

Application of SAN DIEGO GAS & ELECTRIC)
COMPANY for authority to update its gas and)
electric revenue requirement and base rates)
effective January 1, 2019 (U 902-M))

Application No. 17-10-___

Exhibit No.: (SDG&E-15-WP)

WORKPAPERS TO
PREPARED DIRECT TESTIMONY
OF WILLIAM H. SPEER
ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

OCTOBER 2017



**2019 General Rate Case - APP
INDEX OF WORKPAPERS**

Exhibit SDG&E-15-WP - ELECTRIC DISTRIBUTION

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Overall Summary For Exhibit No. SDG&E-15-WP

Area:	ELECTRIC DISTRIBUTION
Witness:	William H. Speer

Description	In 2016 \$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Non-Shared Services	122,467	133,087	141,569	164,729
Shared Services	0	0	0	0
Total	122,467	133,087	141,569	164,729

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer

Summary of Non-Shared Services Workpapers:

Description	In 2016 \$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
A. Reliability & Capacity	244	341	341	341
B. Construction Services	5,363	6,277	7,668	19,167
C. DistOps Enterprise Geographic Info Sys Standards	1,379	1,427	1,309	1,253
D. Electric Distribution Operations	15,590	18,098	20,222	22,546
E. Kearny Operations Services	1,349	2,133	2,133	2,133
F. Grid Operations	667	567	781	567
G. Officer	772	772	772	772
H. Project Management	660	1,095	1,431	1,347
I. Electric Regional Operations	35,613	37,738	35,864	42,792
J. Skills & Compliance Training	4,133	4,273	4,436	4,661
K. Service Order Team (SOT)	161	161	161	161
L. Substation C&O	4,582	5,691	5,316	5,322
M. System Protection	1,460	1,679	1,768	1,861
N. Distribution and Engineering	2,342	1,985	2,743	4,299
O. Troubleshooting	7,896	7,796	7,796	7,796
P. Vegetation Management	26,455	26,499	26,447	26,415
Q. Regional Public Affairs	1,965	1,912	1,837	1,802
R. Major Projects	119	110	110	110
S. Technology Utilization	1,042	1,170	1,192	1,225
T. Compliance & Asset Management	2,694	2,856	2,856	2,856
U. Tech Solutions and Reliability	2,544	2,898	3,260	3,260
V. Emergency Management	2,503	2,831	4,933	5,344
W. Strategic Planning and Business Optimization	1,630	2,390	2,390	2,390
X. Distributed Energy Resources	1,304	1,539	1,559	1,699
Y. Asset Management	0	849	4,244	4,610
Total	122,467	133,087	141,569	164,729

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: A. Reliability & Capacity
Workpaper: 1ED001.001

Summary for Category: A. Reliability & Capacity

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	28	52	52	52
Non-Labor	216	288	288	288
NSE	0	0	0	0
Total	244	340	340	340
FTE	0.3	0.6	0.6	0.6

Workpapers belonging to this Category:

1ED001.001 Reliability & Capacity

Labor	28	52	52	52
Non-Labor	216	288	288	288
NSE	0	0	0	0
Total	244	340	340	340
FTE	0.3	0.6	0.6	0.6

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED001.001 - Reliability & Capacity

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: A. Reliability & Capacity
Category-Sub: 1. Reliability & Capacity
Workpaper: 1ED001.001 - Reliability & Capacity

Activity Description:

Distribution Planning performs operational activities related to providing administrative and technical support associated with the operations and maintenance of the electric distribution system. Typical activities include monitoring, forecasting, and responding to utilization of the electric distribution system in order to serve customers with safe and reliable electric energy. Electric distribution system load increases come in the form of new customer connections to the system and increased loads from existing customers. Customer load growth drives the installation of new and upgraded facilities, circuits and substations. Distribution Planning is tasked with forecasting, planning, and designing the electric distribution system that facilitates the construction of electric facilities to connect new customers to SDG&E's system and ultimately increase the capacity of the electric distribution system infrastructure to support new load throughout the service territory. Furthermore, Distribution Planning actively supports O&M activities including staffing the Emergency Operations Center and Construction and Operations districts during major events and storm drills. Other responsibilities include support of the Community Fire Safety Program, reviewing and revising distribution planning design standards, reviewing fusing requests and providing engineering input on planning worksheets, performing load studies, participating in distributed generation and renewable resource studies, integrating advanced technologies and Smart Meter data into the planning process, responding to internal and external customer data requests, training, and attending relevant technical committee meetings.

Forecast Explanations:

Labor - 3-YR Average

Labor costs are based on a 3-year average. The 3-year average is the most indicative of the current and future forecasted base-line spending of this group due to the fact that the O&M component of the costs are expected to remain fairly stable over the next several years. A higher percentage of the costs in this group are capitalized.

Non-Labor - 3-YR Average

Non-labor costs are based on a 3-year average. The 3-year average is the most indicative of the current and future forecasted base-line spending of this group due to the fact that the O&M component of the costs are expected to remain fairly stable over the next several years. A higher percentage of the costs in this group are capitalized.

NSE - 3-YR Average

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: A. Reliability & Capacity
 Category-Sub: 1. Reliability & Capacity
 Workpaper: 1ED001.001 - Reliability & Capacity

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		413	228	103	27	28	53	53	53	
Non-Labor		232	312	223	200	216	288	288	288	
NSE		0	0	0	0	0	0	0	0	
Total		645	539	326	227	244	341	341	341	
FTE		4.4	2.3	1.0	0.3	0.3	0.6	0.6	0.6	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: A. Reliability & Capacity
 Category-Sub: 1. Reliability & Capacity
 Workpaper: 1ED001.001 - Reliability & Capacity

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	3-YR Average	52	52	52	0	0	0	52	52	52
Non-Labor	3-YR Average	213	213	213	75	75	75	288	288	288
NSE	3-YR Average	0	0	0	0	0	0	0	0	0
Total		266	266	266	75	75	75	341	341	341
FTE	3-YR Average	0.6	0.6	0.6	0.0	0.0	0.0	0.6	0.6	0.6

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID
2017	RAMP Incremental	0	75	0	75	0.0	1-Sided Adj	SGAHAGAN20161114141435813

Explanation: RAMP proposed activity: Distribution Planning Process - Distribution Planning is purchasing an enhanced forecasting tool that will improve forecasting by evolving from a static forecasted value to a twenty-four hour load shape. In addition to a forecasted twenty-four hour load shape, the tool also applies geospatial data to generate a spatial forecast which provides an improved method to allocate load growth. These enhancements allow for a thorough distribution forecast, enable a detailed review of DERs and can provide a schedule for a DER on the distribution system. The \$75k non-labor cost is for the licensing of the new software.

2017 Total		0	75	0	75	0.0		
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2018	RAMP Incremental	0	75	0	75	0.0	1-Sided Adj	SGAHAGAN20161114141458717
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Explanation: RAMP proposed activity: Distribution Planning Process - Distribution Planning is purchasing an enhanced forecasting tool that will improve forecasting by evolving from a static forecasted value to a twenty-four hour load shape. In addition to a forecasted twenty-four hour load shape, the tool also applies geospatial data to generate a spatial forecast which provides an improved method to allocate load growth. These enhancements allow for a thorough distribution forecast, enable a detailed review of DERs and can provide a schedule for a DER on the distribution system. The \$75k non-labor cost is for the licensing of the new software.

2018 Total		0	75	0	75	0.0		
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2019	RAMP Incremental	0	75	0	75	0.0	1-Sided Adj	SGAHAGAN20161114141518983
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Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
 2019 GRC - APP
 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: A. Reliability & Capacity
 Category-Sub: 1. Reliability & Capacity
 Workpaper: 1ED001.001 - Reliability & Capacity

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation: RAMP proposed activity: Distribution Planning Process - Distribution Planning is purchasing an enhanced forecasting tool that will improve forecasting by evolving from a static forecasted value to a twenty-four hour load shape. In addition to a forecasted twenty-four hour load shape, the tool also applies geospatial data to generate a spatial forecast which provides an improved method to allocate load growth. These enhancements allow for a thorough distribution forecast, enable a detailed review of DERs and can provide a schedule for a DER on the distribution system. The \$75k non-labor cost is for the licensing of the new software.								
2019 Total		0	75	0	75	0.0		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: A. Reliability & Capacity
Category-Sub: 1. Reliability & Capacity
Workpaper: 1ED001.001 - Reliability & Capacity

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	330	198	91	22	24
Non-Labor	227	308	223	215	222
NSE	0	0	0	0	0
Total	557	506	314	238	245
FTE	3.8	1.9	0.9	0.3	0.3
Adjustments (Nominal \$) **					
Labor	0	-14	-7	0	0
Non-Labor	0	0	0	-15	-5
NSE	0	0	0	0	0
Total	0	-14	-7	-15	-5
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	330	184	85	22	24
Non-Labor	227	308	223	200	216
NSE	0	0	0	0	0
Total	557	492	308	223	240
FTE	3.8	1.9	0.9	0.3	0.3
Vacation & Sick (Nominal \$)					
Labor	48	29	14	3	4
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	48	29	14	3	4
FTE	0.6	0.3	0.2	0.0	0.1
Escalation to 2016\$					
Labor	35	15	5	1	0
Non-Labor	5	3	0	0	0
NSE	0	0	0	0	0
Total	40	18	5	1	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	413	228	103	27	28
Non-Labor	232	312	223	200	216
NSE	0	0	0	0	0
Total	645	539	326	227	244
FTE	4.4	2.2	1.1	0.3	0.4

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: A. Reliability & Capacity
 Category-Sub: 1. Reliability & Capacity
 Workpaper: 1ED001.001 - Reliability & Capacity

