Study is $81 million. The total proposed 2018 depreciation expense is $2.003 billion, over one-third of the requested total revenue requirement.[700]

D.15-11-021, at 396, stated, "In D.12-11-051, we warned SCE against over-reliance on judgment without further explanation, and encouraged SCE to provide more transparency in its depreciation showing."[701] In D.15-11-021, we again found significant shortcomings in SCE's showing and offered guidance for the current GRC. We offered guidance to avoid the possibility that a failure by SCE to meet its burden of proof for depreciation costs would burden future ratepayers with a disproportionate share of the costs of removal and salvage. We stated, "First, we believe that SCE can and must do more to explain and justify its use of judgment in its depreciation showing."[702]

We further stated,

> Second, we direct SCE to provide considerably more detail in support of its net salvage proposals for at least five of the largest accounts, as measured by proposed annual depreciation expense. At a minimum, this detail shall include:
>
> 1. A quantitative discussion of the historical and anticipated future Cost of Removal (COR) on a per unit basis for the large (greater than 15% as measured by portion of plant balance) asset classes in the account. This discussion should identify and explain the key factors in changing or maintaining the per-unit COR.
> 2. A quantitative discussion of the historical and anticipated future retirement mix (i.e., retirements among different asset

[700] SCE-09, Vol.02 at 17, Table 11-7.

[701] See, e.g., D.12-11-051 at 673, 685.

[702] D.15-11-021 at 397.

classes), identifying and explaining the key factors in changing or maintaining this mix.

3. A quantitative discussion of the life of assets and original cost of assets being retired, in relation to the COR, on both a historical and anticipated future basis. This discussion should be integrated with and/or cross-reference the proposal for life characteristics.

4. An account-specific discussion of the process for allocating costs to COR.[703]

And,

> Third, we recognize that this is at least the second consecutive GRC that the Commission has expressed serious concern with the quality of SCE's depreciation showing. In order to motivate SCE to take these concerns seriously in developing its direct showing for its next GRC, we encourage ORA and TURN (and any other interested party) to consider making proposals in that GRC to shift a portion of the under-collection risk from future customers to SCE's shareholders. Parties should only make such proposals if SCE's direct showing in the following GRC exhibits the same types of shortcomings, discussed here and in D.12-11-051, in a widespread manner.[704]

In response to these directives, SCE produced a Depreciation Study which under the guise of meeting the Commission's directives seeks to introduce a new method for determining depreciation rates. We find, however, the study brings us no closer to resolving questions about the reliability of SCE's depreciation showing. Indeed, the study presents additional questions and assumptions which are not readily verified or resolved. Most notably, SCE's study presents a new proposal for determining depreciation rates rather than simply, as the

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[703] *Id.* at 398.

[704] *Id.* at 398-399.

directives intended, providing additional evidence supporting SCE's depreciation testimony.

Apparently recognizing the untenability of the results of its study, SCE scales back the results the study would seemingly support and proposes a cap on depreciation following the principle of gradualism. Then, in a further display of the lack of support SCE provides for its study, SCE in its rebuttal testimony states it "is not proposing to change depreciation practices to an entirely different net salvage analysis method."[705]

We find little merit in either the results of the depreciation study or the application of gradualism to its results. Straight-line depreciation following Standard Practice U-4[706] remains the proscribed means for determining depreciation rates. The multiplicity of assumptions underlying SCE's proposal argues against our deviating from our long-standing and accepted practice.

18.1. Foundational Overview

The purpose of depreciation is to allow a utility to recover the original cost of the asset, as well as the net salvage value (salvage minus cost of removal), over the life of the asset. This ensures assets are paid for by the customers who benefit from the use of the asset. To meet this objective, the Commission uses the Straight-line Remaining Life depreciation method described by Standard Practice U-4.

Under the straight line remaining life depreciation method, the undepreciated asset amount (original cost less accumulated depreciation plus the

[705] SCE-25, Vol. 4, at 61-62.

[706] Originally issued by the Commission in 1952 and subsequently revised in 1953, 1954, and 1961.

estimated net salvage) is depreciated over the remaining life of the asset. The net salvage includes the cost of removal of the asset at the end of its useful life as well as any salvage value the asset may have at that time. The original cost of the asset and the net salvage are expressed in nominal dollars. This is shown by the following formula:

$$\text{Depreciation Expense} = \frac{\text{Plant Balance} - \text{Reserve} - \text{Gross Salvage} + \text{Cost of Removal}}{\text{Remaining Service Life of Asset(s)}}$$

A net salvage rate under Standard Practice U-4 is applied to the plant balance to determine the future net salvage. The net salvage rate is computed as follows:

$$\frac{\text{Net Salvage (\$)}}{\text{Retirements (\$)}} = \frac{\text{Gross Salvage (\$)}}{\text{Retirements (\$)}} - \frac{\text{Cost of Removal (\$)}}{\text{Retirements (\$)}}$$ [707]

Under the per-unit analysis proposed by SCE's depreciation study, SCE determines the future net salvage rate based on a "per-unit net salvage." In an effort to counter TURN's contention as to the complexity of its method, SCE's expert Dr. Ronald White describes it in his testimony:

> The per-unit model is described by the following four simple steps:
>
> **Step 1.** Average net salvage per-unit recorded over a few recent activity years to obtain a normalized per-unit ratio applicable to future vintage-year retirements.
>
> **Step 2.** Divide the average ratio derived in Step 1 by vintaged per-unit additions.
>
> **Step 3.** Multiply forecasted retirements by ratios derived in Step 2 and a selected age-adjusted inflation rate to obtain forecasted future net salvage for each future activity year.

[707] SCE-09, Vol. 3, at 16, Figure II-2

> **Step 4.** Sum the forecasted future net salvage derived in Step 3 and divide by total plant in service to obtain estimate of future net salvage rate.[708]

The analysis incorporates as a multiplier an "age-adjusted inflation rate" to obtain the forecasted net salvage. Despite stating the forecasted net salvage in future inflated dollars, SCE did not similarly adjust the dollars to be accrued for that forecast.

TURN raises valid concerns about this issue, describing it as a "currency mismatch" due to the calculation of costs based on future currency that has a lower value than today's dollars collected from current ratepayers.[709] Although TURN may raise valid criticisms of SCE's methods, TURN's own proposal ignores Standard Practice U-4 and Commission precedent in support of SCE collecting approximately 1.2 times SCE's incurred net salvage costs for recent years.

Both SCE's per-unit analysis and TURN's proposal are substantial deviations from Standard Practice U-4 and we do not adopt them here.

Following the directive of D.15-11-021, SCE performed this analysis on nine T&D accounts, "which comprise 85% of the total COR expense proposed."[710] SCE contends, in an effort to establish the reasonableness of its per unit analysis, "Comparing the results of both approaches demonstrates that the results are largely comparable … and underscores the reasonableness of SCE's proposal."[711]

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[708] SCE-25, Vol. 4, at 64:20 – 65:2.

[709] TURN Opening Brief, at 297.

[710] SCE-09, Vol. 3, at 12:8-9.

[711] SCE-25, Vol. 4, at 15:13-14.

Comparison of Traditional vs. Per-Unit Net Salvage Analysis Results[712]

Account	Traditional Analysis	Per-Unit with 2.72% Inflation	SCE Proposed	Traditional compared to Per-Unit
354	-931%	-185%	-75%	Higher
355	-175%	-499%	-90%	Lower
356	-388%	-210%	-100%	Higher
364	-656%	-488%	-263%	Higher
365	-293%	-538%	-144%	Lower
366	-228%	-401%	-38%	Lower
367	-178%	-261%	-75%	Lower
368	-68%	-47%	-25%	Higher
369	-520%	-387%	-125%	Higher

Likely recognizing that these net salvage rates are significantly different, SCE explains,

> These variances between the results produced by a traditional analysis versus a per-unit analysis do not demonstrate flaws in the per-unit approach; rather, they reflect the difference between past retirement experience and what one can reasonably expect about future retirements and costs.[713]

SCE then further explains by reference to its traditional analysis which supports a depreciation increase of $782 million and the per-unit analysis supporting an increase of $893 million, "… the traditional analysis, without application of expert judgment, produces depreciation expense approximately as large as the results supported by SCE's per-unit analysis."[714] Notably missing from this explanation is that expert judgment is a required element of the

[712] *Id.*, at 16, Table II-3.

[713] *Id.*, at 16.

[714] SCE-25, Vol. 4 at 16:17-20, at 17, Figure II-2

traditional analysis, Standard Practice U-4. We further note, we have questioned the expert judgment applied by SCE for its traditional analysis in the previous two SCE general rate case decisions, D.12-11-051 and D.15-11-021.

We are left with little that supports recognition of SCE's proposed ballooning amount for depreciation. SCE, however, rather than requesting as part of its revenue requirement the nearly $1 billion its analysis would suggest proposing, moderates its proposal to less than one-tenth of what – if reliable – would be fiscally responsible and proposes an $84 million increase to its depreciation accrual.

We are left with a failure of any party to establish by a preponderance of the evidence the validity of their proposed net salvage ratios, along with our own recognition that due to the costs of removal net salvage is nearly always negative. Therefore, we find it reasonable to maintain in most instances the net salvage ratios which were previously adopted by D.15-11-021. We also note Standard Practice U-4's reliance on regularly updated numbers increases the likelihood the net salvage ratios are reliable. As SCE states, "in future rate cases, SCE will have the ability to take its then-surviving plant balances to even better refine its projections about the future in light of then-available conclusions about historical costs-per-unit."[715]

18.2. T&D Net Salvage

SCE has proposed increases to most net salvage ratios, tempered by a 25% cap for T&D accounts. As discussed above, we do not adopt the proposed net salvage ratios based on SCE's depreciation studies, but rather maintain the ratios

[715] SCE Exhibit 09, Vol. 3, at 8:6-8.

adopted in the 2015 GRC for most accounts. For those accounts for which SCE proposed a net salvage ratio which is equal to or lower than the ratio which was previously authorized, we have accepted the SCE proposal as reasonable. The following table provides a summary of the contested accounts and the amounts authorized.

Account (all values are negative)	2015 GRC	SCE	TURN	Adopted
Transmission Plant				
352 - Structures and Improvements	35%	35%	35%	35%
353 - Station Equipment	15%	10%	10%	10%
354 - Towers and Fixtures	60%	75%	35%	60%
355 - Poles and Fixtures	72%	90%	100%	72%
356 - Overhead Conductors & Devices	80%	100%	60%	80%
357 - Underground Conduit	0%	0%	5%	0%
358 - Underground Conductors & Devices	15%	19%	15%	15%
359 - Roads and Trails	0%	0%	5%	0%
Distribution Plant				
361 - Structures and Improvements	25%	30%	30%	25%
362 - Station Equipment	25%	31%	30%	25%
364 - Poles, Towers and Fixtures	210%	263%	210%	210%
365 - Overhead Conductors & Devices	115%	144%	100%	115%
366 - Underground Conduit	30%	38%	50%	30%
367 - Underground Conductors & Devices	60%	75%	75%	60%
368 - Line Transformers	20%	25%	35%	20%
369 - Services	100%	125%	70%	100%
370 - Meters	5%	0%	0%	0%
373 - Street Lighting & Signal Systems	30%	38%	100%	30%

18.3. Life

SCE's proposed service lives are disputed for only three categories of assets: (1) T&D (Account 369), (2) hydroelectric (hydro) facilities; and (3) solar photovoltaic facilities.

18.3.1. T&D Life

SCE proposed service lives for all but two T&D accounts that are the same, or longer, as the service lives authorized in the 2015 GRC. ORA did not oppose any of SCE's T&D life proposals. TURN disputed only the proposed life for Account 369, Services.

SCE proposed decreasing the service life for Account 353, Station Equipment, by five years. The dollar-weighted average service life for this category is 44 years. We find the evidence does not support changing the adopted service life from the currently authorized 45 years.

SCE proposed decreasing the service life for Account 367, Underground Conductors & Devices, by two years, to 43 years. The proposal is consistent with the weighted average service life for this account and is adopted.

SCE proposed maintaining a 45 year service life for Account 369, Services, even while acknowledging that its own data produces a result suggesting an estimated service life of 65 years. SCE however, questions its own data due to a change from three-phase bare-wire conductor which was identified as three units of property to triplex which is categorized as one unit. This change then resulted in accounting modifications which leads SCE to doubt the analysis as to the estimated service life. Instead of relying on data driven analysis – as SCE does for other accounts – SCE argues we should revert to reliance on a simulated plant record and maintain the authorized service life from the 2015 GRC. We find SCE's disregard for its own data troubling and are not persuaded by SCE's arguments against its consideration. TURN's proposal to accept a 55 year service life is reasonable and is more consistent with historical data and therefore, is adopted.

Unless otherwise noted above, SCE's proposals are approved. The following table shows a summary of the accounts.

Account		2015 GRC	SCE	TURN	Adopted
TRANSMISSION PLANT					
350.2	Easements	60	60		60
352	Structures and Improvements	55 S 3.0	55 L 1.0		55 L 1.0
353	Station equipment	45 R 0.5	40 L 0.5		45 R 0.5
354	Towers & Fixtures	65 R 5	65 R 5		65 R 5
355	Poles & Fixtures	50 R 0.5	65 SC		65 SC
356	Overhead Conductors & Devices	61 R 3	61 R 3		61 R 3
357	Underground Conduit	55 R 3.0	55 R 3.0		55 R 3.0
358	Underground Conductors & Devices	40 R 2.5	45 S 1.0		45 S 1.0
359	Roads and Trails	60 SQ	60 R 5.0		60 R 5.0
DISTRIBUTION PLANT					
360.2	Easements	60	60		60
361	Structures and Improvements	42 R 2.5	50 L 0.5		50 L 0.5
362	Station Equipment	45 R 1.5	65 L 0.5		65 L 0.5
364	Poles, Towers & Fixtures	47 L 0.5	55 R 1.0		55 R 1.0
365	Overhead Conductors & Devices	45 R 0.5	55 R 0.5		55 R 0.5
366	Underground Conduit	59 R 3.0	59 R 3.0		59 R 3.0
367	Underground Conductors & Devices	45 R 0.5	43 R 1.5		43 R 1.5
368	Line Transformers	33 R 1	33 S 1.5		33 S 1.5
369	Services	45 R 1.5	45 R 1.5	55 R 1.5	55 R 1.5
370	Meters	20 R 3.0	20 R 3.0		20 R 3.0
373	Street Lighting & Signal Systems	40 L 0.5	48 L 1.0		48 L 1.0
GENERAL BUILDING					
390	Structures and Improvements	38 R 3.0	45 R 0.5		45 R 0.5

18.3.2. Hydro Life

SCE proposes to set the depreciable life of hydroelectric facilities equal to the average remaining years on the facilities' current FERC licenses, unless the

license is expired or will expire within five years. For those facilities, the depreciable life is assumed to be extended by forty years to approximate the anticipated renewal period. For facilities outside the five-year window of expiration, renewal is not assumed. SCE argues in its Reply Brief that it is not suggesting all hydro facilities more than five years from license expiration will be decommissioned. "Rather, the point is to estimate a reasonable depreciable life for the turbines, generators, and other hydro assets that will be replaced before the final decommissioning of the overall facility."[716] SCE further contends this is consistent with Commission practice, logically ties to applicable federal regulations, and avoids assuming renewal of licenses for small hydro facilities due to their uncertain economics.[717]

TURN was the only party to contest SCE's proposal for hydroelectric facilities. TURN does not dispute SCE's approach for facilities with over fifteen years to license expiration (adopt as the service life the time to license expiration) or for facilities with under five and one-half years to license expiration (adopt as the service life the time to expiration, extended by forty years). TURN proposes, for those facilities with between 5.5 and 15 years remaining life until license expiration, the service life be extended by 33.7 years. TURN derives this number by reducing the forty year renewal period by 16% (reflecting SCE's experience of decommissioning of hydro facilities).[718]

The currently authorized hydro depreciation rate is 2.68%. SCE's proposal would increase the rate to 3.57% and would increase the annual accrual by $10.5

[716] SCE Reply Brief, at 161-162.

[717] SCE Reply Brief, at 161.

[718] TURN Opening Brief, at 325.

million. TURN's proposal would result in a rate of 2.13%, a decrease of $5.5 million.[719]

The evidence supports recognizing the vast majority of licenses will be renewed. SCE has not met its burden to establish the authorized depreciation rate of its hydroelectric plant is 3.57% based on its anticipated service life which presumes all facilities with a remaining service life over five and one-half years will not be renewed. We adopt as reasonable a rate of 2.13%.

18.3.3. Solar Life

The 2015 GRC adopted a 25-year average service life for SCE's solar PV assets based in part on an admission on SCE's website and manufacturer warranties.[720] SCE now contends the previously authorized 20-year average service life should be readopted. We find SCE's contention that the service life for solar PV assets should more nearly match the roof life and lease life is reasonable. We adopt a 20-year average service life for solar PV assets.

18.4. Generation Decommissioning

SCE proposes to escalate costs of decommissioning generation plant to the anticipated cost in the year of retirement and, based on that inflated cost, seeks to accrue depreciation on an annual basis over the remaining service life of the plant. For example, based on a solar PV decommissioning expense of $80.8 million in 2038, assuming a twenty year service life, SCE proposes we adopt an annual accrual of $4.04 million.

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[719] The difference between the two proposals is $16 million. SCE Opening Brief, at 268.

[720] D.15-11-021, at 429-430.

TURN counters decommissioning expenses should be escalated to 2020, consistent with Standard Practice U-4. TURN's proposal avoids collecting dollars now on a vastly inflated expense. TURN's proposal is persuasive; SCE has not met their burden to support recovery of the escalated expense without a concurrent adjustment to the annual accrual. We therefore adopt the annual accrual proposed by TURN for Mountainview 3 & 4 of $0.3 million, Solar PV of $3.2 million, and Peakers of $0.2 million.

18.5. Depreciation Study – Additional Issues

We continue to be troubled by the inadequacy of SCE's evidence supporting its claimed depreciation expense. As indicated (but not accepted) by the per unit analysis and suggested gradualism, the depreciation expense may be significantly greater than what is accepted here. If so, the cost of removing plant may not be adequately funded by the depreciation reserves. That outcome could raise the question as to whether future ratepayers should bear the burden of paying more for plant than the benefit they receive or whether that cost should be borne by shareholders due to SCE's own evidentiary failings and to avoid the proscription of Public Utilities Code §454.8.

Therefore, we direct SCE to work with TURN, ORA, the Energy Division, and any interested parties to develop a more reliable depreciation study for the Commission to examine and consider in the next GRC. This study should not support only the incremental request for depreciation, but also, the amount already accrued. We expect that SCE's next depreciation study will present depreciation expenses that rely much less on expert opinion and judgment, and much more on data and statistical analyses.

19. Rate Base – Additional Issues

We discussed in section 17 that Rate Base represents the depreciated value of assets used to provide service to customers and the product of the Rate Base and the authorized rate of return equals a utility's return on its shareholders' investment.

In some instances, SCE's spending was more than what had been authorized by the 2015 GRC decision, D.15-11-021. In other instances, capital investments or a portion of an investment were not allowed in a prior decision. In a third instance, TURN argues for a disallowance based on alleged imprudence. Now, in this application, SCE has proposed that these investments should be included in rate base and SCE should earn its authorized rate of return on them. TURN is uniformly opposed to these additions to rate base, contending that expenditures which have not been authorized or which were imprudent, should not, by the passage of time, be authorized and added to rate base.

19.1. Aged Poles

SCE's opening testimony recounts that:

> In the 2015 GRC Decision, the Commission approved only part of SCE's Aged Pole program to systematically replace aged poles on a proactive basis …. The Commission authorized SCE's replacement of more than 14,000 aged poles over the period 2013 to 2015. SCE actually replaced 8,586 more poles than what the Commission authorized.[721]

SCE's testimony shows the shortfall of authorized compared to actual spending for this program in 2014 and 2015 was $108 million and states, SCE "did not collect the revenue requirement on these aged poles during the period

[721] SCE-09, Vol. 2, at 3:19 – 22.

2015-2017. Starting in 2018, SCE's plant balances will reflect the remaining book value of the replacement."[722]

SCE contends that the shortfall of the $108 million resulted in lost revenues of $23 million over the 2015-2017 GRC cycle, that "SCE has permanently foregone those revenues"[723] and the "extent of the remedy SCE has already endured" is a sufficient basis to support recovery now for the additional 8,586 poles which were not previously authorized.[724]

We found in D.15-11-021 that it was prudent for SCE to replace 5,245 of these aged poles in 2013 and an additional 9,000 in 2014 to support the "ramp up" for the Pole Loading Program and in recognition that some value was being provided to ratepayers because some poles may have failed in service while also recognizing some could have continued to provide service to ratepayers for many years to come.[725]

In D.15-11-021 we disallowed additional aged pole expenditures, stating,

> The fact that the new poles provide service to ratepayers and are used and useful is insufficient to prove that the expenditures to purchase and install the poles should be recovered from rates. That question turns on the prudency of the investment decision.[726]

19.1.1. SCE Has Not Presented Evidence Supporting Recovery

SCE does not answer the question as to the prudency of the investment decision, stating "SCE does not seek re-litigation of the merits of the program in

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[722] *Id.* at 4:4-6.

[723] SCE Opening Brief, at 284.

[724] SCE Reply Brief at 165.

[725] *Id.*, at 113-114.

[726] D.15-11-021, at 112.

this case." Instead, SCE acknowledges "… SCE replaced too many poles based solely on their age even though they may have provided additional months or years of service …" and contends "… no one can know, today, how many more months or years sixty-five or seventy-year-old poles would have continued to provide service had SCE not replaced them under the Aged Pole program."[727] SCE contends TURN's remedy of permanently removing from rate base the previously disallowed capital expenditures is "extreme," stating,

> TURN's proposal unreasonably assumes that the imprudence related to early replacement extends to the average life of the replacement poles, or 55 years, and relatedly assumes that customers are to receive free electric utility service from these poles to overcome the utility's ambitious safety initiative spanning an 18-month period. This unfair, punitive and unreasonable outcome should be rejected outright.[728]

SCE, in response, assumes that the disallowance ordered in D.15-11-021 must be interpreted to have extended only to that rate cycle, allowing SCE to begin "cost recovery of the replacement poles … at a significantly discounted price in 2018."[729] SCE argues the aged poles would have failed eventually and the replacement poles are "used and useful" providing "decades of future value to ratepayers."[730]

We agree TURN's proposal to disallow recovery for replacement poles would have to implicitly find that the aged poles which were replaced would not have failed during the lifetime of the replacement poles. That is a finding which

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[727] SCE Opening Brief, at 284.

[728] *Id.*, at 283.

[729] *Id.*, at 282-283.

[730] *Id.*, at 282.

logic dictates we cannot make. Additionally, SCE is correct, the replacement poles are now used and useful. As we stated in D.15-11-021 however, whether the poles are used and useful is not the only question which must be answered. SCE still has not answered the question posed prior to D.15-11-021, a precondition before we would allow recovery in rates for expenditures to purchase and install the poles. That question turns on the prudency of the investment decision. SCE has not established, indeed has not presented evidence, which would support a finding that it was prudent to replace poles (beyond the poles the Commission authorized) which continued to be used and useful at the time they were replaced. Absent evidence – which we indicated in D.15-11-021 should be provided – supporting the prudence of early replacement of aged poles over higher frequency of inspections or pole reinforcement or other evidence which would support the prudency of the expenditure, we continue to disallow recovery for the 8,586 more aged poles SCE replaced over what the Commission authorized.[731] In disallowing recovery now we note our decision is based on a failure by SCE to establish the prudence of its expenditure: that it was reasonable to replace poles which although "aged" continued to be used and useful. We are presented with an unknown period of time during which it was not prudent to replace the existing poles but also recognize that at some point in time it would become prudent to replace these aged poles. Therefore, we do not preclude SCE from attempting to establish in its next GRC the prudency of replacing the 8,586 poles by a certain date or dates.

[731] D.15-11-021, at 114 authorized recovery of actual replacements in 2013 of 5,245 (originally stated to be 5,330) and 9,000 of the 14,500 poles requested. The program was not authorized for 2015 as it was originally intended to provide a ramp up for other pole replacement programs.

19.1.2. Other Disallowances From the 2015 GRC Decision

TURN has identified two other disallowances from the 2015 GRC which SCE would like to include in rates now and to which TURN objects. These are capital expenditures for the Advanced Technology Laboratories and the Pebbly Beach Generation Automation Project.

19.1.2.1. Advanced Technology Laboratories

In D.15-11-021 we disallowed half of the request for the Westminster Lab upgrades because SCE did not establish portions of the upgrades were related to matters that should be funded by ratepayers. We disallowed all of the request for the Equipment Demonstration and Evaluation Facility (EDEF) "because SCE has not shown that the technical problems it would address are unique to SCE and that other more cost-effective options do not exist for doing this research."[732] The disallowance for Westminster for 2014 was $1.8 million and for 2015 was $2 million. The disallowance for EDEF for 2014 was $3.3 million and for 2015 was $4.4 million.

SCE responds to the Commission's determination that "SCE has not shown that the problems it would address are not unique to SCE" by stating "EDEF was not designed for that purpose."[733] SCE then argues "the standard in judging these expenditures is whether they are prudent"[734] and supports its claim of prudence by asserting

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[732] *Id.*, at 50.

[733] SCE-02, Vol. 11, at 33:12.

[734] *Id.*, at 33:16.

> SCE identified a specific need for a set of capabilities that would allow it to safely, reliably, and prudently accelerate testing and deploying new technologies to support California's energy and environmental goals, and specifically with respect to its fault detection activities, work to improve grid safety.[735]

As TURN notes, however, "SCE simply does not address the Commission's valid concern that the capabilities supported by EDEF may not need to be owned by SCE but rather could be obtained through vendors or research institutions."[736]

As for whether SCE has demonstrated "other more cost-effective options…exist for doing this research" SCE relies on its survey to which thirteen research facilities/laboratories responded. SCE claims the survey results show SCE's own facility is the only facility which can meet all of SCE's needs, making EDEF "the most efficient means to execute this work.[737] TURN's review of the survey result finds however, that the survey shows every feature SCE wants could be provided by multiple facilities.[738]

Consistent with D.15-11-021, we continue to consider it to be relevant whether or not the facility would address problems which are unique to SCE. We also continue to find SCE has not established that other more cost-effective options do not exist. SCE claims a single facility (their own) is more cost effective but they have provided nothing to support that claim. In recognition that the services provided by Westminster (now Fenwick) and EDEF could not have been

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[735] *Id.*, at 33:13-16.

[736] TURN-11, at 5:3-5.

[737] SCE-02, Vol. 11, at 33:24-25.

[738] TURN-11, at 5:17-24.

obtained for nothing and that these facilities are used and useful and therefore providing some value to ratepayers, we allow half of the expenditures for these facilities (including maintaining the one-half disallowance for Westminster and the entire disallowance for EDEF adopted in D.15-011-021) and adopt capital expenditures for SCE's laboratories, as follows.

Advanced Technology Capital Expenditures
($000)

Project	2016[739]	2017	2018	2019	2020	2016-2020
Fenwick Labs (Westminster)	1,033	2,347	2,098	3,129	4,778	13,385
Pomona Lab[740]	1,110	1,701	1,205	1,320	1,390	6,726
EDEF	338	1,142	264	272	281	2,297

19.1.2.2. Pebbly Beach Automation

The disallowance of capital expenditures for the PBGS Automation Project is discussed at section 7.4.2.

19.2. 2014-15 Capital Spending Above Authorized

TURN has identified five infrastructure programs for which SCE recorded, for 2014 and 2015, $235 million more capital spending than was authorized by D.15-11-021.[741] The programs are four T&D Infrastructure Replacement programs: WCR, Substation Transformer Bank Replacement, Substation Circuit

[739] In SCE-18, Vol. 11 at 6, SCE agreed with ORA to use 2016 recorded (instead of forecasted) capital expenditures for Advanced Technology Labs.

[740] The amounts requested for Pomona were not disputed and are adopted.

[741] TURN-12, at 14-15.

