

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

Application of San Diego Gas & Electric Company (U 902 M) for Authority, Among Other Things, to Increase Rates and Charges for Electric and Gas Service Effective on January 1, 2016.

Application No. 14-11-003  
(Filed November 14, 2014)

Application of Southern California Gas Company (U 904 G) for Authority to Update its Gas Revenue Requirement and Base Rates Effective on January 1, 2016.

Application No. 14-11-004  
(Filed November 14, 2014)

**SPENDING ACCOUNTABILITY REPORT OF  
SAN DIEGO GAS & ELECTRIC COMPANY (U 902 M) AND  
SOUTHERN CALIFORNIA GAS COMPANY'S (U 904 G)**

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GAS COMPANY

February 28, 2019

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Respectfully submitted,

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Southern California Gas Company and San Diego Gas & Electric Company  
2017 Interim Spending Accountability Report

February 28, 2019

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## 1. INTRODUCTION

In compliance with the letter from Energy Division (ED) Director, Edward Randolph, dated October 18, 2018 (ED Compliance Letter), Southern California Gas Company (SoCalGas) and San Diego Gas & Electric Company (SDG&E) (collectively, the Utilities) submit this Interim Spending Accountability Report comparing 2017 imputed authorized spending to actual spending (2017 Interim Report). This 2017 Interim Report covers spend authorized in the Test Year (TY) 2016 General Rate Case (GRC) cycle for activities that address safety, reliability, and/or maintenance, consistent with Public Utilities Code (P.U. Code) Section 591. This 2017 Interim Report is timely filed in accordance with the ED Compliance Letter and ED's December 11, 2018 e-mail granting the Utilities' extension request, which established a February 28, 2019 submission deadline.

### a. Background

On November 14, 2013, the California Public Utilities Commission (Commission) opened Rulemaking (R.) 13-11-006, *Order Instituting Rulemaking to Develop a Risk-Based Decision-Making Framework to Evaluate Safety and Reliability Improvements and Revise the Rate Case Plan for Energy Utilities* (the Risk OIR). The purpose of this rulemaking was to incorporate a risk-based decision-making framework into the Rate Case Plan (RCP) for the energy utilities' GRCs, in which utilities request funding for safety-related activities. In response to the Risk OIR, the Commission issued Decision (D.) 14-12-025 which ordered each of the large energy utilities, beginning February 1, 2015, to include thorough descriptions of the risk assessment and mitigation plans that they use in their GRCs in all future GRC applications. SoCalGas and SDG&E filed their respective TY 2016 GRC applications on November 14, 2014,<sup>1</sup> prior to the issuance of D.14-12-025. On July 1, 2016, the Commission issued D.16-06-054 addressing the Utilities' TY 2016 GRC and related matters. Although the Utilities filed their TY 2016 GRC prior to the issuance of D.14-12-025, D.16-06-054 ordered them to provide interim accountability reports on a limited set of risk mitigation projects for spending in the years 2014 through 2016. Pursuant to D.16-06-054 and D.17-01-012, the Utilities submitted their first

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<sup>1</sup> See Application (A.) 14-11-003/004 (cons.). On December 26, 2014, the two applications were consolidated.

interim spending accountability report for years 2014 and 2015 on June 30, 2017,<sup>2</sup> and on October 6, 2017 the Utilities submitted their second interim spending accountability report, which, among other things, updated the first report to include 2016 spend.<sup>3</sup>

ED reviewed the Utilities' interim reports pursuant to D.16-06-054 for years 2014 through 2016 and, to the extent consistent with its authority, found that the Utilities have followed the Commission orders noted above.<sup>4</sup> In addition, the ED Compliance Letter stated, "[t]he Energy Division directs the Utilities to each file an Interim Risk Spending Accountability Report for the 2017 reporting period by December 31, 2018."<sup>5</sup> ED further directed the Utilities to serve these reports on the service list of the TY 2016 GRC proceedings (A.14-11-003 et al.) and instructed them about what to include in the 2017 Interim Report.

Based on the ED Compliance Letter, the Utilities evaluated what was included in the scope of this 2017 Interim Report and what warranted variance explanations. The methodology SoCalGas and SDG&E used to determine what is in scope of this 2017 Interim Report is discussed in Section 1.c. below.

In this 2017 Interim Report, the Utilities include the following required information as directed in the ED Compliance Letter:<sup>6</sup>

- (1) a list of the workpapers<sup>7</sup> authorized or in effect during 2017 that were associated with a safety or reliability risk category as well as workpapers associated with a maintenance activity;
- (2) the authorized and actual spending for 2017 and the difference in dollars and in percent;
- (3) variance explanations for those workpapers that meet ED's criteria;

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<sup>2</sup> Investigation (I.) 16-10-015/016 (cons.), Compliance Filing of The Interim Spending Accountability Report of San Diego Gas & Electric Company and Southern California Gas Company (filed June 30, 2017).

<sup>3</sup> A.17-10-007/008 (cons.), Test Year 2019 General Rate Case Application (filed October 6, 2017) at Appendix A. *See also* A.17-10-007/008, SoCalGas/SDG&E Direct Testimony of Jamie K. York (Compliance) (October 6, 2017), Ex. SCG-45/SDG&E-44/York at Appendix C.

<sup>4</sup> ED Compliance Letter at 1-2.

<sup>5</sup> *Id.* at 2.

<sup>6</sup> *Id.* at 2-3.

<sup>7</sup> In the GRC, the Utilities include Operations and Maintenance (O&M) workpapers as well as Capital workpapers. O&M workpapers consist of one or more cost centers. Similarly, Capital workpapers are comprised of one or more budget codes. For purposes of this 2017 Interim Report, the Utilities are defining "program" as directed in the ED Compliance Letter as workpapers.

- (4) if a variance explanation is warranted, also provide:
  - a. a description of each workpaper,
  - b. location in the TY 2016 GRC where the workpaper is described,
  - c. location in the TY 2019 GRC where the workpaper is described,
  - d. a list of projects that were canceled or deferred within each workpaper
  - e. a list of projects which were not presented in the TY 2016 GRC but were taken up, and
  - f. if applicable, the regulatory account where the spending for each workpaper is recorded, the 2017 year-end balance, and the disposition of any cost recovery request; and
- (5) total company authorized spending for 2017 categorized into Operations & Maintenance (O&M) and capital workpapers.

ED's variance explanation criteria is as follows:<sup>8</sup>

- a. SDG&E – Electric:
  - i. Expense: A difference of at least \$5 million, or a percentage difference of at least 20% subject to a minimum difference of \$2.5 million.
  - ii. Capital: A difference of at least \$10 million, or a percentage difference of at least 20% subject to a minimum difference of \$5 million.
- b. SDG&E – Gas:
  - i. Expense: A difference of at least \$2.5 million, or a percentage difference of at least 20% subject to a minimum difference of \$0.5 million.
  - ii. Capital: A difference of at least \$5 million, or a percentage difference of at least 20% subject to a minimum difference of \$1 million.
- c. SoCal Gas:
  - i. Expense: A difference of at least \$5 million, or a percentage difference of at least 20% subject to a minimum difference of \$1 million.
  - ii. Capital: A difference of at least \$10 million, or a percentage difference of at least 20% subject to a minimum difference of \$2 million.
- d. SDG&E/SoCal Gas Shared:
  - i. Expense: A difference of at least \$5 million, or a percentage difference of at least 20% subject to a minimum difference of \$1 million.
  - ii. Capital: A difference of at least \$10 million, or a percentage difference of at least 20% subject to a minimum difference of \$2 million.

When developing this 2017 Interim Report, the Utilities met with ED on several occasions to discuss scope and content. The Utilities incorporated feedback and, thus the format and content provided herein is a product of those discussions. Given the expanded scope of the 2017 Interim Report as directed by the ED Compliance Letter to now include safety, reliability, and maintenance pursuant to P.U. Code § 591, the Utilities requested an extension of the original

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<sup>8</sup> ED Compliance Letter at 2-3.



December 31, 2018 deadline. On December 11, 2018, ED granted the Utilities' request for an extension to February 28, 2019.<sup>9</sup>

It is important to recognize that this 2017 Interim Report covers the TY 2016 GRC cycle, for which the Utilities filed applications before the risk-informed GRC framework was adopted, and during which the Utilities have undertaken the transitional process of implementing this framework. Accordingly, the 2017 Interim Report reflects a transitional time period and is in compliance with the above-noted directives. The 2017 Interim Report thus does not reflect the Utilities' comprehensive safety risk showing presented in their Risk Assessment and Mitigation Phase (RAMP) Report or the Utilities' respective TY 2019 GRC Applications, nor the framework under which the Utilities developed that showing. Accountability reporting subject to the new risk-informed GRC framework requirements for the Utilities are not anticipated to occur until 2020.<sup>10</sup>

**b. General Rate Case Cycles of the Utilities**

The Utilities file GRC applications with the Commission seeking authorization of a revenue requirement to recover the reasonable costs forecasted to incur in the test year,<sup>11</sup> and a mechanism for adjusting the revenue requirement annually during the post-test years,<sup>12</sup> for a total

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<sup>9</sup> E-mail from Mr. Michael Zelazo, Energy Division, dated December 11, 2018.

<sup>10</sup> D.14-12-025 states, at 46, that the accountability reports "shall report on the activities and spending the utility undertook during the GRC test year, and during each attrition year." D.14-12-025, at 47, also sets a timeline for submitting the annual accountability reports: "SoCalGas' [accountability] reports to be filed by July 31 after the applicable reporting period; and SDG&E's reports to be filed by September 30 after the applicable reporting period." Accordingly, the Utilities' first post-RAMP accountability reports will be submitted in 2020, after their 2019 GRC test years.

<sup>11</sup> A GRC follows the Commission's approved RCP, which outlines the required submittals, procedures, and deadlines associated with a GRC. The RCP utilizes a "base-year/test-year" approach to GRC ratemaking. Pursuant to the RCP, the GRC typically consists of testimony and workpapers justifying forecasted O&M and capital costs in a future period. The last recorded year available forms the "Base Year." The year for which the Commission is formally approving the revenue requirement, and when new rates are to take effect, is called the "Test Year." The Utilities' showing provides recorded amounts for the base year and annual forecasts as a means to get to the test year. The annual forecasts provided between the base year and test year are referred to as "Forecast Years."

<sup>12</sup> For years 2 and 3 of the GRC cycle (and an additional year 4 proposed in the Utilities' TY 2019 GRC filing), referred to as post-test years or attrition years, the Utilities also propose a post-test year mechanism. Ultimately, the GRC decision will prescribe how to adjust the test year revenue requirement for inflation and other factors that may affect costs, such as additional capital projects between test years.

GRC period that typically spans three years. A revenue requirement is the amount of money the Utilities are allowed to collect, or recover, from their customers through rates.<sup>13</sup>

The final outcome of a GRC is a Commission-approved test year revenue requirement comprised of O&M and capital-related funding for the forecast years that compound annually up to the test-year. Additionally, a post-test year mechanism is approved generally for escalation on the test-year revenue requirement. These approvals may or may not be the same as originally presented by the Utilities.

To illustrate the GRC cycles, the diagram below demonstrates the Utilities' last two GRC cycles as well as the Utilities' TY 2019 GRC application filed on October 6, 2017.

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<sup>13</sup> Generally, the Utilities' GRCs are presented in direct, base year dollars and converted into a test year revenue requirement using a ratemaking model, the Results of Operation (RO) model. The process by which the RO model converts the direct, base year dollars into a test year revenue requirement includes the escalation of costs (converting base year dollars into test year nominal dollars), intercompany billings between the Utilities, applying overheads (such as benefits) to capital projects, and converting the capital forecasts into capital-related costs (depreciation, taxes, and return).

**Diagram 1: GRC Cycles of SoCalGas and SDG&E<sup>14, 15</sup>**

<b>2012 GRC Proceeding</b>					
Base Year	2009				
Forecast Year	2010				
Forecast Year	2011				
<b>Test Year</b>	<b>2012</b>	<b>2016 GRC Proceeding</b>			
Post-Test Year	2013	Base Year	2013		
Post-Test Year	2014	Forecast Year	2014		
Post-Test Year	2015	Forecast Year	2015	<b>2019 GRC Proceeding</b>	
		<b>Test Year</b>	<b>2016</b>	Base Year	2016
		Post-Test Year	2017	Forecast Year	2017
		Post-Test Year	2018	Forecast Year	2018
				<b>Test Year</b>	<b>2019</b>
				Post-Test Year	2020
				Post-Test Year	2021
				Post-Test Year	2022

As noted above, this Interim Report compares 2017 imputed authorized to actual spending. Diagram 1 illustrates that 2017 figures were authorized by the Commission during the TY 2016 GRC proceeding in D.16-06-054 through the approval post-test year ratemaking mechanism. However, 2017 amounts were also forecasted in the TY 2019 GRC proceeding as a means to develop the Utilities’ test year request.

Further, the Utilities are presenting this 2017 Interim Report in direct dollars. Direct dollars are the input into the revenue requirement, but are not the revenue requirement itself, which is authorized in a GRC decision. In addition to direct dollars, the Utilities also present their balanced programs in this report (*e.g.*, Transmission Integrity Management Program

<sup>14</sup> The Utilities are proposing a four-year term (2019-2022) for the TY 2019 GRC cycle, which would result in the next test year to be 2023. *See* A.17-10-008, The Second Revised Direct Testimony of Jawaad A. Malik (Post-Test Year Ratemaking) (April 6, 2018), Ex. SCG-44-2R/Malik at 1; *see also* A.17-10-007, The Second Revised Direct Testimony of Kenneth J. Deremer (Post-Test Year Ratemaking) (April 6, 2018), Ex. SDG&E-43-2R/Deremer at 1.

<sup>15</sup> Exhibit references herein refer to utility exhibit numbers as listed on their respective websites.

(TIMP), Distribution Integrity Management Program (DIMP), and Storage Integrity Management Program (SIMP)) on a revenue requirement basis, because the Utilities report on and manage to the authorized revenue requirement levels, not the direct spending. At ED's request, the Utilities are presenting the balanced programs herein in both direct dollars and on the regulatory account basis.

**c. Determination of safety, reliability and maintenance-related programs**

Senate Bill (SB) 549<sup>16</sup> became effective on January 1, 2018 and added P.U. Code 591 which requires “an electrical or gas corporation to annually notify the commission . . . of each time since that notification was last provided that capital or expense revenue authorized by the commission for maintenance, safety, or reliability was redirected by the electrical or gas corporation to other purposes.”<sup>17</sup>

This 2017 Interim Spending Report includes a listing of all programs<sup>18</sup> authorized or in effect during 2017 that were associated with a safety or reliability risk category<sup>19</sup> as well as programs associated with a maintenance<sup>20</sup> activity. Therefore, in-scope workpapers for SDG&E include electric distribution, electric generation, electric & fuel procurement, gas distribution, gas transmission, customer services, information technology including cyber security, support services, administrative & general, and SDG&E's balanced programs including the DIMP, TIMP, Tree Trimming Program and SDG&E's New Environmental Regulatory Balancing Account (NERBA).

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<sup>16</sup> SB 549, Stats. 2017-2018, Ch. 284 (Cal. 2017).

<sup>17</sup> P.U. Code § 591(a).

<sup>18</sup> Programs are defined as workpaper categories for expense items (e.g. 1ED011.000 – Electric Regional Operations) and as budget codes for capital expenditures (e.g. 13247 FiRM – Phases 1 & 2). *See* ED Compliance Letter at 2, n. 2.

<sup>19</sup> Categories include, but are not limited to: (1) Infrastructure Integrity, Physical Security and Environmental; (2) Cyber Security and Customer Data Privacy; (3) Wildfires; (4) System Reliability; and (5) Public & Employee Safety, Disaster Recovery. *Id.* at 2, n. 3.

<sup>20</sup> *Id.* at 2, n. 4. These are activities associated with expensed and capitalized work related to Federal Energy Regulatory Commission Accounts 510-515, 528-532, 541-545, 551-554, 568-574, 576, 590-598, 830-837, 843, 861-869, 885-895, 932 and 935.

Similarly, in-scope workpapers for this 2017 Interim Spending Report for SoCalGas include gas distribution, gas transmission, gas storage, gas procurement, customer services, information technology including cyber security, support services, administrative & general, and SoCalGas’ balanced programs including DIMP, TIMP, SIMP, Research, Development and Demonstration (RD&D) and SoCalGas’ NERBA.

**d. Derivation of Authorized Dollars**

	<b>2017 Imputed Authorized Total Direct O&amp;M<sup>21</sup></b>	<b>2017 Imputed Authorized Total Direct Capital</b>	<b>2017 Authorized Total Rev Req<sup>22</sup></b>
<b>SoCalGas</b>	1,314,099	699,754	2,277,999

	<b>2017 Imputed Authorized Direct O&amp;M<sup>23</sup></b>	<b>2017 Imputed Authorized Direct Capital</b>	<b>2017 Authorized Total Rev Req<sup>24</sup></b>
<b>SDG&amp;E</b>	934,910	621,392	1,852,839

For the majority of the workpaper categories covered in Attachments A and B of this report, the “authorized” amounts are imputed authorized funding values for those workpapers

<sup>21</sup> In developing this report, the Utilities discovered an error in the source file calculations adopted in the RO model from D.16-06-054 and D.16-09-043, specifically in the summary of the escalation of shared service workpapers from 2013 dollars to 2016 dollars. This error has no impact on the revenue requirement. However, it does impact the computation to derive the 2017 imputed authorized for shared service workpapers. SoCalGas’ corrected 2017 imputed authorized total direct O&M is \$1,312,167 instead of \$1,314,099, a difference of \$1,932. The tables presented herein do not reflect these corrected amounts, but rather are denoted with footnotes.

<sup>22</sup> AL 4990 and AL 5075. The 2017 authorized revenue requirement (Rev Req) is computed by taking the authorized base margin and miscellaneous revenue from D.16-06-054 plus the attrition increase, which is calculated by applying the approved factor of 3.5% to the TY 2016 base margin.

<sup>23</sup> For the reason stated in footnote 21, SDG&E’s corrected 2017 imputed authorized total direct O&M is \$931,439 instead of \$934,910, a difference of \$3,471. The tables presented herein do not reflect these corrected amounts, but rather are denoted with footnotes.

<sup>24</sup> AL 2917-E/AL 2490-G, AL 2917-E-B/AL 2490-G-B, AL 2544-G, AL 3028-E, and AL 2989-E. The 2017 authorized Rev Req is computed by taking the authorized base margin and miscellaneous revenue from D.16-06-054 / D.16-09-043 plus the attrition increase, which is calculated by applying the approved factor of 3.5% to the TY 2016 base margin.

that are fully or partially devoted to addressing safety, reliability, and/or maintenance risks.<sup>25</sup> In the GRC, after the test year revenue requirement has been established, the attrition year revenue requirement is based on an approved post-test year mechanism, which is applied to the total base margin. D.16-06-054 and D.16-09-043 authorized the TY 2016 revenue requirement for the Utilities with attrition increases of 3.5% for 2017 and 2018.<sup>26</sup> To derive the 2017 imputed authorized O&M, 2016 adopted expenses, which were presented in BY 2013 dollars, were escalated to 2016 dollars based on the adopted labor and non-labor escalation rates.<sup>27</sup> The authorized 3.5% attrition factor was then applied to this expense level to derive the 2017 imputed authorized O&M.

In the TY 2016 GRC, specific capital project forecasts were approved for assets forecasted to be placed in-service in years 2014-2016 to establish the test-year rate base and the capital-related revenue requirement (*i.e.* depreciation, tax, and return) for TY 2016. The post-test year revenue requirement increases are then calculated by applying a 3.5% factor to the total base margin component of the revenue requirement. As such, there are no explicitly authorized capital expenditures, by project/workpaper, in the post-test years for the TY 2016 GRC. For the purposes of this report, the Utilities imputed a proxy value for 2017 authorized capital expenditures by taking a three-year average of the escalated capital spending for the years 2014 through 2016 and then applying the authorized attrition increase to this amount. The Utilities believe this is the most reasonable methodology to derive the authorized figures for capital expenditures because it normalizes the direct capital spending assumptions from the forecast years.

For the balanced programs, in addition to expressing these programs on a direct dollar basis, this report presents O&M and capital in revenue requirement terms because the programs are tracked on a revenue requirement basis, as required by the annual advice letter filings. Reviewing balanced programs in these terms, rather than in nominal direct dollars, reflects more

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<sup>25</sup> The Commission-approved final GRC decisions do not always provide authorized figures by project or activity, which may be needed for accountability reporting.

<sup>26</sup> D.16-06-054 at 229 and 282.

<sup>27</sup> The Utilities presented the O&M expenses in direct nominal dollars (*i.e.*, 2017 authorized is in 2017 dollars). The authorized escalation factors used to calculate the direct nominal dollars were approved in D.16-06-054 and discussed on pages 160-161 (SDG&E) and 269-270 (SoCalGas).

accurately how the Utilities manage these programs and track costs. The Utilities attempt to manage balanced programs within the authorized revenue requirement for the entire GRC cycle and not within an individual spending year. While O&M and capital spend, including the timing of capital becoming rate base, are building blocks in creating an authorized revenue requirement, it is the authorized revenue requirement itself that Utilities are measured against financially. Further, and as described above, GRCs establish and authorize test year revenue requirements to which an attrition year mechanism or escalator is applied to build attrition year revenue requirements.

## 2. SUMMARY OF REPORT FINDINGS BY COMPANY

### Non-Balanced Reportable Totals for SDG&E

	2017 Actuals	2017 Imputed Authorized <sup>28</sup>	\$ Variance	% Variance
SDG&E Direct Capital	676,943	550,052	126,890	23%
SDG&E Direct O&M	403,823	493,881	(90,058)	-18%
<b>SDG&amp;E Direct Total</b>	<b>1,080,766</b>	<b>1,043,933</b>	<b>36,832</b>	<b>4%</b>

### Non-Balanced Reportable Totals for SoCalGas

	2017 Actuals	2017 Imputed Authorized <sup>29</sup>	\$ Variance	% Variance
SoCalGas Direct Capital	678,319	561,131	117,189	21%
SoCalGas Direct O&M	585,415	677,057	(91,641)	-14%
<b>SoCalGas Direct Total</b>	<b>1,263,735</b>	<b>1,238,188</b>	<b>25,547</b>	<b>2%</b>

## 3. OVERVIEW OF 2017 INTERIM SPENDING ACCOUNTABILITY REPORT

The 2017 Interim Report provides summary explanations of variances between actual and imputed authorized spending derived from SoCalGas and SDG&E's 2016 GRC (2016 GRC).

While the 2017 Interim Report provides simple and accessible overviews of the variances, some variance explanations cannot tell the whole story. Certain underlying themes and issues run

<sup>28</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, SDG&E's corrected direct O&M is \$491,536 instead of \$493,881, a difference of \$2,345.

<sup>29</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, SoCalGas' corrected direct O&M is \$676,524 instead of \$677,057, a difference of \$533.

throughout many of these variance explanations. As such, SoCalGas and SDG&E provide this overview for the 2017 Interim Report to expand on some of the variances between their 2017 direct recorded expenditures and the 2017 imputed authorized direct expenses from the 2016 GRC, in those instances where further detail will provide greater insight and understanding to the Commission.

In this overview, SoCalGas and SDG&E expand on four particular themes and topics from the 2017 Interim Report. First, safety is a foremost consideration at SoCalGas and SDG&E. Safety is a major factor in any operational decision, and the decisions leading to the variances discussed in the 2017 Interim Report often enhanced overall programmatic safety. In addition, SoCalGas and SDG&E demand compliance from all employees with our many regulatory requirements, including those concerning safety, reliability and maintenance.

Second, California's method of ratemaking encourages certain decision-making which can lead to variances. Specifically, the Commission authorizes forecasts to set rates on a prospective basis.<sup>30</sup> While an unregulated company can react to cost changes closer to real time, subject to market forces, utilities instead must rely on prospective rates set forth via regulatory proceedings to establish and prove their forecasted business costs. Because of this, variances occur based on reprioritizations, regulatory changes, continuous learning, and the actions of third-parties. This issue is reflected in many variances, but is an important overarching factor in many decisions, whether expressed or not. In addition, prospective ratemaking encourages efficient and long-term management solutions over short-term or ongoing remedies and, as discussed below, inevitably leads to variances from forecasts.

Third, programs with variances based on changes in labor can be challenging to fully capture. Retirements, re-prioritizations, talent searches, and the need for appropriate training and qualifications can all impact recorded labor costs. While SoCalGas and SDG&E work to factor such changes into their GRCs, several variances noted in this 2017 Interim Report reflect the ongoing and unpredictable nature of people movement.

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<sup>30</sup> See, e.g., *Cal. Pub. Util. Comm'n v. FERC*, 894 F.2d 1372, 1383 (D.C. Cir. 1990) (noting, "The rule against retroactive ratemaking ... tends to make this highly regulated market approximate ordinary ones, where, for example, General Motors may not, after a sale, demand another \$500 to cover its costs, and a buyer may not demand a refund because he just discovered that a competitor had been offering similar cars for less. The doctrine is, of course, a two-way street.").



Fourth, and finally, with respect to certain operating units and programs, the Utilities provide additional discussion here because they touch on issues that do not lend themselves well to concise variance descriptions. For example, SoCalGas's IT operating group was substantially impacted by IT outages, requiring enhanced spending on capital that was not anticipated in the original forecasts or authorized levels. SDG&E's IT operating group had the same issue and had to undertake substantial unanticipated compliance expenditures related to customer care. SDG&E's Gas Distribution group exceeded authorized for both O&M and capital, mostly as a result of higher costs from increased third-party work resulting from improving economic conditions, increases in leak detection, reprioritizations to upgrade aging infrastructure, and other changes. SoCalGas' Gas Distribution operating group experienced an overall negative variance related to labor, but at the same time capital spending exceeded authorized because of replacement work associated with leaks, prioritized service replacements, and a concerted effort to replace segments of pipe found to be relatively poor performing. Advanced Meter Infrastructure (AMI) also had a profound impact on variances for SoCalGas. SoCalGas' TY 2016 GRC forecasts did not reflect the net benefits realized from AMI implementation, and AMI resulted in a decrease to customer service and meter reading costs.

SoCalGas and SDG&E provide the following variance explanations with additional detail to aid the Commission on the variances included herein.

**a. Safety**

The safety of customers and employees is paramount to SoCalGas and SDG&E. It is the concern for improving safety that motivated many of the decisions underlying the variances included in the 2017 Interim Report. The variances are thus replete with such decisions. For example, SDG&E's Electric Distribution Construction Services incurred lower than forecasted O&M expenses resulting from a change in scope related to the Fire Risk Mitigation (FiRM) program, which resulted in a shift from O&M to capital related activities to mitigate risk (reflected in the Safety & Risk Management group of capital activities being higher than authorized). The replacement of conductors with relatively high failure rates, which is primarily a capital expenditure became the highest priority. As a second example, SoCalGas opted for solutions where gas infrastructure was replaced instead of being repaired. The *Replacements* budget code in SoCalGas' Gas Transmission operating group is one budget code where this occurred. Over the last few years, SoCalGas increased its leak detection and remediation efforts

to enhance safety and to comply with General Order (GO) 112-F and SB 1371. SoCalGas diversified its leak detection technology by including aerial leak detection. These enhancements were designed to mitigate more leaks and safety risks through the replacement of pipe which lead to higher capital and reduced O&M expenditures. SoCalGas and SDG&E have been mindful of safety in conducting their businesses, regardless of whether safety is explicitly mentioned in each variance below.

**b. Variances Resulting from Forecast Methodology**

Many variances outlined in the 2017 Interim Report are the result of aspects inherent in the use of a forecasted test year methodology. The methodology has been in place in California for several decades, and under it, utilities are allowed to reprioritize as needed. In addition, variances occur because of changes between GRC Applications, and based on the actions (and inaction) of third parties. Other times, projects are performed earlier or later in a cycle, resulting in the appearance of variances.

California utilities use a forecasted test year methodology for their GRCs, which provides the Commission with a “snapshot in time” of all of the utility’s forecasted test year expenses, for every aspect of the business, as well as forecasted capital costs and post-test-year expenses, over a three-year period. Through the course of the 3-year cycle, SoCalGas and SDG&E are faced with changing conditions, new opportunities to improve operations, changes in the regulatory landscape, and varying needs of third parties which can drive the utilities to reallocate resources. This is particularly the case where forecasts are created two years in advance of the test year – meaning the 2016 forecasts which were escalated to 2017 levels were likely created around 2014, ahead of when the Utilities filed their respective GRC Applications. This can be true for forecasts involving capital spending, where forecasts may include specific projects. Naturally, if a project is forecasted and constructed in 2016, that project is unlikely to recur in 2017. It is for these reasons that “utilit[ies] [are] allowed the flexibility to reprioritize the authorized funds in order to ensure safe and reliable operations.”<sup>31</sup> The Commission has explicitly recognized that

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<sup>31</sup> Energy Division, Safety-Related Spending Accountability Report for Southern California Edison (May 2017) at 10, *available at* [http://www.cpuc.ca.gov/uploadedFiles/CPUC\\_Public\\_Website/Content/Safety/SCESafety-RelatedSpending.pdf](http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Safety/SCESafety-RelatedSpending.pdf) (Safety Report); *see also* Resolution E-4464 (May 10, 2012) at 7 (“Under GRC ratemaking, the utilities are given an authorized revenue requirement to manage various parts of their utility business. Recognizing that the utilities may need to re-prioritize spending and spend more or less

“new programs or projects may come up, others may be cancelled, and there may be reprioritization. *This process is expected and is necessary* for the utility to manage its operations in a safe and reliable manner.”<sup>32</sup> And, the Commission recognizes that utilities are incentivized to operate efficiently.<sup>33</sup> Accordingly, in light of the right to prioritize as the companies’ deem prudent, SoCalGas and SDG&E are allowed to re-prioritize spending as needed between O&M and capital. Both companies managed their spending to their overall allocation, as permitted by Commission authority.