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	-14	-7	0	0
Non-Labor	0	0	0	-15	-5
NSE	0	0	0	0	0
Total	0	-14	-7	-15	-5
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012 Total		0	0	0	0.0		
2013	Other	-14	0	0	0.0	1-Sided Adj	RPISANES20161109190402873
2013 Total		-14	0	0	0.0		
2014	Other	-7	0	0	0.0	1-Sided Adj	RPISANES20161109190556717
2014 Total		-7	0	0	0.0		
2015	Other	0	-11	0	0.0	CCTR Transf To 2100-3704.000	RPISANES20161112114220640
2015 Total		0	-15	0	0.0		
2015	Other	0	-4	0	0.0	1-Sided Adj	RPISANES20161112114327253
2015 Total		0	-15	0	0.0		
2016	Other	0	-5	0	0.0	1-Sided Adj	RPISANES20170224152847493
2016 Total		0	-5	0	0.0		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: A. Reliability & Capacity
Category-Sub: 1. Reliability & Capacity
Workpaper: 1ED001.001 - Reliability & Capacity

RAMP Item # 1

Ref ID: SGAHAGAN20161114141435813

RAMP Chapter: SDG&E-4

Program Name: Distribution Planning Process

Program Description: Addresses the growing impact DERs have on the distribution system

Risk/Mitigation:

Risk: Distributed Energy Resources (DERs) Safety and Ope

Mitigation: Implement improved modeling tools that incorporate PV generation into forecasts for distribution pla

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	50	50	50
High	125	125	125

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No software license payments until 2017

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: B. Construction Services
Workpaper: 1ED002.000

Summary for Category: B. Construction Services

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	250	1,125	1,332	1,471
Non-Labor	5,113	5,152	6,336	17,696
NSE	0	0	0	0
Total	5,363	6,277	7,668	19,167
FTE	2.0	11.4	13.4	14.8

Workpapers belonging to this Category:

1ED002.000 Construction Services

Labor	250	1,125	1,332	1,471
Non-Labor	5,113	5,152	6,336	17,696
NSE	0	0	0	0
Total	5,363	6,277	7,668	19,167
FTE	2.0	11.4	13.4	14.8

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED002.000 - Construction Services

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: B. Construction Services
 Category-Sub: 1. Construction Services
 Workpaper: 1ED002.000 - Construction Services

Activity Description:

Construction Services provides oversight of all construction performed by Contractors on Electric Distribution. This is to ensure that all work is built to SDG&E safety standards and in accordance with current contracts following G.O. 95 and 128 codes. The O&M portion of the work conducted by Construction Services includes transformer installs/removals and O&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.

Forecast Explanations:

Labor - Base YR Rec

The labor forecast utilized the base year 2016. Labor includes the O&M portion of several employees whose costs are split among various plan categories. The O&M percentage of this labor ranges from 2% to 70%, depending on the activities. Base year 2016 included the work generated by FiRM project, and as those costs are not captured at current levels in previous years, base year is the most representative estimate for the next three years.

Non-Labor - Base YR Rec

Non-Labor costs are also based on the 2016 base year. Non-labor includes additional "associated with Capital" O&M and Transformer installations. This also includes O&M additions due to the FiRM project, which were not captured at current levels in previous years. Accordingly, the base year 2016 estimate methodology the most representative of the next three years.

NSE - Base YR Rec

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		75	140	134	104	250	1,125	1,332	1,471	
Non-Labor		3,033	2,762	2,751	6,416	5,113	5,152	6,336	17,696	
NSE		0	0	0	0	0	0	0	0	
Total		3,107	2,902	2,885	6,520	5,363	6,277	7,668	19,167	
FTE		0.7	1.3	1.2	0.8	2.0	11.4	13.4	14.8	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: B. Construction Services
Category-Sub: 1. Construction Services
Workpaper: 1ED002.000 - Construction Services

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	250	250	250	875	1,082	1,221	1,125	1,332	1,471
Non-Labor	Base YR Rec	5,113	5,113	5,113	39	1,223	12,583	5,152	6,336	17,696
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
Total		5,363	5,363	5,363	914	2,305	13,804	6,277	7,668	19,167
FTE	Base YR Rec	2.0	2.0	2.0	9.4	11.4	12.8	11.4	13.4	14.8

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	Other	56	0	0	56	0.5	1-Sided Adj	RPISANES20161130190635970	
Explanation:		O&M labor allocation for four employees transferring to Construction Services from Pole Brushing. This is a net zero impact to the overall request as dollars requested in this group are subtracted from an equal adjustment in pole brushing.							
2017	FOF-Implementation	0	25	0	25	0.0	1-Sided Adj	TSWETEK20170613101052030	
Explanation:		FOF Implementation Costs							
2017	RAMP Incremental	0	108	0	108	0.0	1-Sided Adj	RPISANES20161201090422810	
Explanation:		RAMP proposed activity: Overhead small wire and connector replacement - A comprehensive wire correction program aimed to enhance distribution system reliability specifically for protection from energized wire down incidents in the non-fire threat zone (non-FTZ). Scope of work includes installing line monitoring, field and substation relay and communication systems, SCADA switches, and replacing conductors or connectors in single phase areas with small conductor. This is the O&M component of the capital cost of this project, which is estimated to be 3.7% of the capital cost. The O&M to capital split is based off of actuals from similar projects SDG&E has completed.							
2017	FOF-Ongoing	0	10	0	10	0.0	1-Sided Adj	TSWETEK20170613102412900	
Explanation:		FOF ongoing costs that lead to capital savings							
2017	RAMP Incremental	12	0	0	12	0.1	1-Sided Adj	TSWETEK20170305112611573	
Explanation:		RAMP baseline and proposed activity: Workforce Planning - Baseline activities to replace critical roles after retirements. Proposed activity is to add new monthly training modules.							
2017	Other	625	75	0	700	7.0	1-Sided Adj	RPISANES20170310061506543	

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: B. Construction Services
Category-Sub: 1. Construction Services
Workpaper: 1ED002.000 - Construction Services

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation: Contractor Safety Program Enhancement: Two construction managers, five field safety advisors, software, and training costs. The new hires will act as safety specialists in Contractor Safety requirements, ensure effective contractor safety oversight procedures are in place, perform assessments of the business units to validate adherence to the Contractor Safety Program. Software and training help support this initiative.								
2017	RAMP Incremental	0	32	0	32	0.0	1-Sided Adj	SGAHAGAN20170511134329870
Explanation: RAMP proposed activity: Switch Inspection and High-Risk Replacement (OH) - Proactively test, repair, or replace switches on the OH system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades. See supplemental workpaper for estimate methodology.								
2017	RAMP Incremental	0	47	0	47	0.0	1-Sided Adj	SGAHAGAN20170511134850930
Explanation: RAMP proposed activity: Switch Inspection and High-Risk Replacement (UG) - Proactively test, repair, or replace switches on the UG system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades. See supplemental workpaper for estimate methodology.								
2017	RAMP Incremental	0	32	0	32	0.0	1-Sided Adj	SGAHAGAN20170511135238363
Explanation: RAMP proposed activity: Proactively replace bridged cutout switches with SCADA gang operated or disconnect switches - Proactively replace bridged cutout switches in order to improve relay coordination and reliability. Reduce risk of safety hazards in the field while operating bridged cutouts. (This is the O&M component of work orders associated with minor units of property.) See supplemental workpaper for estimate methodology.								
2017	Other	182	0	0	182	1.8	1-Sided Adj	RPISANES20170626134312623
Explanation: O&M allocation plus non-productive labor for 13 additional employees (gas & electric CA's). Additional hires are intended to address increasing Contractor workload.								
2017	FOF-Ongoing	0	-290	0	-290	0.0	1-Sided Adj	RPISANES20170719161820060
Explanation: SM FOF- Identified Savings								
2017 Total		875	39	0	914	9.4		
2018	Other	182	0	0	182	1.8	1-Sided Adj	RPISANES20161130190113530
Explanation: O&M allocation plus non-productive labor for 13 additional employees (gas & electric CA's). Additional hires are intended to address increasing Contractor workload.								

Note: Totals may include rounding differences.

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Category: B. Construction Services
Category-Sub: 1. Construction Services
Workpaper: 1ED002.000 - Construction Services

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2018	Other	56	0	0	56	0.5	1-Sided Adj	RPISANES20161130190736643
Explanation:		O&M labor allocation for four employees transferring to Construction Services from Pole Brushing. This is a net zero impact to the overall request as dollars requested in this group are subtracted from an equal adjustment in pole brushing.						
2018	FOF-Ongoing	0	10	0	10	0.0	1-Sided Adj	RPISANES20161201085622887
Explanation:		FOF- Expenses related to future capital savings						
2018	Other	625	35	0	660	7.0	1-Sided Adj	RPISANES20170310061606627
Explanation:		Contractor Safety Program Enhancement: Two construction managers, five field safety advisors, software, and training costs. The new hires will act as safety specialists in Contractor Safety requirements, ensure effective contractor safety oversight procedures are in place, perform assessments of the business units to validate adherence to the Contractor Safety Program. Software and training help support this initiative.						
2018	RAMP Incremental	0	540	0	540	0.0	1-Sided Adj	RPISANES20161201090432967
Explanation:		RAMP proposed activity: Overhead small wire and connector replacement - A comprehensive wire correction program aimed to enhance distribution system reliability specifically for protection from energized wire down incidents in the non-fire threat zone (non-FTZ). Scope of work includes installing line monitoring, field and substation relay and communication systems, SCADA switches, and replacing conductors or connectors in single phase areas with small conductor. This is the O&M component of the capital cost of this project, which is estimated to be 3.7% of the capital cost. The O&M to capital split is based off of actuals from similar projects SDG&E has completed.						
2018	FOF-Ongoing	0	-1,493	0	-1,493	0.0	1-Sided Adj	RPISANES20170719162233553
Explanation:		SM FOF- Identified Savings						
2018	RAMP Incremental	12	0	0	12	0.1	1-Sided Adj	TSWETEK20170305112939043
Explanation:		RAMP baseline and proposed activity. Baseline activities to replace critical roles after retirements. Proposed is to provide new monthly training modules.						
2018	RAMP Incremental	0	750	0	750	0.0	1-Sided Adj	SGAHAGAN20170310122819707
Explanation:		RAMP proposed activity: Post-Construction True-Up Quality Assurance and Quality Control (QA/QC) Program - After further analysis this program has been expanded and renamed since the RAMP filing to Pole Risk Mitigation & Engineering (PRiME) - PRiME is a 10-year program designed to address risks related to pole loading, specifically focused on wood poles. SDG&E will focus on the areas of highest risk first. During the first few years, SDG&E will aggressively analyze the poles based on a risk model where wood poles will be replaced and designed for known local wind conditions, and for all known attachments. See supplemental workpaper for estimate methodology.						