Breaker Replacement, and "Other" (including Underground Oil Switch Replacement), and a new program: Overhead Conductor. TURN argues these amounts (and others) should be disallowed because the Commission has not previously found these amounts to be reasonable and SCE's showing of reasonableness is inadequate.[742]

SCE responds that the assets are used and useful, SCE made prudent decisions concerning these expenditures, evaluations of reasonableness should not be made program-by program, and that its showing is adequate.[743]

We agree with TURN that SCE cannot establish reasonableness based simply on a claim that an expenditure was made and has resulted in an investment which is used and useful for SCE's customers.[744]

SCE does not disagree. SCE acknowledges, "It is well established that while utilities have the ultimate burden to prove the reasonableness of any costs they request, any party contesting those costs has the burden of going forward to produce evidence to support its own position."[745]

Although the fact that an expenditure has been made and there is evidence that the asset is used and useful may support a finding that a capital expenditure in excess of amounts authorized by an earlier GRC decision is reasonable, the existence of these factors does not preclude our review on a "program-by-program" basis of the reasonableness of the expense.

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[742] TURN Opening Brief, at 340.

[743] SCE-25, Vol. 3, at 20-32.

[744] TURN Opening Brief, at 340-341.

[745] SCE Reply Brief, at 173, quoting D.15-03-049, at 6.

Excepting the Overhead Conductor program, SCE has met its burden of proof to establish that these expenditures have resulted in used and useful assets at a just and reasonable expense. In reaching this finding we consider not just the limited evidence of the expenditures for 2014 and 2015, but rather we consider the totality of the evidence supporting these programs. TURN's limited focus on 2014 and 2015 takes these expenditures out of context of those programs in which the expenditures are made and does not meet TURN's burden of production in this instance. Therefore, we accept the recorded capital expenditures for these Infrastructure Replacement programs excepting the Overhead Conductor program. As discussed in section 4.8.4, we impose a 10% disallowance of the 2015 and 2016 Overhead Conductor recorded costs of $155.456 million, resulting in a disallowance of $15.55 million. Therefore, we approve, $115 million for 2014 and $52.3 million for 2015, following the disallowance for the Overhead Conductor program.

19.3. Changes in Accounting

TURN has identified two separate accounts for which costs were initially approved as O&M expenses in prior GRCs and which SCE subsequently capitalized and put into rate base. These accounts are for underground location costs (Account 588.281) and real property expenses (Account 920.220). $4.2 million was expensed for underground location costs in the 2015 GRC but then subsequently capitalized and $9.9 million for real property was expensed in the 2012 and 2015 GRCs but has been capitalized since 2013.[746] TURN does not object to the accounting changes. TURN's objection is to what it characterizes as

[746] TURN Opening Brief, at 349.

double recovery for amounts which were initially forecast as expense and were subsequently capitalized.[747]

TURN recommends a disallowance of $1,420,000 for each of 2015, 2016, and 2017 as representative of capitalized underground locating costs for those years which had been forecast as an O&M expense in the 2015 GRC.[748] TURN recommends the disallowance be permanent.[749]

TURN further recommends a disallowance of $9.94 million from gross plant due to real property expenses which were recovered by the 2012 and 2015 GRCs even though an accounting change capitalizing this recovery was made in 2013. TURN also recommends this disallowance be permanent.[750]

SCE does not dispute TURN's calculations. Instead, SCE contends the adjustments should be rejected because: 1) SCE needs to accurately and timely record its expenses to either capital or O&M; 2) a change to accounting is not "an assault on the integrity of the future test year ratemaking process" because the $14 million in dispute is 0.1% of SCE's T&D capital for the period (2013-2017); and, 3) allowing only accounting changes which coincide with rate case test years would be inconsistent with current practice.[751]

We agree SCE should continue to accurately and timely record its expenses to capital or O&M. We also agree SCE's accounting changes are reasonable and

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747 *Ibid.*, at 350.

748 TURN also recommends that SCE remove 17.48% of recorded expenses from the historical period (2011-2014) from O&M Account 588.281, resulting in a $363,000 downward adjustment to the forecast. SCE stipulated to this adjustment in SCE-29 at 33.

749 TURN Opening Brief, at 350.

750 *Id.*

751 SCE Opening Brief, at 294-296.

not an assault on the integrity of the future test year ratemaking process. Lastly, we find no reason to delay accounting changes to coincide with rate case test years. We also find there is no reason to permit SCE a double recovery of capital expenditure of amounts previously authorized and adopted by an O&M forecast.

Therefore, we disallow $4.26 million from gross plant ($1.42 million for each of 2015, 2016, and 2017) for underground location costs (Account 588.281) which was expensed in the 2015 GRC but then subsequently capitalized.

We also disallow $9.94 million from gross plant for real property expenses (Account 920.220) which was expensed in the 2012 and 2015 GRCs but has been capitalized since 2013. Each of these disallowances are permanent.

19.4. SPIDACalc Pole Issues

In April 2013 SCE began using SPIDACalc, a software program, to calculate pole loading safety factors for its poles. Based on its use of SPIDACalc, SCE forecast for its 2015 GRC that 3% of its poles would require repair and 19% would need to be replaced. In D.15-11-021 we adopted a forecast of 18,213 pole replacements per year (for 2015 through 2025) for SCE's Pole Loading Program and authorized a corresponding capital expenditure of $245.006 million.[752]

Shortly after SPIDACalc was launched, SCE began receiving reports of larger than expected poles being recommended by the program.[753] Ultimately SCE began using a new version of SPIDACalc (version 6 as opposed to Version 5)

[752] D.15-11-021, at 140 - 141.

[753] SCE-25, Vol. 3, at 48:6-7.

and SCE found the predicted failure rate was reduced by approximately 55% for PLP pole replacements and 50% for non-PLP pole replacements.[754]

After SCE and TURN submitted their testimony they agreed to submit joint testimony setting forth the calculations for potential disallowances arising from SCE's use of SPIDACalc resulting in the premature replacement of poles. This testimony, SCE-TURN-01, *SCE-TURN Joint Supplemental Testimony Regarding SPIDA Software Disallowance Scenarios and Calculations*, while confirming the parties' disagreement as to whether or not a disallowance is warranted, provides agreed testimony as to the potential disallowance based on various timing scenarios and other factors. The following table sets forth the possible disallowances.

Table IV-1[755]

Impact to 2018 GRC cycle revenue requirement (in millions of dollars)

	No Disallowance		Returned to Rate Base after 10 years		Returned to Rate Base after 20 years		Complete Disallowance	
Starting Date	All Poles	Gates 1-4	All Poles	Gates 1-4	All Poles	Gates 1-4	All Poles	Gates 1-4
April 2013	$0	$0	$74.7	$74.7	$120.1	$120.1	$210.5	$210.5
September 2014	$0	$0	$69.9	$64.8	$112.3	$104.2	$196.9	$182.6
January 2015	$0	$0	$66.5	$56.4	$106.9	$90.7	$187.4	$159.0
September 2015	$0	$0	$38.9	$21.7	$62.5	$34.9	$109.5	$61.1

[754] SCE-TURN-01, 4:13-16.

[755] SCE-Turn-01, at 9.

SCE and TURN agree the numbers set forth on the above table reflect the present value revenue requirement for each of the agreed scenarios. SCE and TURN also agree that an adopted disallowance (if any) for this SPIDACalc pole replacement issue should be spread over the entire three-year GRC cycle of 2018-2020. The numbers shown are stated to capture the "impact of the lower revenue requirement associated with removing the poles from rate base and then returning them to rate base at a later date…." and thereby eliminate the need for any further rate base adjustment.[756]

SCE advocates for no disallowance based on the belief "it acted prudently to procure, deploy, improve, and eventually update SPIDACalc Version 5 with Version 6" but also argues that if a disallowance is adopted by the Commission is should consider the fact that these prematurely replaced poles would have been replaced eventually.[757]

TURN proposes a disallowance for the life of the replacement poles for two reasons. First, due to SCE's delay in placing a "reassessment hold" on pole replacements until September 1, 2015, despite its earlier concerns that SPIDACalc v5.0 was identifying poles for replacement which would meet pole loading safety factors. Second, TURN advocates a complete disallowance due to SCE's failure to inform the Commission about these issues with SPIDACalc during the 2015 GRC.[758]

Alternatively, the parties have agreed to proposed disallowances if the Commission decides some level of pole replacement at 10 years and 20 years.

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[756] *Id.*, at 8.

[757] *Id.*, 5:24-6:2.

[758] TURN, Opening Brief, at 352-359.

The proposed disallowances assume that the poles replaced due to the use of SPIDACalc v5.0 would have been replaced within that amount of time.

The 10-year proposed disallowance is derived from the 9.6 year difference in the age of poles replaced in the PLP using SPIDACalc v5.0 compared to the age of poles replaced in the deteriorated Pole program. This proposal presumes that poles which failed SPIDACalc v5.0 but passed SPIDACalc v6.0 were close to being overloaded and would have needed to be replaced due to deterioration within an additional ten years.[759]

TURN has alternatively proposed a 20-year disallowance based on the argument that the 10-year proposed disallowance presumes the prematurely replace poles were in poor condition, but it is more reasonable to presume the condition of the prematurely replaced poles was consistent with the rest of SCE's poles. On this basis, TURN proposes relying on the 55-R1 life curve to estimate age Based on this estimate, TURN assumes the actual expected life of the prematurely replaced poles would have been between 30 years and the 10 years proposed by SCE and proposes 20 years.[760]

The "Gates" in the table refers to steps in SCE's pole replacement process. SCE contends poles in Gates 5 or 6 should be excluded because reassessment would not have been practical at that time because a pole at Gate 5 has already been released for installation.[761]

The starting dates proposed by the SCE-TURN table are based on possible times for the Commission to find the expenditures for poles should be

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[759] SCE-Turn-01, at 6:3-19.

[760] *Id.*, 6:20-7:9.

[761] *Id.*, 7:16-21.

disallowed. *April 2013* is the initial implementation date of SPIDACalc v5.0. *September 2014* is the time of the first major update of SCE's Engineering Team to PLP Management of SCE's internal evaluation of SPIDACalc v5.0. *January 2015* reflects the conclusion of the engineering evaluation leading to the development of SPIDACalc v6.0. *September 2015* coincides with SCE's instruction to its contractor to hold all assessments based on SPIDACalc v5.0 to permit reassessment using SPIDACalc v6.0 following confirmation that SPIDACalc v5.0 had overstated the need for replacement by at least 50%.[762]

We begin with the recognition and findings that no pole will last forever, that it was imprudent to replace poles prematurely, and that premature replacement, when the poles continued to be useful, resulted in a loss of value to ratepayers. Therefore, we exclude from further consideration both the "No Disallowance" options and the "Complete Disallowance" options.

We find that it is just and reasonable to base the impact to the SCE revenue requirement on returning the value of these poles to rate base after 20 years. This 20-year disallowance is based on our finding that it is reasonable to presume the life span of the prematurely replaced poles would have been consistent with the life span of the rest of SCE's poles. Furthermore, we find SCE did not meet its burden to establish a shorter life span for these poles.

Lastly, we adopt April 2013 as the commencement date for disallowing these pole expenditures. April 2013 is when SCE began using SPIDACalc v5.0. We find it was not prudent of SCE to use SPIDACalc v5.0 at that time due to SPIDA's lack of experience, SCE's inadequate vetting of the software (it did not

[762] *Id.*, 6:7-18.

perform an engineering benchmark or any field testing or verification prior to procurement),[763] and a lack of prudence by SCE in embarking on a program of this magnitude. SCE acknowledges pole loading assessment is a "very complex set of analysis" with "a lot of assumption."[764] It recognized the "sheer volume of pole loads being conducted by SCE will naturally amplify (more quickly) any small issue with any software product."[765] Nevertheless, this new pole loading assessment software was deployed almost immediately to assess an "unprecedented number of pole loads per year through PLP."[766] Despite this, SCE proceeded to select an unknown software with which it had no prior experience[767] and which was anticipated to "launch SPIDA into the level of major pole assessment vendors."[768]

Based on these facts, we find SCE's selection of SPIDACalc v5.0 and immediate implementation lacked prudence and supports disallowing recovery of all expenditures for poles which were prematurely replaced due to SCE's imprudent use of the software. Therefore, we reduce SCE's revenue requirement by $120.1 million over the 2018-2020 GRC cycle.

19.5. Correction for Shareholder Assigned Costs

Beginning with the 2006 GRC decision and continuing with each successive GRC decision since then, the Commission has barred SCE from

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763 SCE-25, Vol. 3, Appendix E.

764 RT, Vol. 16:17-19, 24-25.

765 SCE-25, Vol. 3, at 43, fn. 94.

766 *Id.*

767 RT Vol. 16, 2245:6-9.

768 SCE-25, Vol 3, Attachment 1, at 1-4.

recovering through customer rates certain portions of employee compensation. These items relate to the Short-term Incentive Program, Executive Incentive Compensation, and Supplemental Employee Retirement Plan. Historically SCE applied a capitalization rate to these expenses, thereby capitalizing a portion of them.

Although SCE adjusted the revenue requirement to reflect the assignment of these costs to shareholders, it had not made the adjustment to plant-in-service to remove the portions of the capitalized costs which the Commission had assigned to shareholders. Instead the rate base continued to include these costs for benefits. In April 2017, SCE discovered this issue and concluded an adjustment to SCE's forecast is necessary. The intervenors do not contest SCE's testimony or the proposed adjustment. SCE estimates the reduction to rate base will be approximately $34 million in 2018. In addition to the rate base adjustment, SCE filed an advice letter refunding to customers the cumulative capital revenue requirement from 2009 through 2017, plus interest relating to this adjustment.[769]

19.6. Rate Base – Additional Issues

The additional issues raised by SCE's Opening Brief and TURN's Reply are issues which we have discussed and applied as it concerns specific expenditures and forecasts, such as for Catalina and for the Pole Loading Program following SCE's use of SPIDACalc. SCE raises them generally because TURN, in its discussion of specific expenditures and forecasts, has advocated we adopt certain policies of general application concerning these issues.

[769] *See* Advice Letter 3702-E, effective as of December 21, 2017.

First, SCE contends it should continue to be permitted to "true up" rate base during a GRC test year when it has spent more than it was authorized in the previous GRC cycle. Although we agree, we note it should not be presumed that the true up will be authorized following review by the Commission. As SCE states (and we agree), "[t]o the extent the utility is expected to justify expenditures above those specifically authorized, the standard is whether the utility acted reasonably."[770]

SCE then attempts to place limits on our judgment, stating, "[t]hat judgment by the Commission may go to the reasonableness of the *timing* of the investment …"[771] We agree when reviewing expenditures which are in excess of an adopted forecast, SCE must establish the reasonableness of the timing of the investment. SCE, however, must also establish that the amount of the investment is fair and reasonable to rate payers. The fact that money has been spent on something that is used and useful for ratepayers does not necessarily establish that the expenditure was fair and reasonable and should be recovered in rates.

Second, SCE contends that when the Commission disallows an expenditure due to imprudence, it does not necessarily mean the investment should never be included in rate base.

TURN argues there should be a "fundamental rule: … a capital expenditure disallowed in a prior decision must stay disallowed." This would create a presumption that the disallowance would continue

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[770] SCE Opening Brief, at 304.

[771] *Ibid.*

> … unless and until the Commission states otherwise. And if the utility (or any other party, for that matter) believes that the Commission should change its treatment of previously disallowed amounts, the burden would be on that party to establish the reasonableness of the proposed change to the previously disallowed amount.[772]

SCE agrees that investments which the Commission has found are not used and useful to customers should never be included in rate base. By contrast, SCE argues that when the investment is a used and useful asset, the utility may meet its burden of proof in a subsequent GRC to establish the reasonableness of the expenditure. We agree and have applied these principles to specific expenditures elsewhere in this decision.

We decline to create a presumption that once an expenditure has been disallowed it must stay disallowed. We, however, agree that a party advocating the Commission should change its treatment of previously disallowed amounts bears the burden to establish the reasonableness of the proposed change. It should not be presumed that since the expenditure has resulted in the creation of a used and useful asset that the expenditure is also prudent and recoverable.

20. Results of Examination

Public Utilities Code § 314.5 provides in relevant part,

> The commission shall inspect and audit the books and records for regulatory and tax purposes (1) at least once every three years in the case of every electrical … corporation serving over 1,000 customers …. An audit conducted in connection with a rate proceeding shall be deemed to fulfill the requirements of this section.

[772] TURN Opening Brief, at 331.

ORA states that it conducted an examination of SCE's financial records in accordance with the foregoing section and sections 314 and 309.5 of the Public Utilities Code.[773]

> The general objectives of ORA's examination are to ensure that the interests of ratepayers are reasonably protected and that SCE's financial records, on which the GRC was built, were reasonable and proper for ratemaking purposes under established Commission rules and regulations.[774]

ORA had no recommended adjustment to expenses associated with:

- SCE-02, Transmission and Distribution
- SCE-03, Customer Service
- SCE-04, Information Technology
- SCE-05, Power Supply
- SCE-06, Human Resources, and
- SCE-07, Operational Services.[775]

Based on ORA's results of the Utility Plant review for 2013 to 2015, ORA proposed an audit adjustment to increase weighted average Customer Advances for Construction (CAC) and reduce weighted average Rate Base for 2015 by $2.267 million.[776] SCE made this adjustment in errata prior to the filing of ORA's testimony.[777]

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[773] ORA-22, at 1:11-13.

[774] ORA Opening Brief, sec. 21, at 250.

[775] ORA-22, at 2.

[776] ORA-22, at 2.

[777] SCE-09, Vol. 2A, at 45, Table IV-14.

Additionally, ORA reviewed various balancing and memorandum accounts:

- RRIMA (Residential Rate Implementation Memorandum Account, Oct 2015-June 2016)
- RIIM (Reliability Investment Incentive Mechanism) and successor account SRIIM (Safety and Reliability Investment Incentive Mechanism)
- Bark Beetle CEMA (Catastrophic Event Memorandum Account) (2012-2014)
- PDDMA (Project Development Division Memorandum Account)
- MCAGCCMA (Marine Corps Air Ground Combat Center Memorandum Account, Oct 2014 – Jun 2016)
- SOBA (Edison Smart Connect Opt-Out Balancing Account, Apr 2012 – Jun 2016)
- RSDMA (Residential Service Disconnection Memorandum Account, Jan 2015 – Jun 2016)
- EDRPMA (Energy Data Request Program Memorandum Account, Dec 2014 - Jun 2016)
- CDAP (Customer Data Access Project costs), also known as ESPI Energy

Service Provider Interface costs) and

- TAMA Distribution (Tax Accounting Memorandum Account, 2015) and
- TAMA Generation (Tax Accounting Memorandum Account, 2015)

ORA found no required accounting adjustments. ORA found that the accounting entries to the foregoing 10 accounts for the periods indicated are appropriate, correctly stated and in compliance with applicable Commission decisions. ORA does not object to SCE's proposals regarding the 10 balancing

and memorandum accounts and regulatory mechanisms for modifying, recovering, eliminating and continuing accounts.[778]

21. Compliance

In this GRC, SCE provided a separate exhibit summarizing its compliance with requirements it has identified in its 2006, 2009, 2012 and 2015 GRC decision, as well as other relevant proceedings or settlements.[779] SCE states its purpose is to demonstrate that it has complied with all relevant orders of the Commission.

SCE provides a list of 37 items, with the following information for each item:[780]

- The Commission decision adopting the compliance action item;
- The required action by SCE;
- The supporting decision reference; and
- SCE's Compliance Action and Status: a brief summary of the status of any compliance action items and or a reference (to SCE's exhibits or workpapers in this proceeding) where compliance with a particular item is addressed.

We have reviewed SCE's compliance showing and agree with SCE that it demonstrates SCE's compliance with each of the 37 listed items. Furthermore, we find the format of SCE's presentation to be very helpful in facilitating our review, and we direct SCE to include the same showing as a separate exhibit in its 2021 general rate case testimony.

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[778] ORA-22, at 23-27.

[779] SCE-10, "Compliance Requirements from 2009-2015 GRC Decisions Requirements from other Proceedings and or Settlements."

[780] *Id.*, Table II-1, Southern California Edison Company 2018 General Rate Case Reporting and Compliance Items.

22. CEMA Bark Beetle Recovery

SCE recorded $10.5 million in O&M expenses to its Bark Beetle CEMA for 2012-2014. Pursuant to Resolution E-3238, SCE has requested we find these expenses are reasonable, and authorize the transfer of the December 31, 2014 balance in the Bark Beetle CEMA O&M Cost Sub-account, $10.6 million, to the Base Revenue Requirement Balancing Account (BRRBA) for recovery in rates.[781] ORA reviewed SCE's Bark Beetle CEMA, and does not oppose SCE's request for rate recovery.[782]

We approve the request.

23. CALSLA Issues

SCE owns and maintains over 680,000 streetlights in its service territory.[783] SCE provides streetlight service pursuant to three tariffs:

- LS-1, a non-metered, SCE-owned streetlight tariff;
- LS-2, a non-metered, customer-owned streetlight tariff; and
- LS-3, a metered, customer-owned streetlight tariff.

SCE initiated a process in 2013 whereby governmental entities within its service territory could negotiate with SCE to purchase the streetlight systems located within their jurisdiction. Over 80 cities expressed interest in the purchase of the SCE streetlights in their respective communities.[784] However, in Spring 2015 SCE informed the cities and other jurisdictions in its service territory that it would no longer accept requests for streetlight acquisition submitted after

[781] SCE-12, at 1.

[782] ORA-22, at 24 and 27.

[783] SCE-02, Vol. 5 at 39.

[784] SCE-26, at 1.

August 15, 2015. Local governments could enter a queue by August 15, 2015 in order to preserve the opportunity to purchase streetlights, by entering into an agreement to purchase within one year from the date of SCE's delivery of their respective community's valuation.[785]

In its June 2017 rebuttal testimony, SCE provided the following status report as of May 2017:

- SCE had received CPUC approval and completed streetlight sales agreements with six cities;
- An additional 19 communities were engaged in negotiations or preparing to submit completed agreements to the CPUC; and
- Seven additional communities were also actively working with SCE at that time to finalize and sign agreements for the purchase of streetlights in their communities.[786]

SCE notes that sales of utility assets such as these streetlights, which are necessary and useful in the provision of electric service, require Commission approval under Public Utilities Code Section 851. The Commission established a procedure that allows for § 851 approval via Advice Letter for transactions of less than $5 million, while transactions above that amount require an application. As

[785] *Id.* at 2. SCE states that communities that received their valuation prior to the queue closure date of August 15, 2015 had until August 15, 2016 to enter into an agreement with SCE. Local governments that did not enter into a purchase agreement before the expiration of the one year deadline are no longer able to purchase SCE streetlights through the negotiation and sale process.

[786] *Ibid.*

of May 2017, SCE had submitted three Advice Letters and three applications seeking Commission approval for sale of streetlight systems under § 851.[787]

Testimony addressing SCE's streetlight acquisition program and the issue of LED rebates was submitted by the California City-County Street Light Association (CALSLA). CALSLA represents all street light and traffic control customers in California that receive electric service from SCE (as well as PG&E and SDG&E). A number of SCE's streetlight customers, representing 21 jurisdictions that account for 110,000 streetlights, co-sponsored exhibits with CALSLA.[788]

CALSLA and its co-sponsors provide five recommendations regarding SCE's streetlight acquisition program, and a sixth, related recommendation regarding the Commission's LED rebate funding for streetlights, which would apply to lights that are currently being evaluated for sale under SCE's streetlight acquisition program. While this GRC proceeding may not provide direct solutions to each of CALSLA's issues, we review them here and direct certain additional actions by SCE and CALSLA that we intend to repair what appears to be an inefficient and dysfunctional acquisition process.

The first three of CALSLA's recommendations are interrelated. CALSLA notes that the overall purchase price valuation provided by SCE consists of the cost of the lamps plus fees and taxes, which CALSLA describes as "adjustments

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[787] *Id.* at 3.

[788] Exhibit CALSLA-1 presents CALSLA's "Report on Streetlight Programs" and recommendations, while Exhibits CALSLA-2 through CALSLA-12 present the testimony of the co-sponsors. The co-sponsoring entities are the City of Downey, the City of Huntington Beach, the City of La Verne, the City of Norwalk, Orange County, the City of Palmdale, the City of Rialto, the City of Santa Ana, the City of Temecula, the City of Tustin, and the Western Riverside Council of Governments.

and fees for additional asset components, ad hoc replacements, transition costs, property taxes, and a tax assessment."[789] SCE calculates the value of the lamps using a standard "Replacement Cost New Less Depreciation" (RCNLD) method. According to CALSLA, "the price is non-negotiable, and SCE refuses to consider other methods of valuation such as comparable sales or the capitalization of net income."[790]

CALSLA states that the additional fees and taxes are charged on a case-by-case basis and may not be applied to each sale. For that reason,

it is very difficult for public agencies to understand the nature of SCE's fees and under what circumstances the fees are applied. SCE's sales proposals are brief and provide little discussion of SCE's valuation methodology or the reason for added fees.[791]

In light of the above, CALSLA's first recommendation is that SCE should provide a detailed explanation of all taxes, fees, and charges (line-item by line-item) included in the sales price of street light assets being considered under SCE's street light acquisition program. In rebuttal, SCE contends that it "has been and continues to be transparent in providing every participating jurisdiction with detailed explanations of the valuation methodology and adequate engagement opportunities for questions and feedback."[792] SCE's rebuttal on this first item is not credible to us, given that CALSLA and the co-sponsoring jurisdictions are plainly stating that whatever SCE is telling them or providing to

[789] CALSLA-01 at 6.

[790] *Id.*, at 4, citing SCE's response to a CALSLA data request.

[791] *Id.*, at 6-7.

[792] SCE-26 at 6.

them is not clear enough to enable the buyers to understand SCE's pricing method.

Apart from this matter of basic clarity, CALSLA states that it takes issue with the substance of the tax assessments and the transition fees themselves. Thus, CALSLA's recommendation #2 is that the tax assessment fee should be eliminated from pending street light sales, and CALSLA's recommendation #3 is that the transition fee should also be eliminated from pending street light sales. Instead, CALSLA recommends that SCE should record tax losses as well as profits from street light sales in a balancing account and, in the next GRC, SCE should file workpapers detailing the net proceeds from the sales. If there is a net tax loss across the street light customer class, SCE should recover the loss via a monthly surcharge on participating lamps.[793] Regarding the transition fee, CALSLA contends that "the fee collects mapping and inventory management costs that have already been accounted for in revenue requests from past GRCs and recouped from LS-1 rates [so] the transition fee double charges customers for these expenses."[794]

SCE addresses CALSLA's contentions and recommendations in its rebuttal testimony, suggesting that CALSLA is misinterpreting the substance and purposes of the taxes and fees in question. SCE's response, even if correct on the substance, is surprising to us in that (as we just described above) SCE asserted several pages earlier in the same rebuttal testimony that it "has been and continues to be transparent in providing every participating jurisdiction with

[793] CALSLA-01 at 7.

[794] *Id.*, at 8.

detailed explanations of the valuation methodology and adequate engagement opportunities for questions and feedback." The purchasers say they cannot understand SCE's valuations, SCE responds that it has explained everything, but when the purchasers make recommendations regarding SCE's estimated taxes and fees, SCE responds that the purchasers simply don't understand these terms. SCE cannot have it both ways here.

CALSLA's fourth, fifth and sixth issues and recommendations are also interrelated, and have to do with SCE's less-than-enthusiastic approach to the acquisition process. CALSLA's recommendation #4 is that customers should be permitted to purchase mast arms and luminaires attached to shared distribution poles. CALSLA notes that PG&E does allow customers to purchase lamps on shared distribution poles, citing a 2013 sales agreement with the City of Richmond. CALSLA recommends that SCE should use Pole Contact Agreements to facilitate customer ownership and maintenance of street lights on shared poles. In rebuttal, SCE simply responds that CALSLA's recommendation would jeopardize public and program participant safety, ignoring the PG&E precedent.[795]

CALSLA's recommendation #5 is that the Commission should require SCE to transfer street lights to the customer with 30 days of approval of the sale by the CPUC. CALSLA describes SCE's current policy of conducting lamp-by-lamp inspections prior to the transfer of lamps to the customer as unreasonable. Instead, CALSLA offers that customers will commit to work with SCE to conduct a true-up of SCE's inventory. In rebuttal, SCE describes the steps it takes in its

[795] SCE-26 at 12.

inspection process and asserts that its "current inspection process protects ratepayers and provides an accurate accounting of streetlights to be sold or maintained under SCE ownership."[796] However, despite acknowledging local government concerns "that these and other delays result in financial hardships for customers" SCE provides no evidence that its current inspection policy really does protect ratepayers. Nor does SCE appear open to CALSLA's suggestion that SCE work collaboratively with the purchasers to find a more cost-effective solution.