Because of the cyclical nature of ratemaking, a number of variances included herein were caused at least in part by changes during a cycle. For example, there can be changes to state or federal regulations over the three-year cycle which necessitate changes. In the SoCalGas programs *Wells* and *Pipelines* in Underground Storage Capital, there is a reference to new regulations from the Division of Oil, Gas, and Geothermal Resources (DOGGR), which required compliance by SoCalGas. One draft regulation was released in July of 2016, requiring a primary and secondary well barrier construction, and SoCalGas began proactively implementing changes to meet the regulation requirements before they were approved in June of 2018.<sup>34</sup> Adjusting to these requirements created additional necessary capital costs for SoCalGas. Similarly, SDG&E and SoCalGas’ GRC presentation may also have unintended consequences due to workpapers consisting of cost centers<sup>35</sup> as well as accounting for shared services and direct billing that may be impacted by organizational changes throughout the GRC cycle.

Actions by third-parties over the course of the GRC cycle can also affect expenditures. SDG&E’s *Pipe Relocations – Franchise and Freeway* experienced higher than anticipated costs.

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in a particular area of their business, the Commission affords them substantial flexibility to decide how much to spend in any particular area.”).

<sup>32</sup> D.11-05-018 at 27 (emphasis added).

<sup>33</sup> Safety Report at 3 (noting that “Utilities have an incentive to spend less than their expensed spending budget, because any unspent expense boosts the company’s net income by that amount.”).

<sup>34</sup> On July 8, 2016, the Department of Conservation publicly released pre-rulemaking draft regulations for the Gas Storage Program in the Division of Oil, Gas, and Geothermal Regulations (DOGGR) that included a requirement for a primary and secondary well barrier construction in the California Code of Regulations Section 1726.5(a)(1). This regulation was approved by the Office of Administrative Law (OAL) on June 28, 2018 and made effective as of October 1, 2018.

<sup>35</sup> SDG&E and SoCalGas were ordered to file their GRCs by cost center in D.08-07-046 Ordering Paragraph (OP) 22 at 106.

Those costs were a result of an increase in relocations requested by the state, city and municipal agencies. When there are stronger economic conditions, cities tend to engage in more infrastructure improvements. As the economy continued to improve in 2016 and 2017, more cities engaged in public projects, which, as a result, led to more third-party requests to SDG&E to relocate pipes to allow those projects to move forward.

The forecast structure also creates situations where a variance might appear because work was completed in a prior year or is planned (or delayed) for a future year. Perhaps the clearest examples of this are in the *SDG&E Electric Distribution Capital* operating group. Within that group there was only an overall variance of -3%. However, there are numerous specific workpapers that show a variance of plus or minus 100%. Although many of these do not meet the variance threshold, the numbers paint an unusual picture without the knowledge that many of the line items were completed in previous years or are planned for future years.

Ultimately, the forecasted test-year methodology requires utilities to reprioritize throughout GRC cycles. Many variances included herein are driven, at least in part, by the pressures created by this aspect of managing a utility in California.

**c. Labor**

Labor costs and challenges underlie several decreased O&M expenses. For any particular instance where labor is a contributing factor to a variance, it is usually a combination of causes which lead to the decrease of an expense. Employees can unexpectedly retire, move to other positions within the companies, or move to other employment opportunities outside of the companies. Replacing employees is generally not a simple task. It takes time to find a new employee, especially where unique qualifications are sought such as highly skilled pipeline and electrical system workers. Finally, fewer employees might be needed in certain areas because of technological improvements or because new tools are provided which assist tasks such as the elimination of most manual meter reading activities due to the implementation of the AMI. While all of these labor issues do not occur for every project where there is a negative variance in O&M expenses, they are often a factor, even where they might not be significant enough to be mentioned in a variance explanation.

**i. Particular Operating Units and Groups of Programs**

In addition to the foregoing broader issues, several operating units are worth discussing separate from their variance descriptions. These groups demonstrate how solely looking at the numbers and variances might not capture the entire picture for why money was reprioritized.

**ii. SDG&E and SoCalGas IT**

The IT systems of the two companies experienced changes in 2017 which led to broad unanticipated variances. Originally, some funds were re-prioritized from IT O&M to fund higher priority initiatives. However, in April of 2017 there was a multiple-day system outage.<sup>36</sup> The outage affected virtually all IT systems (customer experience, field operations, etc.). Following this outage (and others in 2017), both SDG&E and SoCalGas reassessed IT system capabilities and determined to again prioritize IT by increasing O&M and substantially increasing capital to improve system reliability.

While these substantial changes were ongoing, SDG&E also had to build out changes driven by regulations and several customer authorization projects that were not anticipated. Assembly Bill 802, for example, required SDG&E and other utilities to build out interfaces to allow larger businesses to access and understand their energy usage. Another example of this was the shift to SAP Enterprise Central Component from Oracle to High-Performance Analytic Appliance (HANA). SAP is the system of record for gas and electric distribution planning as well as construction, maintenance and inspections for SDG&E and SoCalGas. The SAP system began to experience longer processing times and system performance challenges due to significant growth in volume and implementation of new initiatives. Investment in the SAP HANA project mitigated degraded application performance and reduced the risk of system failures.

All of these broader changes in IT contributed to the variances shown herein.

**iii. Gas Distribution**

The Gas Distribution operating groups at both companies experienced notable variances that resulted from broader drivers. For SDG&E, some of the overarching O&M increases

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<sup>36</sup> A.17-10-007, Revised SDG&E Direct Testimony of Christopher R. Olmsted (Information Technology) (December 2017), Ex. SDG&E-24-R/Olmsted at CRO-6:11 – CRO-7:4; A.17-10-008, SoCalGas Direct Testimony of Christopher R. Olmsted (Information Technology) (October 6, 2017), Ex. SCG-26/Olmsted at CRO-7:1-16.

presumably were driven by economic expansion in the area. As discussed above, such economic drivers can lead to increased work for utilities. For example, there was an increase in requests to Locate & Mark as additional digging occurred and required pipelines to be marked for new construction and infrastructure work. Similarly, pipeline maintenance increased for that same reason – as new housing developments, landscaping, renovations, replacing aging technology infrastructure, and other work grew, so did the amount of excavation damage to gas infrastructure that occurred during such work mainly related to third-party damages where a request for a Locate & Mark was not made by third-party excavators. These factors, coupled with increasing leak repair costs of relatively poor performing steel and plastic pipe accounted for much of the increased O&M work. On the capital side, there were unanticipated costs related to improvements for safety. There was extensive work upgrading aging infrastructure. The need for cathodic protection anode bed renewals and new installations to maintain protection for the steel pipeline system were higher than forecasted. In addition, SDG&E spent more than forecasted due to a system-wide project to provide cathodic protection to stranded steel pipeline segments. More leaks were detected that required more extensive remediation, leading to increased work. Regulator station improvements were needed for older equipment to meet compliance requirements and provide a safer working space.

The SoCalGas Gas Distribution operating group experienced an overall negative variance in O&M expenses at the same time as capital expenditures exceeded authorized. The lower O&M levels were largely the result of labor challenges and efficiencies. At the same time, SoCalGas prioritized certain risk mitigation work which had higher capital costs. SoCalGas engaged in an increase in replacement work in lieu of repairs in certain instances. On the whole, these factors accounted for some of the differences depicted in variances herein between O&M and capital for the SoCalGas Gas Distribution group.

#### **iv. SoCalGas AMI**

The SoCalGas AMI project had an impact on many variances because it broadly affected so many areas within the company. Field and meter reading, Customer Contact Center, and human resource were all impacted directly by the implementation of AMI. As described in the

TY 2016 GRC testimony of Mr. Rene Garcia,<sup>37</sup> the SoCalGas forecasts presented business operations, processes, and practices without AMI deployment (*i.e.* “business as usual”). Each GRC witness impacted by AMI deployment put forth testimony excluding operational costs and anticipated benefits as presented in SoCalGas’ separate AMI Application (A.08-09-023), approved in D.10-04-027. Hence, TY 2016 GRC forecasts assumed continuing operations without AMI in all impacted business areas. O&M benefits achieved or attributed to AMI, as defined in the benefit per meter mechanism authorized in D.10-04-027 and established in SoCalGas’ AL 4110, have been included in AMI revenue requirements and were therefore excluded from TY 2016 GRC estimated expenses.

Simply put, the AMI regulatory account is responsible for all costs and benefits through 2017. As a result, the 2017 Imputed Authorized dollar amounts in this report do not reflect the net benefits attributed to AMI implementation whereas the 2017 Recorded Actuals do reflect those net benefits.

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<sup>37</sup> A.14-11-004, Direct Testimony of Rene F. Garcia (Advanced Metering Infrastructure Policy) (July 2014), Ex. SCG-39/Garcia at RFG-1:5-17.

**ATTACHMENT A – SDG&E’s 2017 INTERIM SPENDING ACCOUNTABILITY REPORT**



**1. SDG&E Electric**

**a. SDG&E Electric Distribution**

**i. SDG&E Electric Distribution O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Electric Distribution	92,494	112,011	(19,517)	-17%	
Major Projects	373	157	216	138%	
Reliability & Capacity	254	672	(418)	-62%	
Construction Services	6,042	17,077	(11,036)	-65%	Yes
Distribution Ops EGIM	1,313	2,182	(869)	-40%	
Electric Distribution Operations	14,912	15,134	(222)	-1%	
Kearny Operations Services	1,275	2,104	(830)	-39%	
Grid Operations	729	164	565	345%	
Project Management	842	886	(44)	-5%	
Electric Regional Operations	36,083	38,916	(2,833)	-7%	
Skills & Compliance Training	2,870	4,406	(1,537)	-35%	
Service Order Team (SOT)	195	761	(567)	-74%	
Substation C&O	3,680	7,360	(3,681)	-50%	Yes
System Protection	1,653	1,879	(226)	-12%	
Distribution and Engineering	2,463	1,654	808	49%	
Asset Management	189	0	189	100%	
Troubleshooting	7,294	8,841	(1,546)	-17%	
Vegetation Management (Pole Brushing)	3,271	4,585	(1,315)	-29%	
Technology Utilization	933	1,648	(715)	-43%	
Compliance & Asset Management	2,706	2,917	(211)	-7%	
Tech Solutions & Reliability	2,478		2,478	100%	
Emergency Management	2,942	666	2,275	341%	

**ii. SDG&E Electric Distribution O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Construction Services	Lower than forecasted expenses due to a change in scope related to the Fire Risk Mitigation (FiRM) program and thus resulted in a shift from O&M to capital related activities. To mitigate risk, the replacement of conductors with relatively high failure rates, which is primarily a capital expenditure became the highest priority.		
Substation C&O	Lower than forecasted maintenance and repair of substations. The annual cost to maintain substations is variable and influenced by the results of visual inspections and preventative diagnostic testing. Some preventative maintenance activities are dependent on time-based maintenance cycles that vary from year to year.		

iii. **SDG&E Electric Distribution O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Electric Distribution	Construction Services	1ED002.000	<p>Construction Services provides oversight of all construction performed by Contractors on Electric Distribution. This is to ensure that all work is built to SDG&amp;E Safety Standards and in accordance with current contracts following General Order (G.O.) 95 and 128 codes. The O&amp;M portion of the work conducted by Construction Services; locating services; streetlight maintenance; graffiti abatement; and transformer installs/removals and O&amp;M associated with capital construction. The Contracting group is responsible for all jobs administered by Construction Services. This includes the management of all job packages, such as data management, permit verification, environmental releases, purchase orders and negotiation of start and end dates. Additionally, the group interfaces with Supply Management to aid in processing jobs that meet the criteria and constitute bid work therefore requiring request for proposals. Construction Services also oversees the Aviation Services function within SDG&amp;E. Additionally, Construction Services also includes the group that is responsible for fire coordination and prevention.</p>	SDG&E-10 JTW-47 to JTW-50	SDG&E-15-2R WHS-9 to WHS-12, WHS-53 to WHS-55

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Electric Distribution	Substation Construction and Operations (C&O)	1ED015.000	The Substation Construction & Maintenance and associated support organizations are responsible for the installation and maintenance of 140 distribution substations on the SDG&E system. This section also installs and maintains the control functions of approximately 1,300 overhead and underground distribution field devices. Compliance with SDG&E maintenance programs, CPUC and other regulatory programs, and health and safety programs critical to the safe and efficient installation, maintenance and reliability of all distribution electrical facilities is managed and implemented within the Substation Construction and Maintenance section.	SDG&E-10 JTW-34 to JTW-37	SDG&E-15-2R WHS-9 to WHS-12, WHS-53 to WHS-55

**iv. SDG&E Electric Distribution Capital Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Electric Distribution	416,931	429,396	(12,465)	-3%	
Capacity/Expansion	21,654	24,869	(3,215)	-13%	
C100, OT: 12kV Circuit Extension	1,070		1,070	100%	
C1023 LI New 12kV Circuit & Reconductor C354	2,363		2,363	100%	
C1049, CSW: New 12kV Circuit		837	(837)	-100%	
C108, B: 12 kV Circuit Reconfiguration		134	(134)	-100%	
C1090, JM: New 12kV Circuit		5,278	(5,278)	-100%	Yes
C1120, BQ: New 12kV Circuit		1,099	(1,099)	-100%	
C1161 BD - New 12kV Circuit	52	476	(424)	-89%	

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
C1243, RMV: Reconductor		486	(486)	-100%	
C1243, RMV: OL-REC. Along Ortega Hwy, PH2	9		9	100%	
C1259, MAR: New 12kV Circuit	164		164	100%	
C1282 LC - New Circuit		8	(8)	-100%	
C1288, MSH: New 12kV Circuit		329	(329)	-100%	
C1440 Grant Hill New 12kV Circuit	959		959	100%	
C176 PO: Reconductor		238	(238)	-100%	
C350, LI: Reconductor & Voltage Regulation		188	(188)	-100%	
C917, CC: New 12kV Circuit	933	537	395	74%	
Camp Pendleton 12kV Service	2	60	(59)	-98%	
Distribution System Capacity Improvement	1,507	2,199	(692)	-31%	
Field Shunt Capacitors	918	592	326	55%	
GH New 12kV Circuit		587	(587)	-100%	
GRID/BW Description Dist Integrity Management	10		10	100%	
Increase Granite Sub 5 Circuits Ampacity	103		103	100%	
Jamacha-New 12kV CKT. 1090	359		359	100%	
Middletown 4kV Substation RFS		264	(264)	-100%	
Mira Sorrento 138/12KV Substation		2,393	(2,393)	-100%	
Ocean Ranch 69/12KV Substation	3,298		3,298	100%	
Poseidon - Cannon Substation Modification		3,710	(3,710)	-100%	
Reactive Small Capital Projects	899	2,008	(1,110)	-55%	
Salt Creek Substation & New Circuits	8,140	1,554	6,586	424%	Yes
San Ysidro- New 12kv Circuit 1202		270	(270)	-100%	
Station C - Remove from service	4		4	100%	
Substation 12kV Capacitor Upgrades	8	1,621	(1,613)	-100%	
Substation Security Proj Under \$500K	23		23	100%	
Wabash Canyon Sub 60/12kV Bank 32	835		835	100%	

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
DER Integration	4		4	100%	
Smart Transformers	4		4	100%	
Equip/Tools/Misc	8,293	1,115	7,178	644%	
Electric Distribution Tools/Equipment	8,293	1,115	7,178	644%	Yes
Franchise	14,730	28,714	(13,984)	-49%	
City of San Diego Surcharge Prog (20SD)	11,753	22,747	(10,994)	-48%	Yes
Electric Dist. Street/Hwy Relocations	2,977	5,966	(2,989)	-50%	
Mandated	29,198	39,147	(9,948)	-25%	
Avian Protection	(16)	1,713	(1,730)	-101%	
CMP UG Switch Replacement & Manhole Repair	4,972	10,975	(6,002)	-55%	Yes
Corrective Maintenance Program (CMP)	11,698	9,698	2,001	21%	
Distributed Generation Interconnect. Pro	15		15	100%	
Pole Replacement and Reinforcement	12,194	16,007	(3,814)	-24%	
Replacement of Live Front Equipment	335	754	(419)	-56%	
Materials	15,645	21,045	(5,400)	-26%	
Transformers	15,645	21,045	(5,400)	-26%	Yes
New Business	47,826	59,216	(11,390)	-19%	
Customer Requested Upgrades and Services	12,605	14,287	(1,681)	-12%	
Electric Distribution Easements	1,464	2,262	(798)	-35%	
Electric Meters & Regulators	3,025	2,326	699	30%	
New Business Infrastructure	8,113	12,828	(4,715)	-37%	
New Service Installations	5,195	6,291	(1,096)	-17%	
OH Non-Residential NB	648	685	(37)	-5%	
OH Residential NB	638	713	(75)	-10%	
Sustainable Community Energy Systems		409	(409)	-100%	
Transformer & Meter Installations	3,024	6,250	(3,226)	-52%	
UG Non-Residential NB	4,248	5,383	(1,135)	-21%	

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
UG Residential NB	8,866	7,782	1,085	14%	
Overhead Pools	87,348	106,356	(19,008)	-18%	
Contract Admin Pool	6,761	5,792	969	17%	
Department Overhead Pool	1,690	3,725	(2,035)	-55%	
Local Engineering Pool – Elect Dist Pool	67,797	85,758	(17,961)	-21%	Yes
Local Engineering Pool - Substation Pool	11,099	11,081	18	0%	
Reliability/Improvements	93,891	85,874	8,017	9%	
Advanced Energy Storage	1	928	(927)	-100%	
Advanced Energy Storage Upgrades	122		122	100%	
Advanced Ground Fault Detection	43		43	100%	
Advanced Technology		12,272	(12,272)	-100%	Yes
Avocado Sub 69kV Rebuild	151		151	100%	
C1448, Mto: New 12kV Circuit	714		714	100%	
Capital Restoration of Service	14,248	4,492	9,756	217%	Yes
Condition Based Maintenance Program	1,218	4,219	(3,002)	-71%	
Distribution Circuit Reliability Construction	773	8,518	(7,746)	-91%	Yes
Distribution Substation Projects Strategic	10		10	100%	
Distribution Substation Reliability	2,734	1,402	1,332	95%	
Emergency Transformer & Switchgear	1	291	(290)	-100%	
Energized Test Yard	282		282	100%	
Energy Storage-Non-Balancing	16		16	100%	
Eng Analy for Predictive Cable Failure	550		550	100%	
High Risk Switch Replacement Project	15		15	100%	
Install Scada On Line Capacitors	325		325	100%	
Jacumba Microgrid	269		269	100%	
Management of OH Dist. Service	4,844	8,445	(3,601)	-43%	
Management of UG Dist. Service	3,481	3,685	(204)	-6%	

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Microgrid Systems for Reliability	3,601	6,282	(2,681)	-43%	
Middletown 4kV Sub RFS	(1)		(1)	100%	
New Vine 69/12kV Substation	11,448		11,448	100%	Yes
OIR Reliability Worst Circuits	41		41	100%	
Phasor Measurement Units (Distribution)	16		16	100%	
Poway Substation Rebuild	2,154		2,154	100%	
Power Quality Program	229	154	74	48%	
Rebuild Kearny 69/12kV Substation	6,940	7,912	(972)	-12%	
Rebuild Pt Loma Substation	7,868		7,868	100%	Yes
Remove 4kV Subs. From Service		2,197	(2,197)	-100%	
Replace Obsolete Substation Equipment	5,429	4,276	1,153	27%	
Replacement of Underground Cables	11,144	12,469	(1,324)	-11%	
Roseville 4kV Substation RFS	463		463	100%	
RTU Replacement Project RMS900	1,887		1,887	100%	
San Marcos Sub Rebuild 69kV & 12kV	530		530	100%	
Scada Head-End Replacement	2,455		2,455	100%	
Sewage Pump Station Rebuilds	2,347	1,400	947	68%	
Smart Isolation & Reclosing	45		45	100%	
Streamview 69/12kV Sub Rebuild-Pre Eng	103		103	100%	
Street Light Modernization	163		163	100%	
Substation Mod to Support FLSR	2,577		2,577	100%	
Substation Scada Expansion-Distribution	686		686	100%	
Substation Security		753	(753)	-100%	
Sunnyside 69/12kV Rebuild		669	(669)	-100%	
Tee Modernization Program	1,325		1,325	100%	
Telegraph Canyon- 138/12kV Bank & C1226	1,579	1,115	464	42%	
TL600 - Reliability Pole Replacements	1		1	100%	



WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
TL690A	84		84	100%	
Transmission System Automation	31		31	100%	
Vista 4Kv Substation RFS		328	(328)	-100%	
Wireless Fault Indicators	949		949	100%	
Rebuild Pt Loma 69/12kV Substation		4,068	(4,068)	-100%	
Safety & Risk Management	76,249	45,186	31,063	69%	
C1215- Fire Risk Mitigation Project		21	(21)	-100%	
C441-Pole Loading Study/Fire Risk Mitigation		29	(29)	-100%	
Distribution Aerial Marking and Lighting		103	(103)	-100%	
Fire Risk Mitigation (FIRM) - Phase 3	1,359	28,371	(27,012)	-95%	Yes
Fire Risk Mitigation (FIRM) - Phases 1 And 2	53,704	12,640	41,064	325%	Yes
Fire Threat Zone Adv Protect & SCADA Upg	3,565		3,565	100%	
Long Span Safety Project	52		52	100%	
Meteorology-Fire Behavior Modeling	260		260	100%	
Meteorology-Outage Prediction Modeling	306		306	100%	
Mobile Command Trailers (MCT)	337		337	100%	
Powerworkz		210	(210)	-100%	
Rancho Santa Fe Sub Fire Hardening	2,979		2,979	100%	
SDG&E Weather Instrumentation Install		147	(147)	-100%	
SDG&E Meteorology Supercomputer	2,773		2,773	100%	
SF6 Switch Replacement	3,165	3,665	(500)	-14%	
Twin Engine Helicopter	7,613		7,613	100%	Yes
Unmanned Aircraft System	136		136	100%	
Transmission/FERC Driven Projects	22,094	17,876	4,218	24%	
Cleveland National Forest Power Line Replacement Projects	18,312	5,879	12,433	211%	Yes
ECO Substation		586	(586)	-100%	
Elec Trans Line Reliability Projects	1,928	688	1,239	180%	

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Elec Trans Line Relocation Projects	16	39	(23)	-59%	
Fiber Optic for Relay Protect & Telecom	270	2,270	(2,000)	-88%	
Loop Tl674 Into Del Mar and RFS Tl666D		433	(433)	-100%	
Los Coches Rebuild 138/69/12kV Substation		3,778	(3,778)	-100%	
Los Coches Substation 138/69kV Rebuild	908		908	100%	
Orange County Long Range Plan	278		278	100%	
Relocate South Bay Substation	2	623	(621)	-100%	
Tl 637 Cre-St Wood to Steel		633	(633)	-100%	
Tl 695B Reconductor		170	(170)	-100%	
Tl13821 & 28-Fanita Junction Enhance	(61)	238	(300)	-126%	
Tl13833 Wood to Steel		31	(31)	-100%	
Tl600 Reliability Pole Replacements		0	0	100%	
Tl631 Reconductor Project		790	(790)	-100%	
Tl663 Mission to Kearny Reconductor	29	6	23	375%	
Tl664-Wood to Steel	347		347	100%	
TL670 Mission to Clairemont Reconductor	64	1	63	8856%	
TL676 Mission to Mesa Heights Reconductor		0	0	100%	
TL6914 Los Coches-Loveland Wood to Steel		1,710	(1,710)	-100%	
Tl695 Talega Wood to Steel	1		1	100%	

v. **SDG&E Electric Distribution Capital Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Capacity/Expansion Projects			
C1090, JM: New 12kV Circuit	The project was completed in 2016 and therefore there was no spend in 2017. The original in-service date was forecasted to be 8-31-15 as shown in TY2016 SDG&E-09-CWP-R page 202.		
Salt Creek Substation & New Circuits	This project had carryover spend in 2017 to complete the project. The original in-service date of 3-31-16 was extended to 8-31-17 as shown in TY2019 SDGE-14-CWP-R page 28.		
Equip/Tools/Miscellaneous			
Electric Distribution Tools/Equipment	Higher than forecasted costs due to company-wide purchase of OSHA-mandated climbing belts in addition to purchasing tools intended to improve operational efficiencies. Such improvements, as described, are designed to help mitigate the risk of employee safety.		OSHA-Updated requirements for climbing belts.
Franchise			
City of San Diego Surcharge Prog (20SD)	Lower than forecasted demand from the City of San Diego due to the timing of city approval of construction projects. Unused funds in this workpaper remain available to the city in future years and as such the variance does not impact ratepayers.		
Mandated			
CMP UG Switch Replacement & Manhole Repair	Lower than forecasted activities due to the unplanned increase in the Capital Restoration of Service replacement work (BC 236). Replacements, as described here, allow SDG&E to potentially mitigate risk by restoring and maintaining the integrity of its electric infrastructure. SDG&E remains in compliance with GO 165.		
Materials			
Transformers	Lower than forecasted number of new transformers and transformer replacements is variable and dependent on factors,		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
	such as responding to required remediations identified during inspections and the amount of new business activity.		
Overhead Pools			
Local Engineering Pool – Elect Dist Pool	Forecasted general overhead pool activity costs were directly recorded in projects throughout the electric distribution capital portfolio.		
Reliability/Improvements			
Advanced Technology	Dollars authorized for this activity were re-prioritized to other emergent activities.		
Capital Restoration of Service	SDG&E experienced more total outages than forecasted based on historical trends. Additionally, the safety practices to mitigate fire risk have dramatically affected our ability to restore quickly and consequently increase manhours. Protection settings are more sensitive, reclosing is disabled, and lines are patrolled multiple times until a definitive cause is found before re-energizing.		
Distribution Circuit Reliability Construction	Lower than forecasted replacement activities due to higher than forecasted replacement work in the Capital Restoration of Service (BC 236). Replacement activities, as described here, are designed to mitigate risk by improving electric system reliability.		
New Vine 69/12kV Substation	This project was an emergent activity that was not anticipated during the TY2016 GRC. This project, as described, is designed to mitigate risk by increasing reliability and adding capacity to the downtown San Diego area, which includes the airport.		This project was an emergent activity that was not anticipated during the TY2016 GRC.
Rebuild Pt Loma Substation	This project has carryover spend in 2017 to complete the project. The original in-service date of 12-31-15 was extended to 6-30-18 as shown in TY2019 SDGE-14-CWP-R page 479.		
Safety & risk Management			

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Fire Risk Mitigation (FIRM) - Phase 3	See related variance explanation below in FiRM phase 1 and phase 2.		
Fire Risk Mitigation (FIRM) - Phases 1 and 2	Higher than forecasted capital spend due to the change in approach for the FiRM program where capital replacement activities were prioritized over O&M activities as seen in the O&M Construction Services variance explanation. This system hardening project, as described, is designed to mitigate wildfire-related risk.		
Twin Engine Helicopter	This project was an emergent activity that was not anticipated during the TY2016 GRC. As described, the use of a twin-engine helicopter, compared to SDG&E's prior single-engine helicopter, is intended to mitigate safety risks associated with flight operations.		This project was an emergent activity that was not anticipated during the TY2016 GRC.
Transmission/FERC Driven Projects			
Cleveland National Forest (CNF) Power Line Replacement Projects	The Distribution portion of the CNF project was accelerated to match Transmission activity levels. As described, acceleration of this project is designed to further mitigate risk by hardening infrastructure in high risk fire areas.		

vi. **SDG&E Electric Distribution Capital Workpaper Descriptions and GRC Testimony Locations**

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Electric Distribution	13285A	C1090, JM: New 12kV Circuit	<p>The purpose of this project is to provide capacity for the new Jamul Casino Resort estimated to add 9.5MW to existing Jamacha (JM) C75 in 2015, and this new business load will cause 90% overload issue on C75. New Jamacha C1090 is designed to serve the new business load and eliminate high load issues on Jamacha C75 and C524.</p> <p>These forecasted capital expenditures support the goal of enhancing safety maintaining system reliability, by replacing wood poles with steel poles, by eliminating the overloads when the new business customer connects to the distribution system, and by installing two new switches to assist with transferring load.</p>	SDG&E-09 JDJ-52 to JDJ-53	N/A
Electric Distribution	22580	Salt Creek Substation & New Circuits	<p>The purpose is to build the new low-profile Salt Creek Substation in the Otay Ranch-Chula Vista Area. SDG&amp;E will install a 69/12kV substation with an ultimate capacity of 120MVA that provides future required capacity to the rapidly developing area and increase the substation /circuit reliability. The new Salt Creek Substation is required to serve the ultimate load for the area of 286MW. The project also includes installing a new five-mile-long 69kV tie-line (TL6965) in the existing transmission corridor from the Salt Creek Substation to Miguel Substation and looping in an</p>	SDG&E-09 JDJ-31 to JDJ-32	SDG&E-14-R AFC-23