Note: Totals may include rounding differences.

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 Witness: William H. Speer
 Category: B. Construction Services
 Category-Sub: 1. Construction Services
 Workpaper: 1ED002.000 - Construction Services

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj_Type	RefID
2018	RAMP Incremental	0	318	0	318	0.0	1-Sided Adj	SGAHAGAN20170511134715960

Explanation: RAMP Proposed Activity: Switch Inspection and High-Risk Replacement (OH) - Proactively test, repair, or replace switches on the OH system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades.
 See supplemental workpaper for estimate methodology.

2018	RAMP Incremental	0	474	0	474	0.0	1-Sided Adj	SGAHAGAN20170511135049113
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Explanation: RAMP Proposed Activity: Switch Inspection and High-Risk Replacement (UG) - Proactively test, repair, or replace switches on the UG system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades.
 See supplemental workpaper for estimate methodology.

2018	RAMP Incremental	0	315	0	315	0.0	1-Sided Adj	SGAHAGAN20170511135611080
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Explanation: RAMP Proposed Activity: Proactively replace bridged cutout switches with SCADA gang operated or disconnect switches - Proactively replace bridged cutout switches in order to improve relay coordination and reliability. Reduce risk of safety hazards in the field while operating bridged cutouts. (This is the O&M component of work orders associated with minor units of property.)
 See supplemental workpaper for estimate methodology.

2018	RAMP Incremental	207	274	0	481	2.0	1-Sided Adj	SGAHAGAN20170512160740407
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Explanation: RAMP Proposed Activity: 4kV Modernization-Distribution - Proposed program aims to remove 4 KV assets and replace with 12 kV. Scope of work may include complete distribution circuit rebuild or relatively minor replacements of distribution system components such as transformers on a case-by-case basis. Distribution risks are determined by number of actual and projected wire down incidents, among other safety related factors.
 This is the O&M component of the capital cost of this project, which is estimated to be 5% of the capital cost. The O&M to capital split is based off of actuals from similar projects SDG&E has completed.

2018 Total		1,082	1,223	0	2,305	11.4		
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2019	Other	182	0	0	182	1.8	1-Sided Adj	RPISANES20161130190145843
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Explanation: O&M allocation plus non-productive labor for 13 additional employees (gas & electric CA's). Additional hires are intended to address increasing Contractor workload.

2019	Other	56	0	0	56	0.5	1-Sided Adj	RPISANES20161130190805440
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Explanation: O&M labor allocation for four employees transferring to Construction Services from Pole Brushing. This is a net zero impact to the overall request as dollars requested in this group are subtracted from an equal adjustment in pole brushing.

Note: Totals may include rounding differences.

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 Witness: William H. Speer
 Category: B. Construction Services
 Category-Sub: 1. Construction Services
 Workpaper: 1ED002.000 - Construction Services

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>	
2019	FOF-Ongoing	0	10	0	10	0.0	1-Sided Adj	RPISANES20161201085631777	
Explanation:		FOF- Expenses related to capital savings							
2019	Other	625	35	0	660	7.0	1-Sided Adj	RPISANES20170310061650103	
Explanation:		Contractor Safety Program Enhancement: Two construction managers, five field safety advisors, software, and training costs. The new hires will act as safety specialists in Contractor Safety requirements, ensure effective contractor safety oversight procedures are in place, and perform assessments of the business units to validate adherence to the Contractor Safety Program. Software and training help support this initiative.							
2019	RAMP Incremental	0	1,080	0	1,080	0.0	1-Sided Adj	RPISANES20161201090505033	
Explanation:		RAMP proposed activity: Overhead small wire and connector replacement - A comprehensive wire correction program aimed to enhance distribution system reliability specifically for protection from energized wire down incidents in the non-fire threat zone (non-FTZ). Scope of work includes installing line monitoring, field and substation relay and communication systems, SCADA switches, and replacing conductors or connectors in single phase areas with small conductor. This is the O&M component of the capital cost of this project, which is estimated to be 3.7% of the capital cost. The O&M to capital split is based off of actuals from similar projects SDG&E has completed.							
2019	FOF-Implementation	0	200	0	200	0.0	1-Sided Adj	TSWETEK20170222144846000	
Explanation:		Cost of FOF savings implementation							
2019	RAMP Incremental	12	0	0	12	0.1	1-Sided Adj	TSWETEK20170305113218950	
Explanation:		RAMP baseline and proposed activity. Baseline activities to replace critical roles after retirements. Proposed activity is to provide monthly training modules.							
2019	RAMP Incremental	0	9,153	0	9,153	0.0	1-Sided Adj	SGAHAGAN20170310122834283	
Explanation:		RAMP proposed activity: Post-Construction True-Up Quality Assurance and Quality Control (QA/QC) Program - After further analysis this program has been expanded and renamed since the RAMP filing to Pole Risk Mitigation & Engineering (PRiME) - PRiME is a 10-year program designed to address risks related to pole loading, specifically focused on wood poles. SDG&E will focus on the areas of highest risk first. During the first few years, SDG&E will aggressively analyze the poles based on a risk model where wood poles will be replaced and designed for known local wind conditions, and for all known attachments. See supplemental workpaper for estimate methodology.							
2019	RAMP Incremental	0	908	0	908	0.0	1-Sided Adj	SGAHAGAN20170511134726337	

Note: Totals may include rounding differences.

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 Witness: William H. Speer
 Category: B. Construction Services
 Category-Sub: 1. Construction Services
 Workpaper: 1ED002.000 - Construction Services

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation:		RAMP Proposed Activity: Switch Inspection and High-Risk Replacement (OH) - Proactively test, repair, or replace switches on the OH system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades. See supplemental workpaper for estimate methodology.						
2019	RAMP Incremental	0	1,353	0	1,353	0.0	1-Sided Adj	SGAHAGAN20170511135056587
Explanation:		RAMP Proposed Activity: Switch Inspection and High-Risk Replacement (UG) - Proactively test, repair, or replace switches on the UG system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades. See supplemental workpaper for estimate methodology.						
2019	RAMP Incremental	0	898	0	898	0.0	1-Sided Adj	SGAHAGAN20170511135619643
Explanation:		RAMP Proposed Activity: Proactively replace bridged cutout switches with SCADA gang operated or disconnect switches - Proactively replace bridged cutout switches in order to improve relay coordination and reliability. Reduce risk of safety hazards in the field while operating bridged cutouts. (This is the O&M component of work orders associated with minor units of property.) See supplemental workpaper for estimate methodology.						
2019	RAMP Incremental	346	469	0	815	3.4	1-Sided Adj	SGAHAGAN20170512160812493
Explanation:		RAMP Proposed Activity: 4kV Modernization-Distribution - Proposed program aims to remove 4 KV assets and replace with 12 kV. Scope of work may include complete distribution circuit rebuild or relatively minor replacements of distribution system components such as transformers on a case-by-case basis. Distribution risks are determined by number of actual and projected wire down incidents, among other safety related factors. This is the O&M component of the capital cost of this project, which is estimated to be 5% of the capital cost. The O&M to capital split is based off of actuals from similar projects SDG&E has completed.						
2019	FOF-Ongoing	0	-1,523	0	-1,523	0.0	1-Sided Adj	RPISANES20170719162750110
Explanation:		SM FOF- Identified Savings						
2019 Total		1,221	12,583	0	13,804	12.8		

Note: Totals may include rounding differences.

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Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	60	113	111	88	215
Non-Labor	2,966	2,733	2,750	6,410	5,113
NSE	0	0	0	0	0
Total	3,026	2,846	2,860	6,498	5,328
FTE	0.6	1.1	1.0	0.8	1.7
Adjustments (Nominal \$) **					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	60	113	111	88	215
Non-Labor	2,966	2,733	2,750	6,410	5,113
NSE	0	0	0	0	0
Total	3,026	2,846	2,860	6,498	5,328
FTE	0.6	1.1	1.0	0.8	1.7
Vacation & Sick (Nominal \$)					
Labor	9	18	18	14	36
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	9	18	18	14	36
FTE	0.1	0.2	0.2	0.1	0.3
Escalation to 2016\$					
Labor	6	9	6	2	0
Non-Labor	67	28	1	6	0
NSE	0	0	0	0	0
Total	73	38	7	8	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	75	140	134	104	250
Non-Labor	3,033	2,762	2,751	6,416	5,113
NSE	0	0	0	0	0
Total	3,107	2,902	2,885	6,520	5,363
FTE	0.7	1.3	1.2	0.9	2.0

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

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Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
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Note: Totals may include rounding differences.

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RAMP Item # 1

Ref ID: ALLLACUN20170309143645000

RAMP Chapter: SDG&E-3

Program Name: Contractor Safety Program - Construction Ops

Program Description: Includes administration activities associated with managed construction work, oversight for construction, incident review and investigation, operations and maintenance activities that involve fixed wing aircraft and a wide range of highly skilled and experienced fire safety and fire

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety

Mitigation: Contractor Safety Review

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	735	735	735
High	882	882	882

Funding Source: CPUC-GRC

Forecast Method: Other

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 752

Explanation: 2015 actuals of 735 escalated to 2016 by dividing by 0.9768TEST

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RAMP Item # 2

Ref ID: RPISANES20161201090422810

RAMP Chapter: SDG&E-12

Program Name: Overhead small wire and connector replacement

Program Description: A comprehensive wire correction program aimed to enhance distribution system reliability specifically for protection from energized wire down incidents in the non-fire threat zone (non-FTZ). Scope of work includes installing line monitoring, field and substation relay and communication systems, SCADA switches, and replacing conductors or connectors in single phase areas with small conductor.