All of CALSLA's concerns coalesce to produce its sixth and final recommendation: due to the delays in the acquisition process that CALSLA attributes to SCE throughout its testimony, CALSLA recommends that customers should not lose rebates on LED streetlights that were scheduled to be eliminated on January 1, 2018 "because of unreasonable delays caused by SCE."[797] CALSLA states that customers sought to purchase their streetlights and converting them to LED to capture energy savings and lower their bills, and that in some instances their purchase plans are no longer feasible without the rebates. In rebuttal, SCE simply notes that LED rebates are not addressed in this GRC proceeding and suggests that CALSLA pursue its proposal in SCE's Energy Efficiency Business Plan proceeding (A.17-01-013). SCE does not respond to the allegations underlying CALSLA's recommendation:

Customers expected SCE to make a good faith effort to efficiently evaluate the lamps and conduct the sales. Yet, this has not been the case. SCE caused

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[796] *Ibid.*

[797] CALSLA-01 at 15.

significant delays in the transfer of street lights to customers to the extent that LED rebates are now in jeopardy. The acquisition program has been active for five years, and yet very few sales have occurred due to no fault of customers.[798]

CALSLA's testimony--and SCE's response in its rebuttal testimony--indicates to us that SCE's process for transferring streetlight ownership should be improved. More than anything, we find the difficulties reported by CALSLA, and SCE's response to CALSLA's concerns, to be puzzling. While SCE's testimony is not clear on this point, it appears that SCE created this program on its own initiative in 2013. SCE invited the cities and other governmental entities to submit requests to purchase SCE's streetlights, charging them $10,000 each for that opportunity. Then (apparently) SCE had a change of heart about selling these assets, such that the company is now either digging in its heels or dragging its feet in its "negotiations" with the interested jurisdictions. Indeed, CALSLA states that SCE's valuations are presented as "non-negotiable" and SCE's rebuttal to CALSLA suggests in several instances that if SCE and a city are not able to reach a mutually agreeable sales price, that is not really a problem that should concern this Commission because alternatives courses of action are available: either SCE can continue to own and operate the streetlight system, or the city can pursue an eminent domain action in Superior Court to condemn SCE's streetlight system in order to acquire the assets, at a valuation determined by the court. Thus, SCE concludes that there is no need for the Commission to intervene in this "negotiating" process or otherwise set the terms of contract negotiations.[799]

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[798] *Id.* at 11. Unfortunately, the rebates described by CALSLA were in fact terminated by the Commission in 2018.

[799] SCE-26 at 3 and 9. Quotation marks added.

Again, to be blunt, much has happened to alter the very landscape of California and SCE's territory since SCE filed this GRC application in 2016, and it is inarguable that SCE, these jurisdictions, and this Commission have new and extremely pressing and challenging issues that demand their attention. So it concerns us greatly that--as CALSLA observes with its references to SCE's T&D testimony on Distribution Construction & Maintenance, which includes SCE's requested funding for its Street Lighting Program--we are approving SCE's use of ratepayer funds in this GRC to (in part) manage this streetlight acquisition program, only to learn that SCE is approaching the task in such a litigious manner. This is an inappropriate and unreasonable use of ratepayer funds and should not continue. We direct SCE to meet and confer with CALSLA and all interested officials from affected jurisdictions in order to prepare a joint proposal to address each of the concerns raised in CALSLA's testimony regarding (1) the information that interested jurisdictions receive, or do not receive, during the acquisition process, (2) the possibility of including mast arms and luminaires attached to shared distribution poles in streetlight acquisition agreements, (3) more efficient transfer of streetlights following Commission approval of a sale, (4) exploration of the question of the impact of delays on receipt of LED rebates, and (5) any other issues that the Commission could address. The joint proposal should be provided either as part of SCE's testimony when it files its next GRC application, or as a supplemental exhibit as soon as possible after that date. Both sides are encouraged to seek assistance from the Commission's Alternative Dispute Resolution program if that would expedite their efforts or avoid conflict.

24. Other Issues

24.1. Tax Memorandum Accounts

The 2015 GRC decision authorized SCE to establish a TAMA. SCE proposes in this proceeding to extend the TAMA so it may continue to mitigate any tax-related ratemaking implications resulting from estimating differences between forecast and incurred repair deductions, changes in tax law and guidance associated with tax depreciation, and the impact of any tax accounting method changes.[800] No intervenor opposed this proposal.[801]

On November 6, 2017, SCE filed Advice Letter 3610-E under rules relating to its TAMA. The filing was due to an accounting change relating to deductible capitalized software. SCE proposes, and we approve, SCE continue to record in a memorandum account any recorded to forecast differences related to deductible capitalized software and trued up through memorandum accounts through 2020.[802] We agree the TAMA should be extended; however, the extension of the TAMA in its current form will limit the effectiveness of this important account. We do not find the limitations on TAMA to be beneficial. We consider additional requirements for TAMA to be reasonable.

Commission precedent supports a policy of requiring the utilities subject to our jurisdiction establish memorandum accounts to track the various costs and benefits of newly enacted tax law. In 2011, following passage of the federal Tax Relief Act, the Commission adopted Resolution L-411A in order to

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[800] SCE-09, Vol. 2, at 20.

[801] ORA-02, at 2; SCE-02-T, at 2-4.

[802] SCE-59, at 42-43.

> … preserve the opportunity for the Commission to decide at a future date whether some of the impacts of the Tax Relief Act, not otherwise reflected in rates, ought to be reflected in future rates, without having to be concerned with issues of retroactive ratemaking.[803]

The Tax Relief Act created the likelihood of large and unexpected decreases in tax expense for the utilities which, due to the timing of Commission rate cases, created the possibility that benefits of the tax decrease might not accrue to ratepayers in the same way they would if the tax decrease had been expected. The Commission's solution to this challenge was to direct certain utilities, to establish memorandum accounts in order to allow the Commission to determine at a future date whether rates should be changed, without the impediment of claims of retroactive ratemaking.

Based on that precedent, and consistent with our identical orders in the SDG&E and SoCalGas Test Year 2016 proceeding and the Liberty Utilities Test Year 2016 GRC,[804] in D.17-05-013 we created a memorandum account to track all differences between forecast and recorded tax expenses so that we could more closely examine revenue impacts caused by PG&E's implementation of various tax laws, tax policies, tax accounting changes, or tax procedure changes. This was intended to help the Commission review the reasonableness of PG&E's election of various tax options, such as various tax policies, tax procedures, or tax accounting changes. The memorandum account has separate line items detailing the differences between tax expenses forecasted and tax expenses incurred, specifically resulting from (1) net revenue changes, (2) mandatory tax law

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[803] Resolution L-411A, at 3.

[804] D.16-12-024, Ordering Paragraph 6.

changes, tax accounting changes, tax procedural changes, or tax policy changes, and (3) elective tax law changes, tax accounting changes, tax procedural changes, or tax policy changes. The account remains open and the balance in the account shall be reviewed in every subsequent GRC proceeding until a Commission decision closes the account.[805]

ORA, in its updated testimony following the passage of the 2017 Tax Cuts and Jobs Act (TCJA) and SCE's own updated testimony, recommends that the Commission adopt a broadened tax memorandum account consistent with that adopted for the other investor owned utilities.[806] We agree SCE should establish a new tax memorandum account, consistent with that adopted by the other investor owned utilities.

As we have required of SDG&E, SoCalGas, and PG&E, SCE shall notify the Commission of any tax-related changes, any tax-related accounting changes, or any tax-related procedural changes that materially affect, or may materially affect, revenues. Our reference to "materially affect" means a potential increase or decrease of $3 million or more. The failure to disclose such changes in a timely fashion undermines the integrity of the regulatory process, and may amount to a violation of Rule 1.1.

Finally, we find that the establishment of a memorandum account is consistent with Resolution L-411A at 13 in which the Commission stated:

We believe that an even handed approach to regulation requires us to consider, when there has been a large and unexpected decrease in expenses

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805 *See*, D.17-05-013, at 115-118.

806 ORA-02-T, at 2-7:6-22.

between rate cases, whether it is appropriate to establish a memorandum account to allow for a future decrease in rates.

24.2. SCE Request for Oral Argument

We note SCE has requested final oral argument pursuant to Rule 13.13 of the Commission's Rules of Practice and Procedure section 16 of the Scoping Memo and Joint Ruling of Assigned Commissioner and Administrative Law Judges issued in this proceeding. The request was granted. Final oral argument was held June 20, 2018.

25. Conclusion

Excepting as is otherwise discussed by this decision, the application of Southern California Evidence is granted.

26. Comments on Proposed Decision

The proposed decision of ALJs Roscow and Wildgrube in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on _____, and reply comments were filed on _____ by _____.

27. Assignment of Proceeding

President Picker is the assigned Commissioner and Stephen C. Roscow and Eric Wildgrube are the assigned ALJs in this proceeding.

Findings of Fact

1. With respect to individual uncontested issues in this proceeding, we find that SCE has made a prima facie just and reasonable showing, unless otherwise stated in this opinion.

Transmission and Distribution

Operational Overview

2. SCE's forecasts of OpX savings are reasonable.

Risk Informed Decision Making

3. SCE, ORA and CUE agree that the Commission should not base its decision on safety related-cost recovery on SCE's risk informed decision making analyses until SCE's planning approach is further developed.

Safety and Reliability Investment Incentive Mechanism (SRIIM)

4. SCE's proposed enhancements to SRIIM, with the modifications SCE agreed to make in response to CUE, are reasonable.

Residential line extension

5. SCE's approach to forecasting cable feet per installed meter for residential line extensions is reasonable.

Residential Tract Development

6. SCE's approach to forecasting cable feet per installed meter for residential tract developments is reasonable.

Rule 20 Issues

7. The Commission's decision in PG&E's 2017 Test Year GRC ordered PG&E to establish a one way Rule 20A balancing account that tracks the annual capital and expense costs for Rule 20A undergrounding projects, on a forecast and recorded basis.

8. The Commission ordered that overcollected balances in the account shall remain available for future Rule 20A projects, and that the balances in the account would be reviewed in PG&E's next GRC proceeding.

Distribution Transformers

9. New service connections are a major driver for new transformer purchases, but most distribution work activity involves installing or replacing under sized, failed or deteriorated transformers.

T&D – System Planning

10. In the context of T&D System Planning, the term "grid" refers to "the infrastructure comprised generally of transmission lines, substations, distribution circuits, and critical equipment such as circuit breakers, relays, substation transformers, conductors, and automation apparatus."

11. The overall drivers of SCE's planning process are accommodating increased capacity needs (resulting from new customers or increased load from existing customers) while meeting system reliability.

Photovoltaic (PV) Dependability and Capacity Driven Capital Expenditures

12. It is reasonable to accept SCE's use of its PV Dependability study for the purpose of preparing its GRC forecast.

Distribution Circuit Upgrades

13. SCE considers distribution circuit upgrades when it forecasts any portion of its distribution system to be overloaded and if existing distribution equipment cannot meet the needs of the system.

14. SCE cannot and should not require wholesale DERs, already connected to SCE's system, to pay for circuit upgrades triggered by new retail DER.

New Distribution Circuits

15. SCE builds new distribution circuits as part of three types of projects: (1) new substation projects, (2) substation capacity increase projects, and (3) as standalone projects.

16. ORA's methodology did not address SCE's project-specific forecast and ORA does not contest the need for any specific projects SCE identified as necessary.

Substation Expansion Projects

17. Substation expansion projects fall into three categories: (1) substation capacity projects located within scope in the existing substation footprint; (2) substation expansion that includes projects where the substation perimeter fence requires expansion; and (3) new substations.

18. ORA expects the new "Safari" substation will be delayed and will not be completed in this GRC cycle, but additional information provided by SCE in its rebuttal testimony supports a conclusion that it is more likely than not that the new "Safari" substation will be completed in this GRC cycle.

Substation Equipment Replacement Program

19. Funding for SCE's Substation Equipment Replacement Program is used to replace overstressed circuit breakers on SCE's system.

Subtransmission Lines Plan

20. SCE expended less than forecast for its Subtransmission Lines Plan in 2016 due to construction permitting and other unexpected delays on specific projects, but SCE's forecast for the 2018-2020 GRC period is based on project specific requirements during this period.

4 kV Programs

4 kV Cutover Program

21. SCE's 4 kV Cutover Program converts portions of 4 kV circuits to higher voltages in order to reduce load and foster reliability.

22. SCE has demonstrated that its methodology for estimating the scope and cost of its 4 kV cutover program is reasonable.

4 kV Substation Elimination Program

23. SCE's 4 kV Substation Elimination Program involves conversion of the entire 4 kV circuitry from a substation to higher voltage.

24. Now that SCE proposes to expand the pace of its 4 kV Substation Elimination Program, a closer look is warranted.

25. TURN's analysis of SCE's 4 kV Substation Elimination Program demonstrated that the program provides questionable benefits.

Grid Reliability Projects

26. The Commission granted SCE a permit to construct the Cerritos Channel Transmission Tower Replacement Project in D.18-08-021 and noted that construction of the project is scheduled to begin September 1, 2018 and to be completed by the fourth quarter of 2020.

27. The Cerritos Channel Transmission Tower Replacement Project is unlikely to be used and useful during the 2018-2020 rate case period.

T&D – Distribution Maintenance and Inspection

28. SCE's method of forecasting its T&D Distribution Maintenance and Inspection O&M and capital costs by using its 2015 recorded adjusted expenses as a basis for proposed Test Year projects and activities is reasonable.

T&D – Distribution Construction and Maintenance

29. SCE's explanation of a misunderstanding by ORA regarding O&M for Street Lighting Operations and Maintenance (FERC sub account 585.170) is reasonable.

30. SCE has not made a persuasive argument that ratepayers should fund SCE's service guarantees.

31. ORA's testimony demonstrated that SCE significantly underspent the budgets for Distribution Storm O&M (FERC sub account 598.170) authorized by the Commission in its 2012 GRC and its 2015 GRC.

32. A one-way balancing account for Distribution Storm Expenses could lead to an unbalanced outcome where ratepayers would receive refunds in years when the weather was mild, but shareholders would fund part of storm-related repairs in years when the weather was more severe.

T&D – Substation Construction & Maintenance

33. SCE's rebuttal testimony effectively refuted ORA's recommendation to reduce SCE's requested funding for Substation Physical Security.

T&D – Transmission Construction & Maintenance

34. SCE's forecast expenses for two items in FERC Account 571.150, (1) Transmission Overhead and Underground Line Maintenance and (2) Transmission Vegetation Management, are reasonable.

Transmission Tools and Work Equipment

35. Regarding SCE's capital forecast, ORA recommends reductions of $616,000 in 2016 and $519,600 in 2017 for transmission tools and work equipment activities.

36. SCE used a five year average (2011-2015) to develop its 2016 – 2018 forecasts due to the unpredictability of equipment retirements and external drivers.

37. ORA proposes to use SCE's recorded adjusted capital expenditure for 2016, and SCE agrees.

38. SCE effectively rebutted ORA's critique of SCE's forecast capital expenditures for transmission tools and work equipment activities and demonstrated that its forecast is reasonable.

T&D – Infrastructure Replacement

Worst Circuit Rehabilitation Program

39. In rebuttal testimony and at hearing, SCE justified its forecast capital expenditures for its Worst Circuit Rehabilitation Program.

Cable Life Extension Program

40. SCE's capital expenditure forecast for its Cable Life Extension Program is reasonable.

Cable-In-Conduit Replacement Program

41. SCE's capital expenditure forecast for its Cable-in-Conduit Program is reasonable.

Overhead Conductor Program

42. SCE developed and implemented its Overhead Conductor Program (OCP) following the Commission's decision in SCE's 2015 rate case.

43. Although the Commission had not authorized any funding for OCP in D.15-11-021, once the program became operational SCE replaced 74 circuit miles in 2015 and 202 circuit miles in 2016, with recorded capital expenditures for the program equal to $58 million in 2015 and $97 million in 2016.

44. TURN demonstrated that incorrect engineering created circumstances where some wires may have more extensive damage that they would otherwise, thus justifying its recommended 10% disallowance.

45. ORA demonstrated in testimony that SCE provided no explanation of how it determined that annual replacement of 300 circuit miles would be optimal.

Underground Oil Switch Replacement Program

46. SCE's capital expenditure forecast for its Underground Oil Switch Replacement Program is reasonable.

Capacitor Bank Replacement Program

47. SCE originally forecast $34.744 million in capital expenditures for 2017 2018, based on a forecast annual replacement volume higher than the historical five year average, albeit "significantly" lower than the steady state replacement rate.

48. SCE agreed to accept TURN's proposal to use 2014 unit costs, which reduces SCE's forecast to $27.692 million.

Automatic Recloser Program

49. SCE's 2017-2018 capital expenditure forecast for its Automatic Recloser Program is reasonable.

PCB Transformer Replacement Program

50. SCE's 2017-2018 capital expenditure forecast for its PCB Transformer Replacement Program is reasonable.

Substation Infrastructure Replacement Program

51. SCE's 2017-2018 capital expenditure forecast for its Substation Infrastructure Replacement Program is reasonable.

T&D – Poles

Poles--Capital Expenditures

52. For pole-related capital expenditures, TURN demonstrated in its testimony that these costs increased by amounts "above and beyond" general inflation.

53. TURN asks reasonable questions regarding the reasons SCE's contractor costs increased much faster than the rate of inflation, and SCE has not responded with a fact based explanation.

54. SCE has not affirmatively demonstrated that its contractor costs are reasonable and its circular argument that, because SCE uses a competitive process, the results of that process must be reasonable, is insufficient.

55. It is reasonable to adopt TURN's recommended downward adjustment of the unit costs for the categories listed below by removing SCE's reported increase in contractor costs from 2012 to 2015:

Distribution Deteriorated Pole Replacement and Restorations

Pole Loading Distribution Pole Replacements

Pole Loading Transmission Pole Replacements

Transmission Deteriorated Pole Replacement and Restorations

T&D – Grid Modernization

Grid Modernization Capital Expenditures

Distribution Automation Programs

56. It is reasonable to approve less funding for distribution automation than requested by SCE, because a lower amount will result in the proper balance between SCE's need to maintain and upgrade aging infrastructure while also accommodating realistic levels of DER growth in the 2018-2020 GRC period.

57. TURN's testimony regarding the DER portion of distribution automation shows that beyond a limited number of installations, there is insufficient value to installing more advanced Remote Intelligent Switches to achieve full switching automation.

Communications

58. SCE has not demonstrated the need to proactively update substations by implementing a Substation Automation (SA 3) program at this time.

59. The Common Substation Platform (CSP) will deliver cybersecurity and interoperability benefits

60. SCE has demonstrated that the Field Area Network (FAN) will provide cybersecurity benefits and ensure that distribution devices have sufficient communications.

61. TURN demonstrated in testimony that funding for Distribution System Efficiency Enhancement Program (DSEEP) will enable SCE to maintain the existing communications network while the new FAN is being installed.

62. SCE should be authorized $15 million for the Distribution System Efficiency Enhancement Program (DSEEP) over the 2018-2020 period. This amount reflects SCE's historic rate of spending for the DSEEP.

63. SCE's showing did not demonstrate why expenditures for a Wide Area Network (WAN) are necessary during this GRC period.

Tools for Data Analysis and Decision Making

64. SCE's request for its System Modeling Tool (SMT) is compliant with the DRP proceeding.

65. SCE's request for its DRP External Portal is compliant with the DRP proceeding.

66. The Grid Management System (GMS) will provide cybersecurity benefits, enable DERs, and integrate SCE's distribution software.

T&D – Grid Technology

Distribution Volt VAR Control

67. SCE reasonably established that its proposed Distribution Volt VAR Control (DVVC) program is intended to provide reliability benefits and benefits of reduced energy costs for SCE's customers.

Energy Storage Pilots

68. ORA's objection to SCE's Distributed Energy Storage Integration (DESI) pilot program is incorrect because ORA has misunderstood Commission policy regarding such pilot programs.

69. The DESI pilots do not meet the criteria for Electric Program Investment Charge (EPIC) funding, but they do meet the criteria for GRC funding.

70. Pursuant to D.12-05-037, Ordering Paragraph 3, the Commission defined an EPIC-eligible RD&D project as one that supports research into the installation and operation of pre-commercial technologies.

71. The energy storage technologies that SCE proposes to implement in its DESI pilots are in the early stages of the technology maturity cycle, but these technologies are already commercially available.

72. The DESI pilots involve expenditure for capital projects that will be "used and useful" for the duration of their service lives, and "will provide energy services to customers for the useful life of the asset, rather than for a particular project or demonstration" in contrast with EPIC projects that are only funded for a three year period.

73. SCE demonstrated that the proposed DESI pilots will provide ratepayer benefits that could not be obtained with existing pilots or SCE-owned storage facilities.

T&D – Safety Training & Environmental Programs

Environmental Program – Transmission (FERC Account 565.281)

74. SCE's O&M forecast request is based on the environmental remediation work forecasted for specific transmission projects in 2018-2020, and uses the same methodology the Commission adopted for SCE in D.15-11-021.

Hazardous Waste Management & Disposal – Distribution (FERC Account 598.250)

75. SCE's proposal to use a multi-year average as the forecasting methodology Distribution Hazardous Waste Management & Disposal (FERC Account 598.250) due to the unpredictable nature of this account is reasonable. SCE properly excluded two years showing unusually high activity, which would have otherwise inflated its forecast.

T&D – Other Costs, Other Operating Revenues

T&D –Other Operating Revenues

76. SCE receives Other Operating Revenues (OOR) from transactions not associated with the sale of electric energy. Tariffed OOR is based on CPUC or FERC approved rates, and offsets the revenue requirement SCE would otherwise collect from general ratepayers.

T&D – Other Costs

77. SCE's forecasts for Transmission and Distribution Work Order write-offs are based on five year averages of recorded data, a method approved by the Commission in SCE's two most recent GRC proceedings because accounts like these are influenced by forces outside SCE's control.

78. SCE's rebuttal testimony provided a detailed and reasonable explanation of the logic underlying SCE's calculations costs for Transmission and Distribution Capital Related Expense, as well as a detailed critique of ORA's method.

79. SCE accepted TURN's recommended methodological change to SCE's calculation of its forecast for underground locating services (FERC Account 588.281). This results in a test year forecast equal to $8.227 million, which is $363,000 lower than SCE's original request of $8.590 million.

Customer Service Re-Platform

80. Tracking the costs and benefits of CS Re-Platform in a memorandum account is reasonable.

Customer Service – O&M

81. We find the link between customer growth and increased expenses to be tenuous and to support TURN's recommendations against upward adjustments

of SCE's forecasts based on growth due to the impact of automation and increasing efficiency.

Meter Reading Operations – FERC Account 902

82. The reduced proposal of $9.909 million, removing the projected increase due to growth, is reasonable.

Test, Inspect, and Repair Meters – FERC Account 586.400

83. The proposed reduction eliminating the increase for customer growth and the reduced proposal of $15.438 million is reasonable.

Turn-On and Turn-Off Services – FERC Account 586.100

84. SCE established the increase of $114,000 for customer growth. Excluding $289,000 for CS Re-Platform benefits, we find $5.164 million reasonable.

Customer Installation and Energy Theft Expense – FERC Account 587

85. We find $6.506 million for this account is reasonable.

Meter Services Operations and Management – FERC Account 580

86. We find $5.671 million is reasonable following reduction of $155,000 for customer growth.

Billing Services – FERC Account 903.500

87. We find $23.645 million is reasonable.

Credit and Payment Services – FERC Account 903.200

88. Excluding the increase for customer growth and CS Re-Platform expenses and benefits, we find reasonable $15.477 million for this account.

Postage – FERC Account 903.100

89. Following an adjustment for the 2018 postal rate increase we find reasonable TURN's proposed adjusted forecast of $14.371 million.

Uncollectable Expenses – FERC Account 904

90. TURN's recommended forecast of 0.211% based on a five-year average of 2012 – 2016 using 2016 unadjusted data is consistent with the downward trend of the data.

Customer Contact Center– FERC Account 903.800

91. It is reasonable to accept $43.779 million for this account.

Business Customer Division– FERC account 908.600

92. We find reasonable a forecast of $18.790 million.

Customer Programs and Services– FERC account 905.900

93. We find reasonable the forecast of $24.656 million for Customer Programs and Services.

94. SCE has demonstrated a commitment to outreach to its diverse communities which is consistent with NDC's recommendations; we will not impose greater requirements.

Operating Unit Management and Support–FERC Accounts 901 and 907.600

95. We find reasonable for FERC Accounts 901 and 907.600 a forecast of $6.887 million.

Customer Service – Capital

96. We find reasonable $24.251 million for 2017 and $34.956 million for 2018.

Customer Service – Other Operating Revenue

97. SCE estimates OOR to be $27.981 million in Test Year 2018. The forecast is undisputed and reasonable.

Customer Service – Additional Issues

98. SCE and SBUA entered into two joint exhibits and stipulations, SCE-SBUA–1 and SCE-SBUA-2. The commitments agreed to by SCE within these stipulations are reasonable and further the interests of ratepayers generally and small business customers of SCE specifically.

Information Technology – O&M and Hardware

Hardware/Software Licenses & Maintenance

99. SCE has met its burden to establish the forecast of $70.73 million for this account.

Business Integration & Delivery

100. A 2018 forecast for BID of $37.196 million is reasonable.

Grid Services

101. The forecast for Grid Services for 2018 of $34.5 million is reasonable.

Information Technology – Capitalized Software

102. ORA proposed using SCE's recorded capital expenditures in place of forecast expenditures for 2016 for several capitalized software projects. SCE did not object, provided "2016 recorded costs are used for all IT capital projects and cherry-picking is not utilized."

103. Except as noted, we find it reasonable to use the 2016 recorded capital expenditures.

Contingency Amounts in Capitalized Software Forecasts

104. SCE's request for 2017 of $24.75 million and $23.86 million for 2018 software contingencies is not reasonable.

105. We find disallowing these contingencies should motivate SCE to remain within its forecast budgets for these projects. If additional funds become necessary, SCE may seek to establish that necessity in the next GRC.

Cybersecurity and Compliance

106. We adopt as reasonable and exclusive of contingencies, $22.590 million for 2016, $52.003 million for 2017, and $47.457 million for 2018 for Cybersecurity and Compliance software.

107. We agree with SCE that their showing is adequate and a memorandum account is not needed. We also agree further review of how to address cyber-related information would be appropriate in another forum.

Grid Modernization Cybersecurity

108. We adopt the 2016 recorded expense of $2.901 million and find reasonable 40% of the forecasted expenses (less contingencies) for 2017 and 2018, $5.34 million and $8.063 million, respectively.

Other Capitalized Software

Vegetation Management Project

109. We find reasonable the recorded expense for 2016 of $916,000 and the forecast (less contingency) for 2017 of $4.75 million for the Vegetation Management Project.

Comprehensive Situational Awareness for Transmission

110. Comprehensive Situational Awareness for Transmission (CSAT) was known as Advanced Phasor Data Analytics when approved by D.15-11-021.

111. SCE's lack of transparency for how the previously approved funding was spent leads us to find SCE's revised forecast is not just and reasonable for ratepayers. Instead, we find the 2016 recorded expense of $0, $0.476 million for 2017, $0.951 million for 2018, $3.236 million for 2019, and $3.236 million for 2020 to be just and reasonable to ratepayers.

Grid Planning & Analytics Software

112. We accept as reasonable the recorded expense for 2016 for the GIPT, GAA, LTPT, and GCM projects of $9.371 million, and 50% of SCE's request (the forecast less contingencies), $12,796 million for 2017, and $7.332 million for 2018.

Enterprise Content Management Project

113. SCE has established the distinctions between ECM and eDMRM and that the ECM project is reasonable and necessary. The requests (the forecast less contingencies) of $2.833 million for 2017, and $4.333 million for 2018 are reasonable.

Operating System Software

114. We find reasonable the forecast capital expenditure for this account for 2016 of $8.75 million, and the forecast less contingencies, of $13.113 million for 2017, and $19.80 million for 2018.

Information Technology - Customer Service Re-Platform

115. The factors to support establishing a memorandum account to track Customer Service Re-Platform costs, benefits, and capital expenditures for review in the next GRC are present.