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
			<p>existing 69kV tie-line (TL6910) to the Salt Creek substation.</p> <p>This project supports the goal of maintaining system reliability by bringing on new capacity.</p>		
Electric Distribution	2060	Electric Distribution Tools/Equipment	<p>This blanket project is required to purchase new electric distribution tools and equipment required by field personnel to inspect, operate and maintain the electric distribution system.</p> <p>These forecasted capital expenditures support the goal of enhancing safety and reliability by providing the necessary tools and equipment to safely inspect, operate and maintain the electric distribution system.</p>	SDG&E-09 JDJ-57 to JDJ-58	SDG&E-14-R AFC-33 to AFC-34

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Electric Distribution	2130	City of San Diego Surcharge Program (20SD)	<p>This project converts overhead facilities to underground based on requirements and negotiated agreement with the City of San Diego (commonly referred to as the “surcharge program”). This project provides replacement of existing overhead electric facilities with new underground electric facilities (transmission and distribution), in accordance with Resolution E-3788. Replacement is effected at the request of the City of San Diego. This is a separate and distinct program unrelated to the Rule 20A program (budget 210). All expenses associated with this program will be reimbursed to SDG&amp;E by the city from the proceeds of a surcharge collected from each electric meter account in the city of San Diego, thus this project is ratepayer and rate base neutral.</p> <p>These forecasted capital expenditures support the goals of safety and reliability, because aged infrastructure is replaced with new facilities when conversions are done.</p>	SDG&E-09 JDJ-61 to JDJ-62	SDG&E-14-R AFC-39



Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Electric Distribution	2890	CMP UG Switch Replacement & Manhole Repair	<p>The purpose of this project is to replace or remove underground and overhead switches and to repair underground structures, all of which impact system integrity and employee and public safety.</p> <p>These forecasted capital expenditures support the goals of enhancing safety, maintaining system reliability and maintaining regulatory compliance, by ensuring overhead and underground electric distribution facilities are maintained in accordance with State regulations.</p>	SDG&E-09 JDJ-63 to JDJ-65	SDG&E-14-R AFC-47 to AFC-48
Electric Distribution	2140	Transformers	<p>This project is required to provide distribution transformers necessary to operate and maintain the electric distribution system. This blanket project is required to purchase transformers, supplying new and replacement equipment and maintaining inventory at each electric distribution service center.</p> <p>These forecasted capital expenditures support the majority of the goals for Electric Distribution. Transformers are used in the majority of the categories of work.</p>	SDG&E-09 JDJ-69 to JDJ-70	SDG&E-14-R AFC-55 to AFC-56

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Electric Distribution	9010	Local Engineering Pool - ED Pool	<p>The Local Engineering - ED Pool consists of planners, designers and engineers, and support personnel who research, analyze, and design the facilities needed to serve customers. These persons address the engineering needs for new services, facilities relocations, overhead-to-underground conversions, capacity, and reliability projects. These persons also address the interaction with internal and external customers in preparing a work order package for construction. This pool includes the costs that will be allocated to electric distribution capital activities.</p> <p>These forecasted capital expenditures support the goals of enhancing safety, maintaining adequate reliability levels, and compliance with federal, state and local regulations.</p>	SDG&E-09 JDJ-83 to JDJ-85	SDG&E-14-R AFC-69 to AFC-70
Electric Distribution	10261E	Advanced Technology	<p>This project portfolio's focus is on reliable grid management. SDG&amp;E needs to manage the grid to maintain compliance with Rule 2 standards of service while customers increasingly adopt new technologies to meet their own needs that require connection to the grid. Customer's photovoltaic systems, electric vehicle (EV) charging facilities, and other choices are introducing a new complexity into grid operations. To reliably manage the grid, SDG&amp;E needs grid sensing and situational awareness technologies and grid management tools.</p>	SDG&E-09 JDJ-102 to JDJ-105	N/A

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
			These forecasted capital expenditures support the goal of enhancing system reliability.		
Electric Distribution	2360	Capital Restoration of Service	<p>This project is required to accomplish restoration of electric service due to system interruptions caused by severe inclement weather conditions, fires, equipment failures and damages caused by a third party. This project provides for the reconstruction of existing overhead and underground distribution facilities as necessary to restore electric service to customers.</p> <p>The purpose of this project is to fund responsive repairs to SDG&amp;E distribution facilities as necessary to restore electric service to customers in a timely manner and in compliance with the CPUC General Orders.</p>	SDG&E-09 JDJ-94 to JDJ-95	SDG&E-14-R AFC-81 to AFC-82
Electric Distribution	932400	Distribution Circuit Reliability Construction	This project provides funds for the addition of equipment necessary to improve service reliability of electric customers and maintain corporate reliability standards. This budget supports construction of projects that include installation of fuses, OH and UG manual switches, SCADA service restorers, SCADA switches, overhead fault indicators, overhead line	SDG&E-09 JDJ-114 to JDJ-115	SDG&E-14-R AFC-106 to AFC-107

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
			<p>extensions and circuit reconductoring for improving electric system reliability. The electric service reliability will deteriorate in the absence of comprehensive remedial solutions offered by these projects; also, electric reliability performance is negatively impacted by system deficiencies and aging infrastructure.</p> <p>These forecasted capital expenditures support the goal(s) of the SCADA initiative program or SCADA. This will provide faster isolation of faulted electric distribution circuits (feeders &amp; branches), resulting in faster load restoration when system disturbances occur. Furthermore, preventing equipment deterioration will promote SDG&amp;E's ability to meet reliability expectations of electric customers.</p>		
Electric Distribution	132430	New Vine 69/12kV Substation	This budget provides funding to construct a new 69/12 kV substation with an ultimate capacity of 120 MVA in the downtown San Diego area. The project is currently under construction and will serve the downtown and outlying areas in San Diego once completed. The project will also add tie capacity and increase reliability to the existing substations in the area.	N/A	SDG&E-14-R AFC-97 to AFC-98

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Electric Distribution	12690	Rebuild Pt Loma Substation	<p>Point Loma Substation currently ranks in the Substation Equipment Assessment (SEA) Team's upper fifth percentile of poor performing substations, with outages being the result of 69 kV insulator and cable failures as well as 12 kV insulator, circuit breaker, and disconnect switch failures.</p> <p>The Point Loma Substation was originally built over 60 years ago and currently ranks in the SEA Team's upper fifth percentile of poor performing substations with outages. The existing substation does not allow room for expansion and its current configuration does not meet today's reliability standards. A rebuild of Point Loma Substation will result in improved reliability and capacity for both Distribution and Transmission. The project will also mitigate slope stability issues at the site.</p>	SDG&E-09 JDJ-95 to JDJ-97	SDG&E-14-R AFC-82 to AFC-83

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Electric Distribution	142470	Fire Risk Mitigation (FiRM) - Phase 3	<p>In 2013, SDG&amp;E combined the fire hardening efforts with a program designed to address pole loading issues, creating a program called the Fire Risk Mitigation (FiRM) program. FiRM is aggressively addressing fire risk by hardening critical areas, by replacing antiquated line elements, by utilizing advanced technology, and by improving facilities to adequately handle known local weather conditions. FiRM is being broken into multiple phases, with the scope of work varying within each phase.</p> <p>These forecasted capital expenditures support the goal of enhancing safety, reliability, and risk management by hardening critical areas, replacing antiquated line elements, utilizing advanced technology, and improving system ability to adequately handle known local weather conditions. This program will strengthen the overhead electric system in fire prone areas, resulting in improved reliability.</p>	SDG&E-09 JDJ-128 to JDJ-129	Combined with Ph 1 & Ph 2 in 13247

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Electric Distribution	13247A/132470	Fire Risk Mitigation (FiRM) - Phases 1 and 2	<p>In 2013, SDG&amp;E combined the fire hardening efforts with a program designed to address pole loading issues, creating a program called the Fire Risk Mitigation (FiRM) program. FiRM is aggressively addressing fire risk by hardening critical areas by replacing antiquated line elements, utilizing advanced technology, and safeguarding facilities from known local weather conditions. FiRM is being broken into multiple phases, with the scope of work varying within each phase.</p> <p>These forecasted capital expenditures support the goal of enhancing safety, reliability, and risk management by hardening critical areas, replacing antiquated line elements, utilizing advanced technology, and improving system preparedness for known local weather conditions. This program will strengthen the overhead electric system in fire prone areas, resulting in improved reliability.</p>	SDG&E-09 JDJ-123 to JDJ-124	SDG&E-14-R AFC-111 to AFC-112
Electric Distribution	172420	Twin Engine Helicopter	This budget will provide funding to purchase a twin-engine helicopter to address safety risks associated with helicopter operations, as well as to provide a more capable aircraft. Currently, SDG&E contracts the exclusive use of a single-engine helicopter for flight operations. To address safety concerns and the need for a more capable aircraft, the decision has been made to acquire a twin-engine helicopter. Financial analysis	N/A	SDG&E-14-R AFC-121 to AFC-122

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
			demonstrates a lower cost to ratepayers over the life of the asset when the aircraft is purchased, as opposed to leased.		
Electric Distribution	13282A/81650	Cleveland National Forest (CNF) Power Line Replacement Projects	<p>This budget is required as part of an agreement with CNF to replace aging overhead infrastructure with new overhead and underground facilities. As part of the renewal of our Master Special Use Permit with CNF, SDG&amp;E agreed to rebuild overhead power lines by replacing them with new overhead and underground facilities.</p> <p>These forecasted capital expenditures, as described, are designed to support the goal of enhancing safety, reliability, and risk management by replacing aged overhead power lines, located within high risk fire areas, with new, hardened overhead facilities, and in some cases with new underground facilities.</p>	SDG&E-09 JDJ-127 to JDJ-128	SDG&E-14-R AFC-143 to AFC-144



**b. SDG&E Electric Generation**

**i. SDG&E Electric Generation O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000) <sup>1</sup>	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Electric Generation	34,398	56,982	(22,585)	-40%	
Generation - Plant - Admin	236	176	60	34%	
Generation Plant Miramar	1,714	2,430	(715)	-29%	
Generation Plant Palomar	17,526	24,450	(6,924)	-28%	Yes
Resource Planning	129	1,107	(977)	-88%	
SVP - Power Supply		723	(723)	-100%	
Generation Plant Desert Star	13,273	25,409	(12,136)	-48%	Yes
Generation Plant Cuyamaca Peak	701	1,220	(519)	-43%	
VP - Generation & Resource Planning		424	(424)	-100%	
Resource Planning Director	818	1,045	(227)	-22%	

<sup>1</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, the corrected 2017 imputed authorized is \$56,962 instead of \$56,982, a difference of \$20.

ii. **SDG&E Electric Generation O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Generation Plant Palomar	One third of the cost for the Palomar inspection outage expected for 2018 was requested in the TY 2016 GRC, so that over the entire 3-year cycle, the full cost would be collected from ratepayers.	The steam turbine portion of the Palomar outage is now expected to take place in 2019. Similarly, the hot-gas path portion of the overhaul is now expected to take place in 2020, as the combustion turbines have been running fewer hours than was forecasted in the TY 2016 GRC.	
Generation Plant Desert Star	Lower than forecasted operating run hours of the combustion and steam turbines.  One third of the cost for a minor inspection outage scheduled for 2017 was requested in the TY 2016 GRC base year, so that over the entire 3-year cycle, the full cost would be collected from ratepayers.	The Desert Star outages are now expected to take place in 2020 and 2021 as the combustion turbines have been running fewer hours than was forecasted in the TY 2016 GRC.	

iii. **SDG&E Electric Generation O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Electric Generation	Generation Plant Palomar	1EG003.000	<p>Generation Plant Palomar encompasses the operation and maintenance of the Combined Cycle Generating Plant at Palomar Energy Center (PEC).</p> <p>The PEC maintenance program supports the company’s goals of safety and reliable system operation. The maintenance program is based on reliability centered maintenance practices, designed to ensure the safe, reliable operation of the facility over its lifetime. Maintenance activities are designed and scheduled based on a variety of factors including manufacturer recommendations, operating history, predictive techniques, past experience, subject matter expert input, and industry best practice.</p>	SDG&E-11 CSL-13 to CSL-15	SDG&E-16 DAB-18 to DAB-19
Electric Generation	Generation Plant Desert Star	1EG006.000	<p>Generation Plant Desert Star encompasses the operation and maintenance of the combined Cycle Generating Plant at Desert Star Energy Center (DSEC).</p> <p>The DSEC maintenance program supports the company’s goals of safety and reliable system operation. The maintenance program is based on reliability centered maintenance practices, designed to ensure the safe, reliable operation of the facility over its lifetime. Maintenance activities are designed and scheduled based on a variety of factors including manufacturer recommendations, operating history, predictive techniques, past</p>	SDG&E-11 CSL-15 to CSL-18	SDG&E-16 DAB-19 to DAB-20

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
			experience, subject matter expert input, and industry best practice.		

**iv. SDG&E Electric Generation Capital Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Electric Generation	13,158	12,377	781	6%	
Capital Tools & Test Equipment		401	(401)	-100%	
CPEP Operational Enhancements	3,890	724	3,166	437%	
DSEC Operational Enhancements	3,482	5,786	(2,304)	-40%	
Generation Capital Tools & Test Equipment	122		122	100%	
MEF Operational Enhancements	757	944	(187)	-20%	
PEC Operational Enhancements	4,553	4,522	31	1%	
Ramona Solar Plant Oper Enhance	354		354	100%	

**v. SDG&E Electric Generation Capital Workpaper Descriptions and GRC Testimony Locations**

Not necessary, no workpaper mapping required for this category because no variance met the selection criteria.

**c. SDG&E Electric & Fuel Procurement**

**i. SDG&E Electric & Fuel Procurement O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Electric & Fuel Procurement	7,701	9,637	(1,937)	-20%	
Long Term Procurement	1,861	2,708	(847)	-31%	
Trading & Scheduling	2,008	3,263	(1,255)	-38%	
Mid and Back Office	3,831	3,666	165	4%	

**ii. SDG&E Electric & Fuel Procurement O&M Workpaper Descriptions and GRC Testimony Locations**

Not necessary, no workpaper mapping required for this category because no variance met the selection criteria.

**2. SDG&E Gas**

**a. SDG&E Gas Distribution**

**i. SDG&E Gas Distribution O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Gas Distribution	26,433	23,937	2,350	10%	
Gas Distribution	26,433	23,937	2,496	10%	
Field O&M - Other Services	405	97	308	318%	
Field O&M - Leak Survey	1,841	1,384	458	33%	
Field O&M - Locate & Mark	3,971	2,762	1,209	44%	Yes
Field O&M - Main Maintenance	3,416	2,169	1,246	57%	Yes
Field O&M - Service Maintenance	1,734	1,379	355	26%	
Field O&M - Tools Fittings & Materials	919	1,250	(331)	-27%	
Field O&M - Electric Support	308	800	(492)	-61%	
Field O&M - Supervision & Training	3,193	2,772	421	15%	
Asset Management	1,054	2,038	(984)	-48%	Yes
Measurement & Regulation	4,056	3,814	242	6%	
Cathodic Protection	1,783	2,068	(285)	-14%	
Operations Management & Training	3,753	3,405	348	10%	

**ii. SDG&E Gas Distribution O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Field O&M - Locate & Mark	Higher than forecasted number of USA tickets and number of standbys required for city infrastructure emergencies. This growth included spending for surveillance and basic Locate & Mark activities that, as described, are designed to mitigate risk to public and employee safety.		
Field O&M - Main Maintenance	Higher than forecasted volume of pipeline maintenance activities and stricter city regulations resulting in greater duration and complexity of repairs.		
Asset Management	Resources forecasted as O&M for the Gas Geographic Information System & Services (GGISS) group were allocated to capital expense to align with the actual capital work performed by the GGISS work group.		

**iii. SDG&E Gas Distribution O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Distribution	Field O&M - Locate & Mark	1GD000.002 / 1GD000.002	Locate and Mark is the process mandated by 49 CFR 192.614 (Damage prevention program) and the California One Call Law (Government Code section 4216), where the owner of underground facilities, when notified by the Underground Service Alert One-Call Center of a planned excavation, must respond within two working days and mark the location of those underground facilities that are in conflict with the	SDG&E-04 FBA-18 to FBA-20	SDG&E-04-R GOM-36 to GOM-39



Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
			<p>planned excavations.</p> <p>This workpaper is in scope of the report because locate and mark activities, as described, are designed to mitigate damage by third party excavators that can interrupt gas service and pose a risk to public and employee safety.</p>		
Gas Distribution	Field O&M - Main Maintenance	1GD000.003 / 1GD000.003	<p>Main maintenance includes investigating and repairing leaks in distribution mains and moving, lowering, and raising short sections of gas distribution mains, vaults, and related structures.</p> <p>This workpaper is in scope of the report because main maintenance activities, as described, are designed to mitigate risks associated with hazards to public safety, infrastructure integrity and system reliability.</p>	SDG&E-04 FBA-20 to FBA-23	SDG&E-04-R GOM-39 to GOM-41
Gas Distribution	Asset Management	1GD001.000 / 1GD001.000	<p>Asset Management is the evaluation of the condition of the distribution system. This includes maintaining asset records, identifying corrective maintenance solutions, and coordinating with field personnel on completion and recording of O&amp;M activities.</p> <p>This workpaper is in scope of the report because the maintenance of gas distribution system records is a critical risk mitigation measure designed to mitigate hazards to public and employee safety, infrastructure integrity, and to the reliable delivery of natural gas to SDG&amp;E customers.</p>	SDG&E-04 FBA-45 to FBA-52	SDG&E-04-R GOM-57 to GOM-62

iv. **SDG&E Gas Distribution Capital Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Gas Distribution	78,495	39,776	38,720	97%	
Gas Distribution	78,495	39,776	38,720	97%	
Cathodic Protection	2,568	820	1,748	213%	Yes
CNG Station Upgrades	420		420	100%	
Code Compliance	1,907	404	1,504	373%	Yes
Distribution Easements	35	45	(10)	-23%	
Local Engineering	9,320	5,244	4,076	78%	Yes
Meter and Regulator Materials	2,761	8,054	(5,293)	-66%	Yes
New Business	8,370	10,163	(1,793)	-18%	
Pipe Relocations - Franchise and Freeway	15,896	4,358	11,538	265%	Yes
Pressure Betterment	829	2,098	(1,269)	-60%	Yes
Regulator Station Improvements and Other	2,422	527	1,895	360%	Yes
Replacements of Mains & Services	16,736	2,462	14,274	580%	Yes
System Minor Additions, Relocations and Retirements	9,158	3,154	6,004	190%	Yes
Tools and Equipment	2,657	2,086	571	27%	
Cathodic Protection System Enhancement	5,415	360	5,055	1405%	Yes

v. **SDG&E Gas Distribution Capital Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Cathodic Protection	Higher than forecasted number of new and renewed cathodic protection (CP) stations installed and an increased cost per station due to municipality constraints and higher contractor costs. This provides funding for the installation of new CP systems and equipment for the protection of steel pipelines, which is, as described, designed to mitigate the risk of a potential pipeline incident.		
Code Compliance	Higher than forecasted volume of code compliance work due to acceleration of planned work. This provides funding for capital code compliance projects that, as described, are designed to mitigate public safety risks.		
Local Engineering	Higher than forecasted level of local engineering work due to higher overall level of capital construction activity. This provides funding for a broad range of services to support Gas Distribution field capital asset construction.		
Meter and Regulator Materials	Lower than forecasted purchases of meters and regulators as existing inventories were used at a greater level than forecasted.		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Pipe Relocations - Franchise and Freeway	Higher than forecasted level of activity due to the Mid Coast MTD Trolley pipeline relocation project.		Mid Coast MTD Trolley pipeline relocation project.
Pressure Betterment	Some pressure betterment project work was deferred to allow for higher priority work, such as leak repairs and compliance activities to be completed.	The following projects were deferred to 2018: Carlton Oaks Reg. Station & Back-tie, and El Norte Bridge Conduit, Torrey Meadows Bridge.	
Regulator Station Improvements and Other	This provides funding for capital projects that are designed to improve safety, provide code compliance, and improve gas system performance. Therefore, these activities are, as described, designed to mitigate risk by replacing buried piping and equipment in vaults. Higher than forecasted activity due to emergent regulator station and valve replacement work.		Three additional regulator stations added/relocated.  Replacement of an inoperable valve in La Jolla.

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Replacements of Mains & Services	<p>This provides funding for the replacement of risk-ranked poor performing pipe and the replacement of pipelines requiring emergency leak repairs. Higher than forecasted activity on the risk mitigation project to replace vintage steel pipelines showing relatively high leakage rates. This included two emergent pipeline renewal projects. Additionally, relatively high pipeline leak rates resulted in more leak repairs which are funded in this budget code.</p>		<p>Vista Campana renewal project, steel replacement with poly pipe.</p> <p>Bay Park renewal project, steel replacement with poly pipe.</p>
System Minor Additions, Relocations and Retirements	<p>This provides funding for projects not covered in other work categories that are required to maintain the continued integrity of SDG&amp;E's Gas Distribution system. These include main and service additions and relocations due to customer requests or Company requirements. Higher than forecasted activity due to the emergent Mt. Soledad high pressure pipeline relocation project.</p>		<p>Mt. Soledad pipeline relocation project.</p>
Cathodic Protection System Enhancement	<p>This provides funding in conjunction with the CP funding for the installation or renewal of CP system assets to improve the application of CP to steel pipelines. Higher than forecasted funding due to a system-wide project to provide cathodic protection to "stranded steel pipeline assets," areas in the system. These activities maintain CP assets and mitigate risk related to high-pressure and medium-pressure distribution pipelines.</p>		<p>The Stranded Steel Asset Project, completed during 2017, protection for valves and stranded segments.</p>

vi. **SDG&E Gas Distribution Capital Workpaper Descriptions and GRC Testimony Locations**

Witness Area	Capital Workpaper or Prime Budget Code #	Workpaper Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Distribution	005090 and 125510	Cathodic Protection	<p>This budget code includes expenditures associated with the installation of new and replacement CP systems and equipment in accordance with state and federal pipeline corrosion control standards.</p> <p>This category includes costs for activities, as described, designed to mitigate infrastructure integrity risks.</p>	SDG&E-04 FBA-82 to FBA-85	SDG&E-04-R GOM-91 to GOM-94
Gas Distribution	005070	Code Compliance	<p>This budget code provides funds for upgrades or additions to facilities to ensure compliance with minimum federal safety standards for gas pipelines, 49 CFR 192 and General Order 112-E.</p> <p>This category includes costs for activities, as described, designed to mitigate public safety risks.</p>	SDG&E-04 FBA-77 to FBA-80	SDG&E-04-R GOM-84 to GOM-88
Gas Distribution	009020	Local Engineering	<p>This work category provides the labor and non-labor funding for a broad range of services to support Gas Distribution field capital asset construction. Certain costs are incurred by capital projects that originate from central activities which are subsequently distributed to those capital projects. Costs include technical planning, project management, and engineering activities.</p> <p>This category includes costs for activities, as described, designed to mitigate system reliability risks.</p>	SDG&E-04 FBA-89 to FBA-93	SDG&E-04-R GOM-99 to GOM-103

Witness Area	Capital Workpaper or Prime Budget Code #	Workpaper Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Distribution	005020	Meter and Regulator Materials	<p>This budget code provides for the capital material expenses for purchasing new residential, commercial, and industrial gas meters and pressure regulators.</p> <p>This category includes costs for activities, as described, designed to mitigate infrastructure integrity risks.</p>	SDG&E-04 FBA-66 to FBA-67	SDG&E-04-R GOM-75 to GOM-77
Gas Distribution	005050	Pipe Relocations - Franchise and Freeway	<p>This budget code provides funding for the required relocation of existing gas facilities when necessitated by public improvements. Generally, the work involves a change in alignment or elevation of existing gas pipelines and associated facilities and is driven by local and state agency requirements.</p> <p>This category includes costs for activities, as described, designed to mitigate public safety risks.</p>	SDG&E-04 FBA-71 to FBA-72	SDG&E-04-R GOM-80 to GOM-82
Gas Distribution	005030	Pressure Betterment	<p>Recorded in this budget code are expenditures for Gas Distribution pressure betterment projects performed on an on-going basis to maintain system reliability and service to all customers. Pressure betterment projects are performed in areas where there is insufficient capacity or pressure to meet load growth.</p> <p>This category includes costs for activities, as described, designed to mitigate system reliability risks.</p>	SDG&E-04 FBA-68 to FBA-69	SDG&E-04-R GOM-77 to GOM-79
Gas Distribution	005100	Regulator Station Improvements and Other	<p>This budget code provides funding for small capital projects that improve safety, provide required code compliance, and improve gas system performance or reliability through the replacement of aging gas pipeline system operating equipment.</p> <p>This category includes costs for activities, as described, designed to mitigate infrastructure integrity risks.</p>	SDG&E-04 FBA-85 to FBA-89	SDG&E-04-R GOM-94 to GOM-98

Witness Area	Capital Workpaper or Prime Budget Code #	Workpaper Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Distribution	005080	Replacements of Mains & Services	<p>Funding in this budget code is required to address compliance requirements for the elimination of potentially hazardous conditions due to leaking or relatively poor performing gas pipelines. This budget code provides for the replacement of poor performing gas distribution system pipelines.</p> <p>This category includes costs for activities, as described, designed to mitigate infrastructure integrity risks.</p>	SDG&E-04 FBA-80 to FBA-81	SDG&E-04-R GOM-88 to GOM-91
Gas Distribution	005010	System Minor Additions, Relocations and Retirements	<p>This budget code captures expenditures not covered in other work categories that are required to maintain the continued integrity of SDG&amp;E's gas distribution system.</p> <p>This category includes costs for activities, as described, designed to mitigate public safety risks.</p>	SDG&E-04 FBA-63 to FBA-65	SDG&E-04-R GOM-73 to GOM-75
Gas Distribution	125510	Cathodic Protection System Enhancement	<p>This budget code tracks projects specifically associated with creating dedicated high-pressure and medium-pressure distribution pipeline CP systems.</p> <p>This category includes costs for activities, as described, designed to mitigate infrastructure integrity risks.</p>	SDG&E-04 FBA-82 to FBA-85	SDG&E-04-R GOM-91 to GOM-94



**b. SDG&E Gas Engineering**

**i. SDG&E Gas Engineering O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>2</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Gas Engineering		146	(146)	-100%	
Gas Engineering		107	(107)	-100%	
Codes & Standards		39	(39)	-100%	

**ii. SDG&E Gas Engineering O&M Workpaper Descriptions and GRC Testimony Locations**

Not necessary, no workpaper mapping required for this category because no variance met the selection criteria.

**c. SDG&E Gas Transmission**

**i. SDG&E Gas Transmission O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Gas Transmission	4,942	5,332	(390)	-7%	
Gas System Integrity	173	320	(147)	-46%	
Public Awareness	173	320	(147)	-46%	
Gas Transmission	4,769	5,012	(243)	-5%	
Pipeline O & M	1,636	1,367	269	20%	
Compressor Station O & M	3,086	3,527	(442)	-13%	
Transmission Field Technical Services	47	117	(70)	-60%	

<sup>2</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, the corrected 2017 imputed authorized is \$145 instead of \$146, a difference of \$1.

**ii. SDG&E Gas Transmission O&M Workpaper Descriptions and GRC Testimony Locations**

Not necessary, no workpaper mapping required for this category because no variance met the selection criteria.

**iii. SDG&E Gas Transmission Capital Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Gas Transmission	9,331	7,482	1,849	25%	
Auxiliary Equipment	306		306	100%	
Capital Tools	110	121	(11)	-9%	
Cathodic Protection	216	228	(12)	-5%	
Compressor Stations	3,556	3,256	300	9%	
Land Rights	506	22	484	2195%	
Local Engineering Pool		148	(148)	-100%	
Meter & Regulator (M&R) Stations	2,506	1,246	1,261	101%	Yes
New Pipelines	1,727	584	1,143	196%	Yes
Relocations		342	(342)	-100%	
Replacements	405	1,535	(1,130)	-74%	Yes

**iv. SDG&E Gas Transmission Capital Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
M&R Stations	Unforecasted scope revisions on the Tecolote project.		
New Pipelines	Higher than forecasted customer demand due to the Carlsbad Energy Center delayed plan approval of the project pushing actuals from 2016 into 2017.		
Replacements	This budget code, as described, is designed to mitigate infrastructure integrity risks. Lower than forecasted activity due to permitting delays and easement issues, primarily on the Mission Trail project.		