Risk/Mitigation:

Risk: Electric Infrastructure Integrity
 Mitigation: Wire Correction Program

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	944	944	944
High	1,228	1,228	1,228

Funding Source: CPUC-GRC
 Forecast Method: Zero-Based
 Work Type: Non-Mandated
 Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0
 Explanation: No historical costs

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 Category-Sub: 1. Construction Services
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RAMP Item # 3

Ref ID: SGAHAGAN20170222131907450

RAMP Chapter: SDG&E-1

Program Name: FiRM

Program Description: FiRM stands for fire risk mitigation program. The program examines distribution circuits in the backcountry and develops projects to harden the system based on known conditions. Currently FiRM is budgeted for over 90 million in 2016.

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: System Hardening

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	2	2	2
High	3	3	3

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 3089

Explanation: 2016 Actuals

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RAMP Item # 4

Ref ID: SGAHAGAN20170310122800897

RAMP Chapter: SDG&E-12

Program Name: Post-Construction True-Up Quality Assurance and Quality Control (QA/QC) Program

Program Description: AKA Pole Risk Mitigation & Engineering (PRiME); new process creation and enhancements aimed to improve data quality, true up as-built designs, and correct field failures based on overloaded pole calculations. Corrective actions may include minor unit additions or rearrangements and major unit replacements (i.e. poles).

Risk/Mitigation:

Risk: Electric Infrastructure Integrity

Mitigation: Inspection and preventative maintenance programs

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	836	1,532	2,438
High	836	1,532	2,438

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

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 Category-Sub: 1. Construction Services
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RAMP Item # 5

Ref ID: SGAHAGAN20170511134329870

RAMP Chapter: SDG&E-12

Program Name: Switch Inspection and High-Risk Replacement

Program Description: Proactively test, repair, or replace switches on the OH system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades.

Risk/Mitigation:

Risk: Electric Infrastructure Integrity

Mitigation: Distribution Switch Maintenance Program - OH

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	1,030	1,030	1,030
High	1,339	1,339	1,339

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs.

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 Witness: William H. Speer
 Category: B. Construction Services
 Category-Sub: 1. Construction Services
 Workpaper: 1ED002.000 - Construction Services

RAMP Item # 6

Ref ID: SGAHAGAN20170511134850930

RAMP Chapter: SDG&E-12

Program Name: Switch Inspection and High-Risk Replacement UG

Program Description: Proactively test, repair, or replace switches on the UG system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades.

Risk/Mitigation:

Risk: Electric Infrastructure Integrity
 Mitigation: Distribution Switch Maintenance Program - UG

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	1,280	1,280	1,280
High	1,664	1,664	1,664

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs.

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RAMP Item # 7

Ref ID: SGAHAGAN20170511135238363

RAMP Chapter: SDG&E-12

Program Name: RAMP Proposed Activity: Proactively replace bridged cutout switches with SCADA gang operated or disc

Program Description: Proactively replace bridged cutout switches in order to improve relay coordination and reliability. Reduce risk of safety hazards in the field while operating bridged cutouts. (This is the O&M component of work orders associated with minor units of property.)

Risk/Mitigation:

Risk: Electric Infrastructure Integrity

Mitigation: Expand and Maintain Distribution Advanced SCADA Infrastructure

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	629	629	629
High	818	818	818

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs.

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 Category-Sub: 1. Construction Services
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RAMP Item # 8

Ref ID: SGAHAGAN20170512160449587

RAMP Chapter: SDG&E-12

Program Name: 4kV Modernization-Distribution

Program Description: Proposed program aims to remove 4 KV assets and replace with 12 kV. Scope of work may include complete distribution circuit rebuild or relatively minor replacements of distribution system components such as transformers on a case-by-case basis. Distribution risks are determined by number of actual and projected wire down incidents, among other safety related factors.

Risk/Mitigation:

Risk: Electric Infrastructure Integrity

Mitigation: Overhead distribution modernization and hardening

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	180	180	180
High	234	234	234

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: B. Construction Services
Category-Sub: 1. Construction Services
Workpaper: 1ED002.000 - Construction Services

RAMP Item # 9

Ref ID: TSWETEK20170305112611573

RAMP Chapter: SDG&E-17

Program Name: Contr Admtr - Electric • Contract Admtr - Gas • Constrn Advr - Elect, Gas • Constrn Svcs Supv

Program Description: Annual ESCMP/OpQual and monthly staff/safety meeting training.

Risk/Mitigation:

Risk: "Workforce Planning": Loss of employees with deep

Mitigation: 'Knowledge transfer tools and processes are available; Workforce planning tools and templates availa

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	5	5	5
High	56	55	56

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 5

Explanation: 5k is actuals from 2015

Supplemental Workpapers for Workpaper 1ED002.000

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Construction Services
Work Group - 1ED002.000

Witness - D Weim

\$000's	2012 Actual			2013 Actual			2014 Actual			2015 Actual			2016 Actual		
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE
Recorded Historical	75	3,033	0.7	140	2,762	1.3	134	2,751	1.2	104	6,416	0.9	250	5,113	2.0
Adjustments															
TOTAL	75	3,033	0.7	140	2,762	1.3	134	2,751	1.2	104	6,416	0.9	250	5,113	2.0

FORECAST	2017			2018			2019			FORECASTING METHODOLOGY
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	
	1,125	5,442	11.4	1,332	7,829	13.4	1,471	19,219	14.8	Base year recorded plus incremental increases identified

Incremental Increases / Decreases for Future Years:

Category	2017			2018			2019			Explanation
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	
RAMP	625	75	7.0	625	35	7.0	625	35	7.0	Contractor Safety Program Enhancement: Two construction managers, five field safety advisors, software, and training costs. The new hires will act as safety specialists in Contractor Safety requirements, ensure effective contractor safety oversight procedures are in place, and perform assessments of the business units to validate adherence to the Contractor Safety Program. Software and training help support this initiative.
RAMP	0	0	0.0	207	274	2.0	346	469	3.4	RAMP proposed activity: 4kV Modernization - Distribution - Proposed program aims to remove 4kV assets and replace with 12kV. Scope of work may include complete distribution circuit rebuild or relatively minor replacements of distribution system components such as transformers on a case-by-case basis. Distribution risks are determined by number of actual and projected wire down incidents among other safety related factors. This is the O&M component of the capital cost of this project, which is estimated to be 5% of the capital cost. The O&M to capital split is based off of actuals from similar projects SDG&E has completed.
RAMP	12	0	0.1	12	0	0.1	12	0	0.1	RAMP baseline and proposed activity: Workforce Planning - Baseline activities to replace critical roles after retirements. Proposed activity is to add new monthly training modules.
RAMP	0	108	0.0	0	540	0.0	0	1080	0.0	RAMP proposed activity: Overhead small wire and connector replacement - A comprehensive wire correction program aimed to enhance distribution system reliability specifically for protection from energized wire down incidents in the non-fire threat zone (non-FTZ). Scope of work includes installing line monitoring, field and substation relay and communication systems, SCADA switches, and replacing conductors or connectors in single phase areas with small conductor. This is the O&M component of the capital cost of this project, which is estimated to be 3.7% of the capital cost. The O&M to capital split is based off of actuals from similar projects SDG&E has completed.
RAMP	0	32	0.0	0	318	0.0	0	908	0.0	RAMP proposed activity: Switch Inspection and High-Risk Replacement (OH) - Proactively test, repair, or replace switches on the OH system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades. Detailed methodology is attached.
RAMP	0	47	0.0	0	474	0.0	0	1353	0.0	RAMP proposed activity: Switch Inspection and High-Risk Replacement (UG) - Proactively test, repair, or replace switches on the UG system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades. Detailed methodology is attached.
RAMP	0	32	0.0	0	315	0.0	0	898	0.0	RAMP proposed activity: Proactively replace bridged cutout switches with SCADA gang operated or disconnect switches - Proactively replace bridged cutout switches in order to improve relay coordination and reliability. Reduce risk of safety hazards in the field while operating bridged cutouts. (This is the O&M component of work orders associated with minor units of property.) Detailed methodology is attached.
RAMP	0	0	0.0	0	750	0.0	0	9153	0.0	RAMP proposed activity: Post-Construction True-Up Quality Assurance and Quality Control (QA/QC) Program - AKA Pole Risk Mitigation & Engineering (PRIME) - PRIME is a 10-year program designed to address risks related to pole loading, specifically focused on wood poles. SDG&E will focus on the areas of highest risk first. During the first few years, SDG&E will aggressively analyze the poles based on a risk model where wood poles will be replaced and designed for known local wind conditions, and for all known attachments. Detailed methodology is attached.
Workforce Development	56	0	0.5	56	0	0.5	56	0	0.5	O&M labor allocation for four employees transferring to Construction Services from Pole Brushing. This is a net zero impact to the overall request as dollars requested in this group are subtracted from an equal adjustment in pole brushing.
Workforce Development	182	0	1.8	182	0	1.8	182	0	1.8	O&M allocation plus non-productive labor for 13 additional employees (gas & electric CA's). Additional hires are intended to address increasing Contractor workload.

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Incremental Increases / Decreases for Future Years:

Category	2017			2018			2019			Explanation
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	
Fueling Our Future Efficiencies	0	10	0.0	0	10	0.0	0	10	0.0	Fueling our Future - Expenses related to future capital savings.
Fueling Our Future Efficiencies	0	25	0.0	0	0	0.0	0	200	0.0	Fueling our Future - Cost of fueling our future savings implementation.