Information Technology – Managed Services Providers

116. SCE's use of Managed Services Providers and its request for this account are reasonable.

Generation

117. ORA proposed using SCE's recorded capital expenditures in place of forecasted expenditures for 2016 for SCE's generation capital expenses. SCE has agreed with this recommendation. Except as noted below, we agree and find reasonable the 2016 recorded capital expenditures.

Generation – Catalina

Catalina – O&M

118. ORA accepts SCE's 2018 forecast for O&M for this account of $4.374 million. It is reasonable and we approve it.

Catalina – Pebbly Beach Generating Station Automation

119. The costs for the PBGS Automation Project have not been established to be just and reasonable and therefore, we do not allow them.

Catalina – Other Capital Projects Under $3 million

120. We find ORA's recommendation is just and reasonable and adopt the 2016 actual recorded expense of $.007 million and the forecast of $0.448 million for each of the years 2017 and 2018.

Solar Photovoltaic

121. SCE submits its 2013 and 2014 O&M expenses for reasonableness review in this GRC. SCE incurred $8.286 million for 2013 and $4.270 million for 2014. These expenses are not disputed and we find them reasonable and recoverable.

Fuel Cells

122. SCE's forecast for O&M for its fuel cell program is $0.379 million. This amount was not disputed. We find it is reasonable.

Human Resources

123. Legislation passed in 2018 prohibits an electrical or gas corporation from recovering from ratepayers any annual salary, bonus, benefits, or other consideration of any value, paid to an officer of the electrical corporation or gas corporation, and requires that compensation instead be funded solely by shareholders of the utility.

124. Commission Resolution E-4963 ordered SCE and other affected utilities to establish "Officer Compensation Memorandum Accounts" (OCMA) with an effective date of January 1, 2019.

125. SCE complied by filing Advice Letter 3927-E, which was approved by the Commission's Energy Division on January 29, 2019.

Human Resources Department and Executive Officers

Human Resources Operating Unit

126. No parties contested the reasonableness of SCE's forecast for HR Department O&M expenses.

Executive Officers

127. Executive Incentive Compensation (EIC) awards are largely based on shareholder benefits.

128. SCE financial performance may benefit ratepayers, but the ratepayer benefit is much less direct than the shareholder benefit.

129. The additional testimony prepared by SCE regarding its EIC Plan, while informative, is not evidence that the EIC awards incent executives to achieve ratepayer benefits.

130. We remain unconvinced that ratepayers should fund 100% of SCE's EIC program.

Benefits and Other Compensation

Short Term Incentive Program

131. It is reasonable to continue to use the same ratio of total STIP spending to labor expense (12.11%) as we adopted in D.15-11-021.

132. Even though the STIP and the EIC use the same financial metric, and even though the Commission adopted a 40% reduction for the EIC, the Commission only adopted a 10% reduction for the authorized STIP amount in the 2015 GRC based on the financial performance metric.

Long Term Incentives

133. Parties' positions regarding Long Term Incentives (LTI) are essentially unchanged since SCE's 2015 GRC, when we concluded that LTI does not align executives' interests with ratepayer interests, and continued "our consistent practice" and denied SCE recovery for its LTI program.

Recognition Programs

134. SCE provided thorough support for its forecast of costs for its Recognition Programs in its rebuttal testimony, in response to ORA's critique of its direct showing.

Pension Costs

135. SCE states in testimony that upcoming Retirement Plan changes will reduce the Plan's long term cost structure.

136. Based on SCE's testimony, ORA supported SCE's 2018 forecast, and recommended that the Commission authorize the same annual amount for 2019 and 2020. SCE accepted ORA's proposal.

Medical Programs

137. In D.15-11-021 we deferred to SCE's reliance on medical program cost escalation rates provided by its plan administrators, rather than relying on a broader public study as proposed by ORA.

138. ORA has not demonstrated that a different approach is warranted in this proceeding.

Operational Services

Business Resiliency

139. SCE forecasts $7.964 million in O&M expenses for the organization in Test Year 2018. Of that amount, $74,000 would fund one analyst position to better support Emergency Management Operations training and exercise activities.

140. SCE's forecast for Business Resiliency O&M expenses is reasonable, including funding for an additional analyst position.

Corporate Environmental Services

141. SCE supports the request made by SDG&E in this proceeding for recovery of SDG&E's costs relating to the San Dieguito Wetlands and Wheeler North Reef.

Corporate Real Estate (CRE)

Service Center Modernization Program

142. TURN demonstrated in testimony that for the past ten years, over the course of three GRC cycles, SCE has repeatedly requested and received significant funding to modernize its service centers, but has not used significant portions of those funds for that purpose.

143. SCE explains that the funds were "reallocated at the corporate level to projects that were deemed more critical for the delivery of safe and reliable service to SCE's customers."

144. The purpose, need for, and cost of the "more critical" projects is unknown, because SCE did not provide this information in response to challenges by TURN in SCE's 2012 rate case, its 2015 rate case, and now in this 2018 rate case.

145. Instead, SCE invokes the general principle that "utilities must retain flexibility in spending funds authorized in GRC decisions."

146. The Commission has repeatedly authorized funding for service center modernization to address what we understood to be significant modernization needs, on the basis of SCE's testimony that the funding was "critical to fostering safe and effective environments for its workforce" and would address "severe and pressing needs."

147. SCE's justification of the need to modernize its identified service centers is generally sound, which is consistent with our willingness to fund these projects in the past.

Bishop Service Center

148. SCE's proposed modernization of the Bishop Service Center is necessary for worker safety, regulatory compliance, and operational efficiency.

Kernville Service Center

149. SCE's proposed modernization of the Kernville Service Center is necessary for worker safety, regulatory compliance, and operational efficiency.

Redlands Service Center

150. SCE's proposed modernization of the Redlands Service Center is necessary for worker safety, regulatory compliance, and operational efficiency.

Ridgecrest Service Center

151. SCE's proposed modernization of the Ridgecrest Service Center is necessary to support of safe and efficient service over the projected life of the facility.

San Joaquin Service Center

152. SCE's proposed modernization of the San Joaquin Service Center is necessary to foster a safe and effective work environment and to addresses new operational methods and equipment requirements.

Santa Ana Service Center

153. SCE's proposed modernization of the Santa Ana Service Center is necessary to foster a safe and effective work environment.

Santa Barbara Service Center

154. SCE has justified its proposal to relocate its Santa Barbara Service Center because the reduction in employee travel time will result in the dual benefits of shorter outages in the Santa Barbara area, as well as higher retention rates for SCE's employees.

Barstow Service Center

155. SCE's uncontested Barstow Service Center modernization proposal is reasonable.

Blythe Service Center

156. SCE's uncontested Blythe Service Center modernization proposal is reasonable.

Shaver Lake Service Center

157. SCE's uncontested Shaver Lake Service Center modernization proposal is reasonable.

Operational Support Program

Infrastructure Upgrade Projects

158. SCE's forecast of capital expenditures of $45.978 million for Test Year 2018 related to nine infrastructure upgrade projects during the 2018-2020 GRC period is reasonable.

Substation Maintenance and Test Buildings (Substation Reliability Upgrades)

159. SCE's forecast of capital expenditures of $8.254 million for Substation Maintenance and Test Buildings and Substation Reliability Upgrades in Test Year 2018 is reasonable.

Facility Repurpose Projects

160. TURN effectively demonstrated that SCE's justification for the "Storage of Critical Electrical Equipment Spares Project" did not meet SCE's burden to prove the project is reasonable.

Projects Less Than $3 Million

161. SCE's forecast of capital expenditures of $5.524 million for Test Year 2018 related to Projects Less Than $3 Million during the 2016-2020 period is reasonable.

Blanket Capital Program

Non-Electric Capital Maintenance

162. In 2016 SCE forecast $21 million in capital expenditures for Non-Electric Capital Maintenance but only recorded $14 million, and has not explained why it would require $21 million annually for this program in 2018.

163. TURN's recommended funding levels for Non-Electric Capital Maintenance, $14.49 million for 2017 and $15.215 million for 2018, are reasonable.

Substation Capital Maintenance

164. TURN's recommendation to use recorded 2016 expenditures ($10.766 million) as the basis for the 2017 and 2018 forecasts of Substation Capital Maintenance is reasonable, without escalation for 2017 or 2018, or imposing a reduction from the 2016 level.

Energy Efficiency

165. SCE's forecast of capital expenditures of $2.919 million for Test Year 2018 related to Energy Efficiency Projects during the 2016-2020 period is reasonable.

Ergonomic Equipment

166. SCE's forecast of capital expenditures of $1.355 million for Test Year 2018 related to Ergonomic Equipment during the 2016-2020 period is reasonable.

Ongoing Furniture Modifications

167. SCE's forecast of capital expenditures of $3.961 million for Test Year 2018 related to Ongoing Furniture Modifications during the 2016-2020 period is reasonable.

Various Major Structures

168. Although spending for SCE's Various Major Structures (VMS) Program is for unplanned or emergent projects, and therefore is unpredictable, TURN demonstrated that SCE has not supported its significantly higher forecasts with evidence that unforeseen, necessary capital spending will rise to those levels, or even is likely to do so.

169. Although CRE's responsibility has expanded since SCE's last GRC, SCE provided little actual analysis to support its significantly higher expenditure forecasts for the 2017-2020 period

170. TURN demonstrated in its testimony that SCE has used VMS funds in the past for projects that could have been planned in advance and presented to the Commission for review and approval.

Corporate Health and Safety

171. ORA's recommendation to exclude EPRI funding from SCE's Corporate Health and Safety O&M forecast for Test Year 2018 reflects ORA's misunderstanding of D.15-04-020, which denied SCE's request to fund EPRI Program 60 research using EPIC funds. The Commission did not take any action in D.15-04-020 that extended beyond the EPIC program.

172. SCE seeks GRC funding for EPRI Program 60 research because it was denied EPIC-authorized funding in D.15-04-020.

173. The Commission previously approved SCE's request for EPRI funding in its 2012 GRC decision, D.12-11-051, so it is logical and reasonable for SCE to seek this funding in this GRC proceeding. SCE's specific funding request in this proceeding is reasonable.

Corporate Security

174. SCE's forecast of $26.906 million in Corporate Security O&M expenses for Test Year 2018 is reasonable.

175. SCE's capital expenditure forecast for Corporate Security during the 2016-2018 period, adjusted to include final 2016 recorded capital expenditures, is reasonable.

Supply Management

176. SCE's 2018 Test Year O&M forecast for the Supply Management organization is unchanged from 2015 spending levels and is reasonable.

177. SCE's capital expenditure forecast for Supply Management during the 2016-2020 period, adjusted to include final 2016 recorded capital expenditures, is reasonable.

Supplier Diversity

178. SCE's 2018 Test Year O&M forecast for the Supplier Diversity organization is reasonable.

Transportation Services

Operating Costs

Fuel Operating Costs

179. SCE accepted TURN's recommendation to use the 2016 version of the Energy Information Administration's Annual Energy Outlook to update projections of its forecast gas and diesel fuel costs. The resulting total combined fuel cost forecast of $15.654 million is reasonable.

Capital

180. SCE's capital expenditure forecast for Transportation Services during the 2016-2018 period, adjusted to include final 2016 recorded capital expenditures, is reasonable.

Administrative & General

Ethics and Compliance

181. SCE forecasts Administrative and General (A&G) expenses for Ethics and Compliance for 2018 of $9.863 million. We find the request to be reasonable.

Regulatory Affairs

Regulatory Affairs Labor: FERC Account 920/921

182. We find reasonable SCE's forecast of $15.214 million of Test Year 2018 expenses for its Regulatory Affairs Department in FERC Accounts 920/921.

Regulatory Affairs – Integrated Planning Power Procurement: FERC Account 557

183. We find reasonable SCE's forecast of $10 million for Test Year 2018 for Integrated Planning Power Procurement, FERC Account 557. SCE used the Last Recorded Year as the forecast method.

Corporate Communications

Corporate Communications Operations Labor: FERC Account 920/921

184. We find reasonable SCE's forecast of $5.071 million of Test Year 2018 expenses for its Corporate Communications Operations Department in FERC Accounts 920/921.

Corporate Communications - Outside Services: FERC Account 923

185. SCE forecasts $1.689 million for FERC Account 923 for: 1) ethnic media services; 2) communications measurement; and 3) communications quality assurance. We find the forecast to be reasonable.

Local Public Affairs

Local Public Affairs – FERC Account 920/921

186. SCE forecasts $7.904 million for Test Year 2018 for Local Public Affairs, FERC Account 920/921. The amount is not disputed; we find the forecast is reasonable.

187. The National Diversity Coalition (NDC) however, urges we require SCE to host at least five capacity building workshops annually for community-based organizations. These workshops were intended to inform and educate customers and community organizations about company programs and initiatives. SCE discontinued these workshops in 2015 following a reorganization and

determination that the workshops are not core to the Local Public Affairs' function. Although NDC establishes the workshops were well attended and inexpensive and would likely continue to be, NDC does not establish a basis for requiring these workshops; we decline to order them.

Corporate Membership Dues and Fees – FERC Account 930

188. We find SCE has not met its burden to establish any portion of the Edison Electric Institute dues are recoverable from ratepayers.

189. SCE has not established the ratepayer benefits of supporting California Taxpayer Association, Business Roundtable, California Small Business Association, and California Small Business Roundtable. Accordingly, we find a forecast of $168,701 FERC Account 930 for the ratepayer funded portion of dues and memberships costs is reasonable.

Financial Services

190. We find reasonable SCE's 2018 forecast for the Financial Services Department of $43.3 million for Accounts 920/921 and TURN's recommendation of $13.251 million for Financial Services Accounts 923/930.

Audits

191. We find reasonable the SCE forecast of $8.657 million for the Audit Service Department in 2018.

Legal - Removal of Costs Resulting from Alleged Imprudence

192. We approve as reasonable a 10% reduction of the forecast for Outside Counsel. As for In-House Counsel, we also note SCE has, in a number of instances, renewed previously denied arguments without providing an explanation as to what has changed to warrant a different outcome in the present case. Therefore, we reduce the In-House forecast an additional 5% for a total of 15% reduction.

193. Although we decline to order changes to SCE's internal guidance concerning the removal of costs for imprudent activities, we consider greater transparency to be warranted and recognize recalcitrance by SCE in regards to this issue may undermine its showing in meeting its burden of proof in future GRCs.

194. We find the parties should meet and confer to explore this proposal further. During this process the parties should consider means to accurately determine the portion of In-House Counsel costs and other expenses which are incurred in connection with findings of utility imprudence. This consideration should include timekeeping or other means to accurately evaluate the allocation of expenses, notwithstanding our previous rejection of ORA's predecessor, the Division of Ratepayer Advocate's, suggestion that SCE be required to have a timekeeping system.

Law

In-House, FERC Accounts 920/921

195. Following application of the 15% reduction discussed above, we find reasonable a forecast of $21.587 million for In-House Counsel.

FERC Accounts 923/925/928 Outside Counsel

196. We find reasonable a forecast of $12.532 million.

FERC Account 930 Corporate Governance

197. As we have in past rate cases we exclude equity compensation; we find reasonable a forecast of $3.1 million.

Claims

198. We find reasonable SCE's Administrative Expense forecast of $3.025 million.

199. We find reasonable a forecast of $14.948 million for Claims Reserves.

Workers' Compensation

200. Neither ORA nor TURN challenge the forecasted administrative expense of $6.783 million and we find it reasonable.

201. We find reasonable for Workers' Compensation Reserve expense, a forecast of $7.773 million.

Disability Program

202. SCE's forecast of $833,000 for Disability Administration is not disputed and is reasonable.

203. We find reasonable a forecast for the Disability Program of $17.766 million.

Property and Liability Insurance

Property Insurance

204. SCE accepts ORA's and TURN's recommended property insurance expense forecast of $14.070 million for Test 2018 (a reduction of $2 million from SCE's original forecast) and we adopt it as reasonable.

Liability Insurance

205. We find SCE's continuing reliance on an expert forecast is reasonable and find reasonable for total liability insurance expense the forecast of $92.427 million.

Ratemaking Proposals

Establishment of the DER Deferred Project Memorandum Account (DERDPMA)

206. SCE has withdrawn its request to establish the DERDPMA.

Establishment of the Public Utilities Code Section 706 SCE Officer Compensation Memorandum Account (SOCMA)

207. SCE's request to establish this memorandum account has been mooted by statutory changes enacted after SCE made this proposal in its September 2016 application.

ORA's Proposal to Establish a One Way Storms Balancing Account

208. In the section of this decision addressing T&D Distribution Construction and Maintenance, we denied ORA's proposal to create a one way balancing account for Distribution Storm Expenses (FERC Sub Account 598.170).

209. SCE's five-year average forecast method for storm expenses is reasonable given the inherent variability of storm expenses and SCE's storm expenses forecast is reasonable.

Uncontested Proposals for Memorandum Accounts and Balancing Accounts

210. SCE provided a list in its opening brief of its memorandum account and balancing account proposals that are uncontested, and we find each of the uncontested proposals reasonable.

Jurisdictional Issues

211. SCE uses a Commission approved methodology to calculate factors to allocate total company costs between CPUC and FERC jurisdictional revenue requirements and presents those unopposed allocation factors in SCE-09, Table IV 6. SCE's uncontested jurisdictional allocation factors are calculated according to methods we have approved in the past and are reasonable.

Sales and Customer Forecast

212. TURN's forecast of new Residential and Non-Residential meters is reasonable.

213. SCE's forecast of new Agricultural meters is reasonable.

214. It is reasonable to adjust SCE's forecasts of retail sales and number of customers based on the adopted forecast of new meters.

Other Operating Revenues

215. SCE's total OOR forecast of $126.426 for 2018 is reasonable.

Cost Escalation

216. SCE's uncontested cost escalation method is reasonable.

Post Test Year Ratemaking

217. An appropriate PTYR mechanism is simple; accurately aligns with how costs are incurred for the utility; and gives the utility an incentive to manage costs while enhancing productivity.

218. Global Insight escalation rates are a reasonable forecast of the inflationary increases for O&M labor costs.

219. SCE's PTYR escalation rates for other O&M expenses are reasonable.

220. Escalating capital additions by 2.49% per year is reasonable.

221. The following escalation rates are reasonable:

Category	2019	2020
O&M: Labor Escalation Rates[807]	2.89%	2.94%
O&M: Benefits Escalation Rates		
Medical Programs	7.00%	7.00%
Dental Programs	4.20%	4.20%
Vision Service Plan	3.00%	3.00%
Disability Programs (=updated labor escalation rates)	2.89%	2.94%
Group Life Insurance	0.00%	0.00%
Misc. Benefit Programs[808]	2.20%	2.27%
Executive Benefits	0.00%	0.00%
401 (k) (=updated labor escalation rates)	2.89%	2.94%
Capital Additions (applied to 2018 capital additions, based on the 2018 authorized capital expenditures authorized in this decision)	2.49%	2.49%

222. SCE's Z-factor mechanism is reasonable.

223. SCE's proposal to implement PTYR updates by advice letter is reasonable.

[807] SCE-59 at 11, table III-4.

[808] SCE-59 at 12, table III-5.

224. The adopted PTYR mechanism strikes an appropriate balance between the goals described above as well as the parties' different positions.

Rate Base Components

The Tax Cuts and Jobs Act

225. On December 22, 2017, Public Law 115-97, the Tax Cuts and Jobs Act (TCJA), was signed into law.

226. SCE served testimony addressing the impact of the TCJA on February 16, 2018 and an evidentiary hearing was held on March 19, 2018.

Revenue Requirement

227. With its updated testimony, SCE requests a 2018 GRC revenue decrease of $22 million, 0.38% less than the 2017 authorized GRC revenue requirement; SCE requests that the Commission adopt a 2018 revenue requirement of $5.534 billion.

228. Attrition years 2019 and 2020 would follow with increases to the Authorized Base Revenue Requirement (ABRR) of $431 million and $503 million, respectively.

229. The deferred taxes reflected on SCE's regulatory books of account are based on the differences between SCE's regulatory tax liability, including Cost of Removal, and its actual tax liability, as calculated on its actual depreciable basis and consistent with IRC section 168(i)(9)(A)(i). This is consistent with Treasury Regulation § 1.167(l)-1(h)(1)(iii).

230. Prior to the TCJA, SCE included Cost of Removal when it calculated its ADIT. SCE, by including Cost of Removal in the calculation of ADIT, normalized the Cost of Removal and ensured all ratepayers over the life of the asset shared in that expense. Excluding Cost of Removal from the ARAM calculation increases the tax expense for current customers in excess of the

benefit received from the asset. The effect is the Cost of Removal is not normalized, despite it being a cost which should be shared equally by all ratepayers.

231. SCE has consistently normalized the benefits of accelerated depreciation derived from its depreciable basis. Likewise, it is our intention SCE continues to normalize the benefits of the TCJA.

232. Some other assets are not subject to normalization rules. These assets are typically referred to as "unprotected" assets. SCE identifies the unprotected assets as: Accrued Vacation, ITCC, Mixed Service Costs, AFUDC, Other Historical Basis Differences, and Cost of Removal. In past GRCs normalization rules have been applied to them, even though not required, again to ensure that ratepayers over the life of the asset are treated equally.

233. Returning excess funds to current ratepayers does not impose a greater burden on future ratepayers. Rather, repayment now returns the excess funds to ratepayers who are the closest in time to the recent ratepayers who contributed those funds to these accounts. Therefore, it is reasonable to require the net excess deferrals relating to the unprotected assets consisting of: Accrued Vacation, ITCC, Mixed Service Costs, AFUDC, and Other Historical Basis Differences, to be returned to ratepayers. Consistent with the return of other funds due to implementation of the TCJA, it is reasonable to require these funds be returned on an amortized basis over 2018-2020.

234. We find reasonable TURN's calculation of SCE's operational cash requirement by applying the new tax rate only to the 2018 year-end balance reducing the workers' compensation estimate to $12.144 million.

235. We find reasonable TURN's use of the 21% tax rate for both beginning- and end-of-2018, reducing the unfunded pension estimate to $16.413 million.

236. SCE agrees with ORA and TURN that it should have a broadened Tax Memorandum account.

237. We agree the benefits of the TCJA should flow to the ratepayers.

238. Ratepayers should begin receiving the benefit of the TCJA now and continuing through the remainder of this GRC cycle, 2018-2020.

Customer Advances

239. Customer Advances represent funds provided by others, such as developers, to construct new distribution facilities to be served by the utility.

240. No party challenges the CIAC forecast, and we agree it is reasonable.

Customer Advances – Electric Construction

241. We find reasonable ORA's forecast of $84.7 million for 2018 Customer Advances for Electric Construction.

Customer Advances – Temporary Services

242. We find reasonable ORA's forecast for 2018 of $6.122 million.

Materials and Supplies

Generation M&S

243. SCE's forecast of Generation M&S is reasonable.

T&D M&S

244. SCE's forecast of T&D M&S is reasonable and is adopted.

Working Cash

245. We find reasonable elimination of the Cash Bank Balances of $6.9 million from the Working Capital forecast. The other Operational Cash Requirements are not contested.

Lead Lag Study

246. SCE's Lead-Lag Study seeks to quantify the amount of funds needed from investors to cover the timing difference between receipt of revenues and payment of expenses. SCE's analysis for this GRC shows, on average, SCE pays expenses 12.7 days before receiving corresponding revenues. Based on estimated daily expenses of $28.9 million, SCE estimates its Lead-Lag Working Cash requirement is $367 million.

Revenue Lag Days

247. We find reasonable a Revenue Lag Day estimate of 45.01 days, accepting SCE's proposal, as adjusted by TURN.

Income Tax Lag

248. ORA's proposal of 96.98 days Federal Income Tax lag and of 117.20 days California Income Tax Lag is consistent with prior decisions and results in Income Tax Lag Day calculations which are representative and is reasonable.

Fuel and Purchased Power Expense Lag

249. We find TURN's proposal to use the more recent Fall forecasts reasonable, as is SCE's proposal to consistently use forecasts from the same period resulting in proposals of 36.4 lag days for purchased power, $206.3 million for fuel, $4,574.2 million for purchased power, and working cash requirements of $7.2 million for fuel, and $107.8 million for purchased power as adjusted for use of the United States Postal Service for 31% of payments.

Other O&M Expense Lag (ISO Charges)

250. ORA has agreed the ISO charges are correctly calculated at 12.1 expense lag days for Other O&M Expense Lag.

Depreciation & Deferred Income Tax Lag

251. SCE's Expense Lag Day calculation is included in the lead lag study to compensate investors for the timing difference between the receipt of revenues and the accrual of depreciation expense and deferred income taxes. We agree, consistent with long-standing practice, it is appropriate to continue to compensate for this lag.

Customer Deposits

252. SCE is required to offset rate base by the amount of its customer deposits as an adjustment for working cash. In every GRC since 2003, SCE has urged the Commission revisit this decision and recognize customer deposits as debt which is not offset against rate base. In each decision for each GRC the Commission has reached the same conclusion.

253. Beginning with its 2012 GRC, the Commission granted SCE permission to use a portion (up to 10%) of its customer deposits to promote the Company's use of minority and community banks. No Party opposes this proposal, and we again adopt it.

254. It is reasonable for $231.9 million, less 10% devoted to the community bank program, to be used as a rate base offset. An offsetting interest expense based on the three-month commercial paper interest rate is also reasonable.

AFUDC

255. SCE's proposed AFUDC rates through the post-test year period have not been opposed by any party SCE's proposed AFUDC rates are reasonable.

Rate Base Components – Additional Issues

Long-Term Incentives

256. It is reasonable to adopt the proposed disallowance of Long-Term Incentives. The authorized rate base is correspondingly increased by $4.3 million.

Other Accounts Receivable

257. TURN's recommendation for $50.8 million for 2018 Accounts Receivable, based on 2016 recorded data, is reasonable.

Depreciation

258. Straight line depreciation following Standard Practice U-4 remains the proscribed means for determining depreciation rates.

259. Both SCE's per unit analysis and TURN's depreciation proposal are substantial deviations from Standard Practice U-4.

260. We find neither SCE nor TURN established by a preponderance of the evidence the validity of their proposed net salvage ratios.

261. We find that due to the costs of removal, net salvage is nearly always negative.

262. We find it reasonable to maintain in most instances the net salvage ratios which were previously adopted by D.15 11 021.

263. The reasonable net salvage ratios are set forth in the following table:

Account (all values are negative)	2015 GRC	SCE	TURN	Adopted
Transmission Plant				
352 - Structures and Improvements	35%	35%	35%	35%
353 - Station Equipment	15%	10%	10%	10%
354 - Towers and Fixtures	60%	75%	35%	60%
355 - Poles and Fixtures	72%	90%	100%	72%
356 - Overhead Conductors & Devices	80%	100%	60%	80%
357 - Underground Conduit	0%	0%	5%	0%
358 - Underground Conductors & Devices	15%	19%	15%	15%
359 - Roads and Trails	0%	0%	5%	0%
Distribution Plant				
361 - Structures and Improvements	25%	30%	30%	25%
362 - Station Equipment	25%	31%	30%	25%
364 - Poles, Towers and Fixtures	210%	263%	210%	210%
365 - Overhead Conductors & Devices	115%	144%	100%	115%
366 - Underground Conduit	30%	38%	50%	30%
367 - Underground Conductors & Devices	60%	75%	75%	60%
368 - Line Transformers	20%	25%	35%	20%
369 - Services	100%	125%	70%	100%
370 - Meters	5%	0%	0%	0%
373 - Street Lighting & Signal Systems	30%	38%	100%	30%

264. Service lives, as shown by the following summary of accounts table, are reasonable:

Account		2015 GRC	SCE	TURN	Adopted
TRANSMISSION PLANT					
350.2	Easements	60	60		60
352	Structures and Improvements	55 S 3.0	55 L 1.0		55 L 1.0
353	Station equipment	45 R 0.5	40 L 0.5		45 R 0.5
354	Towers & Fixtures	65 R 5	65 R 5		65 R 5
355	Poles & Fixtures	50 R 0.5	65 SC		65 SC
356	Overhead Conductors & Devices	61 R 3	61 R 3		61 R 3
357	Underground Conduit	55 R 3.0	55 R 3.0		55 R 3.0
358	Underground Conductors & Devices	40 R 2.5	45 S 1.0		45 S 1.0
359	Roads and Trails	60 SQ	60 R 5.0		60 R 5.0
DISTRIBUTION PLANT					
360.2	Easements	60	60		60
361	Structures and Improvements	42 R 2.5	50 L 0.5		50 L 0.5
362	Station Equipment	45 R 1.5	65 L 0.5		65 L 0.5
364	Poles, Towers & Fixtures	47 L 0.5	55 R 1.0		55 R 1.0
365	Overhead Conductors & Devices	45 R 0.5	55 R 0.5		55 R 0.5
366	Underground Conduit	59 R 3.0	59 R 3.0		59 R 3.0
367	Underground Conductors & Devices	45 R 0.5	43 R 1.5		43 R 1.5
368	Line Transformers	33 R 1	33 S 1.5		33 S 1.5
369	Services	45 R 1.5	45 R 1.5	55 R 1.5	55 R 1.5
370	Meters	20 R 3.0	20 R 3.0		20 R 3.0
373	Street Lighting & Signal Systems	40 L 0.5	48 L 1.0		48 L 1.0
GENERAL BUILDING					
390	Structures and Improvements	38 R 3.0	45 R 0.5		45 R 0.5

265. We find the vast majority of hydroelectric facility licenses will be renewed and find reasonable a depreciation rate of 2.13% for hydroelectric facilities.