**v. SDG&E Gas Transmission Capital Workpaper Descriptions and GRC Testimony Locations**

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Transmission	004x8	M&R Stations	<p>This Budget Code includes the costs of installing and rebuilding large meter set assemblies for transmission-served customers and pressure limiting stations residing on the gas transmission system.</p> <p>This category includes costs associated with the safe and reliable local operation of SDG&amp;E pipelines in conformance with DOT and CPUC requirements for the limiting of pipeline and vessel operating pressures.</p>	SDG&E-06 RKS-26 to RKS-27	SDG&E-07-R JGT-16 to JGT-18
Gas Transmission	004x1	New Pipelines	<p>This cost category includes:</p> <ol style="list-style-type: none"> <li>1. Cost forecasts for the installation of new gas Transmission facilities to serve a new electric peaker plant in Carlsbad, California (NRG Joint-venture Utility Electric Generator at Carlsbad).</li> <li>2. Costs associated with the design and installation of new</li> </ol>	SDG&E-06 RKS-15 to RKS-17	SDG&E-07-R JGT-9 to JGT-10

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
			<p>Transmission pipelines to serve new customer loads and/or to improve the ability to move natural gas to points of critical need at adequate pressure (New Pipelines – Blanket W.O. projects). 3. Billed capital to provide for payment for non-shared engineering and planning services provided to SDG&amp;E by SoCalGas (New Transmission Pipelines Billed – Capital).</p> <p>This category includes costs for activities, as described, designed to mitigate system reliability risks.</p>		
Gas Transmission	004x2	Replacements	<p>This Budget Code includes costs associated with the design and installation of transmission pipeline replacements.</p> <p>This category includes costs for activities, as described, designed to mitigate infrastructure integrity risks.</p>	SDG&E-06 RKS-17 to RKS-19	SDG&E-07-R JGT-10 to JGT-11

### 3. SDG&E Other

#### a. SDG&E Customer Services

##### i. SDG&E Customer Services O&M Variances

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Customer Services	61,622	78,583	(16,961)	-22%	
Customer Services - Office Operations	20,886	24,849	(3,963)	-16%	
Credit & Collections	2,289	3,142	(852)	-27%	
Advanced Metering Ops (AMO)	7,367	9,311	(1,944)	-21%	Yes
Customer Contact Center (CCC) Operations	8,667	9,781	(1,114)	-11%	

CCC Support	2,563	2,616	(52)	-2%	
CS - Information & Technologies	19,695	29,184	(9,489)	-33%	
Commercial & Industrial (C&I) Services	3,133	6,073	(2,940)	-48%	Yes
Communications, Marketing, Research, & Web	6,107	13,474	(7,367)	-55%	Yes
Customer Programs, Pricing and Other Office	5,256	3,110	2,146	69%	Yes
Residential Services	5,199	6,526	(1,327)	-20%	Yes
Customer Services - Field	21,041	24,550	(3,509)	-14%	
Customer Services Field - Dispatch	3,909	3,336	574	17%	
Customer Services Field - Operations	13,665	16,277	(2,612)	-16%	
Customer Services Field - Supervision	1,037	1,646	(609)	-37%	
Customer Services Field - Support	2,429	3,291	(861)	-26%	

**ii. SDG&E Customer Services O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Customer Services - Office Operations			
Advanced Metering Ops	<p>Lower than forecasted staffing level during some portion of 2017.</p> <p>Resources forecasted for O&amp;M activities were shifted to emergent capital work.</p> <p>Savings were achieved through Fueling our Future (FOF) initiatives.</p>		<p>Emergent capital projects to maintain and enhance the smart meter network.</p> <p>FOF initiatives were not contemplated in the TY 2016 GRC.</p>
CS - Information & Technologies			
C&I Services	<p>Forecasts included resources for commercial outreach and a fire safety program; however, expenses for these resources were recorded in Customer Programs and Electric Distribution due to organizational</p>		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
	<p>realignment. This realignment also resulted in some organizational efficiencies.</p> <p>Lower than forecasted staffing level during some portion of 2017.</p>		
Communications, Marketing, Research, & Web	<p>Rate Reform progressed at a slower pace than originally anticipated statewide and therefore delayed related rate education and outreach and research.</p> <p>Lower than forecasted staffing level during some portion of 2017.</p>	Incremental customer research deferred to 2019.	
Customer Programs, Pricing and Other Office	Resources forecasted in A&G, Customer Services and Customer Assistance and Residential Services areas were recorded in Customer Programs as a result of organizational changes.		
Residential Services	<p>Forecasts included Low Income/Customer Assistance and New Products and Services activities; however, expenses were actually recorded in Customer Programs. Partially offset by forecasts for Customer Privacy activities forecasted in Customer Programs, but actually recorded in Residential Services.</p> <p>Activities related to Rate Education and Outreach did not occur as forecasted and activities transferred to Rate Education and Outreach are now shown in Communications.</p> <p>Lower than forecasted staffing level during some portion of 2017.</p>	BY 2013 efforts to prepare customers for Rate Reform did not continue at the same spending level in 2017 due to the statewide delay in implementing Rate Reform.	The Electric Clean Transportation group expanded beyond the TY 2016 authorized levels in support of state policy goals to reduce greenhouse gas emissions and in support of Senate Bill 350.

**iii. SDG&E Customer Services O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Customer Services - Office Operations	Advanced Metering Ops	100000.000/ 100001.000	<p>AMO supports the delivery of customer services on premises, responds to customer inquiries, resolves customer problems, and ensures safe, accurate, and reliable metering for all of SDG&amp;E's 2.26 million electric meters, covering all of San Diego County and South Orange County.</p> <p>This workpaper is in scope of the spending accountability report due to the FERC maintenance and safety-related activities, as described, designed to mitigate safety risks.</p>	SDG&E-14 BMB-10 to BMB-18	SDG&E-18 JDS-9 to JDS-18

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
CS - Information & Technologies	C&I Services	100009.000/ 11N002.000	<p>C&amp;I Services provides education and communication materials on energy rates, tariff services, safety, and regulatory information to all business customers through various outreach channels. C&amp;I Services uses research and a collaborative process to identify and provide value to its customers and seeks to continuously improve the quality and content of its outreach and support activities. To effectively meet the wide and growing array of customers' complex energy needs, SDG&amp;E delivers customer services through a team of highly trained and specialized customer contact personnel. C&amp;I Services' activities are broken down into three functional areas: Small &amp; Medium Business Account Management, Large Customer Account Management, and Customer Services Staff Support.</p> <p>Safety and Critical Event Support coordinates the safety education and outreach efforts to support all business customers. As a result of the wildfires in 2007, the winter storms in 2010, and the more active earthquake activity, SDG&amp;E identified a growing need to help its customers be better informed and prepared to respond to emergency situations regarding their energy service.</p> <p>This workpaper is in scope of the spending accountability report due to activities, as described, designed to mitigate wildfire risk.</p>	SDG&E-14 BMB-72 to BMB-81	SDG&E-19 LCD-20 to LCD-26



Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
CS - Information & Technologies	Communications, Marketing, Research, & Web	100010.000/ 11N003.000	<p>The Customer Communications, Research and Web expenses cover the costs associated with developing and implementing mass outreach communications, providing oversight and management of the SDG&amp;E web site, providing oversight of the development of outreach materials, conducting qualitative and quantitative research, engaging customers through social media channels, and providing key services through mobile application development and management.</p> <p>This workpaper is in scope of the spending accountability report due to the safety messaging in customer communications and on the web.</p>	SDG&E-14 BMB-82 to BMB-102	SDG&E-19 LCD-27 to LCD-44
CS - Information & Technologies	Customer Programs, Pricing and Other Office (CP&P)	100011.000/ 11N004.000	<p>CP&amp;P is primarily responsible for administering the Demand Response Reliability Programs as mandated by the CPUC and have been approved for collection through rates. In addition, CP&amp;P acquires customer information for data bases, demographics, and cost studies, provides analytical and technical support for various regulatory filings, and sponsors events within the new construction industry to encourage safe, efficient, and economical use of the utility's service.</p> <p>The three additional groups added to CP&amp;P include an Office of Customer Privacy, a Project Management Office (or "Customer Services PMO"), and a Business Integration group. The additional groups support the growing needs of our customers.</p> <p>This workpaper is in scope of the spending accountability report due to Customer Privacy being authorized in this work group in TY2016 (Geier/Schneider DLG-6 to DLG-7 TY 2016 Risk Chapter 3) in addition to 2017 NGAT costs being recorded here.</p>	SDG&E-14 BMB-102 to BMB-111	SDG&E-19 LCD-44 to LCD-49

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
CS - Information & Technologies	Residential Services	100008.000/ 11N001.000	<p>The Residential Customer Services (RCS) represents a department formed in 2012 with the objective of centralizing key functional groups that deliver, manage or support residential customers. ESA Program Natural Gas Appliance Testing (NGAT) or carbon monoxide (CO) testing, is a safety-related program for Customer Assistance’s ESA Program participants. SDG&amp;E conducts CO testing on homes weatherized through the ESA Program in accordance with the Statewide Energy Savings Assistance Program Installation Standards and the Statewide Energy Savings Assistance Program Policy and Procedures Manual.</p> <p>This workpaper is in scope of the spending accountability report due to Customer Privacy 2017 costs being reported here. Also, in TY2016, the NGAT activity was authorized in the Residential Customer Service work group, whereas in TY2019, the NGAT activity 2017 costs are reported under the Customer Programs, Pricing and Other Office work group. The NGAT activity, as described, is designed to mitigate customer safety risk.</p>	SDG&E-14 BMB-60 to BMB-72	SDG&E-19 LCD-9 to LCD-20

**b. SDG&E Information Technology**

**i. SDG&E Information Technology O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>3</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Information Technology	64,679	85,397	(20,718)	-24%	
Cybersecurity	9,673	6,189	3,484	56%	
Information Security	1,474	417	1,057	253%	Yes
Director - Information Security	683	391	292	75%	
Security Engineering	1,572	1,564	8	1%	
Security Operations	1,902	2,406	(503)	-21%	
Information Security Contracts	2,866	416	2,450	589%	Yes
IT Security NSS		194	(194)	-100%	
Director IT Infrastructure	1,176	768	408	53%	
Informational Security Program		34	(34)	-100%	
Information Technology	55,006	79,208	(24,202)	-31%	
IT Leadership Subtotal	576	1,946	(1,370)	-70%	
VP Information Technology		988	(988)	-100%	
SVP & CITO	576	958	(382)	-40%	
Application Services Subtotal	14,336	23,822	(9,485)	-40%	
Director - Application Services		1,145	(1,145)	-100%	Yes
IT Applications NSS	13,578	19,306	(5,728)	-30%	Yes
Software Dev - Work Meas Systems	458	329	129	39%	
Software Dev - Work Meas & Electric Syst		1,438	(1,438)	-100%	Yes
Field Force Program Delivery Team	20	989	(969)	-98%	
IT Opex Enterprise Training and CC		288	(288)	-100%	

<sup>3</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, the corrected 2017 imputed authorized is \$84,117 instead of \$85,397, a difference of \$1,280.

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>3</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
IT Portfolio Management	280	326	(46)	-14%	
Infrastructure Subtotal	15,421	27,383	(11,962)	-44%	
Network Communication Services Director	32	1,208	(1,177)	-97%	Yes
Infrastructure Eng & Ops Director	335	1,364	(1,030)	-75%	Yes
Infrastructure Program Office	359	561	(202)	-36%	
Project Management Office-NCS		594	(594)	-100%	
Infrast Prgrm Office	541	403	138	34%	
IT Telecom PMO	39		39	100%	
IT Vendor Management Office	252		252	100%	
IT Infrastructure NSS	3,331	1,358	1,974	145%	Yes
Telecom Field Voice	2,120	3,939	(1,819)	-46%	Yes
Client Technology & Depot Services	1,622	1,586	36	2%	
Enterprise Server Group		65	(65)	-100%	
Middleware and Internet Engineering	903	2,218	(1,315)	-59%	Yes
Storage and Administration		28	(28)	-100%	
Enterprise Operations	335	2,038	(1,703)	-84%	Yes
Server Management	913	1,531	(619)	-40%	
Unix Server Group		76	(76)	-100%	
IT Network Field - LAN/WAN Voice	5	598	(592)	-99%	
IT Network Hardware Software Maintenance		874	(874)	-100%	
Enterprise Command Center	1,907	3,604	(1,696)	-47%	Yes
Wintel Server Group		69	(69)	-100%	
Project Improvement Office-NCS	418	1,955	(1,538)	-79%	Yes
Service Delivery - NCS	827	739	88	12%	
Service Development Program Management	266	467	(201)	-43%	
Solutions Architecture	422	621	(200)	-32%	

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>3</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
SDGE Network Integration		14	(14)	-100%	
SCG Network Integration		2	(2)	-100%	
Voice Enterp Support	450	824	(374)	-45%	
Client Tech Svcs	45	610	(565)	-93%	
Network Engineering	299		299	100%	
Enterprise Modeling Test Team		35	(35)	-100%	
Database / IT&OTI Contracts Subtotal	15,492	15,308	183	1%	
Database Contracts Maintenance	4,917		4,917	100%	Yes
IT&OTI Contracts SS	8,267	10,289	(2,022)	-19%	
Software Dev - Database Administrator	2,307	5,019	(2,712)	-54%	Yes
Network/Telecom Services and Voice Subtotal	9,180	10,749	(1,568)	-15%	
Network/Telecom Services	5,949	9,282	(3,333)	-36%	Yes
Voice Leased Circuits	1,039	738	301	41%	
Managed Service Voice Enterprise	2,192	728	1,464	201%	Yes

**ii. SDG&E Information Technology O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Cybersecurity Total	Due to industrywide emergent cybersecurity threats not anticipated during TY 2016, additional support was required for Information Security.		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Information Security	The variance is driven by increased industrywide cyber threats, which required more data and privacy governance support.		
Information Security Contracts	The variance is driven by increased industrywide cyber threats, which required more support, including IT security contracts.		
Information Technology Total	Information Technology had reduced O&M due to higher capital expenditures to meet regulatory requirements and to shift O&M funding to higher priority operational needs. In addition, a multi-day data center outage, impacting hundreds of applications, required additional capital work to recover, further shifting resources from O&M.		
Application Services Subtotal			
Director - Application Services	Lower than forecasted staffing level during some portion of 2017.		
IT Applications NSS	Increased regulatory requirements shifted work to capital for Customer Care such as AB802 and Customer Authorization projects.		
Software Dev - Work Meas & Electric Syst	Increase in capital such as GIS and Powerworkz shifted work from O&M.		
Infrastructure Subtotal			
Network Communication Services Director	Lower than forecasted staffing level during some portion of 2017.		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Infrastructure Eng & Ops Director	Resources shifted to capital for environment recovery following multi-day data center outage.		
IT Infrastructure NSS	Desktop support was higher than forecasted.		
Telecom Field Voice	Capital contracts replaced O&M maintenance costs.		
Middleware and Internet Engineering	Resources shifted to capital for environment recovery following multi-day data center outage.		
Enterprise Operations	Resources shifted to capital for environment recovery following multi-day data center outage.		
Enterprise Command Center	Reorganized as the IT Service Optimization with fewer employees.		
Project Improvement Office-NCS	Project Improvement Office-NCS was reorganized with fewer employees.		
Database / IT&OTI Contracts Subtotal	Contract costs were distributed across multiple cost centers (Database Contracts, IT&OTI Contracts and Database Administrator)		
Database Contracts Maintenance	See Database / IT&OTI Contracts Subtotal.		
Software Dev - Database Administrator	See Database / IT&OTI Contracts Subtotal.		
Network/Telecom Services and Voice Subtotal	Activities forecasted in Network/Telecom services were recorded to Voice Leased Circuits and Managed Service Voice Enterprise		
Network/Telecom Services	See Network/Telecom Services and Voice Subtotal.		
Managed Service Voice Enterprise	See Network/Telecom Services and Voice Subtotal.		

iii. **SDG&E Information Technology O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Information Technology	Information Security	2100-3101 / 2100-3101	This cost center provides Data & Privacy Governance support, including IT security awareness and training, and Privacy, Legislative, and Data Governance enterprise wide. This category includes costs for activities, as described, designed to mitigate cyber security risks.	SDG&E-19-R-A SJM-19 to SJM-20	SDG&E-25 GW-25 to GW-27
Information Technology	Information Security Contracts	2100-3781 / 2100-3781	This cost center contains all IT Security Contracts, including system-wide hardware and software maintenance agreements. This category includes costs for activities, as described, designed to mitigate cyber security risks.	SDG&E-19-R-A SJM-19 to SJM-20	SDG&E-25 GW-25 to GW-27
Information Technology	Director - Application Services	2100-3087 / N/A	IT Applications support the development, implementation and maintenance of computer software utilized by customers, employees and/or vendor partners. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-16 to SJM-17	N/A
Information Technology	IT Applications NSS	1IT001.000 / 1IT001.000	IT Applications support the development, implementation and maintenance of computer software utilized by customers, employees and/or vendor partners. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-12 to SJM-13	SDG&E-24-R CRO-11
Information Technology	Software Dev - Work Meas & Electric Syst	2100-3093 / N/A	This cost center supports Geographic Information System (GIS) and Computer-Aided Design (CAD) Applications services for both SDG&E and SoCalGas. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-16 to SJM-17	N/A
Information Technology	Network Communication Services Director	2100-3095 / 2100-3095	Activities include department level management for plan, design, build, implementation and management of system-wide network and telecommunications infrastructure. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-17 to SJM-19	SDG&E-24-R CRO-14 to CRO-15



Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Information Technology	Infrastructure Engineering & Operations Director	2100-3102 / 2100-3102	The infrastructure and engineering operations director cost center manages the work activities and prioritization of the Share Applications department for project, operational and system support activities. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-16 to SJM-17	SDG&E-24-R CRO-14
Information Technology	IT Infrastructure NSS	1IT002.000 & 1IT003.000 / 1IT002.000	IT Infrastructure supports the design, implementation and operation of the company's computing infrastructure, and includes both hardware and software. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-14	SDG&E-24-R CRO-12
Information Technology	Telecom Field Voice	2100-0207 / 2100-0207	This cost center is responsible for the installation and maintenance of telecom equipment including Private Branch Exchanges (PBXs), microwave, data and mobile radio services across the SDG&E service territory, including Corporate Center (parent). This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-17 to SJM-19	SDG&E-24-R CRO-14 to CRO-15
Information Technology	Middleware and Internet Engineering	2100-3100 / 2100-3100	Infrastructure engineering support for the following systems: email, Gateways, File Transfer Protocol (FTP), Enterprise System Management, middleware and Internet technologies such as directories and web and application servers that are used on a system-wide basis. This category includes costs for activities, as described, designed to mitigating reliability risks.	SDG&E-19-R-A SJM-17 to SJM-19	SDG&E-24-R CRO-14 to CRO-15
Information Technology	Enterprise Operations	2100-3107 / 2100-3107	This group is responsible for operating processes, monitoring and maintaining of the Enterprise and Distributive delivery infrastructures. This operational support structure is in place to ensure business service levels are attained while being cost efficient. In addition, this organization is capable of identifying services outages and providing a resolution process for first and second level problem tiers. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-17 to SJM-19	SDG&E-24-R CRO-14 to CRO-15

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Information Technology	Enterprise Command Center	2100-3502 / 2100-3502	The Enterprise command center organization provides operation system-wide services to ensure network/telecom availability for all related business applications and services that are dependent upon voice, data, microwave, etc. category of communication services. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-17 to SJM-19	SDG&E-24-R CRO-14 to CRO-15
Information Technology	Project Improvement Office-NCS	2100-3683 / 2100-3683	Preventative maintenance activities on network and telecom infrastructure. This cost center is responsible for the design and implementation of computing infrastructure projects for Local Area and Wide Area networks and voice systems that link all company facilities. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-17 to SJM-19	SDG&E-24-R CRO-14 to CRO-15
Information Technology	Database Contracts Maintenance	N/A / 2100-3916	This cost center provides maintenance and enhancement support for system wide database administration. This category includes costs for activities, as described, designed to mitigate reliability risks.	N/A	SDG&E-24-R CRO-14 to CRO-15
Information Technology	Software Dev - Database Administrator	2100-3091 / 2100-3091	This cost center provides maintenance and enhancement support for system wide database administration. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-16 to SJM-17	SDG&E-24-R CRO-14
Information Technology	Network/Telecom Services	2100-3106 / 2100-3106	Provides system-wide leased lines for transmission of voice and data information for utilities and affiliates including circuits, trunks, long distance, remote access, and vendor costs for billing analysis. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-17 to SJM-19	SDG&E-24-R CRO-14 to CRO-15
Information Technology	Managed Service Voice Enterprise	2100-3884 / 2100-3884	This cost center is for the monthly vendor payments for the managed services of system-wide voice support costs. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19-R-A SJM-17 to SJM-19	SDG&E-24-R CRO-14 to CRO-15

iv. **SDG&E Information Technology Capital Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Information Technology	109,203	37,671	71,532	190%	
Software-Customer Care Mandated	36,899	99	36,800	37095%	Yes
Software-Utility Operations Mandated	11,020		11,020	100%	Yes
Hardware-Utility Operations Mandated	31		31	100%	
Infrastructure-Hardware Capacity	2	2,266	(2,264)	-100%	Yes
Network/Telecom-Hardware Capacity	626		626	100%	
Software-Utility Operations Capacity	625		625	100%	
Hardware-Utility Operations Capacity	574		574	100%	
Infrastructure-Hardware Reliability	13,566	210	13,356	6347%	Yes
Network/Telecom-Hardware Reliability	6,530	2,119	4,411	208%	Yes
Software-Utility Operations Reliability	21,896	3,723	18,173	488%	Yes
Hardware-Utility Operations Reliability	12,887		12,887	100%	Yes
Dist Energy Resource Mgmt (DERMS)	2,161		2,161	100%	Yes
Demand Response Mgmt System (DRMS)	469		469	100%	
Dist. Interconnect. Info Sys (DIIS) Ph 3	1		1	100%	
Smart Grid Endpoint Protection	243		243	100%	
Cyber-Asset, Identity, Access Mgmt-SW	633		633	100%	
Cyber-Sit Aware & Incident Response-SW	196		196	100%	
Cyber-Asset, Identity, Access Mgmt-HW	212		212	100%	
Cyber-Sit Aware & Incident Response-HW	7		7	100%	
Cyber-Other-HW	625		625	100%	
Software-Utility Operations/Strategic		287	(287)	-100%	
OpEx 20/20		5,796	(5,796)	-100%	Yes
GridComm		10,672	(10,672)	-100%	Yes
IT Smart Grid - Software		11,179	(11,179)	-100%	Yes

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
IT Smart Grid - Hardware		1,319	(1,319)	-100%	

**v. SDG&E Information Technology Capital Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Information Technology	Increased capital expenditures due to environment recovery efforts of multi-day data center outage, end of life technology replacement, and increase in regulatory requirements that are outside of this proceeding.		
Software-Customer Care Mandated	The primary variance driven by regulated projects that are out of scope of the spending accountability report for safety, reliability, and/or maintenance.		
Software-Utility Operations Mandated	Variance mainly driven by OpEx 20/20 activity forecasted to a different budget code but recorded to Software-Utility Operations Mandated. Additional variance due to spending on FERC requirements to share rate information and on CAISO Meter Data Settlement and other requirements.		
Infrastructure-Hardware Capacity	End of life desktop/laptop devices that required replacement were forecasted in this workpaper but recorded to Hardware-Utility Operations Reliability.		
Infrastructure-Hardware Reliability	Emergent needs due to end of life technology.		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Network/Telecom-Hardware Reliability	Emergent needs due to end of life technology.		
Software-Utility Operations Reliability	Emergent needs due to end of life technology and remaining compliant with regulation changes		
Hardware-Utility Operations Reliability	Response to significant infrastructure outage and end of life desktop/laptop devices that required replacement forecasted in Infrastructure-Hardware Capacity.		
Dist Energy Resource Mgmt	System upgrade required to meet operational requirements. See TY 2019 GRC workpapers SDG&E-24-CWP, budget code 14860A.		
OpEx 20/20	Activities forecasted in this budget code were recorded to Software-Utility Operations Mandated.		
GridComm	The GridComm project was completed prior to 2017 as forecasted in the TY 2016 GRC workpapers. See SDG&E-19-CWP-R, budget code 10874.		
IT Smart Grid - Software	The IT SmartGrid - Software was completed prior to 2017 as forecasted in the TY 2016 GRC workpapers. See SDG&E-19-CWP-R, budget code 10875.		

vi. **SDG&E Information Technology Capital Workpaper Descriptions and GRC Testimony Locations**

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Information Technology	811	Software-Customer Care Mandated	Applications support the development, implementation and maintenance of computer software utilized by customers, employees and/or vendor partners. Projects included in this budget code are mandated by the CPUC and are related to customer service applications. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19 SJM-21 to SJM-30	SDG&E-24-R CRO-16 to CRO-31
Information Technology	813	Software-Utility Operations Mandated	Applications support the development, implementation and maintenance of computer software utilized by customers, employees and/or vendor partners. Projects included in this budget code are mandated by the CPUC and are related to enterprise-wide software applications in support of utility operations. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19 SJM-21 to SJM-30	SDG&E-24-R CRO-16 to CRO-31
Information Technology	817	Infrastructure-Hardware Capacity	IT Infrastructure supports the design, implementation and operation of the company's computing infrastructure. Projects included in this budget code are related to enterprise-wide infrastructure in support of capacity expansion. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19 SJM-21 to SJM-30	SDG&E-24-R CRO-16 to CRO-31
Information Technology	827	Infrastructure-Hardware Reliability	IT Infrastructure supports the design, implementation and operation of the company's computing infrastructure. Projects included in this budget code are related to enterprise-wide hardware. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19 SJM-21 to SJM-30	SDG&E-24-R CRO-16 to CRO-31
Information Technology	829	Network/Telecom-Hardware Reliability	IT Infrastructure supports the design, implementation and operation of the company's computing infrastructure, includes both hardware and software. Projects included in this budget code are related to enterprise-wide telecommunication investments. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19 SJM-21 to SJM-30	SDG&E-24-R CRO-16 to CRO-31

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Information Technology	833	Software-Utility Operations Reliability	Applications support the development, implementation and maintenance of computer software utilized by customers, employees and/or vendor partners. Projects included in this budget code are related to enterprise-wide software applications in support of utility operations. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19 SJM-21 to SJM-30	SDG&E-24-R CRO-16 to CRO-31
Information Technology	834	Hardware-Utility Operations Reliability	IT Infrastructure supports the design, implementation and operation of the company's computing infrastructure. Projects included in this budget code are related to enterprise-wide hardware investments in support of utility operations. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19 SJM-21 to SJM-30	SDG&E-24-R CRO-16 to CRO-31
Information Technology	1486	DERMS	The development and deployment of a DERMS solution that is capable of monitoring, optimizing, and dispatching Distributed Energy Resources (DER) connected at the Distribution and Transmission system levels. The solution is deployed at multiple DER locations and gives SDG&E the ability to remotely operate its energy storage systems and microgrids, as individual assets or in groups.	N/A	SDG&E-24-R CRO-8
Information Technology	7864	OPEX 20/20	Project includes several enhancements necessary to complete remaining CPD deployments. Activities include training, data conversion, system configuration, and storm period support, including defect resolution.	SDG&E-19 SJM-21 to SJM-30	N/A
Information Technology	10874	GridComm	This program supports various Smart Grid initiatives aimed at automating operations previously performed by manual field inspection. Process automation requires new and updated telecommunications to carry field asset status back to the data center. GridComm program scope consists of implementing telecommunications in 4 areas: 1) Low Power Communications Network; 2) Substation 8 Communications; 3) Field Broadband Connections; and 4) SCADA Optimization.	SDG&E-19 SJM-21 to SJM-30	N/A

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Information Technology	10875	IT Smart Grid - Software	Applications and sensors that support the development, implementation and maintenance of solutions utilized by customers, employees and/or vendor partners. Projects included in this budget code modernize and protect the Electric Grid through various software, hardware, communications, and security technologies. This category includes costs for activities, as described, designed to mitigate reliability risks.	SDG&E-19 SJM-21 to SJM-30	N/A

**c. SDG&E Support Services**

**i. SDG&E Support Services O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>4</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Support Services	37,007	48,281	(11,274)	-23%	
Environmental Services	5,060	7,493	(2,433)	-32%	
Environmental	4,361	6,116	(1,755)	-29%	Yes
Environmental Lab Operations	699	1,377	(678)	-49%	
Real Estate, Land Services & Facilities	31,947	40,788	(8,841)	-22%	
SDG&E Facility Operations	8,447	6,223	2,224	36%	Yes
Land Services	586	661	(75)	-11%	
SDGE Rents	19,042	17,595	1,447	8%	
RE Planning	1,212	664	548	83%	
HQ Rent, Facilities Maintenance & Utilities	915	13,057	(12,142)	-93%	Yes
Facilities & Capital Programs - Admin	95	198	(103)	-52%	

<sup>4</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, the corrected 2017 imputed authorized is \$47,366 instead of \$48,281, a difference of \$915.



WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>4</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
RE Resources	354	817	(463)	-57%	
Facilities Operations South Manager	502	879	(377)	-43%	
RB Data Center & Annex	794	694	100	14%	

**ii. SDG&E Support Services O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Environmental Services			
Environmental	<p>Unforecasted efficiencies resulting from Fueling Our Future (FOF) initiatives that resulted in reduced contractor or consultant usage and other efficiencies.</p> <p>Forecasts included HazMat service calls; however, expenses were recorded in the cost centers that requested the service.</p> <p>Lower than forecasted staffing levels during some portion of 2017.</p>		FOF initiatives were not contemplated in the TY 2016 GRC.
Real Estate, Land Services & Facilities			
SDG&E Facility Operations	Higher than forecasted corporate security costs in addition to the implementation of the 24/7 security monitoring of critical infrastructure at SDG&E. These activities, as described, are designed to mitigate risks related to physical security and workplace violence.		Increase in security monitoring costs at SDG&E substations and other sites containing critical electric and / or gas infrastructure.
HQ Rent, Facilities Maintenance & Utilities	TY 2016 GRC forecast included costs that were billable to Sempra Headquarters for rent and facilities maintenance. Due to an accounting change, expenses are now directly recorded at		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
	Sempra Corporate Center.		

**iii. SDG&E Support Services O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Environmental Services	Environmental	1EV000.000 & 2100-0206 & 2100-3022	The compliance activities in this cost category include management of hazardous waste and Treatment Storage and Disposal Facility (TSDf) operations, oversight of daily environmental compliance activities, and permits and support for compliance with all operations and maintenance activities relating to the Sunrise Powerlink, and its associated facilities, to ensure compliance with the environmental permitting for that project.	SDG&E-18 RSP-4, RSP-11 to RSP-13	SDG&E-23 NCC-8 to NCC-13
Real Estate, Land Services & Facilities	SDGE Facility Operations	1RE001.000	Facility Operations provides O&M support for utility facilities including general offices, construction and operations centers, telecommunications sites, warehouse, and branch/bill payment offices. Maintenance support is either done by company employees or by contracted services. Contracted services account for the majority of the costs and are typically done at leased facilities where the property owner has some level of contractual control over the maintenance obligations. The organization provides facility operations services to SDG&E and the Sempra Energy Corporate Center.  This category includes costs for activities, as described,	SDG&E-17 JCS-4 to JCS-7	SDG&E-22 RDT-12 to RDT-16

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
			designed to mitigate workplace violence and physical security risks.		
Real Estate, Land Services & Facilities	HQ Rent, Facilities Maintenance & Utilities	2100-0708	Corporate Real Estate administers the lease payments and manages the Sempra Energy Headquarters building (HQ) on behalf of Sempra Energy. Through affiliate billing orders, all rents and associated costs are directly charged to the Corporate Center and affiliates that occupy the building. For TY 2016, Corporate Rents included the lease for Sempra Energy's new building at 488 8th Avenue, San Diego, CA.	SDG&E-17 JCS-17 to JCS-21, JCS-12 to JCS-13	SDG&E-22 RDT-25

**iv. SDG&E Support Services Capital Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Support Services	49,824	23,350	26,473	113%	
Real Estate, Land Services & Facilities	49,824	23,350	26,473	113%	
Structures & Improvements	4,591	2,449	2,142	87%	Yes
Safety/Environmental	1,360	5,702	(4,342)	-76%	Yes
Security Systems Blanket	4,347	424	3,924	926%	Yes
Infrastructure/Reliability Blanket	14,199	5,808	8,391	144%	Yes
Remodel/Relocate/Reconfigure Blanket	19,518	5,674	13,844	244%	Yes
Business Unit Expansion Blanket	4,247	2,523	1,724	68%	
Archibus System	1,419	444	975	220%	
Land Blanket	142	328	(185)	-57%	

**v. SDG&E Support Services Capital Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Real Estate, Land Services & Facilities			
Structures & Improvements	Several emergent projects for employee safety and facility security involved building structural repairs/replacements, site lighting and roofing replacements, and improvements to the newly leased Caspian site, which was acquired as a fundamental component of SDG&E's facilities consolidation strategy.		Mission Control Computer Room Raised Floor Replacement Mt Empire Light Pole Replacements Caspian Crane Demolition North Coast Store Room

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
			<p>Canopy Structural Beam Replacement</p> <p>Caspian Heavy Material Storage Area</p>
Safety/Environmental	Forecasts included costs to support new regulations anticipated as necessary to address evolving regulations concerning storm water treatment and discharge; however, these costs did not materialize.		
Security Systems Blanket	Higher than forecasted project work to address evolving security concerns and to mitigate security-related risks. These projects involved improved security physical barriers and access control systems at various facilities, generally responding to identified deficiencies or audits received.		<p>Northeast Construction &amp; Operation Center Perimeter Fence Improvements</p> <p>Mission Control Center Critical Asset Protection</p> <p>Northeast Construction &amp; Operation Center Surveillance Upgrade</p>
Infrastructure/Reliability Blanket	Higher than forecasted work resulting from emergent projects designed, as described, to improve electric service reliability and to mitigate the impact of potential adverse risk events (e.g., Blackout). SDG&E implemented a remodel of its Grid Control Center and replaced two generators at its Century Park Corporate Headquarters campus, where its Emergency Operations Center is located.		<p>Century Park Backup Power Replacement</p> <p>Mission Control (Grid Operations) Transmission Energy Management System Improvements</p>
Remodel/Relocate/Reconfigure Blanket	Higher than forecasted work to support growth, improved adjacencies and maintenance. These emergent projects involved improvements to SDG&E's Aviation Services Field Office, creation of a Grid and Distribution Operator Training facility, improvements to the Mission Skills		<p>Century Park East Tenant Improvement</p> <p>Century Park Annex Plus Tenant Improvement</p>

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
	training facility and tenant improvements to the newly leased CP East and CP Annex + facilities.		Aviation Services Gillespie Field Office Tenant Improvement

**vi. SDG&E Support Services Capital Workpaper Descriptions and GRC Testimony Locations**

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Real Estate, Land Services & Facilities	00701x, 177730	Structures & Improvements	<p>This budget funds minor building modifications, upgrades and facility improvements to adequately support corporate business initiatives, to extend the life of the asset, or increase the functionality of a building or site. Small projects under \$1 million are bundled, when possible, for economies of scale in sourcing. These projects vary year to year based on need, but address the capital replacement or addition of basic, individual interior and exterior facilities construction components, including lighting, fencing, gates, paving, roofing, flooring, windows and storage sheds. Each year’s requirements are prioritized to manage and protect the facility assets, keep the employees safe and optimize real estate value. Scope of work may include modernization projects and/or offer best alternatives for cost avoidance compared to other scenarios.</p> <p>This category includes costs for activities, as described, designed to mitigate safety and physical security risks.</p>	SDG&E-17 JCS-23 to JCS-24	SDG&E-22 RDT-29 to RDT-30

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Real Estate, Land Services & Facilities	00703x	Safety/ Environmental	<p>This budget funds building and system modifications, site upgrades, and other facility improvements necessary to comply with safety and environmental code or regulations, or implement best practices designed to mitigate risk to the environment or safety of employees or the public. Small projects under \$1 million are bundled, when possible, for economies of scale in sourcing. These projects vary year to year based on changes to existing or proposed new regulations. Common project types covered in this budget code are improvements to meet storm water management regulations. Storm water compliance includes physical changes to the site including drainage control, curbs and berms, coverings to manage the flow of storm water and other best management practices. Concrete pads, hazardous waste storage and other requirements, designed to mitigate environmental risk, are covered in this blanket. Safety projects vary in nature, but can include communication systems, fall protection, or other improvements designed to mitigate employee safety risk. Underground storage tank compliance issues and enhanced vapor recovery system upgrades to the fueling systems are also included.</p> <p>This category includes costs for activities, as described, designed to mitigate safety risks.</p>	SDG&E-17 JCS-24 to JCS-25	SDG&E-22 RDT-30 to RDT-31

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Real Estate, Land Services & Facilities	00707x, 167670, 177750	Security Systems Blanket	<p>This budget funds minor building modifications, upgrades, and facility improvements designed to safeguard SDG&amp;E occupied facilities and sites, protect employees and company property, and mitigate corporate liability. Small projects under \$1M are bundled, when possible, for economies of scale in sourcing. Project requirements are prioritized based on corporate security recommendations. Scope of work may vary year to year, based on identification of risks, but all address the security of the company employees, operations, and assets. Common project types covered in this budget code are card readers, cameras, video recorders, and controlled automated gates.</p> <p>This category includes costs for activities, as described, designed to mitigate workplace violence risks.</p>	SDG&E-17 JCS-26	SDG&E-22 RDT-32



Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Real Estate, Land Services & Facilities	167710, 00708x, 147580, 167660, 167700, 08735A, 13749A	Infrastructure /Reliability Blanket	<p>This budget funds building facility infrastructure to support basic building operations, as well as requirements specific to the business unit operations and initiatives. Projects include replacement of systems and major equipment affecting reliability, comfort and safety of employees at numerous sites throughout the portfolio. Common project types covered in this budget code are: Chillers, Boilers, Air Handlers, heating, ventilation and air conditioning (HVAC) Replacements, Generators, uninterruptable power systems (UPS) systems, Electrical Distribution Systems and Computer Room Infrastructure.</p> <p>This budget also funds replacement of existing computer room air conditioning units (CRACs) that are beyond their useful life with new units that will operate from the facility's chilled water plant and funds the addition of redundant UPS modules to keep pace with the anticipated server growth in the data center facility.</p> <p>This category includes costs for activities, as described, designed to mitigate electrical service reliability risks.</p>	SDG&E-17 JCS-27, JCS-30 to JCS-32	SDG&E-22 RDT-33 to RDT-34, RDT-40 to RDT-42, RDT-44 to RDT-45
Real Estate, Land Services & Facilities	00709x, 167680, 177740, 147530	Remodel/Relocate/ Reconfigure Blanket	<p>This budget funds work station relocations and changes needed to provide adequate and efficient office space and work environments for employees. Requirements are based on business needs and functionality needed to meet business and resource objectives. Space standards and guidelines are used to manage space allocations and modifications effectively in reconfigurations. Ergonomics are considered in the upgrades to provide improved working conditions and safety for employees.</p>	SDG&E-17 JCS-28	SDG&E-22 RDT-34 to RDT-35

d. **SDG&E Administrative & General**

i. **SDG&E Administrative & General O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>5</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
A&G	74,548	73,575	973	1%	
Accounting & Finance, Legal, Regulatory Affairs, External Affairs	396	610	(214)	-35%	
Operation Cost Center-USS-Controllars -Business Controls	396	610	(214)	-35%	
Compensation & Benefits	166	337	(171)	-51%	
Health Benefits - Employee Assistance Program	166	337	(171)	-51%	
Corporate Center - General	62,146	60,614	1,532	3%	
SECC Outside Services Employed - F923.1	62,146	60,614	1,532	3%	
Human Resources Dept, Safety, LTD & WC	7,282	9,247	(1,965)	-21%	
Safety, Wellness and Disability Services	1,424	1,594	(169)	-11%	
Organizational Effectiveness	1,877	2,008	(131)	-7%	
Offices of the CEO and President	2,283	2,502	(219)	-9%	
Employee Assistance Program (EAP) And Wellness Programs	260	525	(266)	-51%	
SDG&E Field Safety	874	2,619	(1,745)	-67%	Yes
Safety Programs SDG&E	564		564	100%	
Risk Management	4,557	2,766	1,791	65%	
Risk Management	2,437	2,766	(329)	-12%	
VP Enterprise Risk Management	333		333	100%	
Operations Risk Management SDG&E	1,788		1,788	100%	Yes

<sup>5</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, the corrected 2017 imputed authorized is \$73,446 instead of \$73,575 a difference of \$129.

ii. **SDG&E Administrative & General O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Human Resources Dept, Safety, LTD & WC			
SDG&E Field Safety	Lower than forecasted training costs due to the change in scope of the driver training program. In addition, resources forecasted in this area were recorded in multiple HR and Corporate Pension & Benefits cost centers due to organizational realignments.	Vehicle Technology Program was cancelled in Safety, with Fleet resuming the search for an appropriate device program to address needs.	
Risk Management			
Operations Risk Management SDG&E	Higher than forecasted due to emergent activities related to GRC and risk-related regulatory proceedings, such as development of risk frameworks and tools.		As various proceedings and CPUC risk-related requirements evolved, such as developments in the Safety Model Assessment Proceeding, additional consultant support was needed that was unforeseen at the time of the TY 2016 GRC.

iii. **SDG&E Administrative & General O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Human Resources Dept, Safety, LTD & WC	SDG&E Field Safety	2100-0214	The (Operations Safety)/Field Safety department interprets and advises field operations regarding safety related rules and regulations and provides reviews of potential legislation that would impact field operations. Field Safety plays an important role in support of field safety compliance audits, providing major program support, communications, management, and statistical analysis. This workpaper is in scope of the report due to the group's work in the areas of safety compliance and regulation.	SDG&E-24 SEE-18 to SEE-20	SDG&E-30 TT-30 to TT-31
Risk Management	Operations Risk Management SDG&E	2100-3945	This workpaper focuses on the development of risk frameworks and tools. Its primary responsibility is to refresh the risk registries, apply new risk models to the risk identification, analysis, and evaluation process, and support the implementation of operating unit registries. This workpaper also supports the implementation of asset management such as conformance with asset management standards such as International Organization for Standardization (ISO) 55000 (Asset Management) and American Petroleum Institute's Recommended Practice 1173 (Pipeline Safety Management System).	N/A	SDG&E-02-R GFS-4 to GFS-5

**4. SDG&E Balanced Programs – DIMP, TIMP, Tree Trimming and NERBA**

**a. SDG&E Balanced Programs Direct O&M Costs**

**i. SDG&E Balanced Program Direct O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Total Balanced	34,120	39,755	(5,636)	-14%	
Gas Engineering	9,752	12,393	(2,641)	-21%	
DIMP	5,592	6,527	(935)	-14%	
TIMP	4,160	5,866	(1,706)	-29%	Yes
Gas Transmission		79	(79)	-100%	
RNERBA - ENVIRONMENTAL FEES - GAS REFUNDABLE		79	(79)	-100%	
Electric Distribution	23,194	26,234	(3,041)	-12%	
Vegetation Management (Tree Trimming)	23,194	26,234	(3,041)	-12%	
Support Services	1,174	1,049	125	12%	
RNERBA - Environmental Fees - Electric Refundable	413	421	(8)	-2%	
RNERBA - Environmental Fees - Gas Refundable	761	628	133	21%	

**ii. SDG&E Balanced Programs Direct O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
TIMP	TIMP is managed to the revenue requirement over the GRC authorized (2016 - 2018) cycle and not on an individual year basis. Therefore, individual year expenditures may vary from the authorized amount and also between overall capital and O&M expenditures. The assessment project load and remediation required for the year was lower than anticipated.		

**iii. SDG&E Balanced Programs Direct O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
TIMP & DIMP	TIMP	1TD000.000	Primary activities focus on the development, management and support of the Pipeline Integrity Management Program (TIMP). Support activities include data collection, analysis, management, and reporting; assessment planning; integrity assessments and project management; preventive and mitigative measure analysis; technical and engineering support in the areas of corrosion protection and treatment, metallurgy, pipeline materials specifications and standard operating procedures.	SDG&E-07 MTM-7 to MTM-13	SDG&E-11 MTM-9 to MTM-16

**b. SDG&E Balanced Programs Direct Capital**

**i. SDG&E Balanced Program Direct Capital Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Total Balanced	38,141	14,751	23,390	159%	
DIMP	34,929	9,113	25,815	283%	Yes
TIMP	3,212	5,638	(2,425)	-43%	Yes

**ii. SDG&E Balanced Programs Direct Capital Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
DIMP	DIMP is managed to the revenue requirement over the GRC authorized (2016 - 2018) cycle and not on an individual year basis. Therefore, individual year expenditures may vary from the authorized amount and also between overall capital and O&M expenditures. For 2017 the mileage replaced as part of the early vintage replacement program (Aldyl-A) was higher than the average forecast as the program continues to ramp-up, which results in higher capital expenditure levels.		
TIMP	TIMP is managed to the revenue requirement over the GRC authorized (2016 - 2018) cycle and not on an individual year basis. Therefore, individual year expenditures may vary from the authorized amount and also between overall capital and O&M expenditures. The assessment project load and remediation required for the year was lower than anticipated.		

iii. **SDG&E Balanced Programs Direct Capital Workpaper Descriptions and GRC Testimony Locations**

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
TIMP & DIMP	095460	DIMP	Pipeline and Hazardous Material Safety Administration’s (PHMSA) purpose for DIMP is to enhance pipeline safety by having operators identify and reduce pipeline integrity risks specifically for distribution pipelines. As noted by PHMSA, DIMP requires activities beyond those required by traditional regulation. SDG&E therefore has created individualized DIMP activities such as the Distribution Risk Evaluation and Monitoring System (DREAMS) that are above and beyond its core regulatory requirements. It has also created another individualized DIMP activity called Gas Infrastructure Protection Project (GIPP).	SDG&E-07 MTM-20 to MTM-21	SDG&E-11 MTM-24 to MTM-25
TIMP & DIMP	034680	TIMP	This project addresses the regulatory requirements set forth by the implementation of PSIA 2002. All DOT transmission pipeline work generated to address these regulatory requirements. The underlying cost drivers relate to the number of required assessments (In-Line Inspection (ILI), Direct Assessment, and Pressure Test), repairs, and mitigation activities.	SDG&E-07 MTM-18 to MTM-20	SDG&E-11 MTM-22 to MTM-23



c. **SDG&E Balanced Program Regulatory Account 2017 Cumulative Balances**

i. **SDG&E Regulatory Account – DIMPBA**

<b>SDG&amp;E DIMPBA Details Revenue Requirements (\$000)</b>						
<b>Two-Way</b>						
	(a)	(b)	(c)	(d) = (b) - (c)	(e)	(f) = (a) + (d) + (e)
	<b>Beginning Balance</b>	<b>Actual</b>	<b>Authorized</b>	<b>Under/(Over) Collection</b>	<b>Interest</b>	<b>Ending Balance</b>
<b>Year 2017</b>						
Beginning Balance	(3,516)					(3,516)
O&M		6,199	6,527	(328)		(328)
Capital-Related Costs		3,488	849	2,639		2,639
Interest					(29)	(29)
Subtotal	(3,516)	9,688	7,376	2,312	(29)	(1,233)

ii. **SDG&E Regulatory Account – TIMPBA**

<b>SDG&amp;E TIMPBA Details Revenue Requirements (\$000)</b>						
<b>Two-Way</b>						
	(a)	(b)	(c)	(d) = (b) - (c)	(e)	(f) = (a) + (d) + (e)
	<b>Beginning Balance</b>	<b>Actual</b>	<b>Authorized</b>	<b>Under/(Over) Collection</b>	<b>Interest</b>	<b>Ending Balance</b>
<b>Year 2017</b>						
Beginning Balance	3,985					3,985
O&M		5,200	5,866	(666)		(666)
Capital-Related Costs		250	146	104		104
Interest					40	40
Subtotal	3,985	5,450	6,012	(562)	40	3,462

iii. **SDG&E Regulatory Account – Tree Trimming Balancing Account**

SDG&E Tree Trimming Balancing Account Details Revenue Requirements (\$000)						
One-Way						
	(a)	(b)	(c)	(d) = (b) - (c)	(e)	(f) = (a) + (d) + (e)
	<b>Beginning Balance</b>	<b>Actual</b>	<b>Authorized</b>	<b>Under/(Over) Collection</b>	<b>Interest</b>	<b>Ending Balance</b>
<b>Year 2017</b>						
Beginning Balance	(5,516)					(5,516)
O&M		23,211	26,234	(3,023)		(3,023)
Capital-Related Costs				-		-
Amortization			(3,256)	3,256		3,256
Interest					(55)	(55)
Subtotal	(5,516)	23,211	22,978	233	(55)	(5,338)

iv. **SDG&E Regulatory Account – NERBA Electric**

<b>SDG&amp;E NERBA Electric Details Revenue Requirements (\$000)</b>						
<b>Two-Way</b>						
	(a)	(b)	(c)	(d) = (b) - (c)	(e)	(f) = (a) + (d) + (e)
	<b>Beginning Balance</b>	<b>Actual</b>	<b>Authorized</b>	<b>Under/(Over) Collection</b>	<b>Interest</b>	<b>Ending Balance</b>
<b>Year 2017</b>						
Beginning Balance	(467)					(467)
O&M		470	421	49		49
Capital-Related Costs				-		-
Amortization			(354)	354		354
Interest					(3)	(3)
Subtotal	(467)	470	67	402	(3)	(68)

v. **SDG&E Regulatory Account – NERBA Gas**

<b>SDG&amp;E NERBA Gas Details Revenue Requirements (\$000)</b>						
<b>Two-Way</b>						
	(a)	(b)	(c)	(d) = (b) - (c)	(e)	(f) = (a) + (d) + (e)
	<b>Beginning Balance</b>	<b>Actual</b>	<b>Authorized</b>	<b>Under/(Over) Collection</b>	<b>Interest</b>	<b>Ending Balance</b>
<b>Year 2017</b>						
Beginning Balance	(178)					(178)
O&M		818	707	111		111
Capital-Related Costs				-		-
Amortization				-		-
Interest					(3)	(3)
Subtotal	(178)	818	707	111	(3)	(70)

**d. SDG&E Balanced Program Regulatory Account Disposition**

**TIMP & DIMP Disposition**

Per D.16-06-054, the TIMPBA and Post-2011 DIMPBA are authorized for the three-year GRC period ending December 31, 2018 or until the effective implementation date of SDG&E's next GRC.

Any over- or under-collected balance at the end of each year within the GRC cycle will be carried over to the following year. For any unspent funds (also referred to as overcollections) at the end of the 2016 GRC cycle, SDG&E will propose in its next GRC proceeding to return the overcollections in rates to customers. However, for any costs in excess of the authorized O&M and capital-related costs (also referred to as undercollections), the costs shall be subject to recovery through a Tier 3 advice letter for amounts up to 35% of the 2016 GRC cycle total revenue requirement. Any amount above the 35% threshold will be subject to recovery through a separate application.

**i. SDG&E Regulatory Account – DIMPBA**

In its TY 2019 GRC, SDG&E proposed to return to customers the Post-2011 DIMPBA overcollected balance as of December 31, 2018.<sup>6</sup>

**ii. SDG&E Regulatory Account – TIMPBA**

For TIMP, the 2017 and 2018 year-end balances were undercollected. SDG&E will file a Tier 3 advice letter in 2019 to seek recovery of the 2018 year-end undercollection.

**iii. SDG&E Regulatory Account – Tree Trimming Balancing Account**

The TTBA is a one-way balancing account. Pursuant to D.16-06-054, TY 2016 GRC, effective January 1, 2016, the TTBA will continue for the 2016 GRC cycle.

Disposition of the TTBA balance is through SDG&E's regulatory account update filing in October of each year.

- Via AL 2988-E, effective 1/1/2017, SDG&E returned the projected 2016 year-end overcollection
- Via AL 3137-E, effective 1/1/2018, SDG&E returned the projected 2017 year-end overcollection

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<sup>6</sup> A.17-10-077, Ex. SDG&E-41 (Jasso) at NGJ-12: 10-11.

- Via AL 3291-E, effective 1/1/2019, SDG&E returns the projected 2018 year-end overcollection

**iv. SDG&E Regulatory Account – NERBA Electric**

The NERBA is a two-way balancing account with the following three subaccounts:

1. Polychlorinated Biphenyls (PCB) Subaccount
2. AB 32 Admin Fees Subaccount
3. Municipal Separate Storm Sewer Systems (MS4) Compliance Subaccount

Disposition of the PCB subaccount balance is through SDG&E’s regulatory account update filing in October of each year.

Disposition of the AB 32 Admin Fees subaccount balance is addressed in SDG&E’s Energy Resource Recovery Account (ERRA) proceeding or in a separate application.

Disposition of the MS4 Compliance subaccount balance is through SDG&E’s regulatory account update filing in October of each year.

There have been no dispositions of any of the SDG&E NERBA-E subaccount balances related to the TY 2016 GRC cycle.

**v. SDG&E Regulatory Account – NERBA Gas**

The NERBA is a two-way balancing account with five subaccounts. The following four subaccounts are funded through the TY 2016 GRC:

1. AB 32 Admin Fees Subaccount
2. Subpart W Subaccount
3. MS4 Compliance Subaccount, and
4. LDAR Subaccount

Dispositions of these subaccount balances are addressed in connection with SDG&E’s annual regulatory account balance update filing or addressed in another proceeding as authorized by the Commission.

- Via AL 2712-G, effective 1/1/2019, SDG&E returns the projected 2018 year-end overcollection of LDAR Subaccount and MS4 Compliance Subaccount

**ATTACHMENT B - SOCALGAS' 2017 INTERIM SPENDING ACCOUNTABILITY REPORT**

**1. SoCalGas**

**a. SoCalGas Gas Distribution**

**i. SoCalGas Gas Distribution O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>1</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Gas Distribution	138,264	153,375	(15,111)	-10%	
Gas Control & System Operations-Planning	5,312	7,609	(2,297)	-30%	
Gas Scheduling	697	806	(109)	-13%	
Gas Transmission Planning	544	665	(121)	-18%	
Gas Control & SCADA Operation Group - USS	2,678	3,979	(1,302)	-33%	Yes
Emergency Services	1,394	2,159	(765)	-35%	
Gas Distribution	132,952	145,765	(12,814)	-9%	
Field Services Leadership & Operations Assessment	377	1,504	(1,126)	-75%	Yes
Field O&M - Field Support	19,535	23,792	(4,257)	-18%	
Field O&M - Leak Survey	8,162	8,724	(562)	-6%	
Field O&M - Locate & Mark	14,074	12,857	1,217	9%	
Field O&M - Main Maintenance	23,312	20,811	2,501	12%	
Field O&M - Service Maintenance	12,908	10,649	2,260	21%	Yes
Field O&M - Tools Fittings & Materials	8,511	8,063	448	6%	
Asset Management	8,804	11,338	(2,534)	-22%	Yes
Field O&M - Measurement & Regulation	13,634	13,053	582	4%	
Field O&M - Cathodic Protection	13,297	14,682	(1,385)	-9%	
Operations Management & Training	6,818	15,521	(8,703)	-56%	Yes
Regional Public Affairs	3,519	4,773	(1,254)	-26%	Yes

<sup>1</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, the corrected 2017 imputed authorized is \$153,311 instead of \$153,375, a difference of \$64.



## 2. SoCalGas Gas Distribution O&M Variance Explanations

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Gas Control & System Operations-Planning			
Gas Control & SCADA Operation Group - USS	Lower than forecasted staffing level during some portion of 2017 based on the need to maintain control room monitoring compliance with control room staff while hiring and backfilling positions coupled with ensuring that adequate training and Operator Qualification was completed.		
Gas Distribution			
Field Services Leadership & Operations Assessment	Forecasts included benchmarking project and associated miscellaneous non-labor for the Monitoring and Control Program Assessment and Blueprint Development, however expenses were recorded in cost center (2200-2488) under Gas Engineering.		
Field O&M - Service Maintenance	The activities in this workpaper, as described, are designed to mitigate risks associated with hazards to public safety, infrastructure integrity, and system reliability. Higher non-labor costs related to service alteration, anodeless (AL) Riser and associated paving due to leakage mitigation activities.		
Asset Management	Lower than forecasted staffing level during some portion of 2017.		
Operations Management & Training	This workpaper manages the integrity of the distribution pipeline system, which as described, is designed to mitigate risks. The variance is due to lower than forecasted staffing level during some portion of 2017.		
Regional Public Affairs	Labor and non-labor resources were temporarily reassigned to the Aliso Canyon incident. These costs were excluded from 2017 GRC recorded cost. Additional variance due to lower than forecasted staffing level during some portion of 2017.		