Distribution Switch Maintenance and Upgrade Projects

Bridged Cutout Switch Replacement

	Count	Capital Cost per Switch	O&M Cost per Switch	Program O&M Cost	O&M Cost Per Year	Assumes a 7-Year Cycle
Total Count of Bridged Cutout Switches	2096					
Assume 75% of switches can be replaced	1572	\$36,000	\$4,000	\$6,288,000	\$898,286	These are O&M Construction costs captured in workpaper 1ED002, Construction Services

OH Switch Replacement

	Count	Capital Cost per Switch	O&M Cost per Switch	Program O&M Cost	O&M Cost Per Year	Assumes a 7-Year Cycle
Total Count of FMO OH Switches	3944					
Assume 75% of FMO switches require proactive replacement	2958	\$13,756	\$1,644	\$4,862,952	\$694,707	These are O&M Construction costs captured in workpaper 1ED002, Construction Services
Inspect 100% of non-FMO switches	2130	\$0	\$1,854	\$3,949,020	\$564,146	These are O&M labor costs captured in workpaper 1ED011, Electric Regional Operations
Assume 20% of non-FMO switches will require replacement after inspection	426	\$13,756	\$3,498	\$1,490,148	\$212,878	These are O&M Construction costs captured in workpaper 1ED002, Construction Services
						Construction Non-Labor Total: \$907,586
						Inspection/Repair Labor Total: \$564,146

UG Switch Replacement

	Count	Capital Cost per Switch	O&M Cost per Switch	Program O&M Cost	O&M Cost Per Year	Assumes a 7-Year Cycle
Total Count of FMO UG Switches	3378					
Assume 50% of FMO switches require proactive replacement	1689	\$42,113	\$4,392	\$7,418,088	\$1,059,727	These are O&M Construction costs captured in workpaper 1ED002, Construction Services
Inspect 100% of non-FMO switches	1583	\$0	\$2,100	\$3,324,300	\$474,900	These are O&M labor costs captured in workpaper 1ED011, Electric Regional Operations
Assume 20% of non-FMO switches will require replacement after inspection	317	\$42,113	\$6,492	\$2,057,964	\$293,995	These are O&M Construction costs captured in workpaper 1ED002, Construction Services
						Construction Non-Labor Total: \$1,353,722
						Inspection/Repair Labor Total: \$474,900

The costs noted above will be the annual costs for these projects starting in 2019. Work will ramp up in 2017 and 2018 at the following rates:
 2017 3.5%-7.0% of 2019 costs depending on the project
 2018 35% of 2019 costs

FMO = Field maintenance only. These switches are no longer in the standard. We stock spare parts for emergency maintenance, but we do not install these new any longer.

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PRIME: Non-Labor Construction Costs

Years	2017	2018	2019
Number of Poles Analyzed:	-	1,850	22,600
# of Pole Replacements - 7%	-	130	1,582
Cost of Pole Replacement - \$25k	\$ -	\$ 3,237,500	\$ 39,550,000
CAPITAL 85%	\$ -	\$ 2,751,875	\$ 33,617,500
O&M 15%	\$ -	\$ 485,625	\$ 5,932,500
# of Pole Rearrangements - 3%	-	56	678
Cost of Pole Rearrangement - \$5k	\$ -	\$ 277,500	\$ 3,390,000
CAPITAL 5%	\$ -	\$ 13,875	\$ 169,500
O&M 95%	\$ -	\$ 263,625	\$ 3,220,500
Total Capital	\$ -	\$ 2,765,750	\$ 33,787,000
Total O&M	\$ -	\$ 749,250	\$ 9,153,000

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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: C. DistOps Enterprise Geographic Info Sys Standards
Workpaper: 1ED003.000

Summary for Category: C. DistOps Enterprise Geographic Info Sys Standards

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	1,200	1,266	1,217	1,217
Non-Labor	179	161	92	36
NSE	0	0	0	0
Total	1,379	1,427	1,309	1,253
FTE	18.8	19.5	19.0	19.0

Workpapers belonging to this Category:

1ED003.000 DistOps Enterprise Geographic Information System Standards

Labor	1,200	1,266	1,217	1,217
Non-Labor	179	161	92	36
NSE	0	0	0	0
Total	1,379	1,427	1,309	1,253
FTE	18.8	19.5	19.0	19.0

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED003.000 - DistOps Enterprise Geographic Information System Standards

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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: C. DistOps Enterprise Geographic Info Sys Standard
 Category-Sub: 1. DistOps Enterprise Geographic Info Sys Standards
 Workpaper: 1ED003.000 - DistOps Enterprise Geographic Information System Standards

Activity Description:

Enterprise GIS Services (EGISS) is the section of Electric Distribution Operations that creates and maintains all electric distribution, transmission, telecommunications and substation data in SDG&E's enterprise GIS system. EGISS digitizes the data in a preliminary state, energizes the data in real-time, reconciles and converts design work orders into construction order as-builts, scans them to a central repository, records details in the GIS system, and identifies these assets for tax and franchise fee calculations and reports. SDG&E's enterprise GIS is a direct input of information into many operational and planning tools used by engineering and operations. Accurate and timely data is essential for safety and reliability.

Forecast Explanations:

Labor - Base YR Rec

The forecast method developed for this cost category is Base Year Recorded Plus Incremental Increases. For labor, the base year provides an appropriate baseline in comparison to the overall labor target for the organization. Incremental labor increases from the base year are requested in order to meet targets.

Non-Labor - Base YR Rec

The forecast method developed for this cost category is Base Year Recorded Plus Incremental Increases. For non-labor, the base year provides for necessary funding level for the organization and reflects spending levels for current activities.

NSE - Base YR Rec

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		1,492	1,253	1,200	1,149	1,200	1,266	1,217	1,217	
Non-Labor		580	404	267	224	179	160	91	35	
NSE		0	0	0	0	0	0	0	0	
Total		2,073	1,657	1,468	1,373	1,379	1,426	1,308	1,252	
FTE		23.1	19.7	18.9	18.3	18.8	19.5	19.0	19.0	

Note: Totals may include rounding differences.

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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: C. DistOps Enterprise Geographic Info Sys Standard
 Category-Sub: 1. DistOps Enterprise Geographic Info Sys Standards
 Workpaper: 1ED003.000 - DistOps Enterprise Geographic Information System Standards

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	1,200	1,200	1,200	66	17	17	1,266	1,217	1,217
Non-Labor	Base YR Rec	179	179	179	-18	-87	-143	161	92	36
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
Total		1,379	1,379	1,379	48	-70	-126	1,427	1,309	1,253
FTE	Base YR Rec	18.8	18.8	18.8	0.7	0.2	0.2	19.5	19.0	19.0

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	FOF-Ongoing	-30	-143	0	-173	-0.3	1-Sided Adj	RPISANES20161201091232530	
Explanation:		FOF- ongoing savings							
2017	Other	96	0	0	96	1.0	1-Sided Adj	RPISANES20161205105317810	
Explanation:		Safety and Reliability: A 2014 baseline presentation given to the Executives sets the FTE at 18.8 through 2019. The Executive Presentation of the EGISS Staffing Plan consists of detailed work analysis. The analysis translated into 18.8 permanent FTE's for the steady workload. Temporary employees will cover special projects and other intermittent work. To fill the current gap, two management and six clerical-and-technical employees will be hired totaling \$96k.							
2017	FOF-Implementation	0	125	0	125	0.0	1-Sided Adj	TSWETEK20170222145214533	
Explanation:		Cost of FOF implementation							
2017 Total		66	-18	0	48	0.7			

2018 FOF-Ongoing -79 -143 0 -222 -0.8 1-Sided Adj RPISANES20161201091312283

Explanation: FOF- Ongoing Savings

2018 Other 96 0 0 96 1.0 1-Sided Adj RPISANES20161205105901490

Explanation: Safety and Reliability: A 2014 baseline presentation given to the Executives sets the FTE at 18.8 through 2019. The Executive Presentation of the EGISS Staffing Plan consists of detailed work analysis. The analysis translated into 18.8 permanent FTE's for the steady workload. Temporary employees will cover special projects and other intermittent work. To fill the current gap, two management and six clerical-and-technical employees will be hired totaling \$96k.

2018 FOF-Implementation 0 56 0 56 0.0 1-Sided Adj TSWETEK20170222145251227

Explanation: Cost of FOF implementation

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: C. DistOps Enterprise Geographic Info Sys Standard
 Category-Sub: 1. DistOps Enterprise Geographic Info Sys Standards
 Workpaper: 1ED003.000 - DistOps Enterprise Geographic Information System Standards

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2018 Total		17	-87	0	-70	0.2		
2019 FOF-Ongoing		-79	-143	0	-222	-0.8	1-Sided Adj	RPISANES20161201091336867
Explanation:	FOF- Savings resulting from prior expenditures							
2019 Other		96	0	0	96	1.0	1-Sided Adj	RPISANES20161205110151707
Explanation:	Safety and Reliability: A 2014 baseline presentation given to the Executives sets the FTE at 18.8 through 2019. The Executive Presentation of the EGISS Staffing Plan consists of detailed work analysis. The analysis translated into 18.8 permanent FTE's for the steady workload. Temporary employees will cover special projects and other intermittent work. To fill the current gap, two management and six clerical-and-technical employees will be hired totaling \$96k.							
2019 Total		17	-143	0	-126	0.2		

Note: Totals may include rounding differences.

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Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	1,193	1,011	988	973	1,029
Non-Labor	568	400	267	224	179
NSE	0	0	0	0	0
Total	1,761	1,411	1,256	1,196	1,208
FTE	19.9	16.8	16.0	15.7	15.9
Adjustments (Nominal \$) **					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	1,193	1,011	988	973	1,029
Non-Labor	568	400	267	224	179
NSE	0	0	0	0	0
Total	1,761	1,411	1,256	1,196	1,208
FTE	19.9	16.8	16.0	15.7	15.9
Vacation & Sick (Nominal \$)					
Labor	173	160	158	150	171
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	173	160	158	150	171
FTE	3.2	2.9	2.9	2.7	2.9
Escalation to 2016\$					
Labor	127	81	54	27	0
Non-Labor	13	4	0	0	0
NSE	0	0	0	0	0
Total	139	85	54	27	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	1,492	1,253	1,200	1,149	1,200
Non-Labor	580	404	267	224	179
NSE	0	0	0	0	0
Total	2,073	1,657	1,468	1,373	1,379
FTE	23.1	19.7	18.9	18.4	18.8

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

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Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012	Other	16	9	0	0.3	CCTR Transf From 2100-3558.000	RPISANES20161203101937413
Explanation: consolidate to 2100-0130							
2012	Other	-16	-9	0	-0.3	CCTR Transf To 2100-0130.000	RPISANES20161203101937413
Explanation: consolidate to 2100-0130							
2012	Other	14	3	0	0.2	CCTR Transf From 2100-3560.000	RPISANES20161203102135290
Explanation: consolidate to 2100-0130							
2012	Other	-14	-3	0	-0.2	CCTR Transf To 2100-0130.000	RPISANES20161203102135290
Explanation: consolidate to 2100-0130							
2012	Other	6	1	0	0.1	CCTR Transf From 2100-3561.000	RPISANES20161203102242403
Explanation: consolidate to 2100-0130							
2012	Other	-6	-1	0	-0.1	CCTR Transf To 2100-0130.000	RPISANES20161203102242403
Explanation: consolidate to 2100-0130							
2012	Other	0	0	0	0.0	CCTR Transf From 2100-3557.000	RPISANES20161203102412107
Explanation: consolidate to 2100-0130							
2012	Other	0	0	0	0.0	CCTR Transf To 2100-0130.000	RPISANES20161203102412107
Explanation: consolidate to 2100-0130							
2012	Other	0	2	0	0.0	CCTR Transf From 2100-3559.000	RPISANES20161203102442687
Explanation: consolidate to 2100-0130							
2012	Other	0	-2	0	0.0	CCTR Transf To 2100-0130.000	RPISANES20161203102442687
Explanation: consolidate to 2100-0130							

Note: Totals may include rounding differences.