266. We find SCE's contention that the service life for solar PV assets should more nearly match the roof life and lease life is reasonable and therefore a 20-year average service life for solar PV assets is reasonable.

267. We find reasonable the decommissioning generation plant annual accrual proposed by TURN for Mountainview 3 & 4 of $0.3 million, Solar PV of $3.2 million, and Peakers of $0.2 million.

Rate Base – Additional Issues

Aged Poles

268. SCE has not established it was prudent to replace aged poles which continued to be used and useful.

Advanced Technology Laboratories

269. SCE has not established that other more cost-effective options to Fenwick Labs and the Equipment Demonstration and Evaluation Facility do not exist but We find Fenwick Labs and the Equipment Demonstration and Evaluation Facility are used and useful and authorize 50% of SCE's forecast.

2014-15 Capital Spending Above Authorized

270. SCE's expenditures for T&D Infrastructure Replacement programs: Worst Circuit Rehabilitation, Substation Transformer Bank Replacement, Substation Circuit Breaker Replacement, and "Other" (including Underground Oil Switch Replacement), and a new program: Overhead Conductor have resulted in used and useful assets at a just and reasonable expense of $115 million for 2014 and $114 million for 2015.

Changes in Accounting

271. It is unreasonable to permit SCE a double recovery of capital expenditure of amounts previously authorized and adopted by an O&M forecast.

SPIDACalc Pole Issues

272. We find an adopted disallowance for the SPIDACalc pole replacement issue should be spread over the entire three-year GRC cycle of 2018-2020.

273. We find that no pole will last forever, that it was imprudent to replace poles prematurely, and that premature replacement, when the poles continued to be useful, resulted in a loss of value to ratepayers.

274. It is just and reasonable to base the impact to the SCE revenue requirement on returning the value of these poles to rate base after 20 years.

275. We adopt April 2013 as the commencement date for disallowing these pole expenditure as we find it was not prudent of SCE to use SPIDACalc v5.0 at that time.

Compliance

276. In this GRC, SCE provided Exhibit SCE-10 summarizing its compliance with requirements it has identified in the 2006, 2009, 2012, and 2015 GRC decisions, as well as other relevant proceedings or settlements. We find SCE has complied with the relevant orders of the Commission.

Tax Memorandum Account

277. A tax memorandum account would increase the transparency of SCE's incurred and forecasted income tax expenses to the Commission, so that the Commission can more closely examine revenue impacts caused by SCE's implementation of various tax laws, tax policies, tax accounting changes, or tax procedure changes.

CALSLA Issues

278. CALSLA's testimony in Exhibits CALSLA-01 through CALSLA-12, and SCE's rebuttal testimony in Exhibit SCE-26, demonstrate that that SCE's process for transferring streetlight ownership is structured and managed in an inefficient manner that uses ratepayer funds uneconomically.

Conclusions of Law

1. SCE bears the burden to establish that its requests are just and reasonable.

2. Public Utilities Code §451 provides, in part, "all charges demanded or received by any public utility … shall be just and reasonable."

3. SCE must establish its requests are just and reasonable by the preponderance of the evidence.

4. Public Utilities Code §454.8 requires, in part, "the commission shall consider a method for the recovery of these costs which would be constant in real economic terms over the life of the facilities, so that ratepayers in a given year will not pay for the benefits received in other years."

Safety and Reliability Investment Incentive Mechanism (SRIIM)

5. The Commission should adopt the three enhancements to the capital mechanism of SRIIM proposed by SCE, with the modifications SCE agreed to make in response to CUE.

6. The Commission should adopt the four enhancements to the workforce mechanism of SRIIM proposed by SCE, with the modifications SCE agreed to make in response to CUE.

T&D – System Planning

Distribution Circuit Upgrades

7. SCE's 2017-2018 capital expenditure forecast of $100.485 million for Distribution Circuit Upgrades should be adopted.

New Distribution Circuits

8. SCE's 2017-2018 capital expenditure forecast of $90.137 million for New Distribution Circuits should be adopted.

Substation Expansion Projects

9. SCE's 2017-2018 capital expenditure forecast of $224.101 million for substation expansion projects should be adopted.

Substation Equipment Replacement Program

10. SCE's 2017-2018 capital expenditure forecast of $49.785 million for its Substation Equipment Replacement Program should be adopted.

Subtransmission Lines Plan

11. SCE's 2017-2018 capital expenditure forecast of $205.582 million for its Subtransmission Lines Plan should be adopted.

4 kV Programs

4 kV Cutover Program

12. SCE's requested levels of 2017 and 2018 funding for its 4 kV Cutover Program ($35.955 million in 2017 and $36.663 million in 2018) should be adopted.

4 kV Substation Elimination Program

13. SCE's requested level of funding of its 4 kV Substation Elimination Program in the 2018- 2020 period should be denied.

14. The level of funding recommended by TURN for SCE's 4 kV Substation Elimination Program for the 2018 test year, which we calculate to be $4.897 million, should be approved.

Grid Reliability Projects

15. Spending for the Cerritos Channel Transmission Tower Replacement Project should be disallowed as follows: all spending prior to 2016 and the $57.904 million forecasted amount (CPUC jurisdictional) requested by SCE for the 2016-2020 period. For Test Year 2018, the disallowed amount should be $34.048 million (CPUC jurisdictional).

T&D – Distribution Maintenance and Inspection

16. SCE's undisputed forecast O&M expenses of $159.968 million for T&D Distribution Maintenance and Inspection should be adopted.

17. SCE's undisputed forecast capital expenditures of $273.955 million for T&D Distribution Maintenance and Inspection should be adopted.

T&D – Distribution Construction and Maintenance

18. For Test Year 2018, and $70.491 million for O&M expenses.

19. SCE's undisputed forecast capital expenditures of $203.700 million for T&D Distribution Construction & Maintenance should be adopted.

20. SCE's Test Year 2018 forecast for FERC sub account 585.170, equal to $6.936 million, should be adopted.

21. SCE's shareholders should continue to be responsible for funding SCE's service guarantees.

22. The funding level for Distribution Storm O&M (FERC sub account 598.170) recommended by ORA, $7.814 million, should be adopted.

T&D – Substation Construction & Maintenance

23. SCE's undisputed O&M forecast of $78.15 million for Substation Construction and Maintenance should be adopted.

24. SCE's 2018 capital expenditure forecast of $176.329 million for Substation Construction and Maintenance should be adopted.

T&D – Transmission Construction & Maintenance

25. SCE's O&M forecast of $40.918 million for Transmission Construction and Maintenance should be adopted.

Transmission Tools and Work Equipment

26. SCE's 2018 capital expenditure forecast for Transmission Construction & Maintenance of $216.793 million should be adopted.

T&D – Infrastructure Replacement

Worst Circuit Rehabilitation Program

27. SCE's forecast capital expenditures for its Worst Circuit Rehabilitation Program, a total of $249.313 million for 2017-2018, should be adopted.

28. TURN's policy recommendations should be adopted, as modified below:

(1) the Commission should direct SCE to begin recording cable failures by cable type;

(2) the Commission should direct SCE to change the minimum age used to select mainline cable replacements; and

(3) If a cost benefit analysis determines that a pilot is necessary, SCE should be directed to begin piloting cable injections (instead of replacements) on mainline cable, and report on quantitative and qualitative findings from the pilot in the next GRC.

Cable Life Extension Program

29. SCE's capital expenditure forecast for its Cable Life Extension Program should be adopted.

Cable-In-Conduit Replacement Program

30. SCE's capital expenditure forecast for its Cable-In-Conduit Replacement Program should be adopted.

Overhead Conductor Program

31. SCE spent $97.330 million to support replacement of 202 circuit miles in 2016, so it is reasonable for the Commission to expect that SCE will continue replacements at that level in 2017 and 2018, with the same level of funding, if not a higher level in the event that SCE continues to find ways to improve processes and lower costs.

32. SCE has not met its burden to prove that its requested levels of Overhead Conductor Program funding are reasonable.

33. The Commission should authorize the same level of annual expenditures for SCE's Overhead Conductor Program in 2017 and 2018 that SCE recorded in 2016: $97.330 million (subject to the adjustment we order below).

34. The Commission should adopt TURN's recommendation that we impose a 10% disallowance of Overhead Conductor Program costs, to be paid for by shareholders, to recognize the role that the incorrect engineering had in creating circumstances where some wires may have more extensive damage than they would have otherwise.

35. For Overhead Conductor Program recorded costs in 2015 and 2016 totaling $155.456 million, the Commission should disallow $15.54 million.

36. For the annual Overhead Conductor Program capital expenditures approved in this decision for 2017 and the remainder of this GRC period (2018-2020), SCE should record 10% of its recorded costs in a below the line account. On a forecast basis, this amount would equal $9.733 million annually.

Underground Oil Switch Replacement Program

37. SCE's capital expenditure forecast for its Underground Oil Switch Replacement Program should be adopted.

Capacitor Bank Replacement Program

38. The Commission should adopt SCE's reduced forecast for its Capacitor Bank Replacement Program, based on SCE's agreement to accept TURN's proposal to use 2014 unit costs. The reduced forecast is $27.692 million.

Automatic Recloser Program

39. SCE's 2017-2018 capital expenditure forecast for its Automatic Recloser Program should be adopted.

PCB Transformer Replacement Program

40. SCE's 2017-2018 capital expenditure forecast for its PCB Transformer Replacement Program should be adopted.

Substation Infrastructure Replacement Program

41. SCE's 2017-2018 capital expenditure forecast for the three functions within its Substation Infrastructure Replacement Program should be adopted, as follows:

a. Transformer Replacement: $134.352 million
b. Circuit Breaker Replacement: $88.818 million
c. Substation Switchrack Rebuild: $37.187 million

T&D – Poles

O&M Expenses

42. The following SCE forecasts for Pole-related O&M expenses are uncontested and should be adopted:

a. Transmission and Distribution Pole Loading Program Related Expenses;
b. Transmission and Distribution Deteriorated Pole Inspections; and
c. Joint Pole Organization expenses.

43. The following TURN recommendations for Pole-related O&M expenses should be adopted:

a. Distribution and Transmission Pole Loading Assessments; and
b. Distribution and Transmission Pole Loading Program Repairs.

Capital Expenditures

44. For Pole-related capital expenditures, SCE should be authorized to spend the amounts recommended by TURN and summarized in the table in Section 4.9.2 of this decision.

Pole Loading and Deteriorated Pole Programs Balancing Account

45. No changes in the structure of the PLDPBA are warranted at this time.

T&D – Grid Modernization

Grid Modernization Capital Expenditures

Distribution Automation Programs

46. SCE should be authorized $64.675 million per year for the Worst Circuit Rehabilitation (WCR) portion of distribution automation. TURN's testimony shows that this amount should enable funding for: (1) five Remote Fault Indicators (RFIs) on the 600 WCR circuits; (2) one tie switch and (3) up to two remote controlled switches (RCSs) on the 110 WCR circuits that have no existing ties.

47. SCE should be authorized $11.178 million per year for the DER portion of distribution automation.

Communications

48. SCE's request for $314 million in capital expenditures for its Substation Automation (SA 3) program over the 2018-2020 period should be denied.

49. The Common Substation Platform (CSP) will deliver cybersecurity and interoperability benefits

50. SCE's proposed Common Substation Platform (CSP) and SCE's associated request for $46 million in capital expenditures over the 2018-2020 period should be approved.

51. SCE's proposed Field Area Network (FAN) and SCE's associated request for $199 million in capital expenditures over the 2018-2020 period should be approved.

52. SCE's showing did not demonstrate why expenditures for a Wide Area Network (WAN) are necessary during this GRC period.

53. SCE's request for $314 million in capital expenditures for its proposed Wide Area Network (WAN) over the 2018-2020 period should be denied.

Tools for Data Analysis and Decision Making

54. SCE's request for $2.467 million for Test Year 2018 capital expenditures for its System Modeling Tool (SMT) should be approved.

55. SCE's request for $3.641 million for Test Year 2018 capital expenditures for its DRP External Portal should be approved.

56. SCE's request for $39.456 million for Test Year 2018 capital expenditures for the GMS should be approved.

T&D – Grid Technology

Distribution Volt VAR Control

57. SCE's forecast capital expenditures for its proposed Distribution Volt VAR Control (DVVC) program for Test Year 2018, $4.414 million, should be adopted.

Energy Storage Pilots

58. SCE's forecast capital expenditures for Distributed Energy Storage Integration (DESI) pilots in 2018, $22.499 million, should be adopted.

T&D – Safety Training & Environmental Programs

Environmental Program – Transmission (FERC Account 565.281)

59. SCE's O&M forecast for Transmission Environmental Programs (FERC Account 565.281) should be adopted.

Hazardous Waste Management & Disposal – Distribution (FERC Account 598.250)

60. SCE's O&M forecast for Distribution Hazardous Waste Management & Disposal (FERC Account 598.250) should be adopted.

T&D – Other Costs, Other Operating Revenues

T&D –Other Operating Revenues

61. SCE's undisputed forecast of $126.426 million in 2018 for tariffed OOR for T&D activities should be adopted.

T&D – Other Costs

62. Based on the Commission's findings for specific line items in SCE's forecast for Other Costs in 2018, each of SCE's forecast values (other than Underground Locating Services) should be adopted.

63. The test year forecast for underground locating services (FERC Account 588.281), $8.227 million, that has been mutually agreed upon by SCE and TURN should be adopted.

64. SCE should establish a memorandum account for tracking the costs and benefits of Customer Service Re-Platform.

Customer Service – O&M

Meter Reading Operations – FERC Account 902

65. For the Meter Reading Operations account, the Commission should adopt the reduced proposal of $9.909 million removing the projected increase due to growth.

Test, Inspect, and Repair Meters – FERC Account 586.400

66. For the Test, Inspect and Repair Meter's Account, the Commission should adopt the reduced proposal of $15.438 million.

Turn-On and Turn-Off Services – FERC Account 586.100

67. For the Turn-On and Turn-Off Services Account, the Commission should adopt the forecast of $5.164 million.

Customer Installation and Energy Theft Expense – FERC Account 587

68. For the Customer Installation and Energy Theft Expense Account, the Commission should adopt $6.506 million for this account.

Meter Services Operations and Management – FERC Account 580

69. For the Meter Services Operations and Management Account, the Commission should adopt $5.671 million.

Billing Services – FERC Account 903.500

70. For Billing Services, the Commission should adopt $23.645 million.

Credit and Payment Services – FERC Account 903.200

71. For Credit and Payment Services, the Commission should adopt $15.477 million for this account.

Postage – FERC Account 903.100

72. For Postage, the Commission should adopt TURN's proposed adjusted forecast of $14.371 million.

Uncollectable Expenses – FERC Account 904

73. For Uncollectable Expenses, the Commission should adopt a forecast of 0.211%.

Customer Contact Center– FERC Account 903.800

74. We should adopt $43.779 million for the Customer Contact Center account.

Business Customer Division– FERC account 908.600

75. We should adopt a forecast of $18.790 million for the Business Customer Division Account.

Customer Programs and Services– FERC account 905.900

76. We should adopt the forecast of $24.656 million for Customer Programs and Services.

Operating Unit Management and Support–FERC Accounts 901 and 907.600

77. We should adopt for FERC Accounts 901 and 907.600 a forecast of $6.887 million.

Customer Service – Capital

78. We should adopt $24.251 million for 2017 and $34.956 million for 2018.

Customer Service – Other Operating Revenue

79. SCE estimates OOR to be $27.981 million in Test Year 2018. The forecast should be adopted.

Information Technology – O&M and Hardware

Hardware/Software Licenses & Maintenance

80. We should adopt the forecast of $70.73 million for this account.

Business Integration & Delivery

81. A 2018 forecast for BID of $37.196 million should be adopted.

Grid Services

82. The O&M associated with Grid Modernization capital projects in the amount of $5.046 should be adopted.

83. The forecast for Grid Services for 2018 of $34.5 million should be adopted.

Information Technology – Capitalized Software

84. Except as noted, we should adopt the 2016 recorded capital expenditures for capitalized software in Information Technology.

Contingency Amounts in Capitalized Software Forecasts

85. We should not adopt forecasts for software contingencies.

Cybersecurity and Compliance

86. We should adopt, exclusive of contingencies, $22.590 million for 2016, $52.003 million for 2017, and $47.457 million for 2018 for Cybersecurity and Compliance software.

Grid Modernization Cybersecurity

87. We should adopt the 2016 recorded expense of $2.901 million and adopt 40 percent of the forecasted expenses (less contingencies) for 2017 and 2018, $5.34 million and $8.063 million, respectively.

Other Capitalized Software

Vegetation Management Project

88. We should adopt the recorded expense for 2016 of $916,000 and the forecast (less contingency) for 2017 of $4.75 million for the Vegetation Management Project.

Comprehensive Situational Awareness for Transmission

89. We should adopt the 2016 recorded expense of $0, $0.476 million for 2017, $0.951 million for 2018, $3.236 million for 2019, and $3.236 million for 2020.

Grid Planning & Analytics Software

90. We should adopt the recorded expense for 2016 for the GIPT, GAA, LTPT, and GCM projects of $9.371 million, and 50% of SCE's request (the forecast less contingencies), $12.796 million for 2017 and $7.332 million for 2018.

Enterprise Content Management Project

91. The requests for ECM (the forecast less contingencies) of $2.833 million for 2017 and $4.333 million for 2018 should be adopted.

Operating System Software

92. We should adopt the forecast capital expenditure for the Operating System Software account for 2016 of $8.75 million, and the forecast, less contingencies, of $13.113 million for 2017, and $19.80 million for 2018.

Information Technology - Customer Service Re-Platform

93. SCE should establish a memorandum account to track CS Re-Platform costs, benefits, and capital expenditures for review in the next GRC.

94. We should adopt the 2016 recorded capital expenditures for Managed Services Providers.

Generation

Generation – Nuclear Generation (Palo Verde)

95. No party disputed SCE's O&M expenses or capital expenditures for Nuclear Generation (Palo Verde) and they should be adopted.

Generation – Energy Procurement

96. No party disputed SCE's O&M expenses or capital expenditures for Energy Procurement and they should be adopted.

Generation – Hydro Generation

97. No party disputed SCE's O&M expenses or capital expenditures for hydro generation and they should be adopted.

Generation – Catalina

Catalina – O&M

98. We should adopt SCE's 2018 forecast for Catalina O&M of $4.374 million.

Catalina – Pebbly Beach Generating Station Automation

99. The costs for the PBGS Automation Project have not been established to be just and reasonable and therefore, we should not allow them.

Catalina – Other Capital Projects Under $3 million

100. We should adopt the 2016 actual recorded expense of $.007 million and the forecast of $0.448 million for each of the years 2017 and 2018.

Generation – Other

Mountainview

101. No party disputed SCE's O&M expenses or capital expenditures for Mountainview Generation and they should be adopted.

Peakers

102. No party disputed SCE's O&M expenses or capital expenditures for Peakers and they should be adopted.

Mohave Closure

103. No party disputed SCE's O&M expenses or capital expenditures for generation costs associated with Mohave closure and they should be adopted.

Solar Photovoltaic

104. SCE should be allowed to recover its Solar Photovoltaic O&M expenses of $8.286 million for 2013 and $4.270 million for 2014.

105. We should adopt SCE's 2018 Solar Photovoltaic O&M forecast of $2.842 million and its 2016 recorded capital expenditure of $0.004 million and its forecasts of $0.2 million each for 2017 and 2018.

Fuel Cells

106. We should adopt SCE's forecast for O&M for its fuel cell program of $0.379 million.

Human Resources

107. Pursuant to Public Utilities Code § 706, only the Test Year 2018 officer compensation amounts adopted in this decision should be collected from SCE's ratepayers.

108. The 2019 and 2020 officer compensation amounts should not be collected from SCE's ratepayers.

109. SCE should refund to customers any amounts tracked in the OCMA, as part of SCE's revenue requirement and rate change advice letter implementing this decision.

Human Resources Department and Executive Officers

Human Resources Operating Unit

110. SCE's Test Year 2018 forecast of $43.792 million for HR Department O&M expenses should be adopted.

Executive Officers

111. It is reasonable for ratepayers to fund 40% of SCE's Executive Incentive Compensation (EIC) Plan request.

112. Ratepayers should fund $9.926 million in Executive Incentive Compensation for Test Year 2018.

Benefits and Other Compensation

Short Term Incentive Program

113. In order to accurately remove the costs of incentives tied to "core earnings" and utility financial performance from the STIP, 40% of the total forecast value should be removed from SCE's 2018 STIP expenses.

Long Term Incentives

114. Our approach should to LTI should remain unchanged, and we should deny SCE recovery of its Test Year 2018 forecast LTI program expenses.

Recognition Programs

115. SCE's request for $1.456 million in Test Year 2018 Recognition Program expenses should be adopted.

Pension Costs

116. SCE's updated request for approval of annual pension cost forecasts equal to $57.741 million for 2018, 2019 and 2020 should be adopted.

Medical Programs

117. SCE's forecast medical program costs, based on SCE's escalation rate, should be adopted.

118. The Commission should reconsider this approach in future GRCs if presented with evidence that SCE's forecast methodology resulted in a significant over- or under-collected balance in the Medical Programs Balancing Account.

Executive Benefits Program

119. The precedent established in SCE's 2009, 2012 and 2015 GRCs allows 50% rate recovery of SCE's Test Year 2018 forecast for Executive Benefits

120. SCE should be authorized to recover $10.135 million for Test Year 2018 Executive Benefits, which is 50% of its forecasted expenses.

Operational Services

Business Resiliency

121. SCE's forecast for Business Resiliency O&M expenses should be adopted.

122. SCE's unopposed request for Test Year 2018 capital expenditures related to Business Resiliency should be adopted.

Corporate Environmental Services

123. The updated value for 2016 CES capital expenditures recommended by ORA and accepted by SCE should be adopted.

124. SCE's otherwise unopposed CES capital expenditure forecast for 2016-2018 should be adopted.

125. SDG&E's proposed calculation of its 20% share and overhead costs for marine mitigation with escalation, which is $991,000, $1.015 million, and $1.038 million (all nominal dollars) in 2018, 2019, and 2020, respectively, should be approved.

Corporate Real Estate

CRE O&M

126. SCE's unopposed request for Test Year 2018 O&M expenses related to Corporate Real Estate should be adopted.

CRE Capital

127. Although the Commission has at times found an approach such as ORA's proposed across the board reductions to SCE's CRE request to be appropriate (e.g., when a request has no explainable relationship to well established and

stable recorded costs), in this instance we have an extensive record to support our decisions on a project-specific basis.

Service Center Modernization Program

128. SCE's explanations for its failure to initiate and/or complete its supposedly urgent service center modernization projects that previously received funding are unsupported by record evidence and are therefore unconvincing.

129. Because SCE did not explain its management of the service center modernization funds that we authorized in our prior decisions, SCE should complete the list of prioritized projects in its testimony, but should be denied recovery of these project costs from ratepayers.

130. SCE should record the costs of completing the following service center modernization projects in a below-the-line account: Bishop, Kernville, Redlands, Ridgecrest, San Joaquin, and Santa Ana.

Bishop Service Center

131. SCE should proceed with the Bishop Service Center modernization project as described in its testimony, and at the funding levels shown in Section 9.2.3.1.2 of this decision.

132. SCE should record all the costs of the Bishop Service Center modernization project, from the date of inception through completion, in a below-the-line account.

Kernville Service Center

133. SCE should proceed with the Kernville Service Center modernization project as described in its testimony, and at the funding levels shown in Section 9.2.3.1.3 of this decision.

134. SCE should record all the costs of the Kernville Service Center modernization project, from the date of inception through completion, in a below-the-line account.

Redlands Service Center

135. SCE should proceed with the Redlands Service Center modernization project as described in its testimony, and at the funding levels shown in Section 9.2.3.1.4 of this decision.

136. SCE should record all the costs of the Redlands Service Center modernization project, from the date of inception through completion, in a below-the-line account.

Ridgecrest Service Center

137. SCE should proceed with the Ridgecrest Service Center modernization project as described in its testimony, and at the funding levels shown in Section 9.2.3.1.5 of this decision.

138. SCE should record all the costs of the Ridgecrest Service Center modernization project, from the date of inception through completion, in a below-the-line account.

San Joaquin Service Center

139. SCE should proceed with the San Joaquin Service Center modernization project as described in its testimony, and at the funding levels shown in Section 9.2.3.1.6 of this decision.

140. SCE should record all the costs of the San Joaquin Service Center modernization project, from the date of inception through completion, in a below-the-line account.

Santa Ana Service Center

141. SCE should proceed with the Santa Ana Service Center modernization project as described in its testimony, and at the funding levels shown in Section 9.2.3.1.7 of this decision.

142. SCE should record all the costs of the Santa Ana Service Center project, from the date of inception through completion, in a below-the-line account.

Santa Barbara Service Center

143. SCE's forecasted capital expenditures for relocation of its Santa Barbara Service Center should be adopted.

144. The progress and completion of the relocation of SCE's Santa Barbara Service Center should be reviewed in each of SCE's future GRCs until its completion in order to determine whether SCE has diverted any funds approved in this decision to other uses. In the event that SCE diverts any funds, the question of whether the financial responsibility for this project should be placed on SCE's shareholders should be reviewed.

Barstow Service Center

145. SCE's forecasted capital expenditures for modernization of the Barstow Service Center should be adopted.

Blythe Service Center

146. SCE's forecasted capital expenditures for modernization of the Blythe Service Center should be adopted.

Shaver Lake Service Center

147. SCE's forecasted capital expenditures for modernization of the Shaver Lake Service Center should be adopted.

Operational Support Program

Infrastructure Upgrade Projects

148. SCE's forecast capital expenditures for nine infrastructure upgrade projects should be adopted.

Substation Maintenance and Test Buildings (Substation Reliability Upgrades)

149. SCE's forecast capital expenditures for Substation Maintenance and Test Buildings and Substation Reliability Upgrades should be adopted.

Facility Repurpose Projects

150. SCE's request to proceed with the "Storage of Critical Electrical Equipment Spares Project" should be denied, but SCE should be authorized to recover the 2018 and 2019 forecast IT infrastructure and equipment expenditures associated with its request.

Projects Less Than $3 Million

151. SCE's forecast capital expenditures for Projects Less Than $3 Million should be adopted.

Blanket Capital Program

Non Electric Capital Maintenance

152. TURN's recommended funding levels for Non Electric Capital Maintenance, $14.49 million for 2017 and $15.215 million for 2018, should be adopted.

Substation Capital Maintenance

153. The Commission should adopt TURN's recommendation to use recorded 2016 expenditures ($10.766 million) as the basis for the 2017 and 2018 forecasts of Substation Capital Maintenance, without escalation for 2017 or 2018, or imposing a reduction from the 2016 level.

Energy Efficiency

154. SCE's forecast capital expenditures for Energy Efficiency Projects should be adopted.

Ergonomic Equipment

155. SCE's forecast capital expenditures for Ergonomic Equipment should be adopted.

Ongoing Furniture Modifications

156. SCE's forecast capital expenditures for Ongoing Furniture Modifications should be adopted.

Various Major Structures

157. The Commission should not authorize SCE's unsupported forecast for its Various Major Structures (VMS) Program because SCE's position that its managers may redirect Commission-approved funding to entirely unrelated purposes suggests that the VMS budget is essentially a generic contingency fund.