### 3. SoCalGas Gas Distribution O&M Workpaper Descriptions and GRC Testimony Locations

Witness Area	Workpaper Name	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Control & System Operations-Planning	Gas Control & SCADA Operation Group - USS	2200-2289 / 2200-2289	<p>The Gas Transmission and SCADA Operations Group is responsible for real-time operation and control of gas flows through the pipeline system.</p> <p>This category includes costs for activities, as described, designed to mitigate catastrophic damage involving high-pressure pipeline failure risks.</p>	SCG-05 JLD-34 to JLD-38	SCG-13 DKZ-20 to DKZ-22
Gas Distribution	Field Services Leadership & Operations Assessment	2200-0431 / 2200-0431	<p>Recorded to this cost center are the salary and employee non-labor expenses for the Vice President and his or her assistant for the Field Operations organization.</p> <p>This category includes costs for activities, as described, designed to mitigate public safety risks.</p>	SCG-04-R FBA-76 to FBA-86	SCG-04-R GOM-88 to GOM-90
Gas Distribution	Field O&M - Service Maintenance	2GD000.004 / 2GD000.004	<p>The work in this workgroup is designed to meet federal (49 CFR 192) and state, (General Order 112-E) pipeline safety regulations and to extend the life of the distribution service pipeline system. Service maintenance work is generally corrective in nature and is required to keep the natural gas system operating safely and reliably.</p> <p>This category includes costs for activities, as described, designed to mitigate infrastructure integrity risks.</p>	SCG-04-R FBA-37 to FBA-42	SCG-04-R GOM-56 to GOM-62

Witness Area	Workpaper Name	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Distribution	Asset Management	2GD001.000 / 2GD001.000 & 2SI004.000	<p>Asset management includes activities incurred in the evaluation of the condition of the distribution system. This includes maintaining many asset records, identification of corrective maintenance solutions, and coordinating with field personnel on completion and recording of operations and maintenance activities.</p> <p>This category includes costs for activities, as described, designed to mitigate system reliability risks.</p>	SCG-04-R FBA-50 to FBA-54	SCG-04-R GOM-72 to GOM-77 & SCG-05-R OR-41 to OR-43
Gas Distribution	Operations Management & Training	2GD004.000 / 2GD004.000 & 2SI001.000	<p>Operations Management and Training is a critical component of managing the integrity of the pipeline system to prevent and reduce risks. The activities completed within this workgroup are categorized as Operations Leadership, Field Management, Operations Support and Field Technical Skills Training.</p> <p>This category includes costs for activities, as described, designed to mitigate system reliability risks.</p>	SCG-04-R FBA-54 to FBA-69	SCG-04-R GOM-77 to GOM-81 & SCG-05-R OR-24 to OR-33
Gas Distribution	Regional Public Affairs	2GD005.000	<p>Regional Public Affairs' primary focus is supporting field operations through its work with regional and local governments on issues regarding permitting, proposed regulations, franchises, and emergency preparedness and response.</p> <p>This category includes costs for activities, as described, designed to mitigate public safety risks.</p>	SCG-04-R FBA-69 to FBA-75	SCG-04-R GOM-81 to GOM-87

#### 4. SoCalGas Gas Distribution Capital Variances

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Gas Distribution	298,643	283,693	14,951	5%	
Capital Tools	9,855	7,717	2,138	28%	Yes
Cathodic Protection Capital	8,563	8,152	411	5%	
Field Capital Support	67,751	55,684	12,067	22%	Yes
Main & Service Abandonments	9,649	4,340	5,309	122%	Yes
Main Replacements	37,032	44,073	(7,041)	-16%	
New Business	54,238	31,366	22,872	73%	Yes
Pipeline Relocations - Franchise	13,678	21,739	(8,061)	-37%	Yes
Pipeline Relocations - Freeway	1,452	11,046	(9,593)	-87%	Yes
Regulator Stations	6,659	6,266	393	6%	
Remote Meter Reading	1,325		1,325	100%	
Service Replacements	36,479	18,957	17,523	92%	Yes
Supply Line Replacements	1,899	4,387	(2,488)	-57%	Yes
Meters	14,050	27,080	(13,030)	-48%	Yes
Regulators	3,271	9,112	(5,841)	-64%	Yes
Electronic Pressure Monitors (EPMs)	770	1,048	(278)	-27%	
Gas Energy Measurement Systems (GEMS)	944	1,437	(493)	-34%	
Meter Guards	561	731	(170)	-23%	
Other Distribution Capital Projects	5,349	2,978	2,371	80%	Yes
Pressure Betterments	25,118	27,581	(2,463)	-9%	

## 5. SoCalGas Gas Distribution Capital Variance Explanations

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Capital Tools	Higher than forecasted Capital Tools expenses due to standardizing locate & mark tools and purchase of tools to equip trucks supporting the leak inventory reduction and main replacement effort. Such activities, as described, are designed to mitigate employee safety risks.		
Field Capital Support	Higher than forecasted capital construction activities resulting in a greater need for field capital support.		
Main & Service Abandonments	Higher than forecasted incremental abandonment orders due to an increase in customer requests for facility abandonments and leak mitigations. These activities, as described, are designed to mitigate risks that may result from a hazardous condition due to the potential for third-party damage.		
New Business	Higher than forecasted number of new business installations driven by customer demand. Increase in labor cost from construction activities and higher non-labor cost due to increase in meter set installation costs.		
Pipeline Relocations - Franchise	Lower than forecasted third-party demand for Pipeline Relocation Pipeline projects.		
Pipeline Relocations - Freeway	Lower than forecasted third-party demand for Pipeline Relocation Freeway projects.		
Service Replacements	Higher than forecasted volume of service replacements to address leaks, which as described, are designed to support risk mitigation efforts related to medium-pressure failures.		
Supply Line Replacements	Lower than forecasted expenses due to reprioritization of other capital projects such as replacement of services and mains due to leakage.		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Meters	Lower than forecasted volume of meters purchased.		
Regulators	Lower than forecasted volume of regulators purchased.		
Other Distribution Capital Projects	Higher than forecasted number of valve replacements and third-party projects.		

**6. SoCalGas Gas Distribution Capital Workpaper Descriptions and GRC Testimony Locations**

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Distribution	725 and 906	Capital Tools	<p>The Capital Tools work category includes capital expenditures associated with the purchase of tools and equipment used by Gas Distribution field personnel for the inspection, maintenance and repair of gas pipeline systems.</p> <p>This category includes costs for activities, as described, designed to mitigate employee safety risks.</p>	SCG-04-R FBA-133 to FBA-139	SCG-04-R GOM-134 to GOM-138
Gas Distribution	903	Field Capital Support	<p>Traditional work categories in this budget code include project planning, local engineering, clerical support and field dispatch, field management and supervision, updating of mapping products, and off-production time for support personnel and field crews that install Gas Distribution capital assets.</p> <p>This category includes costs for activities, as described, designed to mitigate system reliability risks.</p>	SCG-04-R FBA-139 to FBA-142	SCG-04-R GOM-138 to GOM-142

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Distribution	254	Main & Service Abandonments	<p>This work category includes expenditures associated with the abandonment of distribution pipeline mains and services, without the installation of a replacement pipeline.</p> <p>This category includes costs for activities, as described, designed to mitigate public safety risks.</p>	SCG-04-R FBA-104 to FBA-107	SCG-04-R GOM-106 to GOM-108
Gas Distribution	151	New Business	<p>This work category provides for changes and additions to the existing gas distribution system to connect new residential, commercial and industrial customers.</p> <p>This category includes costs for activities, as described, designed to mitigate system reliability risks.</p>	SCG-04-R FBA-89 to FBA-92	SCG-04-R GOM-93 to GOM-96
Gas Distribution	262	Pipeline Relocations - Franchise	<p>The work in the Pipeline Relocations - Franchise category includes expenditures associated with relocating or altering SoCalGas facilities in response to external requests, as specified under the provisions of SoCalGas' franchise agreements with city and county agencies.</p> <p>This category includes costs for activities, as described, designed to mitigate public safety risks.</p>	SCG-04-R FBA-116 to FBA-119	SCG-04-R GOM-118 to GOM-120
Gas Distribution	261	Pipeline Relocations - Freeway	<p>The work in the Pipeline Relocations - Freeway category includes expenditures associated with relocating or altering SoCalGas facilities in response to external requests, as specified under the provisions of utility agreements with state and local agencies.</p> <p>This category includes costs for activities, as described, designed to mitigate public safety risks.</p>	SCG-04-R FBA-114 to FBA-116	SCG-04-R GOM-116 to GOM-118

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Distribution	256	Service Replacements	The work represented in the Service Replacements category includes expenditures associated with routine replacement of isolated distribution service pipelines to maintain system reliability and to safely deliver gas to the customer, thus designed to mitigate the risks associated with loss of service and public safety.	SCG-04-R FBA-101 to FBA-104	SCG-04-R GOM-103 to GOM- 106
Gas Distribution	267	Supply Line Replacements	The Supply Line Replacements work category includes expenditures to replace high-pressure distribution pipelines, referred to as "supply lines" at SoCalGas.  This category includes costs for activities, as described, designed to mitigate infrastructure integrity risks.	SCG-04-R FBA-97 to FBA-98	SCG-04-R GOM-99 to GOM-100
Gas Distribution	163	Meters	The expenditures included in the Meters work category are for materials, warehouse handling, technical evaluations, and quality assurance for the purchase of small meters, typical of residential and small business applications, and larger meters, typical of non-residential applications.  This category includes costs for activities, as described, designed to mitigate system reliability risks.	SCG-04-R FBA-124 to FBA-126	SCG-04-R GOM-126 to GOM- 129
Gas Distribution	164	Regulators	The expenditures included in the Regulators capital work category are for the purchase of new installation and replacement regulator materials and technical evaluations.  This category includes costs for activities, as described, designed to mitigate infrastructure integrity risks.	SCG-04-R FBA-127 to FBA-129	SCG-04-R GOM-129 to GOM- 130



Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Distribution	270	Other Distribution Capital Projects	<p>The Other Distribution Capital Projects work category covers construction projects not covered under franchise agreements, not related to freeway work, and not covered in other capital budget categories.</p> <p>This category includes costs for activities, as described, designed to mitigate public safety risks.</p>	SCG-04-R FBA-119 to FBA-122	SCG-04-R GOM-121 to GOM-123

7. SoCalGas Gas Engineering

8. SoCalGas Gas Engineering O&M Variances

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>2</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Gas Engineering	16,230	24,113	(7,883)	-33%	
Land Services & Right of Way	2,358	1,748	610	35%	
Planning & Development	99	39	60	154%	
Dir Engineering & Tech Services	493	487	6	1%	
Measure Reg & Control Manager & Special Projects	369	825	(456)	-55%	
Measurement & Design	520	1,438	(918)	-64%	
Measurement Technologies	1,014	1,057	(43)	-4%	
Measurement Field Support	779	1,295	(516)	-40%	
Engineering Design Manager	714	481	233	48%	
Materials & Quality	236	1,217	(981)	-81%	
Mechanical Design	49	529	(480)	-91%	
Pipeline Design & Gas Standards	626	1,001	(375)	-37%	
Instrument Repair & Field Maintenance Supervision	1,025	1,135	(110)	-10%	
EAC Chemical Section	1,588	2,055	(467)	-23%	
Measure and Red Standards/Mat and BTU Distribution	613	787	(174)	-22%	
High Pressure & Distribution Engineering	513	911	(398)	-44%	
Gas Engineering	5,234	9,106	(3,872)	-43%	Yes

<sup>2</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, the corrected 2017 imputed authorized is \$23,990 instead of \$24,113, a difference of \$123.

**9. SoCalGas Gas Engineering O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Gas Engineering	<p>Lower than forecasted costs due to longer life of catalysts and capitalization of catalyst replacement costs for new assets.</p> <p>Resources forecasted for O&amp;M were shifted to support of emergent projects including reliability projects and also greenhouse gas and renewable gas work funded by Gas Ops RD&amp;D.</p> <p>Lower than forecasted staffing level during some portion of 2017. Forecasts included safety program costs; however, some expenses were recorded to the Safety Champion Cost Center.</p>		<p>Compressor station modernization for Moreno, Ventura, and Honor Rancho</p> <p>Storage wells lateral replacement</p>

**10. SoCalGas Gas Engineering O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Engineering	Gas Engineering	2EN000.000 / 2EN002.000	<p>Under the broad category of Gas Engineering, many core engineering activities are performed to maintain safe and reliable operation and support to the Transmission, Storage, Distribution, and Customer Services organizations at SoCalGas.</p> <p>This category includes costs for activities, as described, designed to mitigate climate change adaptation and reliability risks.</p>	SCG-07 RKS-9 to RKS-13	SCG-09-R DRH-12 to DRH-14

## 11. SoCalGas Gas Transmission

## 12. SoCalGas Gas Transmission O&M Variances

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>3</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Gas Transmission	44,788	55,339	(10,551)	-19%	
Gas System Integrity	9,222	12,688	(3,466)	-27%	
Public Awareness	746	1,305	(559)	-43%	
USS - VP Gas System Integrity	371	538	(167)	-31%	
Business Process & Infographics Solutions	406	208	198	95%	
CADD Applications	215	1,157	(943)	-81%	
ESS Production Support	196	1,013	(816)	-81%	
Work Management & Databases Development	944	2,193	(1,250)	-57%	Yes
Contract & Maintenance	910	533	377	71%	
Field Technologies	191	395	(204)	-52%	
Gas System Integrity Staff & Programs	343	309	33	11%	
Operator Qualification	1,318	308	1,009	327%	Yes
Pipeline System Construction Policy	1,183	859	324	38%	
Quality & Risk	530	476	54	11%	
Enterprise Geographic Information System (EGIS)	780	2,361	(1,581)	-67%	Yes
Shared Public Awareness Activities	60	438	(378)	-86%	
Pipeline Safety & Compliance Manager	647	594	52	9%	
Pipeline Safety Oversight	329	0	329	100%	
Safety Excellence Management System	53	0	53	100%	
Gas Transmission	34,013	40,509	(6,496)	-16%	

<sup>3</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, the corrected 2017 imputed authorized is \$55,216 instead of \$55,339, a difference of \$123.

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>3</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Field Operations Managers - USS	482	458	24	5%	
Technical Services Manager - USS	422	1,053	(631)	-60%	
Pipeline Operations	19,677	24,312	(4,635)	-19%	
Compressor Station Operations	9,754	10,902	(1,148)	-11%	
Director Gas Transmission - USS	204	381	(177)	-46%	
Technical Services	3,474	3,403	71	2%	
Major Projects	1,553	2,142	(589)	-28%	
Major Projects	1,553	2,142	(589)	-28%	

### 13. SoCalGas Gas Transmission O&M Variance Explanations

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Work Management & Databases Development	Resources forecasted for O&M activities were shifted to emergent work including various projects that, as described, are designed to mitigate the risk of records management through the availability of accurate records. Additional variance due to lower than forecasted staffing level during some portion of 2017 due to the required skill set needed.	The following projects were deferred:  MyProject implementation, Work Order Tracking and Portions of Real-Time Monitoring.	
Operator Qualification	Variance due to incorporating expenses into this workpaper from another work paper (the Gas Distribution witness work paper - Operations Management & Training). Recorded expenses were incurred in the Gas Operation System Integrity witness area instead of the Gas Distribution witness. The activities completed in 2017 from this workpaper, as described, are designed to mitigate safety and reliability risks.		
Enterprise Geographic Information System (EGIS)	Resources were re-prioritized to other emergent priorities some of which, as described, are designed to mitigate Records Management risks through the availability and accuracy of the records.	The AutoCad Medium Pressure implementation was deferred to 2018.	

**14. SoCalGas Gas Transmission O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas System Integrity	Work Management & Databases Development	2200-0306	<p>Expenditures covered in this cost center account for labor and expenses to support the activities associated with the Work Management Systems for Meters &amp; Regulators, System Protection Specialists and Work Order Tracking applications, AutoSol Enterprise System. Also, the cost center supports the Technical Services Group in Miramar (SDG&amp;E); specifically, the Electronic Data Management System and the Cathodic Protection Data Management (CPDM) applications. All of these systems are key operational systems to support field functions to verify pipeline and ancillary facilities continue to be fit for service.</p> <p>This category includes costs for activities, as described, designed to mitigate system reliability risks.</p>	SCG-07 RKS-42 to RKS-43	SCG-05-R OR-63 to OR-64
Gas System Integrity	Operator Qualification	2200-2344	<p>Recorded to this cost center are the labor, employee expense, and non-labor materials and services required to manage the company's Operator Qualification (OQ) program and the compliance of employees who perform OQ covered tasks. This team aims to mitigate the risks associated with personnel that otherwise would not have the appropriate level of qualification to safely complete work on gas pipelines. The department provides technical assistance and support, conducts audits, provides guidance and assistance in the development of new and refresher training, provides technical support for issues and concerns arising from rule interpretations, provides assistance prior to and during CPUC audits, performs audits on pipeline contractors to verify compliance with the OQ rules, and manages the process to confirm that all impacted employees are evaluated within the required time frame.</p> <p>This category includes costs for activities, as described, designed to mitigate infrastructure integrity risks.</p>	SCG-04 FBA-57 to FBA-60	SCG-05-R OR-52 to OR-54

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas System Integrity	Enterprise Geographic Information System (EGIS)	2200-2376	<p>The need to gather and harmonize the disparate data sets is being addressed by the synchronization of the GIS system. The high-pressure pipe (maximum operating pressure greater than 60 psi), medium pressure pipe (maximum operating pressure less than or equal to 60 psi), storage field pipe and other above-ground facility pipes exist across multiple GIS and computer aided drafting and design databases and software platforms.</p> <p>This category includes costs for activities, as described, designed to mitigate system reliability risks.</p>	SCG-07 RKS-44 to RKS-45	SCG-05-R OR-65 to OR-66



### 15. SoCalGas Gas Transmission Capital Variances

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Gas Transmission	130,029	105,159	24,871	24%	
Auxiliary Equipment	5,951	7,763	(1,811)	-23%	
Capital Tools	1,497	850	647	76%	
Cathodic Protection	5,833	7,113	(1,281)	-18%	
Compressor Stations	25,883	43,214	(17,331)	-40%	Yes
Freeway Relocations	59	327	(268)	-82%	
Laboratory Equipment	1,109	519	590	114%	
Land Rights	133	231	(99)	-43%	
M&R (Meter & Regulator) Stations	23,337	9,468	13,868	146%	Yes
New Pipelines	17,940	12,859	5,081	40%	Yes
Relocations - Private/Franchise	5,353	10,263	(4,910)	-48%	Yes
Replacements	34,220	6,210	28,010	451%	Yes
Storage - Buildings		583	(583)	-100%	
Supervision & Engineering Pool	4,667	2,505	2,162	86%	Yes
Transmission - Buildings	3,901	3,253	647	20%	
Distribution Operations Control Center	148		148	100%	

**16. SoCalGas Gas Transmission Capital Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Compressor Stations	<p>Expansion in scope of the Blythe Compressor Modernization project which extended the schedule. This was as a result of Front End Engineering Design review which concluded operational needs and life-cycle cost efficiencies objectives could be better achieved by expanding replacement of the supporting infrastructure at the plants in addition to the base compressor units.</p> <p>Similar to the variance above for Blythe, the deferral of Ventura Compressor Modernization to further refine scope resulted in an extension of the schedule.</p> <p>Upon completion, as described, these projects are intended to provide the necessary operational reliability and resiliency to support SoCalGas' transmission system's operational needs and are intended to result in environmental benefits with measurable reduction of criteria air pollutants. Such improvements are designed to mitigate risks associated with reliability.</p>	Construction of Blythe Compressor Station and Deferral of Ventura Compressor Modernization	
M&R Stations	Higher than forecasted pace of work to synergize with ongoing PSEP work to reduce invasive construction activity impacts on the public and for cost efficiencies that may be realized through coordinating these activities.		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
New Pipelines	<p>Higher than forecasted costs for the El Segundo Loop project due to extensive permitting delays. The El Segundo Loop project was originally anticipated to be completed in 2016 and was completed in 2017 instead.</p> <p>This system improvement was necessary to provide continued, uninterrupted, reliable gas service to the area, where two large utility Electric Generators, Chevron's El Segundo refinery, and the Hyperion wastewater treatment facility were on the end of a long dead end with no alternative of supply.</p>		
Relocations - Private/Franchise	<p>Lower-than-forecasted demand of relocating pipelines by third parties to accommodate planned private property development, municipal public works and street improvement projects, and other work required due to right-of-way, contract, and franchise requirements.</p>		
Replacements	<p>Higher than forecasted replacement of pipeline segments due to changes to pipeline safety regulations associated with GO-112F and enhanced leak survey practices and technology.</p> <p>Typically, as described, transmission pipelines are replaced in an effort to mitigate public safety and security risks due to either the condition of the existing pipeline or a change in population density near the pipeline (i.e. change in class location) in accordance with 49 CFR Part 192.</p>		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Supervision & Engineering Pool	<p>Higher than forecasted expenditures in the Transmission Capital categories and the creation of the Major Projects department.</p> <p>Major Projects is an organization at SoCalGas that has been established to provide cost, schedule, risk, quality control, and change control management for major construction projects.</p>		

**17. SoCalGas Gas Transmission Capital Workpaper Descriptions and GRC Testimony Locations**

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Transmission	003x5	Compressor Stations	The Compressor Stations budget code includes costs associated with the installation and replacement of compressor station equipment used in operating the transmission system. The nature of compressor station operation requires consistent maintenance and replacement of key engine components and controls equipment to maintain the reliability and safety of the facility.	SCG-07 RKS-65 to RKS-75	SCG-07 MAB-16 to MAB-24

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Gas Transmission	00308	M&R Stations	<p>This Budget Category includes local controls and communication devices such as programmable logic controllers, pressure transmitters, Uninterruptable Power Supplies systems, temperature probes, gas quality remote sensors, and communication interfaces/technologies. This equipment is used to control the flow of gas in pipelines, valves and regulator stations both locally and through the initiation of remote commands from central Supervisory Control and Data Acquisition (SCADA) system.</p> <p>This category includes costs for activities, as described, designed to mitigate risks associated with the safe and reliable local operation of SoCalGas meter, regulator and valve stations in conformance with DOT and CPUC requirements for the limiting of pipeline and vessel operating pressures.</p>	SCG-07 RKS-77 to RKS-81	SCG-07 MAB-26 to MAB-28
Gas Transmission	00301	New Pipelines	The New Pipeline Additions budget category recognizes the need to install new gas facilities to serve new or increased loads or provide natural gas supply reinforcement to an existing area. This forecast includes three large projects and multiple smaller projects to install new pipelines activities, as described, designed to mitigate reliability risks to the SoCalGas transmission system.	SCG-07 RKS-51 to RKS-54	SCG-07 MAB-9 to MAB-10
Gas Transmission	003x4	Relocations - Private/ Franchise	<p>This Budget Code includes costs associated with the modification and relocation of transmission pipelines to accommodate planned private property development, municipal public works and street improvement projects, and other work required due to right-of-way agreements, contract and franchise requirements.</p> <p>This category includes costs for activities, as described, designed to mitigate system reliability risks.</p>	SCG-07 RKS-58 to RKS-65	SCG-07 MAB-13 to MAB-16
Gas Transmission	003x2	Replacements	Typically, transmission pipelines are replaced to mitigate public safety and security risks due to either the condition of the existing pipeline or a hazardous condition affecting the existing pipeline	SCG-07 RKS-55 to RKS-56	SCG-07 MAB-10 to MAB-13

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
			location. Pipelines with a history of leakage, poor coating, or that are difficult to cathodically protect are routinely evaluated for possible replacement.		
Gas Transmission	00908	Supervision & Engineering Pool	This budget code provides a pool for Supervision and Engineering charges to be made on a direct basis to this capital category that will then be reassigned to the various budget categories on an indirect basis.	SCG-07 RKS-92 to RKS-93	SCG-09-R DRH-40

**18. SoCalGas Gas Underground Storage**

**19. SoCalGas Gas Underground Storage O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Underground Storage	35,528	35,201	327	1%	
Storage Risk Management	1,433		1,433	100%	Yes
Underground Storage	34,095	35,201	(1,107)	-3%	

**20. SoCalGas Gas Underground Storage O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Storage Risk Management	<p>Emergent activity beyond the TY2016 GRC forecast to support aboveground monitoring, data management, compliance, and audit at all the storage fields.</p> <p>This group was created to address additional California Air Resources Board (CARB), DOGGR, and Pipeline and Hazardous Material Safety Administration (PHMSA) regulations and supports the company's goals of safety and compliance.</p>		

**21. SoCalGas Gas Underground Storage O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Underground Storage	Storage Risk Management	2US001.000	<p>This cost supports the company's goals of safety and compliance. The non-refundable risk management O&amp;M costs are directly related to the supporting of aboveground monitoring, data management, compliance, and audit support at all the storage fields. This group was organized and resourced to address CARB, DOGGR, and PHMSA regulations.</p>	N/A	SCG-10-R NPN-24

**22. SoCalGas Gas Underground Storage Capital Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Underground Storage	102,369	72,402	29,967	41%	

Auxiliary Equipment	18,741	11,473	7,268	63%	Yes
Compressor Stations	5,889	9,773	(3,884)	-40%	Yes
Pipelines	21,410	5,103	16,307	320%	Yes
Purification Equipment	3,021	10,336	(7,315)	-71%	Yes
Wells	53,308	35,717	17,592	49%	Yes

### 23. SoCalGas Gas Underground Storage Capital Variance Explanations

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Auxiliary Equipment	<p>Expanded scope of work associated with compliance with new regulations (CPUC General Order 95 Overhead Electric Line Construction) and projects negotiated with local agencies to improve emergency response generated higher spend in this category than previously forecasted.</p> <p>GO-95 Section IV, Heavy Loading design criteria requires infrastructure upgrades with new pole and wires to meet operating conditions during high wind conditions, increasing electrical reliability to the storage field.</p>		
Compressor Stations	<p>Lower than forecasted compressor project work at the non-Aliso storage fields. Restrictions imposed on the use of the Aliso Canyon storage fields has placed additional operational reliance and use on the non-Aliso storage fields resulting in the inability to schedule shut-ins/shutdown of the compressor equipment at those facilities to perform work.</p> <p>Compressor projects restore, maintain and/or improve compressor efficiency, capacity, and reliability. The needs are to maintain safe operation, to restore and/or maintain the units' efficiency, delivery capacity, maintain compliance with environmental regulations and provide reliable service.</p>		



WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Pipelines	<p>Higher than forecasted blanket projects for laterals to return wells to service to maintain or regain deliverability after well work, such as reconfiguring piping in association with well work that converts storage wells to tubing flow only for a dual barrier of safety and consistent with guidance from regulator (DOGGR).</p> <p>This category includes costs associated with upgrading or replacing failed field piping and related components.</p>		
Purification Equipment	<p>Lower than forecasted purification equipment work at the non-Aliso storage fields. Restrictions imposed on the use of the Aliso Canyon storage fields has placed additional operational reliance and use on the non-Aliso storage fields resulting in the inability to schedule shut-ins/shutdown of the purification equipment at those facilities to perform work.</p>		
Wells	<p>Higher than forecasted volume of well plug and abandonments to remove wells and their operations from environmentally sensitive areas, abandon wells with high operating costs and decreased or lack of productivity, higher volume of well workovers and additional cost for well tubing upsizing as SoCalGas redesigned all gas storage wells for tubing flow only to create a dual barrier of safety and consistent with new DOGGR requirements. Such activities, as described, are designed to mitigate infrastructure integrity risks.</p>		

**24. SoCalGas Gas Underground Storage Capital Workpaper Descriptions and GRC Testimony Locations**

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Underground Storage	00419	Auxiliary Equipment	<p>This budget code includes work on various types of field equipment not included in other budget codes such as instrumentation, measurement, controls, electrical, drainage, infrastructure, safety, security, and communications systems.</p> <p>The intent behind the capital expenditure plan is to provide safe, reliable delivery of natural gas to customers and also enhance the integrity, efficiency, and responsiveness of operations while maintaining compliance with applicable regulatory and environmental regulations.</p>	SCG-06 PEB-51 to PEB-54	SCG-10-R NPN-46 to NPN-51
Underground Storage	00411	Compressor Stations	<p>This Budget Category includes costs associated with natural gas compressors. These storage compressor units increase the pressure of natural gas, so it can be injected into the underground reservoirs. Examples of equipment within this area include turbines, engines, high pressure gas compressors, compressed air system equipment, fire suppression systems, gas scrubbers, and related control instruments.</p> <p>This budget category includes the necessary capital for maintenance, replacements, and upgrades of the various storage field compressors to uphold safety, maintain or improve reliability, extend equipment life, achieve environmental compliance, and to meet the required injection capacities.</p>	SCG-06 PEB-26 to PEB-28	SCG-10-R NPN-31 to NPN-35

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Underground Storage	00413	Pipelines	<p>This Budget Category includes costs associated with upgrading or replacing failed field piping and related components.</p> <p>The intent behind the capital expenditure plan is to provide safe, reliable delivery of natural gas to customers and also enhance the integrity, efficiency, and responsiveness of operations while maintaining compliance with applicable regulatory and environmental regulations. For example, if liquid handling pipelines were to fail, gas deliveries may be significantly impacted or sent through metering without complying with standards for water content in pipeline-quality natural gas. Safety equipment in the field also requires clean motive gas for proper operations.</p>	SCG-06 PEB-42 to PEB-47	SCG-10-R NPN-42 to NPN-44
Underground Storage	00414	Purification Equipment	<p>This budget category forecasts costs associated with equipment used primarily for the removal of impurities from, or the conditioning of, natural gas withdrawn from storage. Examples of equipment included in this area are dehydrators, coolers, scrubbers, boilers, pumps, valves, piping, power supply, controls, and instrumentation.</p> <p>The intent behind the capital expenditure plan is to provide safe, reliable delivery of natural gas to customers and also enhance the integrity, efficiency, and responsiveness of operations while maintaining compliance with applicable regulatory and environmental regulations.</p>	SCG-06 PEB-47 to PEB-50	SCG-10-R NPN-44 to NPN-46

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Underground Storage	00412	Wells	<p>This Budget Category includes costs associated with replacing failed components on existing wells, and the design, drilling and completion of replacement wells for the injection and withdrawal of natural gas and reservoir observation purposes. This includes well workover contractors (major well work), drilling contractors, and component materials such as tubing, casing, valves, pumps, and other down-hole equipment.</p> <p>The intent behind the capital expenditure plan is to provide safe, reliable delivery of natural gas to customers and also enhance the integrity, efficiency, and responsiveness of operations while maintaining compliance with applicable regulatory and environmental regulations. For example, leaking tubing strings can become a safety or environmental hazard if not replaced in a timely manner.</p>	SCG-06 PEB-28 to PEB-42	SCG-10-R NPN-35 to NPN-42

**25. SoCalGas Gas Acquisition**

**26. SoCalGas Gas Acquisition O&M Variance**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Gas Procurement	3,729	4,434	(705)	-16%	

**27. SoCalGas Gas Acquisition O&M Workpaper Description and GRC Testimony Location**

Not necessary, no workpaper mapping is required for this category because the variance doesn't meet the selection criteria.