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<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2012 Total		0	0	0	0.0		
2013	Other	6	0	0	0.1	CCTR Transf From 2100-3557.000	RPISANES20161203102653797
Explanation: consolidate to 2100-0130							
2013	Other	-6	0	0	-0.1	CCTR Transf To 2100-0130.000	RPISANES20161203102653797
Explanation: consolidate to 2100-0130							
2013	Other	215	2	0	3.7	CCTR Transf From 2100-3558.000	RPISANES20161203102739767
Explanation: consolidate to 2100-0130							
2013	Other	-215	-2	0	-3.7	CCTR Transf To 2100-0130.000	RPISANES20161203102739767
Explanation: consolidate to 2100-0130							
2013	Other	228	4	0	3.6	CCTR Transf From 2100-3559.000	RPISANES20161203102813747
Explanation: consolidate to 2100-0130							
2013	Other	-228	-4	0	-3.6	CCTR Transf To 2100-0130.000	RPISANES20161203102813747
Explanation: consolidate to 2100-0130							
2013	Other	327	5	0	5.3	CCTR Transf From 2100-3560.000	RPISANES20161203102901787
Explanation: consolidate to 2100-0130							
2013	Other	-327	-5	0	-5.3	CCTR Transf To 2100-0130.000	RPISANES20161203102901787
Explanation: consolidate to 2100-0130							
2013	Other	158	3	0	2.8	CCTR Transf From 2100-3561.000	RPISANES20161203102937107
Explanation: consolidate to 2100-0130							
2013	Other	-158	-3	0	-2.8	CCTR Transf To 2100-0130.000	RPISANES20161203102937107
Explanation: consolidate to 2100-0130							
2013 Total		0	0	0	0.0		
2014	Other	21	0	0	0.3	CCTR Transf From 2100-3557.000	RPISANES20161203103410203
Explanation: consolidate to 2100-0130							
2014	Other	-21	0	0	-0.3	CCTR Transf To 2100-0130.000	RPISANES20161203103410203
Explanation: consolidate to 2100-0130							

Note: Totals may include rounding differences.

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<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2014	Other	164	3	0	3.0	CCTR Transf From 2100-3558.000	RPISANES20161203103444420
Explanation: consolidate to 2100-0130							
2014	Other	-164	-3	0	-3.0	CCTR Transf To 2100-0130.000	RPISANES20161203103444420
Explanation: consolidate to 2100-0130							
2014	Other	277	1	0	4.4	CCTR Transf From 2100-3559.000	RPISANES20161203103522110
Explanation: consolidate to 2100-0130							
2014	Other	-277	-1	0	-4.4	CCTR Transf To 2100-0130.000	RPISANES20161203103522110
Explanation: consolidate to 2100-0130							
2014	Other	414	1	0	6.9	CCTR Transf From 2100-3560.000	RPISANES20161203103559767
Explanation: consolidate to 2100-0130							
2014	Other	-414	-1	0	-6.9	CCTR Transf To 2100-0130.000	RPISANES20161203103559767
Explanation: consolidate to 2100-0130							
2014	Other	69	2	0	1.0	CCTR Transf From 2100-3561.000	RPISANES20161203103640920
Explanation: consolidate to 2100-0130							
2014	Other	-69	-2	0	-1.0	CCTR Transf To 2100-0130.000	RPISANES20161203103640920
Explanation: consolidate to 2100-0130							
2014 Total		0	0	0	0.0		
2015	Other	16	0	0	0.2	CCTR Transf From 2100-3557.000	RPISANES20161203103727873
Explanation: consolidate to 2100-0130							
2015	Other	-16	0	0	-0.2	CCTR Transf To 2100-0130.000	RPISANES20161203103727873
Explanation: consolidate to 2100-0130							
2015	Other	325	3	0	5.9	CCTR Transf From 2100-3558.000	RPISANES20161203103808037
Explanation: consolidate to 2100-0130							
2015	Other	-325	-3	0	-5.9	CCTR Transf To 2100-0130.000	RPISANES20161203103808037
Explanation: consolidate to 2100-0130							
2015	Other	160	0	0	2.6	CCTR Transf From 2100-3559.000	RPISANES20161203103858793
Explanation: consolidate to 2100-0130							

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: C. DistOps Enterprise Geographic Info Sys Standard
 Category-Sub: 1. DistOps Enterprise Geographic Info Sys Standards
 Workpaper: 1ED003.000 - DistOps Enterprise Geographic Information System Standards

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2015	Other	-160	0	0	-2.6	CCTR Transf To 2100-0130.000	RPISANES20161203103858793
Explanation: consolidate to 2100-0130							
2015	Other	361	33	0	5.5	CCTR Transf From 2100-3560.000	RPISANES20161203103935470
Explanation: consolidate to 2100-0130							
2015	Other	-361	-33	0	-5.5	CCTR Transf To 2100-0130.000	RPISANES20161203103935470
Explanation: consolidate to 2100-0130							
2015	Other	76	2	0	1.1	CCTR Transf From 2100-3561.000	RPISANES20161203104021280
Explanation: consolidate to 2100-0130							
2015	Other	-76	-2	0	-1.1	CCTR Transf To 2100-0130.000	RPISANES20161203104021280
Explanation: consolidate to 2100-0130							
2015 Total		0	0	0	0.0		
2016	Other	397	6	0	6.4	CCTR Transf From 2100-3558.000	RPISANES20170224190429880
Explanation: consolidate costs to 2100-0130							
2016	Other	-397	-6	0	-6.4	CCTR Transf To 2100-0130.000	RPISANES20170224190429880
Explanation: consolidate costs to 2100-0130							
2016	Other	346	2	0	5.1	CCTR Transf From 2100-3560.000	RPISANES20170224181412387
Explanation: consolidate costs to 2100-0130							
2016	Other	-346	-2	0	-5.1	CCTR Transf To 2100-0130.000	RPISANES20170224181412387
Explanation: consolidate costs to 2100-0130							
2016	Other	122	0	0	2.0	CCTR Transf From 2100-3559.000	RPISANES20170224190220963
Explanation: consolidate costs to 2100-0130							
2016	Other	-122	0	0	-2.0	CCTR Transf To 2100-0130.000	RPISANES20170224190220963
Explanation: consolidate costs to 2100-0130							
2016	Other	104	8	0	1.5	CCTR Transf From 2100-3561.000	RPISANES20170224174808633
Explanation: consolidate costs to 2100-0130							
2016	Other	-104	-8	0	-1.5	CCTR Transf To 2100-0130.000	RPISANES20170224174808633
Explanation: consolidate costs to 2100-0130							

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
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 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: C. DistOps Enterprise Geographic Info Sys Standard
 Category-Sub: 1. DistOps Enterprise Geographic Info Sys Standards
 Workpaper: 1ED003.000 - DistOps Enterprise Geographic Information System Standards

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2016 Total		0	0	0	0.0		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: D. Electric Distribution Operations
Workpaper: 1ED004.000

Summary for Category: D. Electric Distribution Operations

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	3,055	3,509	3,367	3,307
Non-Labor	12,534	14,588	16,856	19,239
NSE	0	0	0	0
Total	15,589	18,097	20,223	22,546
FTE	22.5	27.5	25.6	24.5

Workpapers belonging to this Category:

1ED004.000 Electric Distribution Operations

Labor	3,055	3,509	3,367	3,307
Non-Labor	12,534	14,588	16,856	19,239
NSE	0	0	0	0
Total	15,589	18,097	20,223	22,546
FTE	22.5	27.5	25.6	24.5

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED004.000 - Electric Distribution Operations

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: D. Electric Distribution Operations
Category-Sub: 1. Electric Distribution Operations
Workpaper: 1ED004.000 - Electric Distribution Operations

Activity Description:

This workgroup is made up of the Electric Distribution Operations Control Center (EDOCC) and Electric Distribution Operations Technology (EDOT). The EDOCC is responsible for operating the Electric Distribution System safely and reliably for planned and unplanned events (e.g., outages). The Center has two main resource types: technical support personnel and operators/programmers. This group supports 24/7 operations management and oversight for: the electric distribution system, District Engineers with Reliability Analysis of feeders and branches, and customer call-backs initiated by the Technical Support Team (TST) for every outage event.

EDOT provides technical and operational assistance necessary to operate the electric distribution system safely and efficiently. System operators will require increased levels of situational awareness for monitoring the performance of the grid with the integration of distributed resources. SDG&E anticipates the installation of 200-300 new remote controlled devices per year to enable operators to more precisely isolate the fault and energize the customer. The Outage Management System (OMS), Distributed Energy Resource Management System (DERMS), and Advanced Distribution Management System (ADMS) will require increased capabilities to meet customer demand and to manage two-way power flow and granular visibility to support the integration of distributed energy resources on the grid. This will require increased support staff, additional equipment, and adequate facilities to effectively manage and maintain these additional devices and resources. This will also require continued support for the Back-Up Control Center, where equipment such as computers, servers, monitors and radio consoles will require constant monitoring.