158. Funding for SCE's Various Major Structures (VMS) Program should be authorized at the level equal to the average of SCE's recorded spending from 2011-2016, $7.894 million, and should not be escalated to a higher level during the 2018-2020 GRC period.

Corporate Health and Safety

159. SCE's 2018 O&M forecast of $5.470 million for Account 925 expenses associated with SCE's Corporate Health & Safety organization should be adopted.

Corporate Security

160. SCE's forecast of Corporate Security O&M expenses for Test Year 2018 should be adopted.

161. SCE's capital expenditure forecast for Corporate Security, adjusted to include final 2016 recorded capital expenditures, should be adopted.

Supply Management

162. SCE's forecast of Supply Management O&M expenses for Test Year 2018 should be adopted.

163. SCE's capital expenditure forecast for Supply Management, adjusted to include final 2016 recorded capital expenditures, should be adopted.

Supplier Diversity

164. SCE's forecast of Supplier Diversity O&M expenses for Test Year 2018 should be adopted.

165. Pursuant to Section 8 of the Commission's General Order 156, each utility (rather than the Commission or another party) shall determine its short- , mid- , and long-term goals for the use of Diverse Business Enterprise, so the Commission should not direct SCE to set additional aspirational goals as NDC recommends.

Transportation Services

Operating Costs

Fuel Operating Costs

166. SCE's forecast amount for outside fuel pumping service costs is reasonable. The total value jointly calculated by SCE and TURN for Test Year 2018 fuel operating costs, $15.654 million, should be adopted.

Capital

167. SCE's capital expenditure forecast for Transportation Services, adjusted to include final 2016 recorded capital expenditures, should be adopted.

Administrative & General

Ethics and Compliance

168. We should adopt SCE's forecast of Administrative and General (A&G) expenses for Ethics and Compliance for 2018 of $9.863 million.

Regulatory Affairs

Regulatory Affairs Labor: FERC Account 920/921

169. We should adopt SCE's forecast of $15.214 million of Test Year 2018 expenses for its Regulatory Affairs Department in FERC Accounts 920/921.

Regulatory Affairs – Integrated Planning Power Procurement: FERC Account 557

170. We should adopt SCE's forecast of $10 million for Test Year 2018 for Integrated Planning Power Procurement, FERC Account 557.

Corporate Communications

Corporate Communications Operations Labor: FERC Account 920/921

171. We should adopt SCE's forecast of $5.071 million of Test Year 2018 expenses for its Corporate Communications Operations Department in FERC Accounts 920/921.

Corporate Communications - Outside Services: FERC Account 923

172. We should adopt SCE's forecast of $1.689 million for FERC Account 923 for: 1) ethnic media services; 2) communications measurement; and 3) communications quality assurance.

Local Public Affairs

Local Public Affairs – FERC Account 920/921

173. We should adopt SCE's forecast of $7.904 million for Test Year 2018 for Local Public Affairs, FERC Account 920/921.

Corporate Membership Dues and Fees – FERC Account 930

174. We should not allow any portion of the Edison Electric Institute dues as recoverable from ratepayers.

175. We should adopt a forecast of $168,701 FERC Account 930 for the ratepayer funded portion of dues and memberships costs.

Financial Services

176. We should adopt SCE's 2018 forecast for the Financial Services Department of $43.3 million for Accounts 920/921 and TURN's recommendation of $13.251 million for Financial Services Accounts 923/930.

Audits

177. We should adopt the SCE forecast of $8.657 million for the Audit Service Department in 2018.

Legal - Removal of Costs Resulting from Alleged Imprudence

178. We should adopt a 10 percent reduction of the forecast for Outside Counsel and reduce the In-House forecast an additional 5 percent for a total of 15 percent.

Law

In-House, FERC Accounts 920/921

179. Following application of the 15 percent reduction discussed above, we should adopt a forecast of $21.587 million for In-House Counsel.

FERC Accounts 923/925/928 Outside Counsel

180. We should adopt a forecast of $12.532 million.

FERC Account 930 Corporate Governance

181. For FERC Account 930, we should exclude equity compensation and adopt a forecast of $3.1 million.

Claims

182. We should adopt SCE's Administrative Expense forecast of $3.025 million associated with the Claims Reserves.

183. We should adopt a forecast of $14.948 million for Claims Reserves.

Workers' Compensation

184. Neither ORA nor TURN challenge the forecasted Workers Compensation administrative expense of $6.783 million and we should adopt it.

185. We should adopt for Workers' Compensation Reserve expense, a forecast of $7.773 million.

Disability Program

186. SCE's forecast of $833,000 for Disability Administration should be adopted.

187. We should adopt a forecast for the Disability Program of $17.766 million.

Property and Liability Insurance

Property Insurance

188. We should adopt as reasonable property insurance expense forecast of $14.070 million for Test 2018.

Liability Insurance

189. We should adopt for total liability insurance expense the forecast of $92.427 million.

Ratemaking Proposals

Modification of the Pole Loading and Deteriorated Pole Programs Balancing Account (PLDPBA)

190. The current account structure of the Pole Loading and Deteriorated Pole Programs Balancing Account should continue for this GRC cycle, with no changes.

ORA's Proposal to Establish a One Way Storms Balancing Account

191. We should deny ORA's proposal to create a one way balancing account for Distribution Storm Expenses (FERC Sub Account 598.170).

ORA's Recommendation to Establish a Grid Modernization Memorandum Account

192. ORA's proposal is moot because this decision addresses the details of SCE's Grid Modernization proposals, specifically authorizing some while

denying others, so there is no need to track SCE's expenditures for possible future recovery.

ORA's Recommendation to Establish a DER Memorandum Account

193. ORA's proposal is moot because we have addressed SCE's funding requests for DER related projects directly, as part of our discussion of distribution automation, where we adopted TURN's recommendation for lower funding levels for DER related distribution. Therefore, there is no need to order SCE to track these authorized expenditures in a memorandum account.

194. SCE's uncontested proposals for memorandum accounts and balancing accounts should be approved.

Jurisdictional Issues

195. SCE's uncontested jurisdictional allocation factors should be approved.

Sales and Customer Forecast

Retail Electricity Sales

196. SCE's forecasts of retail sales and number of customers, as adjusted based on the adopted forecast of new meters, should be approved.

Customer Accounts and New Meter Connections

197. TURN's forecast of new Residential and Non-Residential meters should be approved.

198. SCE's forecast of new Agricultural meters should be approved.

Other Operating Revenues

199. SCE's total OOR forecast of $126.426 million in 2018 should be adopted.

Cost Escalation

200. SCE's uncontested cost escalation method should be adopted.

Post Test Year Ratemaking

201. The following PTYR escalation rates should be adopted:

Category	2019	2020
O&M: Labor Escalation Rates[809]	2.89%	2.94%
O&M: Benefits Escalation Rates		
Medical Programs	7.00%	7.00%
Dental Programs	4.20%	4.20%
Vision Service Plan	3.00%	3.00%
Disability Programs (=updated labor escalation rates)	2.89%	2.94%
Group Life Insurance	0.00%	0.00%
Misc. Benefit Programs[810]	2.20%	2.27%
Executive Benefits	0.00%	0.00%
401 (k) (=updated labor escalation rates)	2.89%	2.94%
Capital Additions (applied to 2018 capital additions, based on the 2018 authorized capital expenditures authorized in this decision)	2.49%	2.49%

202. SCE's Z-factor mechanism should be adopted.

203. SCE's proposal to implement PTYR updates by advice letter should be adopted.

Rate Base Components

The Tax Cuts and Jobs Act

Revenue Requirement

204. SCE should normalize the benefits of the TCJA including deferred taxes reflected on SCE's regulatory books of account based on the differences between SCE's regulatory tax liability, including Cost of Removal, and its actual tax liability, as calculated on its actual depreciable basis and consistent with IRC section 168(i)(9)(A)(i) and Treasury Regulation § 1.167(l)-1(h)(1)(iii).

205. The net excess deferrals relating to the unprotected assets consisting of: Accrued Vacation, ITCC, Mixed Service Costs, AFUDC, and Other Historical

[809] SCE-59 at 11, table III-4.

[810] SCE-59 at 12, table III-5.

Basis Differences, should be returned to ratepayers. Consistent with the return of other funds due to implementation of the TCJA, these funds should be returned on an amortized basis over 2018-2020.

206. We should adopt TURN's calculation of SCE's operational cash requirement by applying the new tax rate only to the 2018 year-end balance reducing the workers' compensation estimate by $12.144 million.

207. We should adopt the use of the 21% tax rate for both beginning- and end-of-2018, reducing the unfunded pension estimate by $16.413 million.

208. SCE should have a broadened Tax Memorandum account.

209. The benefits of the TCJA should flow to the ratepayers.

210. Ratepayers should begin receiving the benefit of the TCJA now and continuing through the remainder of this GRC cycle, 2018-2020.

Customer Advances

211. We should adopt the CIAC forecast.

Customer Advances – Electric Construction

212. We should adopt a forecast of $84.7 million for 2018 Customer Advances for Electric Construction.

Customer Advances – Temporary Services

213. We should adopt a forecast for 2018 of $6.122 million for Customer Advances- Temporary Services.

Materials and Supplies

Generation M&S

214. SCE's forecast of Generation M&S should be adopted.

T&D M&S

215. SCE's forecast for T&D M&S should be adopted.

Working Cash

216. We should adopt elimination of the Cash Bank Balances of $6.9 million from the Working Capital forecast. The other Operational Cash Requirements are not contested and should be adopted.

Lead Lag Study

Revenue Lag Days

217. We should adopt a Revenue Lag Day estimate of 45.01 days, accepting SCE's proposal, as adjusted by TURN.

Income Tax Lag

218. ORA's proposal of 96.98 days Federal Income Tax lag and of 117.20 days California Income Tax Lag should be adopted.

Fuel and Purchased Power Expense Lag

219. We should adopt 36.4 lag days for purchased power, $206.3 million for fuel, $4,574.2 million for purchased power, and working cash requirements of $7.2 million for fuel, and $107.8 million for purchased power as adjusted for use of the United States Postal Service for 31 percent of payments.

Other O&M Expense Lag (ISO Charges)

220. We should adopt ISO charges at 12.1 expense lag days for Other O&M Expense Lag.

Depreciation & Deferred Income Tax Lag

221. It is appropriate to continue to compensate for Expense Lag Days calculation.

Customer Deposits

222. SCE should continue to offset rate base by the amount of its customer deposits as an adjustment for working cash.

223. SCE should have permission to use a portion (up to 10 percent) of its customer deposits to promote the Company's use of minority and community banks.

224. $231.9 million, less 10 percent devoted to the community bank program, should be used as a rate base offset. We should grant an offsetting interest expense based on the three-month commercial paper interest rate expense.

AFUDC

225. The Commission should adopt SCE's proposed AFUDC rates.

Rate Base Components – Additional Issues

Long-Term Incentives

226. We should disallow Long-Term Incentives. The authorized rate base should correspondingly increase by $4.3 million.

Other Accounts Receivable

227. We should adopt TURN's recommendation, based on 2016 recorded data as reasonable and adopt $50.8 million for 2018 Accounts Receivable for this account.

Depreciation

228. Straight line depreciation following Standard Practice U-4 remains the proscribed means for determining depreciation rates.

229. We should maintain in most instances the net salvage ratios which were previously adopted by D.15 11 021.

230. We should adopt the net salvage ratios as set forth by the following table:

Account (all values are negative)	2015 GRC	SCE	TURN	Adopted
Transmission Plant				
352 - Structures and Improvements	35%	35%	35%	35%
353 - Station Equipment	15%	10%	10%	10%
354 - Towers and Fixtures	60%	75%	35%	60%
355 - Poles and Fixtures	72%	90%	100%	72%
356 - Overhead Conductors & Devices	80%	100%	60%	80%
357 - Underground Conduit	0%	0%	5%	0%
358 - Underground Conductors & Devices	15%	19%	15%	15%
359 - Roads and Trails	0%	0%	5%	0%
Distribution Plant				
361 - Structures and Improvements	25%	30%	30%	25%
362 - Station Equipment	25%	31%	30%	25%
364 - Poles, Towers and Fixtures	210%	263%	210%	210%
365 - Overhead Conductors & Devices	115%	144%	100%	115%
366 - Underground Conduit	30%	38%	50%	30%
367 - Underground Conductors & Devices	60%	75%	75%	60%
368 - Line Transformers	20%	25%	35%	20%
369 - Services	100%	125%	70%	100%
370 - Meters	5%	0%	0%	0%
373 - Street Lighting & Signal Systems	30%	38%	100%	30%

231. We should adopt service lives as shown by the following summary of accounts table:

Account		2015 GRC	SCE	TURN	Adopted
TRANSMISSION PLANT					
350.2	Easements	60	60		60
352	Structures and Improvements	55 S 3.0	55 L 1.0		55 L 1.0
353	Station equipment	45 R 0.5	40 L 0.5		45 R 0.5
354	Towers & Fixtures	65 R 5	65 R 5		65 R 5
355	Poles & Fixtures	50 R 0.5	65 SC		65 SC
356	Overhead Conductors & Devices	61 R 3	61 R 3		61 R 3
357	Underground Conduit	55 R 3.0	55 R 3.0		55 R 3.0
358	Underground Conductors & Devices	40 R 2.5	45 S 1.0		45 S 1.0
359	Roads and Trails	60 SQ	60 R 5.0		60 R 5.0
DISTRIBUTION PLANT					
360.2	Easements	60	60		60
361	Structures and Improvements	42 R 2.5	50 L 0.5		50 L 0.5
362	Station Equipment	45 R 1.5	65 L 0.5		65 L 0.5
364	Poles, Towers & Fixtures	47 L 0.5	55 R 1.0		55 R 1.0
365	Overhead Conductors & Devices	45 R 0.5	55 R 0.5		55 R 0.5
366	Underground Conduit	59 R 3.0	59 R 3.0		59 R 3.0
367	Underground Conductors & Devices	45 R 0.5	43 R 1.5		43 R 1.5
368	Line Transformers	33 R 1	33 S 1.5		33 S 1.5
369	Services	45 R 1.5	45 R 1.5	55 R 1.5	55 R 1.5
370	Meters	20 R 3.0	20 R 3.0		20 R 3.0
373	Street Lighting & Signal Systems	40 L 0.5	48 L 1.0		48 L 1.0
GENERAL BUILDING					
390	Structures and Improvements	38 R 3.0	45 R 0.5		45 R 0.5

232. We should adopt a depreciation rate of 2.13% for hydroelectric facilities.

233. We should adopt a 20-year average service life for solar PV assets.

234. We should adopt the decommissioning generation plant annual accrual for Mountainview 3 & 4 of $0.3 million, Solar PV of $3.2 million, and Peakers of $0.2 million.

235. SCE should work with TURN, ORA, the Energy Division, and any interested parties to develop a more reliable depreciation study for the Commission to examine and consider in the next GRC.

Rate Base- Additional Issues

Aged Poles

236. We should not allow recovery for the replacement of aged poles which continued to be used and useful.

Advanced Technology Laboratories

237. We should adopt a 2018 forecast of $2.098 million for Fenwick Labs and $.264 million for the Equipment Demonstration and Evaluation Facility.

2014-15 Capital Spending Above Authorized

238. We should accept the recorded capital expenditures for the Infrastructure Replacement and Overhead Conductor programs of $115 million for 2014 and $114 million for 2015.

Changes in Accounting

239. We should permanently disallow $4.26 million from gross plant ($1.42 million for each of 2015, 2016, and 2017) for underground location costs (Account 588.281) which was expensed in the 2015 GRC but then subsequently capitalized.

240. We should permanently disallow $9.94 million from gross plant for real property expenses (Account 920.220) which was expensed in the 2012 and 2015 GRCs but has been capitalized since 2013.

SPIDACalc Pole Issues

241. We should reduce SCE's revenue requirement by $120.1 million over the 2018-2020 GRC cycle.

Compliance

242. SCE has demonstrated its compliance with each of the 37 items listed in its Compliance exhibit.

Tax Memorandum Account

243. SCE should establish a two-way tax memorandum account to track any revenue differences resulting from the differences in the income tax expense forecasted in this proceeding, and the tax expenses incurred during the 2018-2020 GRC period as well as the differences in any subsequently forecasted tax expenses forecast in subsequent GRCs and the tax expenses incurred during the respective GRC cycles.

CALSLA Issues

244. SCE's management of its streetlight acquisition program in the litigious manner described in Exhibit SCE-26 is an inappropriate and unreasonable use of ratepayer funds and should not continue.

O R D E R

IT IS ORDERED that:

1. Application 16-09-001 is granted to the extent set forth in this Decision. Southern California Edison is authorized to collect, through rates and through authorized ratemaking accounting mechanisms, the 2018 test year base revenue requirement set forth in Appendix C, effective January 1, 2018.

2. Southern California Edison shall file a Tier 1 Advice Letter within twenty days of the effective date of this decision to implement the revenue requirement and ratemaking adopted herein. The revenue requirement and revised tariff sheets will be effective January 1, 2018. The balance of the General Rate Case

Revenue Requirement Memorandum Account shall be amortized in rates thirty days after the effective date of this decision to December 31, 2020.

3. As part of revenue requirement and rate change advice letter filed pursuant to Ordering Paragraph 2, Southern California Edison shall refund to customers any amounts tracked in the Officer Compensation Memorandum Accounts.

4. Southern California Edison Company (SCE) is authorized to implement a Post-Test Year Ratemaking mechanism for both 2019 and 2020, as follows:

   a. Expenses shall be escalated as proposed by SCE, using the same pricing methodology and pricing indices that we adopt for test year escalation, except for labor expenses [namely: disability programs, executive benefits, and 401(k)]. For labor expenses, SCE shall use Global Insight's most current forecast. For medical expenses, we adopt SCE's escalation rate of 8%. We also adopt SCE's proposed escalation rates for other benefits categories. For all other expenses, we adopt SCE's proposal of using the latest Global Insight escalation rates.

   b. Capital-related revenues shall be escalated by increasing gross capital additions in the post test years at a rate of 2.49% per year above the 2018 authorized capital additions.

   c. SCE's Z-factor recovery mechanism shall continue.

   d. We allow SCE to file an advice letter to implement the post-test year revenue requirement. SCE must file an advice letter by December 1st of 2019 and 2020. In these advice letters, SCE must update its post-test year revenue requirement for the following attrition year. For the second attrition year of 2020, SCE shall use the latest Global Insight escalation rates to escalate 2018 authorized level of expenses to 2019 and 2020 levels, but the 2019 authorized level of expenses will not be trued up to reflect the actual escalation factor for 2019.

5. Southern California Edison shall file a Tier 2 Advice Letter within 30 days of the effective date of this decision to establish a two-way tax memorandum

account to record any revenue differences resulting from the income tax expenses forecasted in its General Rate Case (GRC) proceedings, and the tax expenses incurred by Southern California Edison during this 2018-2020 GRC period and each subsequent GRC period.

a. This tax memorandum account shall remain open and the balance in the account shall be reviewed in every subsequent GRC until a Commission decision closes the account.

b. The account shall have separate line items detailing the differences between tax expenses forecasted and tax expenses incurred, specifically resulting from 1) net revenue changes, 2) mandatory tax law changes, tax accounting changes, tax procedural changes, or tax policy changes, and 3) elective tax law changes, tax accounting changes, tax procedural changes or tax policy changes.

c. Southern California Edison may track changes in revenue resulting from the application of the Average Rate Assumption Method in accordance with this decision in the Tax Memorandum Account.

6. Southern California Edison shall notify the Energy Division of the California Public Utilities Commission of any tax-related changes, tax-related accounting changes or any tax-related procedural changes that materially affect or may materially affect revenues. "Materially affect" is defined as a potential increase or decrease of $3 million or more.

7. If Southern California Edison requests an Internal Revenue Service private letter ruling, Southern California Edison shall file and serve a copy of its request to the Internal Revenue Service as a Tier 1 Advice Letter at least 30 days *before* sending the request to the Internal Revenue Service.

8. Any request by Southern California Edison for a private letter ruling concerning application or interpretation of the Tax Cut and Jobs Act shall seek a response to the question, "Is including Cost of Removal/Negative Net Salvage in

the ARAM calculation for the return of excess deferred taxes to ratepayers inconsistent with normalization requirements?"

9. In the event that Southern California Edison Company receives a relevant Internal Revenue Service ruling contradicting this decision, stating it is a normalization violation to include Cost of Removal in book depreciation for purposes of calculating Average Rate Assumption Method, then Southern California Edison shall comply with the Internal Revenue Service's interpretation of the applicable tax laws by filing a Tier 2 advice letter with this Commission to seek an appropriate adjustment to its revenue requirement and/or rate base.

10. Southern California Edison shall file a Tier 2 Advice Letter within 30 days of the effective date of this decision to establish a Customer Service Re-platforming memorandum account to record any costs, capital expenditures, and benefits of Customer Service Re-platforming during this 2018-2020 GRC period and each subsequent GRC period. These items may be reviewed for recovery in the next GRC.

11. Southern California Edison (SCE) shall file a Tier 2 Advice Letter within 30 days of the effective date of this decision to establish a one-way Rule 20A balancing account that tracks the annual capital and expense costs for Rule 20A undergrounding projects, on a forecast and recorded basis. Overcollected balances in the account shall remain available for future Rule 20A projects. The Commission shall review the balances in the account in SCE's next General Rate Case proceeding.

12. San Diego Gas & Electric Company's (SDG&E's) request for an authorized revenue requirement for Marine Mitigation is granted. SDG&E shall file a Tier 1 Advice Letter within twenty days of the effective date of this decision outlining its method to calculate its revenue requirement. SDG&E shall continue tracking

its Marine Mitigation costs and revenue requirement differences in its Marine Mitigation Memorandum Account as required by Decision 15-11-021, as modified. SDG&E shall implement its marine mitigation revenue requirement and ratemaking adopted herein for marine mitigation concurrently with its General Rate Case.

13. Within 45 days of the effective date of this decision, Southern California Edison Company shall issue a true-up of marine mitigation costs billed to San Diego Gas & Electric Company reflecting the categorization of costs as expense.

14. The parties should consider and discuss during the next GRC the means to accurately determine the portion of In-House Counsel costs and other expenses which are incurred in connection with findings of utility imprudence. This consideration should include timekeeping or other means to accurately evaluate the allocation of expenses.

15. SCE shall work with TURN, ORA, the Energy Division, and any interested parties to develop a more reliable depreciation study for the Commission to examine and consider in the next GRC.

16. Southern California Edison Company shall transfer the General Rate Case Revenue Requirement Memorandum Account balance, as of the effective date of this decision, to its Authorized Base Revenue Requirement Balancing Account.

17. Southern California Edison Company and San Diego Gas & Electric Company are not permitted to recover any cost twice. If a cost permitted for recovery here is also recovered from the nuclear decommissioning trust (or any other source), Southern California Edison Company and/or San Diego Gas & Electric Company shall refund the revenue requirement associated with that cost to ratepayers, with interest.

18. Southern California Edison Company and San Diego Gas & Electric Company are authorized to file an application to recover costs in the event that California Coastal Commission does require additional reef construction, or other measures. In that application, Southern California Edison Company shall demonstrate that it has made a reasonable effort to represent ratepayers' interests in front of all applicable regulatory bodies and that its cost forecast is reasonable. Southern California Edison Company and San Diego Gas & Electric Company shall recover any such costs as operations and maintenance expense, not capital expenditures.

19. Southern California Edison Company (SCE) shall meet and confer with the California City-County Street Light Association (CALSLA) and all interested officials from affected jurisdictions in order to prepare a joint proposal to address each of the concerns raised in CALSLA's testimony regarding SCE's streetlight acquisition program, including (1) the information that interested jurisdictions receive, or do not receive, during the acquisition process, (2) the possibility of including mast arms and luminaires attached to shared distribution poles in streetlight acquisition agreements, (3) more efficient transfer of streetlights following Commission approval of a sale, (4) exploration of the question of the impact of delays on receipt of LED rebates, and (5) any other issues that the Commission could address. The joint proposal should be provided either as part of SCE's testimony when it files its next GRC application, or as a supplemental exhibit in that proceeding as soon as possible after the filing date. Both sides are encouraged to seek assistance from the Commission's Alternative Dispute Resolution program if that would expedite their efforts or avoid conflict.

20. Southern California Edison Company shall file its next General Rate Case for test year 2021 pursuant to the applicable Rate Case Plan adopted in Decision 89-01-040, as modified.

21. In its next General Rate Case (GRC), Southern California Edison Company (SCE) shall provide tables with at least five years of recorded spending information associated with each individual expense or expenditure forecast in excess of $1 million. SCE shall also provide summary tables, aggregating this information at the level of major categories (e.g. Transmission and Distribution Infrastructure Replacement, Human Resources). SCE shall provide its own comparable forecast and the Commission's adopted forecast from this GRC as a component of or accompaniment to these tables, both for individual forecasts and summary tables. SCE shall briefly explain any changes in scope of the forecasts, if they are not directly comparable. In the summary tables, SCE shall include any expenses or expenditures that were included in this GRC request, even if the individual expense or expenditure was not actually approved in this decision or implemented by SCE.

22. Application 16-09-001 is closed.

This order is effective today.

Dated _____, at San Francisco, California.