**28. SoCalGas Other**

**a. SoCalGas Customer Services**

**29. SoCalGas Customer Services O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>4</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Customer Services	227,446	299,123	(71,677)	-24%	
Customer Services - Field & Meter Reading	166,237	216,798	(50,561)	-23%	
CS - Field Staff Manager	1,389	2,219	(830)	-37%	
Customer Services Field – Dispatch	10,657	9,816	841	9%	
Customer Services Field – Operations	110,814	128,446	(17,631)	-14%	Yes
Customer Services Field – Supervision	10,697	14,397	(3,700)	-26%	Yes
Customer Services Field – Support	15,923	13,344	2,579	19%	
Meter Reading – Clerical	303	1,241	(938)	-76%	
Meter Reading – Operations	2,327	33,830	(31,504)	-93%	Yes
Meter Reading - Supervision & Training	531	4,507	(3,976)	-88%	Yes
Meter Reading – Support	991	2,750	(1,759)	-64%	Yes
Meter Set Assembly (MSA) Inspection Program	12,605	6,248	6,357	102%	Yes
Customer Services – Information	18,380	25,582	(7,201)	-28%	
Biofuels and Low-Carbon Resources Market Development	486	738	(252)	-34%	
CI-Customer Assistance	2,409	4,564	(2,156)	-47%	Yes
CI-Customer Engagement & Insights	5,611	8,334	(2,723)	-33%	Yes
CI-Segment Services	8,504	10,234	(1,730)	-17%	
Clean Transportation	1,371	1,711	(340)	-20%	
Customer Services - Office Operations	39,035	53,193	(14,158)	-27%	

<sup>4</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, the corrected 2017 imputed authorized is \$299,047 instead of \$299,123, a difference of \$76.

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>4</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Customer Contact Center – Operations	28,812	38,949	(10,137)	-26%	Yes
CCC – Support	7,719	10,113	(2,393)	-24%	Yes
CS - Other Office Ops	2,504	4,132	(1,628)	-39%	Yes
Customer Services - Technology, Policies, & Solutions	3,795	3,551	244	7%	
Business Strategy and Development	1,326	1,332	(6)	0%	
Environmental Affairs	517	725	(208)	-29%	
Environmental Strategy	772		772	100%	
Planning & Legislative Analysis	226		226	100%	
Policy and Environmental Solutions	953	1,494	(541)	-36%	

**30. SoCalGas Customer Services O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Customer Services - Field & Meter Reading	<p>The TY2016 Customer Services - Field (CS-F) and Meter Reading (MR) forecasting method did not reflect the benefits realized from Advanced Metering Infrastructure (AMI) implementation. As anticipated, AMI resulted in a decrease to CS-F and MR costs. See Exh. SCG-39 TY2016 testimony.</p> <p>SoCalGas adjusted the 2017 Imputed Authorized costs for the MSA Inspection Program to align with the TY2019 workpapers (81.5% from CS-F Operations, 7.8% from CS-F Supervision, 10.7% from CS-F Support).</p>		AMI Implementation, MSA-Inspection Program
Customer Services Field - Operations	Lower than forecasted order volumes due to AMI implementation.	Incremental Field Technician Service Enhancements and Incremental Technician Training, including refresher training, technician mentoring and job shadowing, and accelerated Operator Qualification training.	AMI Implementation, MSA-Inspection Program
Customer Services Field - Supervision	Lower than forecasted order volumes (due to AMI implementation) resulted in a reduction of number of forecasted field employees needed. The number of field supervisors is based on an employee-to-supervisor ratio.		AMI Implementation, MSA-Inspection Program

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Meter Reading - Operations	Lower than forecasted costs due to AMI implementation.		AMI Implementation, MSA-Inspection Program
Meter Reading - Supervision & Training	Lower than forecasted costs due to AMI implementation resulted in a reduction of number of forecasted meter readers needed. Supervision and training costs are based on the number of meter readers.		AMI Implementation, MSA-Inspection Program
Meter Reading - Support	Lower than forecasted costs due to AMI implementation.		AMI Implementation, MSA-Inspection Program
MSA Inspection Program	Higher than forecasted costs due to the actual length of time per MSA inspection being greater than the original estimate used for this order type.		AMI Implementation, MSA-Inspection Program
Customer Services – Information (CI)			
CI-Customer Assistance	<p>Lower than forecasted volume of homes treated under the ESA program. SoCalGas' ESA program has been managing to the 2017 annualized program goal of homes treated over the program cycle as set forth in D.16-11-022 and subsequently in Resolution G-3532.</p> <p>Homes treated in 2017 contribute towards SoCalGas' 2017-2020 overall ESA Program cycle goal and as described are designed to mitigate potential customer safety risks.</p>		



WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
CI-Customer Engagement & Insights	Lower than forecasted non-labor costs and cancelled/deferred items described in the next column. Customer Engagement & Insights completed safety communications within the authorized funding level.	Development of business database for research and communication outreach, and survey content for mobile devices.  Secondary research and consumer data subscriptions.  SoCalGas.com website feedback surveys	
Customer Services - Office Operations			
CCC - Operations	Lower than forecasted customer call volume.  Lower than forecasted per call costs.  Forecasted activities in CCC Operations; however, expenses were recorded in other areas. For example, CCC forecasted activities for CARE applications were also authorized in the Low Income proceeding. SoCalGas adjusted the Core Fixed Cost Balancing Account (CFCA) in 2017, to reduce the GRC revenue requirement to avoid double recovery of these costs.  Lower than forecasted staffing level during some portion of 2017.  Lower than forecasted level of service (LOS).	CSF initiative - CSRs will offer expanded appliance safety checks.  CSR capturing customer preference for future contact.  CSRs asking for landlord information on start service orders to help target offerings to renters.  CSRs enrolling customers in MyAccount was combined with offering Paperless Billing to customers and wasn't implemented until late December 2017.	Reduction in CSR call volume related to the decrease in Billing calls due to Advanced Meters;  FOF projects.

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
CCC – Support	<p>Lower than forecasted telecommunications costs due to lower than forecasted customer call volume, call length, and renegotiation of contracted telco rates.</p> <p>Lower than forecasted software maintenance costs.</p> <p>Forecasted activities in CCC Support, however expenses were recorded in other areas.</p> <p>Lower than forecasted staffing level during some portion of 2017.</p> <p>Credits posted from Telco provider for service performance standards not met during 2017.</p>		<p>Reduction in Telco costs related to decrease in Billing calls due the implementation of Advanced Meter;</p> <p>New Technology Manager position started in January 2017.</p>
CS - Other Office Ops	<p>Forecasted activities in CS – Other Office Ops; however, expenses were recorded in other areas.</p> <p>Lower than forecasted staffing level during some portion of 2017 including the elimination of the Senior VP of Customer Services position.</p>		<p>Ramp up of the Customer Data Privacy activities</p>

### 31. SoCalGas Customer Services O&M Workpaper Descriptions and GRC Testimony Locations

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Customer Services - Field & Meter Reading	CSF - Operations	2FC001.000	<p>Costs associated with field technicians providing service at customer premises, including gas meter work, establishing and terminating gas service, lighting gas pilot lights, conducting customer appliance checks, investigating reports of gas leaks, investigating customer complaints of high bills, shutting off and restoring gas service for fumigation, responding to structure fires (e.g., to check for gas leakage/shut off gas service) and other emergency incidents, and other related field services for customers.</p> <p>This workpaper includes activities, as described, designed to mitigate safety risks.</p>	SCG-10 SAF-5 to SAF-24	SCG-18-R GRM-10 to GRM-28
Customer Services - Field & Meter Reading	CSF - Supervision	2FC002.000	<p>Costs for front-line supervisors who provide direct supervision for CSF field technicians and field collectors who work from operating bases and cover all of SoCalGas' service territory.</p> <p>This workpaper includes activities, as described, designed to mitigate safety risks.</p>	SCG-10 SAF-24 to SAF-32	SCG-18-R GRM-28 to GRM-31

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Customer Services - Field & Meter Reading	Meter Reading - Operations	2FC005.000 / 2FC006.000	<p>Costs include full- and part-time meter readers who are dispersed across SoCalGas' operating bases. Meter readers are equipped with MDTs (aka handheld devices) which are used to record customers' gas consumption. Meter readers capture monthly meter reads at customer premises and read over 68 million meters per year. Data from the meter readers' MDTs are uploaded each night and transferred to the company's mainframe computer for processing and billing. Meter readers are also supported by meter reading technicians.</p> <p>This workpaper includes activities, as described, designed to mitigate safety risks.</p>	SCG-10 SAF-34 to SAF-48	SCG-18-R GRM-45 to GRM-47
Customer Services - Field & Meter Reading	Meter Reading - Supervision & Training	2FC007.000 / 2FC008.000	<p>Costs include meter reading supervisors, meter reading training instructors and meter reading field instructors. Supervisors are distributed across SoCalGas' operating bases from which meter readers work, to supervise, coach and manage the performance of meter reading employees. Training instructors conduct the formal training that is required in order to become a meter reader. Field instructors accompany new meter readers out in the field immediately following their completion of formal training to ensure that newly trained meter readers are capable of safely and accurately performing their jobs out in the field on their own.</p> <p>This workpaper includes activities, as described, designed to mitigate safety risks.</p>	SCG-10 SAF-40 to SAF-41	SCG-18-R GRM-49 to GRM-51

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Customer Services - Field & Meter Reading	Meter Reading - Support	2FC008.000 / 2FC009.000	<p>Costs consist of meter reading managers who support meter reading operations and business analysts who support the meter reading technologies, including the daily process to download and upload data to meter reading handheld computers, conduct meter reading route analyses and route realignments, project management, and other reporting and analysis.</p> <p>This workpaper includes activities, as described, designed to mitigate safety risks.</p>	SCG-10 SAF-41 to SAF-42	SCG-18-R GRM-51 to GRM-53
Customer Services - Field & Meter Reading	MSA Inspection Program	2FC005.000	<p>The Department of Transportation (DOT) Code of Federal Regulations (<i>i.e.</i>, CFR 192.481) generally requires that each MSA be inspected every three years for atmospheric corrosion. Meter readers have historically performed this function, but with the implementation of AMI and the elimination of traditional Meter Reading function, a new group, the CS - Field MSA Inspection Organization, was formed in BY 2016. This includes costs to perform physical, onsite inspection of each meter set assembly (MSA) to comply with DOT required MSA inspections for atmospheric corrosion, to identify conditions which require remediation by CS - Field Operations and Distribution field employees, and to contact customers to resolve meter access issues.</p> <p>This workpaper includes activities, as described, designed to mitigate safety risks.</p>	SCG-10 SAF-19 to SAF-30	SCG-18-R GRM-38 to GRM-44  SCG-218 GRM-4 to GRM-8

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Customer Services - Information	CI-Customer Assistance	2IN002.000	<p>ESA Program Natural Gas Appliance Testing (NGAT) or carbon monoxide (CO) testing, is a safety-related program for Customer Assistance’s ESA Program participants. SoCalGas conducts CO testing on homes weatherized through the ESA Program in accordance with the Statewide Energy Savings Assistance Program Installation Standards and the Statewide Energy Savings Assistance Program Policy and Procedures Manual.</p> <p>This workpaper is in scope of the spending accountability report due to the NGAT activity that’s designed to mitigate customers' exposure to unsafe levels of carbon monoxide.</p>	SCG-12-R ADA-30 to ADA-37	SCG-20-R ASC-10 to ASC-11, ASC-24 to ASC-27

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Customer Services - Information	CI-Customer Engagement & Insights	2IN001.000	<p>Customer Engagement &amp; Insights manages four primary areas: (1) Customer Marketing &amp; Communications; (2) Creative Services; (3) Customer Insights &amp; Analytics; and (4) eServices &amp; Data Analysis.</p> <p>The primary functions and objectives of Customer Engagement &amp; Insights are to: Provide proactive communications to customers via mass and targeted channels to build awareness of and improve access to existing and new utility services, programs and resources; Educate customers and stakeholders regarding general topics, including managing gas use and bills, payment options, assistance and rebate programs, service offerings, and <i>natural gas safety</i>; Conduct ongoing quantitative and qualitative research and analyses of customer satisfaction, evaluate and anticipate customer information and service needs and preferences, supporting the development of new customer service options, targeted communications and delivery channels to satisfy those needs; and, to Leverage and expand existing and new e-Channels, (including social media) and communication platforms (such as mobile) to support customer education and awareness building objectives.</p> <p>This workpaper is in scope of the spending accountability report due to the safety messaging in customer communications and on the web.</p>	SCG-12-R ADA-9 to ADA-30	SCG-20-R ASC-13 to ASC-23

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Customer Services - Office Operations	CCC - Operations	200000.000	<p>CCC-Operations expenses cover the costs of answering customer telephone calls related to Gas Leaks, Service Orders, and Billing and Payments; responding to incoming email from customers; responding to inquiries from socialgas.com website and My Account; processing faxed fumigation orders; and, responding to other customer account related inquiries.</p> <p>CCC-Operations is in scope of the spending accountability report because it is generally the first point of contact for emergencies; as such it provides a critical support role in the safety of the SoCalGas system and the public's well-being.</p>	SCG-11 EDG-10 to EDG-23	SCG-19-R MHB-7 to MHB-9, MHB-11 to MHB-20
Customer Services - Office Operations	CCC - Support	200001.000	<p>CCC-Support activities include developing CSR call volume forecasts; scheduling part time CSRs; managing LOS real time performance; developing CCC technology strategy and collaborating with Information Technology to ensure the technology supports operations objectives; training and quality assurance; policy and procedures support; IVR and CSR telephone expenses; and annual technology expenses.</p> <p>CCC-Support is in scope of the spending accountability report due to its critical support functions for CCC-Operations, including scheduling, software maintenance and telco costs.</p>	SCG-11 EDG-23 to EDG-31	SCG-19-R MHB-20 to MHB-27



Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Customer Services - Office Operations	CS - Other Office Ops	200006.000	<p>Customer Service Other Office Ops and Technology is comprised of the following groups: (1) The Vice President of Customer Services provides oversight and leadership for all Customer Services activities; (2) Customer Operations Technology (COT) provides business systems support; (3) Customer Service Technology Project Management develops and manages the governance and standards for customer service technology projects, and monitors and reports on project status; (4) Business Planning Client Support works collaboratively with the client organizations to provide comprehensive financial reporting. The group also ensures that client organizations are in compliance with company policies, accounting principles and SOX reporting requirements.</p> <p>This work group is in scope of the spending accountability report due to the TY2016 request to establish a Customer Data Privacy Program to meet CPUC requirements in D. 12-08-045.</p>	SCG-11 EDG-46 to EDG-53	SCG-19-R MHB-43 to MHB-49

**a. SoCalGas Information Technology**

**i. SoCalGas Information Technology O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>5</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Information Technology and Cybersecurity	20,537	19,602	935	5%	
Information Technology and Cybersecurity	10,206	9,431	775	8%	
SVP & CITO		133	(133)	-100%	
IT Support	103	358	(255)	-71%	

<sup>5</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, the corrected 2017 imputed authorized is \$19,499 instead of \$19,602, a difference of \$103.

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>5</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Director IT SoCalGas Applications	974	1,012	(38)	-4%	
SCG GIS & CAD Services	123	313	(190)	-61%	
SCG Software Development - Database	728	984	(256)	-26%	
SCG Work Management Services	873	2,124	(1,251)	-59%	Yes
Architecture and Integration - SCG	525		525	100%	
SCG Applications Major Market Services	1,428	1,350	78	6%	
IT Applications NSS	5,452	3,158	2,294	73%	Yes
Infrastructure Subtotal	10,331	10,172	160	2%	
Director - Computing Infrastructure	448	1,706	(1,257)	-74%	Yes
Enterprise Command Center - SCG	59	212	(153)	-72%	
Business Communication Services - SCG	320	111	208	187%	
CI Operations Services SCG	236	798	(563)	-70%	
CI Compute Support SCG	831	731	101	14%	
CI Compute Provisioning SCG	555	760	(206)	-27%	
CI Standards	827	135	692	514%	
IT Telecom PMO	102	0	102	100%	
Cybersecurity	601	785	(184)	-23%	
IT Infrastructure NSS	6,352	4,932	1,420	29%	Yes

**ii. SoCalGas Information Technology O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Information Technology and Cybersecurity	<p>Movements between IT organization cost centers.</p> <p>Accounting for mainframe support direct charges originally forecasted at SDG&amp;E.</p>		
Information Technology and Cybersecurity			
SCG Work Management Services	<p>Forecasts included functions performed by "Architecture &amp; Integration – SCG;" however expenses were recorded to a new cost center created post filing.</p>		
IT Applications NSS	<p>Costs forecasted in other areas were recorded in this area. For example, a cost center supporting customer service functions was forecasted as shared but recorded as non-shared.</p>		
Infrastructure Subtotal	<p>The 2017 authorized costs for infrastructure related activities were distributed to various disciplines within this category as needs dictated (e.g., April 2017 IT Outage). Overall summation of Infrastructure actuals is within 2% of authorized.</p>		
Director - Computing Infrastructure	<p>Costs forecasted in this area were recorded to cost centers in other areas.</p>		
IT Infrastructure NSS	<p>Mainframe costs forecasted as a shared service were recorded as non-shared.</p>		

**iii. SoCalGas Information Technology O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Information Technology	SCG Work Management Services	2200-2445 / 2200-2445	This cost center represents support services for a broad range of client organizations, including Gas Operations/Distribution, Construction and New Business Services. This category includes costs for activities, as described, designed to mitigate reliability risks.	SCG-18-R CRO-15 to CRO-19	SCG-26 CRO-15 to CRO-17
Information Technology	IT Applications NSS	2IT001.000 / 2IT001.000	The types of systems supported in this area include: customer field operations, routing, scheduling and dispatching. This category includes costs for activities, as described, designed to mitigate reliability risks.	SCG-18-R CRO-12 to CRO-13	SCG-26 CRO-12 to CRO-17
Information Technology	Director - Computing Infrastructure	2200-2406, 2200-2459, 2200-2460 / 2200-2406	Activities include department level management for plan, design, build, implementation and management of system-wide network and telecommunications infrastructure. This category includes costs for activities, as described, designed to mitigate infrastructure risks.	SCG-18-R CRO-15 to CRO-19	SCG-26 CRO-12 to CRO-17
Information Technology	IT Infrastructure NSS	2IT002.000 / 2IT002.000	Infrastructure activities include: preventative maintenance, problem diagnosis and resolution, and service request processing and implementation. This category includes costs for activities, as described, designed to mitigate infrastructure risks.	SCG-18-R CRO-13 to CRO-14	SCG-26 CRO-13 to CRO-14

iv. SoCalGas Information Technology Capital Variances

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Information Technology	116,021	79,882	36,139	45%	
Applications Subtotal	58,681	32,817	25,864	79%	
Applications - Customer Care/Capacity/Expansion	19	1,205	(1,186)	-98%	
Applications - Customer Care/Mandated		789	(789)	-100%	
Applications - Customer Care/Reliability/Improvements	13,381	1,188	12,193	1026%	Yes
Applications - Utility Operations/Capacity/Expansion		102	(102)	-100%	
Applications - Utility Operations/Mandated	19,167	59	19,108	32516%	Yes
Applications - Utility Operations/Reliability/Improvements	26,114	21,459	4,654	22%	Yes
Opex 20/20		6,455	(6,455)	-100%	Yes
Applications - Utility Operations/Strategic		790	(790)	-100%	
Apps - Corp System/Reliability		770	(770)	-100%	
Infrastructure Subtotal	57,340	47,066	10,274	22%	
Cyber-Asset, Identity, Access Management-SW	363		363	100%	
Cyber-Sit Awareness and Incident Response-SW	5,543		5,543	100%	Yes
Cyber-Threat Management and Info Sharing-SW	1,225		1,225	100%	
Hardware - Utility Operations/Mandated	457		457	100%	
Hardware - Utility Operations/Reliability/Improvements	40,384	1,934	38,450	1988%	Yes
Infra - Hardware/Capacity		5,165	(5,165)	-100%	Yes
Infra-Hardware/Strategic		1,625	(1,625)	-100%	
Infrastructure - Hardware/Reliability/Improvements	550	13,011	(12,461)	-96%	Yes
Network/Telecom - Hardware/Reliability/Improvements	7,804	23,979	(16,175)	-67%	Yes
Network/Telecom - Software/Reliability/Improvements	1,014		1,014	100%	
Network/Tele - Hardware/Capacity		1,352	(1,352)	-100%	

v. **SoCalGas Information Technology Capital Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Applications Subtotal	Increased efforts to modernize critical platforms that started in 2016 due to degradation of the SAP system to mitigate the risk of system failure.		Critical system enhancements
Applications - Customer Care/Reliability/Improvements	The majority of projects in this category are out of scope of this report. The in-scope items mainly relate to reliability and the variances for these projects are below the variance explanation threshold.		
Applications - Utility Operations/Mandated	Majority of projects with actuals in this budget code are not mandated projects and should have been booked under the Reliability category.		
Applications - Utility Operations/Reliability/Improvements	Actuals for many of the Mandated projects should be recorded here; SAP investment is included in actuals, but it was not planned in TY 2016 GRC.		Critical system enhancements
OpEx 20/20	OpEx project closed and remaining work completed under UO/Reliability/Improvements category.		
Infrastructure Subtotal	In 2017, several system-wide IT outages impacted business operations, with one outage lasting multiple days and affecting several hundred applications/services. As a result, IT capital investments in new data center equipment (e.g., servers, storage) and related labor to implement was required to provide a more reliable computing environment. These incremental investments had not been anticipated as part of the TY 2016 GRC.		
Cyber-Sit Awareness and Incident Response-SW	Cyber capital was only forecasted in SDG&E capital in TY 2016 GRC, but it was directly charged to SCG due to accounting policy change.		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Hardware - Utility Operations/Reliability/Improvements	Consolidation of hardware capital from several categories authorized as part of TY 2016 GRC, uplift in actuals due to incremental investments required to address IT related outages.		
Infra - Hardware/Capacity	Work authorized captured in Hardware - UO/Reliability/Improvements.		
Infrastructure - Hardware/Reliability/Improvements	Work authorized captured in Hardware - UO/Reliability/Improvements.		
Network/Telecom - Hardware/Reliability/Improvements	Much of work authorized redeployed to hardware capital investments to address issues identified by IT related outages.		

**vi. SoCalGas Information Technology Capital Workpaper Descriptions and GRC Testimony Locations**

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Information Technology	774	Applications - Customer Care/Reliability/Improvements	Applications support the development, implementation and maintenance of computer software utilized by customers, employees and/or vendor partners. Projects included in this budget code are related to software customer service applications. This category includes costs for activities, as described, designed to mitigate reliability risks.	SCG-18-R CRO-19 to CRO-34	SCG-26 CRO-17 to CRO-39
Information Technology	756	Applications - Utility Operations/Mandated	Applications support the development, implementation and maintenance of computer software utilized by customers, employees and/or vendor partners. Projects included in this budget code are mandated by the CPUC and are related to enterprise-wide software applications in support of utility operations. This category includes costs for activities, as described, designed to mitigate reliability risks.	SCG-18-R CRO-19 to CRO-34	SCG-26 CRO-17 to CRO-39

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Information Technology	776	Applications - Utility Operations/ Reliability/ Improvements	Applications support the development, implementation and maintenance of computer software utilized by customers, employees and/or vendor partners. Projects included in this budget code are related to enterprise-wide software applications in support of utility operations. This category includes costs for activities, as described, designed to mitigate reliability risks.	SCG-18-R CRO-19 to CRO-34	SCG-26 CRO-17 to CRO-39
Information Technology	810	OpEx 20/20	Project includes several enhancements necessary to complete remaining Construction, Planning and Design (CPD) deployments. Activities include training, data conversion, system configuration, and storm period support, including defect resolution.	SCG-18-R CRO-19 to CRO-34	N/A
Information Technology	748	Cyber-Sit Awareness and Incident Response-SW	IT Infrastructure supports the design, implementation and operation of the company's computing infrastructure, includes both hardware and software. Projects included in this budget code are related to enterprise-wide cyber security software. This category includes costs for activities, as described, designed to mitigate cybersecurity and reliability risks.	SCG-18-R CRO-19 to CRO-34	SCG-27-R GW-25 to GW-62
Information Technology	777	Hardware - Utility Operations/ Reliability/ Improvements	IT Infrastructure supports the design, implementation and operation of the company's computing infrastructure. Projects included in this budget code are related to enterprise-wide hardware investments in support of utility operations. This category includes costs for activities, as described, designed to mitigate reliability risks.	SCG-18-R CRO-19 to CRO-34	SCG-26 CRO-17 to CRO-39
Information Technology	760	Infra - Hardware/ Capacity	IT Infrastructure supports the design, implementation and operation of the company's computing infrastructure. Projects included in this budget code are related to enterprise-wide infrastructure in support of capacity expansion. This category includes costs for activities, as described, designed to mitigate reliability risks.	SCG-18-R CRO-19 to CRO-34	SCG-26 CRO-17 to CRO-39
Information Technology	770	Infrastructure - Hardware/ Reliability/ Improvements	IT Infrastructure supports the design, implementation and operation of the company's computing infrastructure. Projects included in this budget code are related to enterprise-wide infrastructure in support of utility operations. This category includes costs for activities, as described, designed to mitigate reliability risks.	SCG-18-R CRO-19 to CRO-34	SCG-26 CRO-17 to CRO-39



Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Information Technology	772	Network/ Telecom - Hardware/ Reliability/ Improvement	IT Infrastructure supports the design, implementation and operation of the company's computing infrastructure, includes both hardware and software. Projects included in this budget code are related to enterprise-wide telecommunication investments. This category includes costs for activities, as described, designed to mitigate reliability risks.	SCG-18-R CRO-19 to CRO-34	SCG-26 CRO-17 to CRO-39

**b. SoCalGas Support Services**

**i. SoCalGas Support Services O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>6</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Support Services	12,971	13,557	(586)	-4%	
Environmental Services	4,711	3,864	847	22%	
Environmental	4,711	3,864	847	22%	
Fleet Services & Facility Operations	4,768	3,759	1,009	27%	
Facilities-Monterey Park Manager	2,570	2,416	154	6%	
Facilities GCT	1,719	1,343	376	28%	
Director	479		479	100%	
Supply Management & Supplier Diversity	3,492	5,934	(2,442)	-41%	
Fabrication & Repair	2,019	3,586	(1,567)	-44%	Yes
Meter Shops & Records	1,473	2,349	(875)	-37%	

<sup>6</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, the corrected 2017 imputed authorized is \$13,523 instead of \$13,557, a difference of \$34.