Forecast Explanations:

Labor - 3-YR Linear

Labor and Non-labor costs use the 3-year linear forecast method plus incremental increases. This method was chosen to best reflect the current labor trend within the workgroup.

Non-Labor - 3-YR Linear

Labor and Non-labor costs use the 3-year linear forecast method plus incremental increases. Non-labor costs include increasing maintenance costs for hardware, software, and exempt materials. These costs go up as more hardware is installed in the field, such as additional SCADA devices, which enhance fire, security, and reliability risk mitigation. The servers managing and collecting the data will also need upgrading and/or replacing. The exempt materials are the largest portion of non-labor in this workgroup. Exempt materials are low-value material items that are replenished as "truck stock". They consist of bulk type materials that are not individually inventoried or managed by the district warehouses. These materials include items like nuts, bolts, washers, connectors, electrical tape and brief-relief kits and are restocked onto service trucks as needed and are not directly charged to the O&M account or Capital Budgets on which they are used. This account represents the collector pool for all of the exempt material costs that are then allocated to the appropriate gas and electric O&M accounts and Capital Budgets as indirect charges.

NSE - 3-YR Linear

N/A

Note: Totals may include rounding differences.

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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: D. Electric Distribution Operations
 Category-Sub: 1. Electric Distribution Operations
 Workpaper: 1ED004.000 - Electric Distribution Operations

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		3,102	3,780	3,158	3,800	3,055	3,508	3,367	3,307	
Non-Labor		7,644	6,288	7,756	8,620	12,534	14,589	16,856	19,240	
NSE		0	0	0	0	0	0	0	0	
Total		10,746	10,068	10,914	12,420	15,590	18,097	20,223	22,547	
FTE		21.0	29.8	24.5	28.8	22.5	27.5	25.7	24.5	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: D. Electric Distribution Operations
 Category-Sub: 1. Electric Distribution Operations
 Workpaper: 1ED004.000 - Electric Distribution Operations

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	3-YR Linear	3,235	3,184	3,132	274	183	175	3,509	3,367	3,307
Non-Labor	3-YR Linear	14,415	16,805	19,194	173	51	45	14,588	16,856	19,239
NSE	3-YR Linear	0	0	0	0	0	0	0	0	0
Total		17,651	19,988	22,326	447	234	220	18,098	20,222	22,546
FTE	3-YR Linear	23.3	22.3	21.3	4.2	3.3	3.2	27.5	25.6	24.5

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	FOF-Ongoing	-189	0	0	-189	-1.9	1-Sided Adj	RPISANES20161201091630437	
Explanation:		FOF- ongoing savings							
2017	Other	363	0	0	363	5.1	1-Sided Adj	RPISANES20161203093927840	
Explanation:		Safety and Reliability. Class of 9 Distribution System Operations to start in January 2017 for 2-years. No class was held in 2016. Cost estimate is based on 12 months in class & 12 months OJT contributing to capital work. While in class, Total cost = \$363k							
2017	Other	0	36	0	36	0.0	1-Sided Adj	RPISANES20161203093950257	
Explanation:		SCADA System Support and Maintenance. The non labor estimate represents the incremental costs of the maintenance contract.							
2017	Other	100	0	0	100	1.0	1-Sided Adj	RPISANES20161203094110553	
Explanation:		Two management employees were on disability in 2016. Expense was not captured as part of the linear trend. Total cost = \$100k							
2017	FOF-Implementation	0	137	0	137	0.0	1-Sided Adj	TSWETEK20170222145634633	
Explanation:		Cost of FOF implementation							
2017 Total		274	173	0	447	4.2			
2018	FOF-Ongoing	-280	0	0	-280	-2.8	1-Sided Adj	RPISANES20161201091706637	
Explanation:		FOF- ongoing savings							
2018	Other	363	0	0	363	5.1	1-Sided Adj	RPISANES20161203094246180	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: D. Electric Distribution Operations
 Category-Sub: 1. Electric Distribution Operations
 Workpaper: 1ED004.000 - Electric Distribution Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation:		Safety and Reliability. Class of 9 Distribution System Operations to start in January 2017 for 2-years. No class was held in 2016. Cost estimate is based on 12 months in class & 12 months OJT contributing to capital work. While in class, Total cost = \$363k						
2018	Other	0	40	0	40	0.0	1-Sided Adj	RPISANES20161203094322513
Explanation:		SCADA System Support and Maintenance. The non labor estimate represents the incremental costs of the maintenance contract.						
2018	Other	100	0	0	100	1.0	1-Sided Adj	RPISANES20161203094404397
Explanation:		Two management employees were on disability in 2016. Expense was not captured as part of the linear trend. Total cost = \$100k						
2018	FOF-Implementation	0	11	0	11	0.0	1-Sided Adj	TSWETEK20170222145714067
Explanation:		Cost of FOF implementation						
2018 Total		183	51	0	234	3.3		
2019	FOF-Ongoing	-288	0	0	-288	-2.9	1-Sided Adj	RPISANES20161201091722327
Explanation:		FOF- Ongoing savings						
2019	Other	363	0	0	363	5.1	1-Sided Adj	RPISANES20161203094459867
Explanation:		Safety and reliability. Class of 9 Distribution System Operations to start in January 2019 for 2-years. No class was held in 2016. Cost estimate is based on 12 months in class & 12 months OJT contributing to capital work. Total cost = \$363k						
2019	Other	0	45	0	45	0.0	1-Sided Adj	RPISANES20161203094538963
Explanation:		SCADA System Support and Maintenance. The non labor estimate represents the incremental costs of the maintenance contract.						
2019	Other	100	0	0	100	1.0	1-Sided Adj	RPISANES20161203094625527
Explanation:		Two management employees were on disability in 2016. Expense was not captured as part of the linear trend. Total cost = \$100k						
2019 Total		175	45	0	220	3.2		

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: D. Electric Distribution Operations
Category-Sub: 1. Electric Distribution Operations
Workpaper: 1ED004.000 - Electric Distribution Operations

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	2,708	3,244	2,733	3,272	2,621
Non-Labor	8,241	7,144	8,636	9,355	12,534
NSE	0	0	0	0	0
Total	10,949	10,388	11,369	12,627	15,155
FTE	20.6	27.0	22.2	25.0	19.1
Adjustments (Nominal \$) **					
Labor	-228	-193	-132	-57	0
Non-Labor	-765	-920	-883	-743	0
NSE	0	0	0	0	0
Total	-993	-1,113	-1,015	-799	0
FTE	-2.5	-1.7	-1.4	-0.5	0.0
Recorded-Adjusted (Nominal \$)					
Labor	2,480	3,051	2,601	3,216	2,621
Non-Labor	7,476	6,224	7,753	8,612	12,534
NSE	0	0	0	0	0
Total	9,956	9,274	10,354	11,828	15,155
FTE	18.1	25.3	20.8	24.5	19.1
Vacation & Sick (Nominal \$)					
Labor	359	484	415	496	435
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	359	484	415	496	435
FTE	2.9	4.4	3.7	4.3	3.5
Escalation to 2016\$					
Labor	263	245	142	88	0
Non-Labor	168	65	2	8	0
NSE	0	0	0	0	0
Total	431	310	144	96	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	3,102	3,780	3,158	3,800	3,055
Non-Labor	7,644	6,288	7,756	8,620	12,534
NSE	0	0	0	0	0
Total	10,746	10,068	10,914	12,420	15,590
FTE	21.0	29.7	24.5	28.8	22.6

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: D. Electric Distribution Operations
 Category-Sub: 1. Electric Distribution Operations
 Workpaper: 1ED004.000 - Electric Distribution Operations

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	-228	-193	-132	-57	0
Non-Labor	-765	-920	-883	-743	0
NSE	0	0	0	0	0
Total	-993	-1,113	-1,015	-799	0
FTE	-2.5	-1.7	-1.4	-0.5	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012	Other	-228	0	0	-2.5	CCTR Transf To 2100-3963.000	RPISANES20161129101629430
Explanation: Costs dedicated to weather							
2012	Other	56	0	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129101757760
Explanation: Union labor costs							
2012	Other	-56	0	0	0.0	CCTR Transf To 2100-0128.000	RPISANES20161129101757760
Explanation: Union labor costs							
2012	Other	17	0	0	0.1	CCTR Transf From 2100-3616.000	RPISANES20161129102241260
Explanation: Union labor costs							
2012	Other	-17	0	0	-0.1	CCTR Transf To 2100-0128.000	RPISANES20161129102241260
Explanation: Union labor costs							
2012	Other	0	0	0	0.4	CCTR Transf From 2100-3616.000	RPISANES20161129102404323
Explanation: move the fte component of labor \$ adjustment of \$56 256.							
2012	Other	0	0	0	-0.4	CCTR Transf To 2100-0128.000	RPISANES20161129102404323
Explanation: move the fte component of labor \$ adjustment of \$56 256.							
2012	Other	317	0	0	1.4	CCTR Transf From 2100-3616.000	RPISANES20161129102635927
Explanation: union labor costs							
2012	Other	-317	0	0	-1.4	CCTR Transf To 2100-0128.000	RPISANES20161129102635927
Explanation: union labor costs							
2012	Other	2	0	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129102809090
Explanation: Union labor costs							

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: D. Electric Distribution Operations
 Category-Sub: 1. Electric Distribution Operations
 Workpaper: 1ED004.000 - Electric Distribution Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2012	Other	-2	0	0	0.0	CCTR Transf To 2100-0128.000	RPISANES20161129102809090
Explanation: Union labor costs							
2012	Other	0	-6	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129102934513
Explanation: Costs dedicated to weather							
2012	Other	0	7	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129103114887
Explanation: Costs dedicated to weather							
2012	Other	0	-7	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129103224620
Explanation: Costs dedicated to weather							
2012	Other	0	-7	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129103427403
Explanation: reversal of previous adjustment (added when should have been subtracted)							
2012	Other	0	-7	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129103521060
Explanation: Costs dedicated to weather							
2012	Other	0	-11	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129103702747
Explanation: Costs dedicated to weather							
2012	Other	0	-31	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129103821940
Explanation: Costs dedicated to weather							
2012	Other	0	-40	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129103942040
Explanation: Costs dedicated to weather							
2012	Other	0	-94	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129104135243
Explanation: Costs dedicated to weather							
2012	Other	0	-114	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129104246397
Explanation: Costs dedicated to weather							
2012	Other	0	-184	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129104401950
Explanation: Costs dedicated to weather							
2012	Other	0	-229	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129104516093
Explanation: Costs dedicated to weather							
2012	Other	0	44	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129104641717
Explanation: Costs dedicated to weather							

Note: Totals may include rounding differences.