APPENDIX A

APPENDIX A

List of Acronyms

ACRONYMS	MEANING
A.	Application
AB	Assembly Bill
ACE	Awards to Celebrate Excellence
ADIT	Accumulated Deferred Income Taxes
AFUDC	Allowance for Funds Used During Construction
ALJ	Administrative Law Judge
API	Asset Priority Index
ARs	Automatic Reclosers
ARAM	Average Rate Assumption Method
BCD	Business Customer Division
BRRBA	Base Revenue Requirement Balancing Account
C&I	Commercial and Industrial
CAISO	California Independent System Operator
CALSLA	California City-County Street Light Association
CCA	Community Choice Aggregator
CEMA	Catastrophic Event Memorandum Account
CEO	Chief Executive Officer
CIAC	Contributions in Aid of Construction
CIC	Cable-in-Conduit
CIP	Critical Infrastructure Protection
CMS	Consolidated Mobile Solution
COR	Cost of Removal
CFC	Consumer Federation of California
CPI	Consumer Price Index

CPI-U	Consumer Price Index for All Urban Consumers
CPI-W	Consumer Price Index for Urban Wage Earners and Clerical Workers
CPUC	California Public Utilities Commission
CRE	Corporate Real Estate
CSAT	Comprehensive Situational Awareness for Transmission
CSP	Common Substation Platform
CS	Customer Service
CUE	Coalition of Utility Employees
CWIP	Construction Work In Progress
D.	Decision
DA	Distribution Automation
DER	Distributed Energy Resources
DESI	Distributed Energy Storage Integration
DR	Demand Response
DRP	Distributed Resources Plan
DSEEP	Distribution System Efficiency Enhancement Program
DSP	Distribution Substation Plan
DVVC	Distribution Volt VAR Control
EDEF	Equipment Demonstration and Evaluation Facility
eDMRM	Electronic Document Management/Records Management
EEI	Edison Electric Institute
EIC	Executive Incentive Compensation
ECM	Enterprise Content Management
EPIC	Electric Program Investment Charge
EPRI	Electric Power Research Institute
ERRA	Energy Resource Recovery Account
ESC	Edison SmartConnect®
ESCBA	Edison SmartConnect Balancing Account

FAN	Field Area Network
FCC	Final Cost Centers
FCI	Facility Condition Index
FERC	Federal Energy Regulatory Commission
FTE	Full Time Equivalent
GAA	Grid Analytics Application
GCM	Grid Connectivity Model
GIPT	Grid Interconnection Processing Tool
GMS	Generation Management System
GO	General Order
GO2	General Order 2
GRC	General Rate Case
GRSM	Gross Revenue Sharing Mechanism
HR	Human Resources
IT	Information Technology
ITCC	Income Tax Component of Contributions
kV	kilovolt
kW	kilowatt
LGBT	Lesbian, Gay, Bisexual and Transgender
LTI	Long Term Incentives
LTIP	Long-Term Incentive Plan
LTPT	Long-Term Planning Tools
M&S	Materials and Supplies
MBEs	Minority Business Enterprises
MEDs	Major Event Days
MSO	Meter Services Organization
MSPs	Managed Services Providers
NDC	National Diversity Coalition
NEM	Net Energy Metering

NERC	North American Electric Reliability Corporation
NSR	Net Salvage Ratio
O&M	Operations and Maintenance
OBs	Opening Briefs
OCMA	Officer Compensation Memorandum Accounts
OCP	Overhead Conductor Program
OOR	Other Operating Revenue
OpX	Operational Excellence
ORA	Office of Ratepayer Advocates
OS	Operational Services
OU	Operating Unit
PBGS	Pebbly Beach Generating Station
PBOPs	Post-retirement Benefits Other than Pensions
PCB	Polychlorinated Biphenyl
PDD	Project Development Division
PDDMA	Project Development Division Memorandum Account
PG&E	Pacific Gas and Electric Company
PLP	Pole Loading Program
PLPBA	PLP Balancing Account
PMO	Program Management Organization
PPA	Power Purchase Agreement
PPO	Planning and Performance Organization
PHC	Prehearing Conference
PTYR	Post-Test Year Ratemaking
PVNGS	Palo Verde Nuclear Generating Station
R.	Rulemaking
RD&D	Research, Development and Demonstration
RCS	Remote Controlled Switches
RFIs	Remote Fault Indicators

RIIM	Reliability Investment Incentive Mechanism
RO	Results of Operations
RS	Results Sharing
RSDMA	Residential Service Disconnection Memorandum Account
RSE	Risk Spend Efficiency
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SB	Senate Bill
SBUA	Small Business Utility Advocates
SCE	Southern California Edison Company
SDD	Supplier Diversity and Development Department
SDG&E	San Diego Gas & Electric Company
SED	Safety and Enforcement Division
SEIA	Solar Energy Industries Association
SERP	Substation Equipment Replacement Program
SIR	Substation Infrastructure Replacement
SM	Supply Management
SMT	System Modeling Tool
SoCalGas	Southern California Gas Company
SRIIM	Safety and Reliability Investment Incentive Mechanism
PV	Photovoltaic
SOMA	SmartConnect Opt-Out Memorandum Account
SONGS	San Onofre Nuclear Generating Station
SRIIM	Safety and Reliability Investment Incentive Mechanism
STIP	Short-Term Incentive Program
T&D	Transmission and Distribution
TAMA	Tax Memorandum Account
TCJA	Tax Cuts and Jobs Act
TCS	Total Compensation Study

TD&D	Technology Demonstration and Deployment TD&D
TSD	Transportation Services Department
TURN	The Utility Reform Network
TY	Test Year
VAR	Volt-Ampere Reactive
WAN	Wide Area Network
WCR	Worst Circuit Rehabilitation
WMDVE	Women, Minority, and Disabled Veteran Enterprise

(END OF APPENDIX A)

APPENDIX B

APPENDIX B

TABLE I

CAPITALIZED SOFTWARE – CONTINGENCIES

EXHIBIT	PROJECT	SCE FORECASTS				ADOPTED	
SCE-04, Vol. 2, Chapter		**2017 Contingency**	**2018 Contingency**	**2017 Project Forecast**	**2018 Project Forecast**	**2017**	**2018**
II. Operating System Software	Operating System Software	-	-	5.946	11.300	5.946	11.300
II. Operating System Software	Database Platform Upgrade	-	-	-	-	-	-
II. Operating System Software	Business Intelligence Tools Upgrade	0.050	0.083	0.300	0.500	0.250	0.417
II. Operating System Software	Enterprise Integration Tools Upgrade	0.050	0.167	0.300	1.000	0.250	0.833
II. Operating System Software	Enterprise Platform Core Refresh	1.333	1.450	8.000	8.700	6.667	7.250
III. Cybersecurity & Compliance	Perimeter Defense	-	-	13.000	13.500	13.000	13.500
III. Cybersecurity & Compliance	Interior Defense	-	-	8.500	8.000	8.500	8.000
III. Cybersecurity & Compliance	Data Protection	-	-	6.000	6.000	6.000	6.000
III. Cybersecurity & Compliance	SCADA Cybersecurity	-	-	8.750	9.070	8.750	9.070
III. Cybersecurity & Compliance	CCS for Generator Interconnections	0.567	0.983	3.400	5.900	2.833	4.917
III. Cybersecurity & Compliance	Grid Modernization - Cybersecurity	2.675	4.038	16.050	24.230	13.375	20.192

EXHIBIT	PROJECT	SCE FORECASTS				ADOPTED	
III. Cybersecurity & Compliance	IT Support for NERC CIP Compliance	-	-	12.920	5.970	12.920	5.970
IV. Technology Consolidation & Optimization	Data Warehouse Consolidation	0.783	0.333	4.700	2.000	3.917	1.667
IV. Technology Consolidation & Optimization	Lotus Notes Migration	0.650	0.500	3.900	3.000	3.250	2.500
IV. Technology Consolidation & Optimization	Disaster Recovery Optimization	0.333	0.383	2.000	2.300	1.667	1.917
IV. Technology Consolidation & Optimization	Enterprise Schedulers Consolidation	-	0.375	-	2.250	-	1.875
IV. Technology Consolidation & Optimization	Database Backup Optimization	0.067	0.250	0.400	1.500	0.333	1.250
IV. Technology Consolidation & Optimization	User Experience Technologies	0.083	0.133	0.500	0.800	0.417	0.667
IV. Technology Consolidation & Optimization	Application Distribution	0.067	0.200	0.400	1.200	0.333	1.000
IV. Technology Consolidation & Optimization	Modernize Tools for Software Development	0.083	0.250	0.500	1.500	0.417	1.250
IV. Technology Consolidation & Optimization	CITRIX VDI Capacity Increase	-	-	-	-	-	-
V. OU Software	SCE.com Strategic Upgrade	-	-	-	-	-	-
V. OU Software	Digital Customer Self Service	1.250	0.667	7.500	4.000	6.250	3.333
V. OU Software	Alerts and Notifications	0.717	0.817	4.300	4.900	3.583	4.083
V. OU Software	Meter Data Management System Upgrade	0.470	-	6.700	-	6.233	-
V. OU Software	NMS Upgrade	-	-	-	-	-	-

EXHIBIT	PROJECT	SCE FORECASTS				ADOPTED	
V. OU Software	2015 GRC Rate Changes	-	-	-	-	-	-
V. OU Software	SmartConnect Monitor&Analysis (SCMAS)	-	0.160	-	0.960	-	0.800
V. OU Software	2018 GRC Rate Changes	0.167	0.167	1.000	1.000	0.833	0.833
V. OU Software	Contact Center Optimization	-	0.483	-	2.900	-	2.417
V. OU Software	WM - Portfolio Management	1.000	1.033	6.000	6.200	5.000	5.167
V. OU Software	Scope Cost Management Tool (SCMT)	0.333	0.500	2.000	3.000	1.667	2.500
V. OU Software	Work Management Dashboard	0.167	0.083	1.000	0.500	0.833	0.417
V. OU Software	Transmission Telecomm Work Order Lifecycle	-	0.333	-	2.000	-	1.667
V. OU Software	Click Schedule Refresh Release 1 & 2	-	-	2.500	3.500	2.500	3.500
V. OU Software	Vegetation Management	0.950	-	5.700	-	4.750	-
V. OU Software	Pole Loading Application Replacement Tool	-	-	-	-	-	-
V. OU Software	Design Manager (DM) Refresh	-	-	-	-	-	-
V. OU Software	Graphic Design Tool (GDT) and Tract Deployment Refresh	0.250	0.583	1.500	3.500	1.250	2.917
V. OU Software	Consolidated Mobile Solution (CMS)	-	-	0.370	-	0.370	-

EXHIBIT	PROJECT	SCE FORECASTS				ADOPTED	
V. OU Software	Field Tools Upgrade	-	0.167	-	1.000	-	0.833
V. OU Software	Enhanced Business Resiliency for Energy Management System	0.500	0.667	3.000	4.000	2.500	3.333
V. OU Software	Comprehensive Situational Awareness for Transmission (CSAT)	0.333	0.667	2.000	4.000	1.667	3.333
V. OU Software	Centralized Remedial Action Scheme (CRAS)	-	-	-	-	-	-
V. OU Software	RGOOSE Conversion	0.983	-	5.900	-	4.917	-
V. OU Software	Energy Management System (EMS) Refresh	1.203	0.445	7.220	2.670	6.017	2.225
V. OU Software	Outage Management System	0.447	-	3.500	-	3.053	-
V. OU Software	Distribution Management System (DMS) Refresh	-	-	-	-	-	-
V. OU Software	Grid Interconnection Processing Tool	1.140	1.044	6.841	6.263	5.701	5.219
V. OU Software	Grid Analytics Applications	2.104	0.059	12.621	0.353	10.518	0.294
V. OU Software	Long Term Planning Tool	1.045	0.996	6.268	5.976	5.223	4.980
V. OU Software	Grid Connectivity Model	0.830	0.834	4.981	5.005	4.151	4.171
V. OU Software	Transient Devices (HW for Test Smart	0.055	-	0.330	-	0.275	-

EXHIBIT	PROJECT	SCE FORECASTS				ADOPTED	
	Form Tool)						
V. OU Software	High-Z Impedence Fault Detection	-	-	-	-	-	-
V. OU Software	Secure DNP Ver5 Support for EMS	-	-	-	-	-	-
V. OU Software	Grid Management Dashboards	0.333	-	2.000	-	1.667	-
V. OU Software	PSMP 2.0	-	0.167	-	1.000	-	0.833
V. OU Software	Substation Health Assessment Tool (previously Asset Mgmt)	-	0.433	-	2.600	-	2.167
V. OU Software	Substation 3D Design	-	0.210	-	1.260	-	1.050
V. OU Software	Electronic Work Order Package Product Automation (e-WOP Ph 2)	-	-	-	-	-	-
V. OU Software	Fast Repsonse Energy Storage	-	-	-	-	-	-
V. OU Software	Generation Automation Upgrade & Control Systems Refresh	0.500	0.333	3.000	2.000	2.500	1.667
V. OU Software	Dam Monitoring and Surveillance	0.167	0.333	1.000	2.000	0.833	1.667
V. OU Software	CAISO Market Enhancement Program (IMEP)	0.667	0.667	4.000	4.000	3.333	3.333
V. OU Software	Energy Planning Platform (EPP) Upgrade	-	0.333	-	2.000	-	1.667
V. OU Software	PCI Replacement						

EXHIBIT	PROJECT	SCE FORECASTS				ADOPTED	
		0.500	0.583	3.000	3.500	2.500	2.917
V. OU Software	Energy Trading and Risk Management (ETRM)	0.500	0.400	3.000	2.400	2.500	2.000
V. OU Software	Aggregated Demand Response (ADR)	0.145	-	0.870	-	0.725	-
V. OU Software	Commodity Management Platform (CMP)	-	-	-	-	-	-
V. OU Software	Generation Management System (GMS) Upgrade	-	-	-	-	-	-
V. OU Software	Usage Measurement System (UMS)	-	0.200	-	1.200	-	1.000
V. OU Software	Work Management and Reliability-Centered Maintentance	-	0.083	-	0.500	-	0.417
V. OU Software	PPD Control Systems Refresh	-	-	-	-	-	-
V. OU Software	Gas Solar Control Systems Refresh	-	-	1.570	0.600	1.570	0.600
V. OU Software	Enterprise Content Management	0.567	0.867	3.400	5.200	2.833	4.333
V. OU Software	Electronic Document Management / Records Management (eDMRM)	-	-	-	-	-	-
V. OU Software	Plant Ledger System Upgrade	-	-	-	-	-	-
V. OU Software	Legal Re-platform	0.367	-	2.200	-	1.833	-

EXHIBIT	PROJECT	SCE FORECASTS				ADOPTED	
V. OU Software	Reg Affairs - TM2 Replacement	-	-	-	-	-	-
V. OU Software	Integrated Budget Planning	-	-	-	-	-	-
V. OU Software	Union Negotiations	-	-	-	-	-	-
V. OU Software	C-CURE 9000	-	-	-	-	-	-
V. OU Software	Facilities Management System	-	-	-	-	-	-
V. OU Software	EHSync Env Clearance Ph 2	0.157	0.062	0.940	0.370	0.783	0.308
V. OU Software	Crisis Information Management System	-	-	-	-	-	-
V. OU Software	Seismic Risk Assessment	-	0.333	-	2.000	-	1.667
V. OU Software	Ariba Deployment and Supplier Portal Decommission	0.167	-	1.000	-	0.833	-
V. OU Software	Mobile Field Response	-	-	-	-	-	-
V. OU Software	Safety Observation	-	-	-	-	-	-
TOTALS		24.751	23.856	212.777	201.077	188.026	177.221

(End of Appendix B)

APPENDIX C
RESULTS OF OPERATIONS 2018

Southern California Edison
2018 General Rate Case
Results of Operations Model
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Southern California Edison
2018 GRC
Appendix C | 2018 CPUC Results of Operations
$ in Thousands

Appendix C | 2018 CPUC Results of Operations

Line	Item	Adopted	PVRR Adjustment	Rate Base Adjustment	Adopted CPUC Total	SCE Request (Based on Feb 2018 Tax Update Testimony)	Difference (Adopted Less SCE Request)
1.	**Total Operating Revenues**	**5,169,930**	**(40,033)**	**(28,323)**	**5,101,574**	**5,534,406**	**(432,832)**
2.	**Operating Expenses:**						
3.	Production						
4.	Steam	6,251	–	–	6,251	7,845	(1,594)
5.	Nuclear	76,747	–	–	76,747	76,747	–
6.	Hydro	41,446	–	–	41,446	41,446	–
7.	Other	81,962	–	–	81,962	81,965	(3)
8.	Total Production O&M	206,406	–	–	206,406	208,003	(1,597)
9.	Transmission	90,970	–	–	90,970	91,118	(148)
10.	Distribution	496,193	–	–	496,193	532,099	(35,906)
11.	Customer Accounts	155,395	–	–	155,395	159,329	(3,934)
12.	Uncollectibles	10,909	–	(60)	10,849	11,954	(1,106)
13.	Customer Service & Information	21,277	–	–	21,277	21,007	270
14.	Administrative & General	602,534	–	–	602,534	647,853	(45,319)
15.	Franchise Requirements	47,274	–	(259)	47,015	50,607	(3,592)
16.	Revenue Credits	(151,292)	–	–	(151,292)	(153,070)	1,778
17.	**Total O&M**	**1,479,666**	**–**	**(319)**	**1,479,347**	**1,568,900**	**(89,553)**
18.	**Escalation**	**95,169**	**–**	**–**	**95,169**	103,952	**(8,784)**
19.	**Depreciation**	**1,571,266**	**–**	**–**	**1,571,266**	1,752,338	**(181,072)**
20.	Taxes Other Than On Income	314,839	–	–	314,839	324,801	(9,962)
21.	Taxes Based On Income	(7,096)	–	(6,113)	(13,209)	38,919	(52,128)
22.	**Total Taxes**	**307,743**	**–**	**(6,113)**	**301,630**	**363,720**	**(62,090)**
23.	**Total Operating Expenses**	**3,453,843**	**–**	**(6,431)**	**3,447,412**	**3,788,910**	**(341,499)**
24.	**Net Operating Revenue**	**1,716,087**	**(40,033)**	**(21,892)**	**1,654,163**	**1,745,496**	**(91,333)**
25.	**Rate Base**	22,552,795	–	(287,700)	22,265,095	22,939,281	(674,187)
26.	**Rate of Return**	7.61%	–	7.61%	7.43%	7.61%	13.55%
27.	**Revenues at Present Rates**	5,640,432			5,640,432	5,640,432	
28.	**Increase/(Decrease) Over Present Revenue Requirement In Rates**	(470,502)			(538,858)	(106,026)	(432,832)
29.	**Balancing/Memorandum Account Undercollection**	41,469			41,469	41,469	–
30.	**Net Increase/(Decrease) Over Present Rates**	(429,033)			(497,389)	(64,557)	(432,832)
31.	**Decrease Over Present Revenue Requirement In Rates**				-9.55%		
32.	**Net Decrease Over Present Rates**				-8.82%		

Southern California Edison
2018 GRC
Appendix C | 2018 CPUC Results of Operations Comparison
$ in Thousands

Comparison of Revenue Requirements (Excludes Balancing/Memo Account Recovery)	2018 $	2019 $	2020 $	Increase Over Prior Year 2019 Increase $	Increase Over Prior Year 2020 Increase $	Increase Over Prior Year 2019 Increase %	Increase Over Prior Year 2020 Increase %
CPUC Adopted vs. SCE Request SCE-60 (Feb 2018)							
CPUC Adopted	5,101,574	5,421,553	5,822,853	319,979	401,300	6.27%	7.40%
SCE Request SCE-60 (Feb 2018)	5,534,406	5,965,179	6,468,180	430,773	503,001	7.78%	8.43%
Difference	**(432,832)**	**(543,626)**	**(645,327)**	**(110,794)**	**(101,701)**		
Decrease From SCE Request	(7.82%)	(9.11%)	(9.98%)				
CPUC Adopted vs. Revenues at Present Rates							
CPUC Adopted	5,101,574	5,421,553	5,822,853				
Revenues at Present Rates	5,640,432	5,640,432	5,640,432				
Difference	**(538,858)**	**(218,879)**	**182,421**				
Increase Over Present Rates	(9.55%)	(3.88%)	3.23%				
SCE Request vs. Revenues at Present Rates							
SCE Request	5,534,406	5,965,179	6,468,180				
Revenues at Present Rates	5,640,432	5,640,432	5,640,432				
Difference	**(106,026)**	**324,747**	**827,748**				
Increase Over Present Rates	(1.88%)	5.76%	14.68%				

Southern California Edison
2018 GRC
Appendix C | 2018 Total Company Results of Operations
$ in Thousands

Appendix C | 2018 Total Company Results of Operations		
Line	**Item**	**Total Company**
1.	**Total Operating Revenues**	**6,114,303**
2.	**Operating Expenses:**	
3.	Production	
4.	Steam	6,251
5.	Nuclear	76,747
6.	Hydro	41,446
7.	Other	81,962
8.	Total Production O&M	206,406
9.	Transmission	172,193
10.	Distribution	499,722
11.	Customer Accounts	155,395
12.	Uncollectibles	12,901
13.	Customer Service & Information	21,277
14.	Administrative & General	641,611
15.	Franchise Requirements	55,909
16.	Revenue Credits	(202,203)
17.	**Total O&M**	**1,563,211**
18.	**Escalation**	**101,037**
19.	**Depreciation**	**1,825,129**
20.	Taxes Other Than On Income	382,198
21.	Taxes Based On Income	99,302
22.	**Total Taxes**	**481,500**
23.	**Total Operating Expenses**	**3,970,877**
24.	**Net Operating Revenue**	**2,143,425**
25.	Rate Base	28,168,867
26.	Rate of Return	7.61%

Southern California Edison
2018 GRC
Appendix C | Post Test Year Summary of Earnings
$ in Thousands

Appendix C | Post Test Year Summary of Earnings		2019				2020			
Line	Item	CPUC	PVRR Adjustment	Rate Base Adjustment	CPUC	CPUC	PVRR Adjustment	Rate Base Adjustment	CPUC
1.	**Total Operating Revenues**	**5,488,729**	**(40,033)**	**(27,143)**	**5,421,553**	**5,888,849**	**(40,033)**	**(25,963)**	**5,822,853**
2.	**Operating Expenses:**								
3.	Production								
4.	Steam	6,251	–	–	6,251	6,251	–	–	6,251
5.	Nuclear	76,747	–	–	76,747	76,747	–	–	76,747
6.	Hydro	41,446	–	–	41,446	41,446	–	–	41,446
7.	Other	81,962	–	–	81,962	81,962	–	–	81,962
8.	Total Production O&M	206,406	–	–	206,406	206,406	–	–	206,406
9.	Transmission	90,970	–	–	90,970	90,970	–	–	90,970
10.	Distribution	496,193	–	–	496,193	496,193	–	–	496,193
11.	Customer Accounts	155,395	–	–	155,395	155,395	–	–	155,395
12.	Uncollectibles	11,581	–	(57)	11,524	12,425	–	(55)	12,371
13.	Customer Service & Information	21,277	–	–	21,277	21,277	–	–	21,277
14.	Administrative & General	596,836	–	–	596,836	596,590	–	–	596,590
15.	Franchise Requirements	50,189	–	(248)	49,941	53,848	–	(237)	53,610
16.	Revenue Credits	(155,776)	–	–	(155,776)	(158,678)	–	–	(158,678)
17.	**Total O&M**	**1,473,072**	**–**	**(305)**	**1,472,766**	**1,474,426**	**–**	**(292)**	**1,474,134**
18.	**Escalation**	**142,218**	**–**	**–**	**142,218**	**187,662**	**–**	**–**	**187,662**
19.	**Depreciation**	**1,646,455**	**–**	**–**	**1,646,455**	**1,746,062**	**–**	**–**	**1,746,062**
20.	Taxes Other Than On Income	334,447	–	–	334,447	357,868	–	–	357,868
21.	Taxes Based On Income	41,748	–	(5,858)	35,890	135,154	–	(5,603)	129,550
22.	**Total Taxes**	**376,195**	**–**	**(5,858)**	**370,337**	**493,022**	**–**	**(5,603)**	**487,418**
23.	**Total Operating Expenses**	**3,637,941**	**–**	**(6,163)**	**3,631,777**	**3,901,172**	**–**	**(5,895)**	**3,895,276**
24.	**Net Operating Revenue**	**1,850,788**	**(40,033)**	**(20,980)**	**1,789,776**	**1,987,677**	**(40,033)**	**(20,067)**	**1,927,576**
25.	Rate Base	24,323,030	–	(275,712)	24,047,318	26,122,019	–	(263,725)	25,858,294
26.	Rate of Return	7.61%		7.61%	7.44%	7.61%		7.61%	7.45%

Southern California Edison
2018 GRC
Appendix C | Results of Operations Jusidictional Allocation %
$ in Thousands

Appendix C | Results of Operations Jusidictional Allocation %					Jurisdictional Allocation %		
						% for 2018	
Line	Description	Total Company	FERC	CPUC	FERC	CPUC	Total
1.	**Total Operating Revenues**	**6,045,947**	**944,373**	**5,101,574**	**15.6%**	**84.4%**	**100.0%**
2.	**Operating Expenses:**						
3.	Production						
4.	Steam	6,251	–	6,251	–	100.0%	100.0%
5.	Nuclear	76,747	–	76,747	–	100.0%	100.0%
6.	Hydro	41,446	–	41,446	–	100.0%	100.0%
7.	Other	81,962	–	81,962	–	100.0%	100.0%
8.	Total Production	206,406	–	206,406	–	100.0%	100.0%
9.	Transmission	172,193	81,223	90,970	47.2%	52.8%	100.0%
10.	Distribution	499,722	3,529	496,193	0.7%	99.3%	100.0%
11.	Customer Accounts	155,395	–	155,395	–	100.0%	100.0%
12.	Uncollectibles	12,841	1,993	10,849	15.5%	84.5%	100.0%
13.	Customer Service & Information	21,277	–	21,277	–	100.0%	100.0%
14.	Administrative & General	641,611	39,077	602,534	6.1%	93.9%	100.0%
15.	Franchise Requirements	55,650	8,635	47,015	15.5%	84.5%	100.0%
16.	Revenue Credits	(202,203)	(50,911)	(151,292)	25.2%	74.8%	100.0%
17.	**Total O&M**	**1,562,893**	**83,546**	**1,479,347**	**5.3%**	**94.7%**	**100.0%**
18.	**Escalation**	101,037	5,868	95,169	5.8%	94.2%	100.0%
19.	**Depreciation**	1,825,129	253,863	1,571,266	13.9%	86.1%	100.0%
20.	Taxes Other Than On Income						
21.	Taxes Other Than On Income - Property	318,357	63,471	254,886	19.9%	80.1%	100.0%
22.	Taxes Other Than On Income - Payroll	63,841	3,888	59,953	6.1%	93.9%	100.0%
23.	Taxes Based On Income	93,189	106,398	(13,209)	114.2%	(14.2%)	100.0%
24.	**Total Taxes**	**475,387**	**173,758**	**301,630**	**36.6%**	**63.4%**	**100.0%**
25.	**Total Operating Expenses**	**3,964,446**	**517,035**	**3,447,412**	**13.0%**	**87.0%**	**100.0%**
26.	**Net Operating Revenue**	**2,081,501**	**427,338**	**1,654,163**	**20.5%**	**79.5%**	**100.0%**
27.	Rate Base	27,881,167	5,616,072	22,265,095	20.1%	79.9%	100.0%
28.	Rate Of Return	7.47%	7.61%	7.43%			

Southern California Edison
2018 GRC
Appendix C | Net-to-Gross Multiplier

Appendix C | Net-to-Gross Multiplier		
Line	**Description**	**Total Company**
1.	Revenues	1.00000
	Uncollectibles Tax Multiplier	
2.	Tax Rate	0.00211
3.	Jurisdictional Factor	1.00000
4.	Tax Rate (Jurisdictionalized)	0.00211
5.	**Uncollectibles Tax Multiplier**	**0.99789**
	Franchise Fees Tax Mutliplier	
6.	Tax Rate	0.00914
7.	Jurisdictional Factor	1.00000
8.	Tax Rate (Jurisdictionalized)	0.00914
9.	**Franchise Fees Tax Mutliplier**	**0.98875**
10.	**Other State(s) Income Tax Multiplier**	
11.	Tax Rate	–
12.	Jurisdictional Factor	0.98875
13.	Tax Rate (Jurisdictionalized)	–
14.	**Other State(s) Income Tax Multiplier**	**0.98875**
15.	**State Income Tax Multiplier**	
16.	Tax Rate	0.08840
17.	Jurisdictional Factor	0.98875
18.	Tax Rate (Jurisdictionalized)	0.08741
19.	**State Income Tax Multiplier**	**0.90134**
20.	**Federal Income Tax Multiplier**	
21.	Tax Rate	0.21000
22.	Jurisdictional Factor	0.98875
23.	Tax Rate (Jurisdictionalized)	0.20764
24.	**Federal Income Tax Multiplier**	**0.69370**
25.	**Uncollectibles and Franchise Fees Multiplier**	**1.01138**
26.	**Net to Gross Multiplier**	**1.44154**

Southern California Edison
2018 GRC
Appendix C | Sales Forecast

Appendix C | Sales Forecast		
Line	**Item**	**Total Company**
1.	**Sales Forecast (GWh)**	
2.	Residential	27,722
3.	Commercial	1,499
4.	Industrial	42,086
5.	Other Public Authority[1]	7,888
6.	Agricultural	4,377
7.	**Total Sales Forecast**	**83,572**
8.	**Customer Forecast**	
9.	Residential	4,486,121
10.	Commercial	20,948
11.	Industrial	582,516
12.	Other Public Authority[1]	10,651
13.	Agricultural	46,606
14.	**Total Sales Forecast**	**5,146,842**

1) Includes Street Lights

Southern California Edison
2018 GRC
Appendix C Reports | Generation
$ in Thousands

Appendix C Reports | Generation		
Line	**Item**	**Total CPUC**
1.	Steam	6,251
2.	Nuclear	76,747
3.	Hydro	41,446
4.	Other	81,962
5.	**Total Production (Constant 2015$)**	**206,406**
6.	Escalation	14,294
7.	**Total Production (Nominal 2018$)**	**220,699**
8.	**Labor, Non-labor, and Other Expense Detail:**	
9.	Labor	75,360
10.	Non-Labor	126,024
11.	Other	5,022
12.	**Total O&M (Constant 2015$)**	**206,406**
13.	**Escalation:**	
14.	Labor	6,786
15.	Non-Labor	7,508
16.	Other	–
17.	**Total Escalation**	**14,294**
18.	**Total O&M (Nominal 2018$)**	**220,699**