**ii. SoCalGas Support Services O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Supply Management & Supplier Diversity			
Fabrication & Repair	<p>Lower than forecasted staffing level during some portion of 2017.</p> <p>Lower than forecasted activity resulting from new DOGGR regulations that reduced pressure control fitting modification work.</p> <p>Lower than forecasted cost in the maintenance, repair and replacement of tools company-wide resulting from the purchase and implementation of a new system-wide tool and repair warranty program. Cost savings are projected to be temporary until the warranty expires.</p>		

**iii. SoCalGas Support Services O&M Workpaper Description and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Supply Management & Supplier Diversity	Fabrication & Repair	2SS002.000	The Fabrication and Tool Repair Shop provides specialized support to Company operations, as both a supplier of custom materials and tools and as a service provider in the modification and repair of materials and tools. In particular, the Tool Shop provides the specialized machining and fabrication of tools, materials, and equipment required to support SoCalGas' operations. In many cases, these tools are manufactured specifically for SoCalGas' pipeline system and are not available through an alternative source. The Fabrication and Tool Repair Shop performs periodic maintenance and repair of the gas handling, electronic, and pneumatic tools. This cost area also supports the technical evaluation of new tools.	SCG-14 RDH-6 to RDH-7	SCG-22-WP pp. 33 to 37

**iv. SoCalGas Support Services Capital Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Support Services	31,257	19,995	11,261	56%	
Infrastructure & Improvements	24,510	19,995	4,515	23%	Yes
Safety & Environmental	6,747		6,747	100%	Yes

v. **SoCalGas Support Services Capital Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Infrastructure & Improvements	The Infrastructure & Improvements forecast funds necessary recurring facility improvements and equipment upgrades to adequately support business operations. The SoCalGas capital renewal program identifies facilities to be repaired or improved, as needed, based on the criticality of the facility, the age of the asset, and the implications for failure to complete the replacement or upgrade. As such, the expenditures in this funding category were higher than forecasted due to aging infrastructure requiring additional repairs and replacements.		In addition to the forecasted activities the following are examples of some of the larger emergent projects completed in 2017: employee training center improvements, GCT 2nd floor improvement, Menifee base tenant improvements and 182nd street base asphalt repave.
Safety & Environmental	The Safety & Environmental category is new for 2017 and was not requested in the TY 2016 GRC. In the TY 2016 GRC, this category would have been included as a part of the Infrastructure & Improvements category. The expenditures in this category were primarily for water pathogen management throughout various SoCalGas locations to ensure safe water supply to SoCalGas facilities, thus, as described, as designed to mitigate safety risks.		Water supply testing and treatment at various SoCalGas facilities.

vi. **SoCalGas Support Services Capital Workpaper Descriptions and GRC Testimony Locations**

Witness Area	Capital Workpaper or Prime Budget Code #	Capital Workpaper or Prime Budget Code Name	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Fleet Services & Facility Operations	006530	Infrastructure & Improvements	The Infrastructure & Improvements forecast funds necessary recurring facility improvements and equipment upgrades to adequately support business operations. The SoCalGas capital renewal program identifies facilities to be repaired or improved, as needed, based on the criticality of the facility, the age of the asset, and the implications for failure to complete the replacement or upgrade. The capital renewal program is based on a systematic management process to plan and budget for known recurring repairs and replacements that extend the life and retain the usable condition of facilities and systems. The requested capital expenditure costs are needed to maintain safety of Company facilities and assets and to support operational needs.	SCG-15 CLH-23 to CLH-26	SCG-23-R CLH-41 to CLH-43
Fleet Services & Facility Operations	006540	Safety & Environmental	The Safety & Environmental request is necessary to comply with mandated American with Disabilities (ADA) improvements to the San Luis Obispo and Santa Barbara facility which will improve customer access and accessibility to this branch office as well as to perform earthquake/seismic retrofits at various facilities throughout the service territory.	N/A	SCG-23-R CLH-47 to CLH-48

c. SoCalGas Administrative & General

i. SoCalGas Administrative & General O&M Variances

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized <sup>7</sup> (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
A&G	85,922	72,312	13,610	19%	
Accounting & Finance, Legal, Regulatory Affairs, External Affairs	921	1,119	(198)	-18%	
Accounting Systems & Compliance	921	1,119	(198)	-18%	
Compensation & Benefits	438	905	(466)	-52%	
Pension & Benefits - Employee Assistance Program	438	905	(466)	-52%	
Corporate Center - General	69,561	48,260	21,301	44%	
SECC Outside Services Employees - F923.1	69,561	48,260	21,301	44%	Yes
Human Resources Dept, Safety, LTD & WC	14,728	20,918	(6,191)	-30%	
SCG President & CEO COO & VP of Human Resources	2,851	3,963	(1,112)	-28%	Yes
SCG Director HR Services	4,495	4,940	(446)	-9%	
SCG Director Safety Wellness	4,768	9,533	(4,766)	-50%	Yes
SCG Director Org Effectiveness	2,614	2,481	133	5%	
Risk Management	274	1,110	(836)	-75%	
Operations Risk Management-SCG	274	1,110	(836)	-75%	

<sup>7</sup> For the reason stated in the Introduction Section 1d. Derivation of Authorized Dollars, footnote 21, the corrected 2017 imputed authorized is \$72,302 instead of \$72,312, a difference of \$10.

ii. SoCalGas Administrative & General O&M Variance Explanations

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Corporate Center - General			
SECC Outside Services Employees - F923.1	<p>Higher than forecasted costs allocated to SoCalGas primarily due to an increase in overall costs for medical plans, post-retirement benefit expenses, and new hires in information technology cybersecurity, infrastructure, governance, and architecture.</p> <p>Embedded in the allocated costs to SoCalGas are the forecasts requested in the TY 2016 GRC designed to mitigate, as described, the risk of workplace violence. This includes contract security, physical security systems, workplace violence training, and various safety programs.</p>		
Human Resources Dept, Safety, LTD & WC			
SCG President & CEO COO & VP of Human Resources	<p>Lower labor expenses due to lower than forecasted staffing level during some portion of 2017.</p> <p>Lower non-labor expenses due to lower than forecasted American Gas Association (AGA) dues, lower purchased services, and lower other employee related expenses than authorized.</p>		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
SCG Director Safety Wellness	<p>Lower than forecasted time required for employees to complete Alert Driving program.</p> <p>Forecasts included employee labor for Alert Driving program training however expenses were recorded in the employees' actual work area.</p> <p>Lower than forecasted expense for other proposed incremental programs resulting from re-scoping and cost efficiencies.</p> <p>Forecasts included costs for the Employee Care Services group, however expenses were recorded in HR Services.</p>		

**iii. SoCalGas Administrative & General O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Corporate Center - General	SECC Outside Services Employees - F923.1	2SE000.001	<p>Corporate center allocated costs include security services provided to protect corporate assets and employees, security systems, and the Corporate Security (CSS) department. The CSS department is responsible for the development and management of programs and policies for security systems, security investigations, workplace violence avoidance, as well as crisis and security risk management services.</p> <p>Corporate Center function is also actively involved in activities designed to mitigate the identified risk of workplace violence by supporting the planning and incident management investigation as well as programs designed to mitigate the risk event before it occurs. This includes training, investigation, employee awareness,</p>	SCG-19 PRW-45 to PRW-53	SCG-28-R MLD-9 to MLD-11



Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
			new hire screening, employee assistance, and corporate security activities.		
Human Resources Dept, Safety, LTD & WC	SCG President & CEO COO & VP of Human Resources	2HR001.000	<p>This workpaper consists of expenses for the SCG President/CEO, COO, SCG Vice President of HR and three administrative assistants.</p> <p>Leadership executes the direction utility employees follow in providing safe and reliable service to customers.</p>	SCG-23-R MLS-4 to MLS-5	SCG-32 MG-12 to MG-13
Human Resources Dept, Safety, LTD & WC	SCG Director Safety Wellness	2HR006.000	<p>The Safety, Wellness and Disability Services department is responsible for positioning SCG employees to lead healthy and productive lives. The services provided by the department extend from pre-employment health testing through the end of employment at SCG. Services include: physical &amp; mental wellness education; safety and industrial hygiene education and compliance; incident prevention, analysis and reporting; Workers' Compensation administration; short-term &amp; long-term disability management; leave-of-absence administration; and return-to-work services.</p> <p>This department is integral to the activities designed to mitigate safety risks.</p>	SCG-23-R MLS-17 to MLS-26	SCG-32 MG-25 to MG-30

**32. SoCalGas Balanced Programs – DIMP, TIMP, SIMP, RD&D and NERBA**

**a. SoCalGas Balanced Programs Direct O&M Expenses**

**i. SoCalGas Balanced DIMP & TIMP Direct O&M Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
DIMP & TIMP	84,077	105,188	(21,111)	-20%	
DIMP	38,300	45,602	(7,302)	-16%	Yes
TIMP	45,777	59,586	(13,809)	-23%	Yes

**ii. SoCalGas Balanced DIMP & TIMP Direct O&M Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
DIMP	DIMP O&M (and capital) are managed over the GRC cycle (2016 - 2018). Therefore, any particular year could be over or underspent compared to authorized. The overall program metrics were met, while maintaining historical cost levels.		
TIMP	TIMP is managed to the revenue requirement over the GRC authorized (2016-2018) cycle and not on an individual year basis. Therefore, individual year expenditures may vary from the authorized amount and also between overall capital and O&M expenditures. This primary driver for		

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
	additional cost was due to additional capital repairs versus O&M mitigations creating a lower O&M spend. All TIMP assessments and repairs meet applicable compliance deadlines.		

**iii. SoCalGas Balanced DIMP & TIMP Direct O&M Workpaper Descriptions and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
TIMP & DIMP	DIMP	2TD000.001	This group has been organized and resourced to address the requirements of the DOT mandated DIMP rules set for in 49 CFR section 192, subpart P. Primarily, the activities will focus on generating and enhancing knowledge of pipeline system (location, materials, data retention, analysis, etc.); Threat identification and mitigation; evaluate, rank and address risk; Damage Prevention, Leakage prevention and mitigation, etc.	SCG-08 MTM-14 to MTM-20	SCG-14 MTM-20 to MTM-28
TIMP & DIMP	TIMP	2TD000.000	Primary activities focus on the development, management and support of the TIMP. Support activities include data collection, analysis, management, and reporting; assessment planning; integrity assessments and project management; preventive and mitigative measure analysis; technical and engineering support in the areas of corrosion protection and treatment, metallurgy, pipeline materials specifications and standard operating procedures.	SCG-08 MTM-8 to MTM-14	SCG-14 MTM-13 to MTM-19

**iv. SoCalGas Balanced Underground Storage SIMP Direct O&M Expenses**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Underground Storage - RSIMP	15,428	6,117	9,311	152%	Yes

**v. SoCalGas Balanced Underground Storage SIMP Direct O&M Variance Explanation**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
Underground Storage - RSIMP	Higher than forecasted costs resulting from the accelerated pace of RSIMP implementation to more expeditiously enhance safety and validate well integrity, as well as enhanced RSIMP activities. This in response to direction from regulators and/or new regulations mandating comprehensive well assessments and additional integrity management activities (PHMSA 2016 Interim Final Rule which adopts American Petroleum Institute (API) Recommended Practice 1171, DOGGR Emergency Regulations, Senate Bill 887, and new DOGGR Underground Storage regulations).		Additional regulatory compliance, program management and support, well inspection, workovers, and mitigation costs associated with expanded, new, regulatory requirements driven by PHMSA's Interim Final Rule, DOGGR Emergency Regulations, and Senate Bill 887 drove more prescriptive requirements and additional expenditures for O&M and capital costs for mechanical integrity testing, monitoring plans, risk management plans, data management, increased frequency of noise and temperature logging of wells, additional field assessments, leak surveys, valve inspections, and pressure monitoring, including a comprehensive safety review of the Aliso Canyon underground natural gas storage facility.

**vi. SoCalGas Balanced Underground Storage SIMP Workpaper Description and GRC Testimony Locations**

Witness Area	WP Activity Description	O&M Workpaper # 2016 GRC/ 2019 GRC	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Underground Storage	Underground Storage - RSIMP	2US002.000	Primary activities focus on the development, management and support of the Storage Integrity Management Program (SIMP). Support activities include inspection, data collection, analysis, management, and reporting as well as project management; preventive and mitigative measure analysis; technical and engineering support in the areas of corrosion/erosion protection and treatment, metallurgy, pipeline materials specifications and standard operating procedures.	SCG-06 PEB-17 to PEB-24	SCG-10-R NPN-25 to NPN-28

**vii. SoCalGas RD&D O&M Variance**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Customer Services	13,493	12,277	1,216	10%	
R-RD&D Technology Development	13,493	12,277	1,216	10%	

**viii. SoCalGas RD&D O&M Workpaper Description and GRC Testimony Reference**

Not necessary, no workpaper mapping is required for this category because the variance doesn't meet the selection criteria.

**ix. SoCalGas New Environmental Regulatory Balancing Account (NERBA) Direct O&M Variance**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
Support Services	7,094	6,277	817	13%	
NERBA	7,094	6,277	817	13%	

**x. SoCalGas NERBA O&M Workpaper Description and GRC Testimony Reference**

Not necessary, no workpaper mapping is required for this category because the variance doesn't meet the selection criteria.

**b. SoCalGas Balanced Programs Direct Capital**

**33. SoCalGas Balanced – DIMP & TIMP Direct Capital Variances**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
DIMP & TIMP	200,427	80,958	119,469	148%	
DIMP	93,669	41,090	52,579	128%	Yes
TIMP - Pipelines by Gas Distribution	2,173	3,553	(1,380)	-39%	
TIMP - Pipelines by Gas Transmission	103,653	36,315	67,338	185%	Yes
TIMP - Capital Tools	932		932	100%	

**34. SoCalGas Balanced – DIMP & TIMP Direct Capital Variance Explanations**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
DIMP	<p>DIMP is managed to the revenue requirement over the GRC authorized (2016-2018) cycle and not on an individual year basis. Therefore, individual year expenditures may vary from the authorized amount and also between overall capital and O&amp;M expenditures. For 2017 the mileage replaced as part of the early vintage replacement program (Aldyl-A &amp; Bare Steel) was higher than the average forecast as the program continues to ramp-up, resulting in higher capital expenditure levels.</p>		
TIMP - Pipelines by Gas Transmission	<p>TIMP is managed to the revenue requirement over the GRC authorized (2016-2018) cycle and not on an individual year basis. Therefore, individual year expenditures may vary from the authorized amount and also between overall capital and O&amp;M expenditures. The primary cause for the variation is the project load which varies each year and the level of remediation that is required is unknown until the actual assessment has been completed. The major contributor in 2017 was the high level of remediation that was required post-assessment. All TIMP assessments and repairs meet applicable compliance deadlines.</p>		

**35. SoCalGas Balanced – DIMP & TIMP Direct Capital Workpaper Descriptions and GRC Testimony Locations**

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
TIMP & DIMP	003120 & 00276	TIMP	This project addresses the regulatory requirements set forth by the implementation of Pipeline Safety Improvement Act (PSIA) of 2002. All DOT transmission pipeline work generated to address these regulatory requirements will be captured in Budget Category (BC) 312 for pipelines operated by the Transmission department and (BC) 276 for pipelines operated by the Distribution department.	SCG-08 MTM-21 to MTM-23	SCG-14 MTM-28 to MTM-31
TIMP & DIMP	002770	DIMP	PHMSA’s purpose for DIMP is to enhance pipeline safety by having operators identify and reduce pipeline integrity risks specifically for distribution pipelines. As noted by PHMSA, DIMP requires activities beyond those required by traditional regulation. SoCalGas therefore has created individualized DIMP activities such as the DREAMS that are above and beyond its core regulatory requirements. It has also created another individualized DIMP activity called GIPP.	SCG-08 MTM-23 to MTM-24	SCG-14 MTM-20 to MTM-28

**36. SoCalGas Balanced Underground Storage SIMP Direct Capital Variance**

WP Activity Description	2017 Actuals (\$000)	2017 Imputed Authorized (\$000)	\$ Variance (\$000)	% Variance	Meets Variance Criteria?
SIMP	64,211	10,735	53,476	498%	Yes



**37. SoCalGas Balanced Underground Storage SIMP Direct Capital Variance Explanation**

WP Activity Description	Variance Explanation	Projects/Activities Canceled or Deferred	Emergent Projects/Activities not Planned in the TY2016 GRC
SIMP	Higher than forecasted costs resulting from the accelerated pace of RSIMP implementation to more expeditiously enhance safety and validate well integrity, as well as enhanced RSIMP activities. This in response to direction from regulators and/or new regulations mandating comprehensive well assessments and additional integrity management activities (PHMSA 2016 Interim Final Rule which adopts American Petroleum Institute (API) Recommended Practice 1171, DOGGR Emergency Regulations, Senate Bill 887, and new DOGGR Underground Storage regulations).		Additional regulatory compliance, program management and support, well inspection, workovers, and mitigation costs associated with expanded, new, regulatory requirements driven by PHMSA's Interim Final Rule, DOGGR Emergency Regulations, and Senate Bill 887 drove more prescriptive requirements and additional expenditures for O&M and capital costs for mechanical integrity testing, monitoring plans, risk management plans, data management, increased frequency of noise and temperature logging of wells, additional field assessments, leak surveys, valve inspections, and pressure monitoring, including a comprehensive safety review of the Aliso Canyon underground natural gas storage facility.

**38. SoCalGas Balanced Underground Storage SIMP Direct Capital Workpaper Description and GRC Testimony Reference**

Witness Area	Capital Workpaper or Prime Budget Code #	WP Activity Description	GRC Workpaper Description	2016 GRC Testimony Reference	2019 GRC Testimony Reference
Underground Storage	00412U	SIMP	SIMP is a proactive, methodical, and structured approach using advanced inspection technologies such as ultra-sonic and neutron type casing logs along with risk management disciplines to address well integrity issues before they result in unsafe conditions for employees or the public, or become major incidents, is a prudent operating practice. Safety and/or integrity conditions that are presently unknown may exist within the high pressure (up to 3,600 psig) above ground pipe laterals and below ground facilities that comprise of 229 aging gas storage field wells that can exceed 13,000 feet in depth. Some SoCalGas wells are more than 75 years old while the average age of all Storage wells is 52 years. In addition, some SoCalGas wells are located within close proximity to many residential dwellings.	SCG-06 PEB-39 to PEB-42	SCG-10-R NPN-51 to NPN-57

c. SoCalGas Regulatory Account 2017 Cumulative Balances

i. SoCalGas Regulatory Accounts – DIMPBA

SoCalGas DIMPBA Details Revenue Requirements (\$000)						
Program Cycle 2016 - 2018						
Two-Way						
	(a)	(b)	(c)	(d) = (b) - (c)	(e)	(f) = (a) + (d) + (e)
	<b>Beginning Balance</b>	<b>Actual</b>	<b>Authorized</b>	<b>Under/(Over) Collection</b>	<b>Interest</b>	<b>Ending Balance</b>
<b>Year 2017</b>						
Beginning Balance	(13,927)					(13,927)
O&M		38,271	45,602	(7,331)		(7,331)
Capital-Related Costs		11,221	4,560	6,661		6,661
Interest					(178)	(178)
<b>Subtotal</b>	<b>(13,927)</b>	<b>49,492</b>	<b>50,162</b>	<b>(670)</b>	<b>(178)</b>	<b>(14,775)</b>

ii. SoCalGas Regulatory Accounts – TIMPBA

SoCalGas TIMPBA Details Revenue Requirements (\$000)						
Program Cycle 2016 - 2018						
Two-Way						
	(a)	(b)	(c)	(d) = (b) - (c)	(e)	(f) = (a) + (d) + (e)
	Beginning Balance	Actual	Authorized	Under/(Over) Collection	Interest	Ending Balance
<b>Year 2017</b>						
Beginning Balance	(18,028)					(18,028)
O&M		44,687	59,586	(14,899)		(14,899)
Capital-Related Costs		2,429	1,411	1,018		1,018
Interest					(263)	(263)
Subtotal	(18,028)	47,116	60,997	(13,881)	(263)	(32,173)

iii. SoCalGas Regulatory Accounts – SIMPBA

SoCalGas SIMPBA Details Revenue Requirements (\$000) Program Cycle 2016 - 2018 Two-Way						
	(a)	(b)	(c)	(d) = (b) - (c)	(e)	(f) = (a) + (d) + (e)
	Beginning Balance	Actual	Authorized	Under/(Over) Collection	Interest	Ending Balance
<b>Year 2017</b>						
Beginning Balance	6,222					6,222
O&M		15,982	6,117	9,865		9,865
Capital-Related Costs		6,343	374	5,970		5,970
Interest					154	154
Subtotal	6,222	22,325	6,490	15,834	154	22,210

iv. SoCalGas Regulatory Accounts – NERBA

SoCalGas NERBA Details Revenue Requirements (\$000)						
Two-Way						
	(a)	(b)	(c)	(d) = (b) - (c)	(e)	(f) = (a) + (d) + (e)
	Beginning Balance	Actual	Authorized	Under/(Over) Collection	Interest	Ending Balance
<b>Year 2017</b>						
Beginning Balance	(844)					(844)
O&M		7,379	6,277	1,102		1,102
Capital-Related Costs				-		-
Amortization			503	(503)		(503)
Interest					(13)	(13)
Subtotal	(844)	7,379	6,781	599	(13)	(258)

v. SoCalGas Regulatory Accounts – RD&D

SoCalGas RD&D Expense Account Details Revenue Requirements (\$000)						
Program Cycle 2016 - 2018						
One-Way						
	(a)	(b)	(c)	(d) = (b) - (c)	(e)	(f) = (a) + (d) + (e)
	Beginning Balance	Actual	Authorized	Under/(Over) Collection	Interest	Ending Balance
<b>Year 2017</b>						
Beginning Balance	(1,227)					(1,227)
O&M		13,484	12,277	1,206		1,206
Capital-Related Costs						-
Interest					(17)	(17)
Subtotal	(1,227)	13,484	12,277	1,206	(17)	(37)

**d. SoCalGas Balanced Program Regulatory Account Disposition of Cost Recovery**

**TIMP & DIMP & SIMP (same for all 3 programs)**

Per D.16-06-054, the TIMPBA, Post-2011 DIMPBA, and SIMPBA are authorized for the three-year GRC period ending December 31, 2018 or until the effective implementation date of SoCalGas' next GRC.

Any over- or under-collected balance at the end of each year within the GRC cycle will be carried over to the following year. For any unspent funds (also referred to as overcollections) at the end of the 2016 GRC cycle, SoCalGas and SDG&E will propose in their next GRC proceeding to return the overcollections in rates to customers. However, for any costs in excess of the authorized O&M and capital-related costs (also referred to as undercollections), the costs shall be subject to recovery through a Tier 3 advice letter for amounts up to 35% of the 2016 GRC cycle total revenue requirement. Any amount above the 35% threshold will be subject to recovery through a separate application.

**i. SoCalGas Regulatory Accounts – TIMPBA and DIMPBA**

- a. In its TY 2019 GRC, SoCalGas did not forecast year-end 2018 balances and, therefore, did not specifically propose to return any overcollections from the TY 2016 GRC cycle to customers because of the uncertainty of whether the unspent funds that existed at the time of the filing of the GRC application would continue to exist at the end of the GRC period. SoCalGas anticipated these overcollections would have been absorbed by costs incurred through the end of the GRC cycle; however, the actual recorded balances for TIMP and DIMP remain overcollected at the end of the GRC cycle. SoCalGas will return these overcollections to customers in connection with its TY 2019 GRC rate implementation.

**ii. SoCalGas Regulatory Account – SIMPBA**

- a. For SIMP, the balance at the end of 2017 had already exceeded the three-year authorized revenue requirement by \$15.3 million, or 78.7%. Therefore, on February 8, 2018, SoCalGas filed Tier 3 advice letter AL 5253-G, seeking to recover 35%, or \$6.8 million of the \$19.5 million authorized revenue for the TY 2016 GRC cycle. AL 5253 was approved and effective as of January 1, 2019 per Resolution G-3544. SoCalGas will seek recovery of the remaining undercollection through a future request.

**iii. SoCalGas Regulatory Account – NERBA**

The NERBA is a two-way balancing account with five subaccounts. The following four subaccounts are funded through the TY 2016 GRC:

1. AB 32 Admin Fees Subaccount
2. Subpart W Subaccount
3. MS4 Compliance Subaccount, and
4. LDAR Subaccount

In each annual October regulatory account balance update advice letter filing, SoCalGas will amortize the projected year-end balance effective January 1 of the following year.

- Via AL 5054-G, effective 1/1/2017, SoCalGas amortized the projected 2016 year-end balances of the AB 32 Admin Fees Subaccount and Subpart W Subaccount.
- Via AL 5202-G, effective 1/1/2018, SoCalGas amortized the projected 2017 year-end balances of the AB 32 Admin Fees Subaccount and Subpart W Subaccount.
- Via AL 5368-G, effective 1/1/2019, SoCalGas amortizes the projected 2018 year-end balances of the AB 32 Admin Fees Subaccount; Subpart W Subaccount; MS4 Compliance Subaccount; and LDAR Subaccount.

**iv. SoCalGas Regulatory Account – RD&D**

The RDDEA is a one-way regulatory account. Pursuant to D.16-06-054, TY 2016 GRC, effective January 1, 2016, SoCalGas is authorized to continue using this account through the three-year GRC cycle ending December 31, 2018 or until the effective implementation date of SoCalGas' next GRC.

For the current GRC cycle (2016-2018), any over- or undercollected balance at the end of each year within the GRC cycle will be carried over to the following year. For any unspent RD&D funds at the end of the current GRC cycle, SoCalGas will propose in its next GRC proceeding to return the overcollections in rates to customers. Undercollections may not be recovered from ratepayers and shareholders will absorb the balance in the event actual expenses exceed authorized levels.



In its TY 2019 GRC, SoCalGas proposed to return to customers the RDDEA overcollected balance as of December 31, 2018.<sup>8</sup>

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<sup>8</sup> A.17-10-008, Ex. SCG-42 (Yu) at RQY-2: 12-13.

## GLOSSARY OF TERMS

A&G	Administrative and General
A.	Application
AB	Assembly Bill
ADA	American with Disabilities Act
AGA	American Gas Association
AL	Advice Letter
AL	Anodeless
AMI	Advanced Meter Infrastructure
AMO	Advanced Metering Operations
API	American Petroleum Institute
BC	Budget Code
BY	Base Year
C&I	Commercial and Industrial
C&O	Construction and Operation
CAD	Computer-Aided Design
CADD	Computer-Aided Design and Drafting
CARB	California Air Resources Board
CARE	California Alternate Rates for Energy
CCC	Customer Contact Center
CFCA	Core Fixed Cost Balancing Account
CFR	Code of Federal Regulations
CGN	Compressed Natural Gas
CITO	Chief Information Technology Officer
CNF	Cleveland National Forest
CMP	Corrective Maintenance Program
CNF	Cleveland National Forest
CO	Carbon Monoxide
COT	Customer Operations Technology
CP	Cathodic Protection
CPD	Construction, Planning, and Design
CP&P	Customer Programs and Pricing
CPD	Construction Planning and Design
CPDM	Cathodic Protection Data Management
CPEP	Cuyamaca Peak Energy Plant
CPUC	California Public Utilities Commission
CRAC	Computer Room Air Conditioning
CS	Customer Service
CSS	Corporate Security Services
CS-F	Customer Service - Field
CSR	Customer Service Representative
D.	Decision
DER	Distributed Energy Resources
DERMS	Distributed Energy Resource Management
DIIS	Distribution Interconnection Information System

DIMP	Distribution Integrity Management Program
DIMPBA	Distribution Integrity Management Program Balancing Account
DOGGR	Division of Oil, Gas, and Geothermal Resources
DOT	Department of Transportation
DREAMS	Distribution Risk Evaluation and Monitoring System
DRMS	Demand Response Management System
DSEC	Desert Star Energy Center
EAP	Employee Assistance Program
ED	Energy Division
EGIM	Electric Geographic Information Management
EGIS	Enterprise Geographic Information System
EPM	Electronic Pressure Monitors
ERRA	Energy Resource Recovery Account
ESA	Energy Savings Assistance
ESS	Enterprise Systems Solutions
EV	Electric Vehicle
FERC	Federal Energy Regulatory Commission
FiRM	Fire Risk Mitigation
FLSR	Fault Location Isolation Service Restoration
FOF	Fueling our Future
FTP	File Transfer Protocol
GCT	Gas Company Tower
GEMS	Gas Energy Measurement Systems
GGISS	Gas Geographic Information System and Services
GIPP	Gas Infrastructure Protection Project
GIS	Geographic Information System
GO	General Order
GRC	General Rate Case
HANA	High Performance Analytic Appliance
HQ	Headquarters
HR	Human Resources
HVAC	Heating, Ventilating, Air Conditioning
HW	Hardware
ILI	In-Line Inspection
IT	Information Technology
IVR	Interactive Voice Response
kV	Kilovolt
LAN	Local Area Network
LDAR	Leak Detection & Repair
LOS	Level of Service
LTD	Long-Term Disability
M&R	Meter and Regulator
MCT	Mobile Command Trailers
MEF	Miramar Energy Facility
MR	Meter Reading
MS4	Municipal Separate Storm Sewer Systems

MSA	Meter Set Assembly
MTD	Metropolitan Transit System
NB	New Business
NERBA	New Environmental Regulatory Balancing Account
NGAT	Natural Gas Appliance Testing
NSE	Non-Standard Escalation
NSS	Non-Shared Services
O&M	Operations and Maintenance
OH	Overhead
OIR	Order Instituting Rulemaking
OQ	Operator Qualification
OSHA	Occupational Safety and Health Administration
PBR	Performance Based Ratemaking
PCB	Polychlorinated Biphenyls
PEC	Palomar Energy Center
PHMSA	Pipeline and Hazardous Materials Safety Administration
PMO	Project Management Office
PPE	Personal Protective Equipment
PSIA	Pipeline Safety Improvement Act
PU	Public Utilities
R.	Rulemaking
RAMP	Risk Assessment Mitigation Phase
RB	Rancho Bernardo
RCP	Rate Case Plan
RD&D	Research, Development and Demonstration
RDDEA	Research, Development, and Demonstration Expense Account
RE	Real Estate
RFS	Remove from Service
RNERBA	Refundable New Environmental Regulatory Balancing Account
RO	Results of Operations
RSIMP	Refundable Storage Integrity Management Program
SB	Senate Bill
SCADA	Supervisory Control and Data Acquisition
SCG	Southern California Gas Company
SDG&E	San Diego Gas & Electric
SEA	Substation Equipment Assessment
SECC	Sempra Energy Corporate Center
SG	Smart Grid
SIMP	Storage Integrity Management Program
SoCalGas	Southern California Gas Company
SOT	Service Order Team
SOX	Sarbanes Oxley
SVP	Senior Vice President
SW	Software
TIMP	Transmission Integrity Management Program
TIMPBA	Transmission Integrity Management Program Balancing Account

TL	Tie-line
TSDF	Treatment, Storage and Disposal Facilities
TTBA	Tree Trimming Balancing Account
TY	Test Year
UG	Underground
UO	Utility Operations
UPS	Uninterruptible Power Systems
USA	Underground Service Alert
USS	Utility Shared Service
VP	Vice President
W.O.	Work Order
WAN	Wide Area Network
WC	Workers' Compensation