Southern California Edison
2018 GRC
Appendix C | Steam
$ in Thousands

Appendix C | Steam			
Line	**FERC**	**Description**	**Total CPUC**
1.	500	Operation Supervision and Engineering	5,925
2.	501	Fuel	–
3.	502	Steam Expenses	–
4.	505	Electric Expenses	–
5.	506	Miscellaneous Steam Power Expenses	326
6.	507	Rents	–
7.	509	Allowances	–
8.	**Total Operation**		**6,251**
9.	510	Maintenance Supervision and Engineering	–
10.	511	Maintenance of Structures	–
11.	512	Maintenance of Boiler Plant	–
12.	513	Maintenance of Electric Plant	–
13.	514	Maintenance of Miscellaneous Steam Plant	–
14.	**Total Maintenance**		**–**
15.	**Total Steam (Constant 2015$)**		**6,251**
16.	Escalation		553
17.	**Total Steam (Nominal 2018$)**		**6,804**
18.	**Labor, Non-labor, and Other Expense Detail:**		
19.	Labor		6,085
20.	Non-Labor		166
21.	Other		–
22.	**Total O&M (Constant 2015$)**		**6,251**
23.	**Escalation:**		
24.	Labor		548
25.	Non-Labor		5
26.	Other		–
27.	**Total Escalation**		**553**
28.	**Total O&M (Nominal 2018$)**		**6,804**

Southern California Edison
2018 GRC
Appendix C | Nuclear
$ in Thousands

Appendix C | Nuclear			
Line	**FERC**	**Description**	**Total CPUC**
1.	517	Operation Supervision and Engineering	–
2.	518	Nuclear Fuel Expense	–
3.	519	Coolants and Water	–
4.	520	Steam Expenses	–
5.	523	Electric Expenses	–
6.	524	Miscellaneous Nuclear Power Expenses	76,747
7.	525	Rents	–
8.	**Total Operation**		**76,747**
9.	528	Maintenance Supervision and Engineering	–
10.	529	Maintenance of Structures	–
11.	530	Maintenance of Reactor Plant Equipment	–
12.	531	Maintenance of Electric Plant	–
13.	532	Maintenance of Miscellaneous Nuclear Plant	–
14.	**Total Maintenance**		**–**
15.	**Total Nuclear (Constant 2015$)**		**76,747**
16.	Escalation		6,113
17.	**Total Nuclear (Nominal 2018$)**		**82,860**
18.	**Labor, Non-labor, and Other Expense Detail:**		
19.	Labor		132
20.	Non-Labor		76,615
21.	Other		–
22.	**Total O&M (Constant 2015$)**		**76,747**
23.	**Escalation:**		
24.	Labor		12
25.	Non-Labor		6,101
26.	Other		–
27.	**Total Escalation**		**6,113**
28.	**Total O&M (Nominal 2018$)**		**82,860**

Southern California Edison
2018 GRC
Appendix C | Hydro
$ in Thousands

Appendix C | Hydro			
Line	**FERC**	**Description**	**Total CPUC**
1.	535	Operation Supervision and Engineering	–
2.	536	Water for Power	5,128
3.	537	Hydraulic Expenses	–
4.	538	Electric Expenses	–
5.	539	Miscellaneous Hydraulic Power Generation Expenses	26,779
6.	540	Rents	–
7.	**Total Operation**		**31,907**
8.	528	Maintenance Supervision and Engineering	–
9.	529	Maintenance of Structures	–
10.	530	Maintenance of Reactor Plant Equipment	–
11.	531	Maintenance of Electric Plant	–
12.	532	Maintenance of Miscellaneous Nuclear Plant	9,539
13.	**Total Maintenance**		**9,539**
14.	**Total Hydro (Constant 2015$)**		**41,446**
15.	Escalation		2,471
16.	**Total Hydro (Nominal 2018$)**		**43,917**
17.	**Labor, Non-labor, and Other Expense Detail:**		
18.	Labor		22,361
19.	Non-Labor		19,085
20.	Other		–
21.	**Total O&M (Constant 2015$)**		**41,446**
22.	**Escalation:**		
23.	Labor		2,014
24.	Non-Labor		457
25.	Other		–
26.	**Total Escalation**		**2,471**
27.	**Total O&M (Nominal 2018$)**		**43,917**

Southern California Edison
2018 GRC
Appendix C | Other Production
$ in Thousands

Appendix C | Other Production			
Line	**FERC**	**Description**	**Total CPUC**
1.	546	Operation Supervision and Engineering	–
2.	547	Fuel	–
3.	548	Generation Expenses	–
4.	549	Miscellaneous Other Power Generation Expenses	18,418
5.	550	Rents	2,332
6.	**Total Operation**		**20,750**
7.	551	Maintenance Supervision and Engineering	–
8.	552	Maintenance of Structures	–
9.	553	Maintenance of Generating and Electric Plant	–
10.	554	Maintenance of Miscellaneous Other Power Generation Plant	18,771
11.	555	Purchased Power	–
12.	556	System Control and Load Dispatching	–
13.	557	Other Expenses	42,441
14.	**Total Maintenance**		**61,212**
15.	**Total Other Production (Constant 2015$)**		**81,962**
16.	Escalation		5,157
17.	**Total Other Production (Nominal 2018$)**		**87,119**
18.	**Labor, Non-labor, and Other Expense Detail:**		
19.	Labor		46,782
20.	Non-Labor		30,158
21.	Other		5,022
22.	**Total O&M (Constant 2015$)**		**81,962**
23.	**Escalation:**		
24.	Labor		4,213
25.	Non-Labor		944
26.	Other		–
27.	**Total Escalation**		**5,157**
28.	**Total O&M (Nominal 2018$)**		**87,119**

Southern California Edison
2018 GRC
Appendix C | Transmission
$ in Thousands

Appendix C | Transmission			
Line	**FERC**	**Description**	**Total CPUC**
1.	560	Operation Supervision and Engineering	15,608
2.	561	Load Dispatching	5,185
3.	562	Station Expenses	10,301
4.	563	Overhead Line Expenses	–
5.	564	Underground Line Expenses	–
6.	565	Transmission of Electricity by Others	2,434
7.	566	Miscellaneous Transmission Expenses	20,299
8.	567	Rents	9,088
9.		Total Operation	62,916
10.	568	Maintenance Supervision and Engineering	3,716
11.	569	Maintenance of Structures	–
12.	570	Maintenance of Station Equipment	7,440
13.	571	Maintenance of Overhead Lines	15,943
14.	572	Maintenance of Underground Lines	–
15.	573	Maintenance of Miscellaneous Transmission Plant	956
16.		Total Maintenance	28,055
17.		**Total O&M (Constant 2015$)**	**90,970**
18.		Escalation	4,428
19.		**Total O&M (Nominal 2018$)**	**95,398**
		Labor, Non-labor, and Other Expense Detail:	
20.		Labor	40,172
21.		Non-Labor	41,723
22.		Other	9,075
23.		**Total O&M (Constant 2015$)**	**90,970**
		Escalation:	
24.		Labor	4,054
25.		Non-Labor	374
26.		Other	–
27.		**Total Escalation**	**4,428**
28.		**Total O&M (Nominal 2018$)**	**95,398**

Southern California Edison
2018 GRC
Appendix C | Distribution
$ in Thousands

Appendix C | Distribution			
Line	**FERC**	**Description**	**Total CPUC**
1.	580	Operation Supervision and Engineering	21,611
2.	582	Station Expenses	27,817
3.	583	Overhead Line Expenses	79,763
4.	584	Underground Line Expenses	–
5.	585	Street Lighting and Signal System Expenses	6,887
6.	586	Meter Expenses	30,654
7.	587	Customer Installations Expenses	6,460
8.	588	Miscellaneous Distribution Expenses	105,012
9.	589	Rents	–
10.		Total Operation	278,204
11.	590	Maintenance Supervision and Engineering	–
12.	591	Maintenance of Structures	–
13.	592	Maintenance of Station Equipment	13,147
14.	593	Maintenance of Overhead Lines	127,734
15.	594	Maintenance of Underground Lines	65,824
16.	595	Maintenance of Line Transformers	–
17.	596	Maintenance of Street Lighting and Signal Systems	–
18.	597	Maintenance of Meters	–
19.	598	Maintenance of Miscellaneous Distribution Plant	11,285
20.		Total Maintenance	217,990
21.		**Total O&M (Constant 2015$)**	**496,193**
22.		Escalation	25,245
23.		**Total O&M (Nominal 2018$)**	**521,439**
		Labor, Non-labor, and Other Expense Detail:	
24.		Labor	239,024
25.		Non-Labor	254,374
26.		Other	2,796
27.		**Total O&M (Constant 2015$)**	**496,193**
		Escalation:	
28.		Labor	21,414
29.		Non-Labor	3,831
30.		Other	–
31.		**Total Escalation**	**25,245**
32.		**Total O&M (Nominal 2018$)**	**521,439**

Southern California Edison
2018 GRC
Appendix C | Customer Accounts
$ in Thousands

Appendix C | Customer Accounts

Line	FERC	Description	Total CPUC	Rate Base Adjustment	Total CPUC
1.	901	Supervision	4,400		4,400
2.	902	Meter Reading Expenses	9,909		9,909
3.	903	Customer Records and Collection Expenses	97,272		97,272
4.	904	Uncollectible Accounts	10,909	(60)	10,849
5.	905	Miscellaneous Customer Accounts Expenses	39,556		39,556
6.		Interest Offset on Customer Deposits	4,258		4,258
7.		**Total Customer Accounts (Constant 2015$)**	**166,304**	**(60)**	**166,244**
8.		Escalation	10,835		10,835
9.		**Total Customer Accounts (Nominal 2018$)**	**177,139**	**(60)**	**177,079**
10.		Less: Account 904 (Uncollectible Accounts)	(10,909)	60	(10,849)
11.		**Total Customer Accounts (Nominal 2018$ - Less Account 904)**	**166,231**	**–**	**166,231**
		Labor, Non-labor, and Other Expense Detail:			
12.		Labor	88,797		88,797
13.		Non-Labor	66,598		66,598
14.		Other	10,909	(60)	10,849
15.		**Total O&M (Constant 2015$)**	**166,304**	**(60)**	**166,244**
		Escalation:			
16.		Labor	7,996		7,996
17.		Non-Labor	2,839		2,839
18.		Other	–		–
19.		**Total Escalation**	**10,835**	**–**	**10,835**
20.		**Total Customer Accounts (Nominal 2018$)**	**177,139**	**(60)**	**177,079**
21.		Less: Account 904 (Uncollectible Accounts)	(10,909)	60	(10,849)
22.		**Total O&M (Nominal 2018$ - Less Account 904)**	**166,231**	**–**	**166,231**

Southern California Edison
2018 GRC
Appendix C | Customer Service & Information
$ in Thousands

Appendix C | Customer Service & Information

Line	FERC	Description	Total CPUC
1.	907	Supervision	2,487
2.	908	Customer Assistance Expenses	18,790
3.	909	Informational and Instructional Advertising Expenses	–
4.	910	Miscellaneous Customer Service and Informational Expenses	–
5.	912	Demonstrating and Selling Expenses	–
6.	913	Advertising Expenses	–
7.		Total Customer Service & Information	21,277
8.	916	Miscellaneous Sales Expenses	–
9.		**Total Customer Service & Information (Constant 2015$)**	**21,277**
10.		Escalation	1,709
11.		**Total Customer Service & Information (Nominal 2018$)**	**22,986**
		Labor, Non-labor, and Other Expense Detail:	
12.		Labor	17,521
13.		Non-Labor	3,756
14.		Other	–
15.		**Total O&M (Constant 2015$)**	**21,277**
		Escalation:	
16.		Labor	1,578
17.		Non-Labor	131
18.		Other	–
19.		**Total Escalation**	**1,709**
20.		**Total O&M (Nominal 2018$)**	**22,986**

Southern California Edison
2018 GRC
Appendix C | A&G Summary
$ in Thousands

Appendix C | A&G Summary

Line	FERC	Description	Total CPUC	Rate Base Adjustment	Total CPUC
1.	920	Administrative and General Salaries	237,306		237,306
2.	921	Office Supplies and Expenses	225,326		225,326
3.	922	Administrative Expenses Transferred - Credit	(113,491)		(113,491)
4.	923	Outside Services Employed	40,310		40,310
5.	924	Property Insurance	13,213		13,213
6.	925	Injuries and Damages	118,720		118,720
7.	926	Employee Pensions and Benefits	40,535		40,535
8.	927	Franchise Requirements	47,274	(259)	47,015
9.	928	Regulatory Commission Expenses	–		–
10.	930	General Advertising Expenses-Miscellaneous General Expenses	19,126		19,126
11.	931	Rents	7,180		7,180
12.		Reduction for A&G Credit for Catalina Utilities	(509)		(509)
13.		Total Operation	634,991	(259)	634,732
14.	935	Maintenance of General Plant	14,817		14,817
15.		**Total O&M (Constant 2015$)**	**649,808**	**(259)**	**649,549**
16.		Escalation	38,657		38,657
17.		**Total O&M (Nominal 2018$)**	**688,465**	**(259)**	**688,206**
18.		Less: Account 927 (Franchise Requirements)	(47,274)		(47,274)
19.		**Total O&M (Nominal 2018$ - Less Account 927)**	**641,191**	**(259)**	**640,932**
		Labor, Non-labor, and Other Expense Detail:			
20.		Labor	249,536		249,536
21.		Non-Labor	325,665		325,665
22.		Other	74,606	(259)	74,347
23.		**Total O&M (Constant 2015$)**	**649,808**	**(259)**	**649,549**
		Escalation:			
24.		Labor	22,471		22,471
25.		Non-Labor	16,186		16,186
26.		Other	–		–
27.		**Total Escalation**	**38,657**	**–**	**38,657**
28.		**Total O&M (Nominal 2018$)**	**688,465**	**(259)**	**688,206**
29.		Less: Account 927 (Franchise Requirements)	(47,274)		(47,274)
30.		**Total O&M (Nominal 2018$ - Less Account 927)**	**641,191**	**(259)**	**640,932**

Southern California Edison
2018 GRC
Appendix C | A&G Summary
$ in Thousands

Appendix C | A&G Summary

Line	Description	Labor	Total CPUC Non-Labor	Total CPUC Other	Total	Rate Base Adjustment	Total CPUC
	Constant $						
1.	**Production**						
2.	Steam	6,085	166	–	6,251		6,251
3.	Nuclear	132	76,615	–	76,747		76,747
4.	Hydro	22,361	19,085	–	41,446		41,446
5.	Other	46,782	30,158	5,022	81,962		81,962
6.	Total Production	75,360	126,024	5,022	206,406	–	206,406
7.	Transmission	40,172	41,723	9,075	90,970		90,970
8.	Distribution	239,024	254,374	2,796	496,193		496,193
9.	Customer Accounts	88,797	66,598	–	155,395		155,395
10.	Uncollectibles	–	–	10,909	10,909	(60)	10,849
11.	Customer Service & Information	17,521	3,756	–	21,277		21,277
12.	Administrative & General	249,536	325,665	27,333	602,534		602,534
13.	Franchise Requirements	–	–	47,274	47,274	(259)	47,015
14.	**Total O&M (Constant 2015$)**	**710,410**	**818,140**	**102,408**	**1,630,958**	**(319)**	**1,630,639**
15.	**Escalation $**						
16.	**Production**						
17.	Steam	548	5	–	553		553
18.	Nuclear	12	6,101	–	6,113		6,113
19.	Hydro	2,014	457	–	2,471		2,471
20.	Other	4,213	944	–	5,157		5,157
21.	Total Production	6,786	7,508	–	14,294	–	14,294
22.	Transmission	4,054	374	–	4,428		4,428
23.	Distribution	21,414	3,831	–	25,245		25,245
24.	Customer Accounts	7,996	2,839	–	10,835		10,835
25.	Uncollectibles	–	–	–	–		–
26.	Customer Service & Information	1,578	131	–	1,709		1,709
27.	Administrative & General	22,471	16,186	–	38,657		38,657
28.	Franchise Requirements	–	–	–	–		–
29.	**Total O&M Escalation $**	**64,299**	**30,870**	**–**	**95,169**	**–**	**95,169**
30.	**Nominal $**						
31.	**Production**						
32.	Steam	6,632	171	–	6,804		6,804
33.	Nuclear	144	82,716	–	82,860		82,860
34.	Hydro	24,375	19,542	–	43,917		43,917
35.	Other	50,995	31,102	5,022	87,119		87,119
36.	Total Production	82,146	133,532	5,022	220,699	–	220,699
37.	Transmission	44,226	42,097	9,075	95,398		95,398
38.	Distribution	260,438	258,205	2,796	521,439		521,439
39.	Customer Accounts	96,794	69,437	–	166,231		166,231
40.	Uncollectibles	–	–	10,909	10,909	(60)	10,849
41.	Customer Service & Information	19,099	3,887	–	22,986		22,986
42.	Administrative & General	272,007	341,852	27,333	641,191		641,191
43.	Franchise Requirements	–	–	47,274	47,274	(259)	47,015
44.	**Total O&M (Nominal 2018$)**	**774,709**	**849,010**	**102,408**	**1,726,126**	**(319)**	**1,725,807**

Southern California Edison
2018 GRC
Appendix C | Other Operating Revenue
$ in Thousands

Appendix C | Other Operating Revenue		
Line	**Description**	**Total CPUC**
1.	**450.000 - Forfeited Discounts**	
2.	Customer Service Operations OOR	11,396
3.	**451.000 - Miscellaneouse Service Revenues**	
4.	Customer Service Operations OOR	8,096
5.	Transmission & Distribution OOR	854
6.	**Total 451.000**	**8,949**
7.	**453.000 - Sales of Water & Water Power**	
8.	Financial and Other Miscellaneous Revenues	110
9.	**454.000 - Rent from Electric Property**	
10.	Transmission & Distribution OOR	29,247
11.	Financial and Other Miscellaneous Revenues	10,505
12.	**Total 454.000**	**39,753**
13.	**456.000 - Other Electric Revenue**	
14.	Customer Service Operations OOR	1,039
15.	CS&I Tariffed Products and Services OOR	405
16.	Transmission & Distribution OOR	53,988
17.	Financial and Other Miscellaneous Revenues	22,839
18.	**Total 456.000**	**78,271**
19.	Gains/Losses on Sale of Property	338
20.	Gross Revenue Sharing Mechanism Authorized Threshold	12,474
21.	Escalation	–
22.	**Total OOR**	**151,292**

Southern California Edison
2018 GRC
Appendix C | Taxes Other Than On Income
$ in Thousands

Appendix C | Taxes Other Than On Income		
Line	**Description**	**Total CPUC**
1.	**Ad Valorem (Property) Taxes**	**254,886**
	Payroll Taxes	
2.	Federal Insurance Contribution Act (FICA)	52,895
3.	Federal Unemployment Tax Act (FUTA)	267
4.	State Unemployment Tax Act (SUTA)	2,803
5.	**Total Payroll Taxes**	**55,964**
6.	Miscellaneous Taxes	4,547
7.	ITC Amortization on CTC Property	(558)
8.	ARAM Expense on CTC Property	–
9.	**Total Taxes Other Than Income**	**314,839**

Southern California Edison
2018 GRC
Appendix C | Taxes Based on Income
$ in Thousands

Appendix C | Taxes Based on Income

Line	Description	Total CPUC	Rate Base Adjustment	Total CPUC
	State Income Taxes			
1.	**Operating Revenue**	**5,169,930**		**5,169,930**
				–
2.	Operating Expenses	1,574,834		1,574,834
3.	Taxes Other Than On Income	314,839		314,839
4.	**Total Expenses**	**1,889,673**		**1,889,673**
5.	Income Tax Adjustments (Schedule M)	**1,920,343**		1,920,343
6.	**State Taxable Income**	**(30,669)**		**(30,669)**
7.	California Income Tax Rate	8.84%		
8.	**California Tax Expense**	**(2,711)**		(2,711)
9.	Arizona Income Tax Rate	–		
10.	**Arizona Tax Expense**	**–**		**–**
11.	New Mexico Income Tax Rate	–		
12.	**New Mexico Tax Expense**	**–**		**–**
13.	**Total State Income Taxes**	**(2,711)**		**(2,711)**
	Federal Income Taxes			
14.	**Operating Revenue**	**5,169,930**		**5,169,930**
15.	Operating Expenses	1,574,834		1,574,834
16.	Taxes Other Than On Income	314,839		314,839
17.	State Income Taxes	(2,711)		(2,711)
18.	Less: California Tax Expense (Current Year)	2,711		2,711
19.	Plus: California Tax Expense (Prior Year)			–
20.	**Total Expenses**	**1,889,673**		**1,889,673**
21.	Income Tax Adjustments (Schedule M)	**1,925,589**		1,925,589
22.	**Federal Taxable Income**	**(35,916)**		**(35,916)**
23.	Federal Income Tax Rate	**21.00%**		
24.	**Federal Tax Expense**	**(7,542)**		**(7,542)**
25.	Deferred Taxes (Plant)	6		6
26.	Deferred Taxes (AFUDC Debt)	–		–
27.	Deferred Taxes (Capitalized Interest)	–		–
28.	Contributions in Aid of Construction	2,654		2,654
29.	Investment Tax Credit	700		700
30.	Accrued Vacation Pay	(203)		(203)
31.	**Total Federal Income Taxes**	**(4,385)**		**(4,385)**
32.	**Total Income Taxes (State & Federal)**	**(7,096)**	**(6,113)**	**(13,209)**

Southern California Edison
2018 GRC
Appendix C | Depreciation & Amortization
$ in Thousands

Appendix C | Depreciation & Amortization				
Line	Description	CPUC	Rate Base Adjustment	Total CPUC
1.	**Generation**			
2.	Nuclear	19,295		19,295
3.	Other Production	38,533		38,533
4.	Hydro	27,691		27,691
5.	Mountainview	23,508		23,508
6.	**Total Generation**	**109,028**	**–**	**109,028**
7.	**Transmission**			
8.	Land	764		764
9.	Substations	74,384		74,384
10.	Lines	47,864		47,864
11.	**Total Transmission**	**123,013**	**–**	**123,013**
12.	**Distribution**			
13.	Land	1,215		1,215
14.	Substations	65,767		65,767
15.	Lines	831,216		831,216
16.	**Total Distribution**	**898,197**	**–**	**898,197**
17.	**General**	224,540		**224,540**
18.	**Total Depreciation**	**1,354,778**	**–**	**1,354,778**
19.	**Amortization**			
20.	Mountainview Intangibles	1,053		1,053
21.	Radio Frequency	440		440
22.	Hydro Relicensing	2,826		2,826
23.	Miscellaneous Intangibles	25		25
24.	Capitalized Software	212,144		212,144
25.	**Total Amortization**	**216,488**	**–**	**216,488**
26.	**Total Depreciation & Amortization**	**1,571,266**	**–**	**1,571,266**

Southern California Edison
2018 GRC
Appendix C | Plant In Service
$ in Thousands

Appendix C | Plant In Service		
Line	**Description**	**CPUC**
1.	**Generation**	
2.	Nuclear	2,029,997
3.	Other Production	879,810
4.	Hydro	1,304,470
5.	Mountainview	803,079
6.	**Total Generation**	**5,017,356**
7.	**Transmission**	
8.	Land	96,087
9.	Substations	3,014,636
10.	Lines	1,922,174
11.	**Total Transmission**	**5,032,898**
12.	**Distribution**	
13.	Land	123,339
14.	Substations	3,339,657
15.	Lines	20,791,201
16.	**Total Distribution**	**24,254,198**
17.	**General**	**2,831,566**
18.	**Total Plant**	**37,136,016**
19.	**Intangible Plant**	
20.	Moutainview Intangibles	41,930
	Radio Frequency	17,583
21.	Hydro Relicensing	153,158
22.	Miscellaneous Intangibles	497
23.	Capitalized Software	1,077,124
24.	**Total Intangible Plant**	**1,290,292**
25.	**Total Plant in Service**	**38,426,308**

Southern California Edison
2018 GRC
Appendix C | Average Lag In Payment of Operating Expenses
$ in Thousands

Appendix C | Average Lag In Payment of Operating Expenses

Line	Description	Total Company	Average Lag Days	Dollar Day Lags
1.	Total Fuel	206,253	32.2	6,641,332
2.	Purchase Power QF USPS	767,060	53.1	40,730,886
3.	Purchase Power QF EFT	1,736,392	44.3	76,922,188
4.	Purchase Power Non-QF	2,070,701	23.6	48,868,544
5.	**Subtotal**	**4,780,406**	**36.2**	**173,162,950**
6.	Company Labor	830,301	12.1	10,046,640
7.	Short-Term Incentive Plan (STIP)	69,995	258.0	18,058,743
8.	Other O&M Expenses	1,043,628	42.7	44,569,367
9.	Goods & Services	756,341	43.9	33,203,361
10.	Materials Issued from Stores	4,915	–	–
11.	Insurance & Line Rent Provisions	31,273	–	–
12.	Injuries and Damages	128,420	–	–
13.	Funded Pension Provisions	57,741	(17.8)	(1,027,790)
14.	Benefits & Unfunded Pension Provisions	(17,873)	3.1	(55,408)
15.	PBOP Provisions	3,850	59.5	229,075
16.	Franchise Requirements	109,780	263.0	28,872,074
17.	Uncollectibles	25,332	–	–
18.	CPUC Fees	–	–	–
19.	**Subtotal**	**3,043,702**	**44.0**	**133,896,063**
20.	Depreciation	1,825,129	–	–
21.	Decommissioning	–	–	–
22.	Taxes - Other Than Income	382,792.4937	30.52	11,683,411
23.	Taxes - Based on Income	143,393	102.4	14,681,797
24.	**Subtotal**	**2,351,315**	**11.2**	**26,365,208**
25.	**Total Operating Expenses**	**10,175,423**	**32.8**	**333,424,220**
26.	Average Days Lag in Collection of Revenues	45.0		
27.	Average Days Lag in Payment of Expenses	32.8		
28.	Excess Revenue Lag	12.2		
29.	Average Daily Expense	27,878		
30.	**Working Cash**	**341,292**		

Southern California Edison
2018 GRC
Appendix C | Working Cash
$ in Thousands

Appendix C | Working Cash		
Line	**Description**	**Total CPUC**
1.	**Operating Cash Requirement**	
2.	Cash	–
3.	Special Deposits	386
4.	Working Funds	116
5.	Prepayments	36,801
6.	Other Accounts Receivable	47,685
7.	Less:	
8.	Employees' Withoulding & Accrued Vacation	(69,369)
9.	Long-Term Incentive Plant	–
10.	Workers Compensation and Injuries & Damages Claims	(60,887)
11.	User Taxes	(28,043)
12.	Edison Smart Connect Adjustment	–
13.	**Total Operating Cash Requirement**	**(73,311)**
14.	Lead-Lag Working Cash Requirement	320,506
15.	**Total Cash Working Capital Requirement**	**247,194**

Southern California Edison
2018 GRC
Appendix C | Rate Base
$ in Thousands

Appendix C | Rate Base

Line	Description	CPUC	Rate Base Adjustment	Total CPUC
1.	**Fixed Capital**			
2.	Plant in Service	37,136,016		37,136,016
3.	Capitalized Software	1,077,124		1,077,124
4.	Other Intangibles	213,168		213,168
5.	**Total Fixed Capital**	**38,426,308**	**–**	**38,426,308**
6.	**Adjustments**			
7.	Customer Advances for Construction	(91,425)		(91,425)
8.	Customer Deposits	(208,711)		(208,711)
9.	**Total Adjustments**	**(300,136)**	**–**	**(300,136)**
10.	**Working Capital**			
11.	Materials & Supplies	213,142		213,142
12.	Mountainview Emissions Credits	4,861		4,861
13.	Working Cash	247,194		247,194
14.	**Total Working Capital**	**465,197**	**–**	**465,197**
15.	**Deductions for Reserves**			
16.	Accumulated Depreciation Reserve	(11,446,885)		(11,446,885)
17.	Accumulated Amortization	(612,403)		(612,403)
18.	Accumulated Deferred Taxes - Plant	(4,028,095)		(4,028,095)
19.	Accumulated Deferred Taxes - Capitalized Interest	–		–
20.	Accumulated Deferred Taxes - CIAC	121,374		121,374
21.	Accumulated Deferred Taxes - Vacation Accrual	14,407		14,407
22.	Unfunded Pension Reserve	(86,973)		(86,973)
23.	**Total Deductions for Reserves**	**(16,038,575)**	**–**	**(16,038,575)**
24.	Rate Base Adjustment		(287,700)	(287,700)
25.	**Rate Base**	**22,552,795**	**(287,700)**	**22,265,095**
26.	Depreciation & Amortization	1,571,266		1,571,266

(End of Appendix C)