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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: D. Electric Distribution Operations
 Category-Sub: 1. Electric Distribution Operations
 Workpaper: 1ED004.000 - Electric Distribution Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2012	Other	0	-44	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129104805467
Explanation: correct previous adjustment (need to subtract rather than add)							
2012	Other	0	-44	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129104849953
Explanation: Costs dedicated to weather							
2012 Total		-228	-765	0	-2.5		
2013	Other	-193	0	0	-1.7	CCTR Transf To 2100-3963.000	RPISANES20161129105150133
Explanation: Costs dedicated to weather							
2013	Other	0	-11	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129105435313
Explanation: Costs dedicated to weather							
2013	Other	0	-909	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129110641120
Explanation: Costs dedicated to weather							
2013 Total		-193	-920	0	-1.7		
2014	Other	-132	0	0	-1.4	CCTR Transf To 2100-3963.000	RPISANES20161129110824220
Explanation: Costs dedicated to weather							
2014	Other	0	-883	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129110946767
Explanation: Costs dedicated to weather							
2014 Total		-132	-883	0	-1.4		
2015	Other	40	0	0	0.4	1-Sided Adj	RPISANES20161112093914937
Explanation: Dec 2015 MyTime Missing Labor Accrual							
2015	Other	-97	0	0	-0.9	CCTR Transf To 2100-3963.000	RPISANES20161129111114970
Explanation: Costs dedicated to weather							
2015	Other	0	-743	0	0.0	CCTR Transf To 2100-3963.000	RPISANES20161129111232710
Explanation: Costs dedicated to weather							
2015 Total		-57	-743	0	-0.5		

Note: Totals may include rounding differences.

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2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: D. Electric Distribution Operations
Category-Sub: 1. Electric Distribution Operations
Workpaper: 1ED004.000 - Electric Distribution Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2016 Total		0	0	0	0.0		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: D. Electric Distribution Operations
Category-Sub: 1. Electric Distribution Operations
Workpaper: 1ED004.000 - Electric Distribution Operations

RAMP Item # 1

Ref ID: TSWETEK20170305115421610

RAMP Chapter: SDG&E-17

Program Name: Distribution System Operators • Working Foreman-Sys Oprs

Program Description: Joint TSO/DSO training program

Risk/Mitigation:

Risk: "Workforce Planning": Loss of employees with deep

Mitigation: "Workforce Planning": Loss of employees with deep knowledge, understanding and experience in Operat

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	29	25	22
High	36	29	27

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 32

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: E. Kearny Operations Services
Workpaper: 1ED006.000

Summary for Category: E. Kearny Operations Services

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	1,210	1,981	1,981	1,981
Non-Labor	140	152	152	152
NSE	0	0	0	0
Total	1,350	2,133	2,133	2,133
FTE	12.4	20.4	20.4	20.4

Workpapers belonging to this Category:

1ED006.000 Kearny Operations Services

Labor	1,210	1,981	1,981	1,981
Non-Labor	140	152	152	152
NSE	0	0	0	0
Total	1,350	2,133	2,133	2,133
FTE	12.4	20.4	20.4	20.4

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED006.000 - Kearny Operations Services

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: E. Kearny Operations Services
 Category-Sub: 1. Kearny Operations Services
 Workpaper: 1ED006.000 - Kearny Operations Services

Activity Description:

There are four functional work groups in the Kearny Maintenance Shops and Lab (Shop): (1) Tool Repair Group - the Shop maintains, repairs, fabricates, and acquires tooling, such as live-line tools, hotsticks, electric and hydraulic equipment and hand-tools. This is instrumental in maintaining the safety of the electric line and substation employees. (2) Apparatus Group - the condition-based maintenance program has necessitated the replacement of an increased number of electrical equipment. This includes the disposal or refurbishment of transformers, capacitors, switches, breakers, and bushings, along with associated gas and oil reclamation and recycling. Environmental concerns have been instrumental in the decision to scrap versus refurbishment. (3) Transformer Repair & High Voltage Testing - the Shop is a certified high voltage test station which tests to confirm the electrical condition of transformers, regulators, mechanical jumpers, grounds, hot sticks and other live line tools and equipment. Due to a fatality in the company in May 2008, there has been an increased demand for testing in the Shop to ensure tool testing compliance. (4) Protective Equipment Testing Lab - the Shop is certified to inspect and test rubber goods used for electrical work personal protection.

Forecast Explanations:

Labor - 5-YR Average

A five year average plus incremental was used to forecast labor for this work group. The tool and rubber goods safety tests are performed on timebased cycles, so even though the number and the cost can vary from year to year, an average provides the best estimate for a typical year.

Non-Labor - 5-YR Average

A five year average plus incremental was used to forecast non labor for this work group. The tool and rubber goods safety tests are performed on timebased cycles, so even though the number and the cost can vary from year to year, an average provides the best estimate for a typical year.

NSE - 5-YR Average

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		1,785	1,841	1,421	1,590	1,210	1,982	1,982	1,982	
Non-Labor		193	117	182	127	140	152	152	152	
NSE		0	0	0	0	0	0	0	0	
Total		1,978	1,959	1,603	1,717	1,349	2,134	2,134	2,134	
FTE		20.9	21.2	15.5	17.0	12.4	20.4	20.4	20.4	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: E. Kearny Operations Services
 Category-Sub: 1. Kearny Operations Services
 Workpaper: 1ED006.000 - Kearny Operations Services

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	1,569	1,569	1,569	412	412	412	1,981	1,981	1,981
Non-Labor	5-YR Average	152	152	152	0	0	0	152	152	152
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		1,721	1,721	1,721	412	412	412	2,133	2,133	2,133
FTE	5-YR Average	17.4	17.4	17.4	3.0	3.0	3.0	20.4	20.4	20.4

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID
2017	Other	412	0	0	412	3.0	1-Sided Adj	TSWETEK20170309082247657

Explanation:

Kearny Operations Services is creating a more formalized and robust Substation Electrician training program which includes the following areas:

1. Journeyman required and elective training
2. Crew Lead elective training
3. Working Foreman required training
4. Annual EPZ required training

The purpose of the program is to increase the knowledge base, skill level, and confidence of our union employees when performing their daily tasks. By doing so, we will create a safer work environment with more engaged employees. The program also offers career development guidance for those interested in progressing through the ranks of the union or who want to seek opportunities in management/administration. In order to accomplish the development, administration and tracking of a program of this magnitude, resources are required. We are asking for 3 FTE's calculated at \$412K annually; broken down as follows: one Training & Development Supervisor (\$150k), two Performance Support Analysts (\$125k each), and annual training/development for the three FTE's (who are all instructors) is \$12k.

2017 Total		412	0	0	412	3.0		
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2018	Other	412	0	0	412	3.0	1-Sided Adj	TSWETEK20170309082300267
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Explanation:

Enhance Substation Electrician Training Program

2018 Total		412	0	0	412	3.0		
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2019	Other	412	0	0	412	3.0	1-Sided Adj	TSWETEK20170309082319220
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Explanation:

Enhance Substation Electrician Training Program

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
 2019 GRC - APP
 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: E. Kearny Operations Services
 Category-Sub: 1. Kearny Operations Services
 Workpaper: 1ED006.000 - Kearny Operations Services

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2019 Total		412	0	0	412	3.0		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: E. Kearny Operations Services
Category-Sub: 1. Kearny Operations Services
Workpaper: 1ED006.000 - Kearny Operations Services

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	1,427	1,486	1,171	1,217	981
Non-Labor	189	116	182	101	123
NSE	0	0	0	0	0
Total	1,616	1,602	1,353	1,318	1,104
FTE	18.0	18.0	13.2	12.9	9.9
Adjustments (Nominal \$) **					
Labor	0	0	0	128	56
Non-Labor	0	0	0	26	17
NSE	0	0	0	0	0
Total	0	0	0	154	73
FTE	0.0	0.0	0.0	1.6	0.6
Recorded-Adjusted (Nominal \$)					
Labor	1,427	1,486	1,171	1,345	1,038
Non-Labor	189	116	182	127	140
NSE	0	0	0	0	0
Total	1,616	1,602	1,353	1,472	1,177
FTE	18.0	18.0	13.2	14.5	10.5
Vacation & Sick (Nominal \$)					
Labor	207	236	187	208	172
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	207	236	187	208	172
FTE	2.9	3.1	2.4	2.5	1.9
Escalation to 2016\$					
Labor	151	119	64	37	0
Non-Labor	4	1	0	0	0
NSE	0	0	0	0	0
Total	156	121	64	37	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	1,785	1,841	1,421	1,590	1,210
Non-Labor	193	117	182	127	140
NSE	0	0	0	0	0
Total	1,978	1,959	1,603	1,717	1,349
FTE	20.9	21.1	15.6	17.0	12.4

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: E. Kearny Operations Services
 Category-Sub: 1. Kearny Operations Services
 Workpaper: 1ED006.000 - Kearny Operations Services

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	128	56
Non-Labor	0	0	0.037	26	17
NSE	0	0	0	0	0
Total	0	0	0.037	154	73
FTE	0.0	0.0	0.0	1.6	0.6

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012 Total		0	0	0	0.0		
2013 Total		0	0	0	0.0		
2014	Other	0	0	0	0.0	CCTR Transf From 2100-3941.000	RPISANES20161109212257383
Explanation: Costs within Substation C&O workpaper materials management cost center 2100-3941, are now under Kearny Operations Services workpaper, cost center 2100-0238.							
2014	Other	0	0	0	0.0	CCTR Transf From 2100-3941.000	RPISANES20161109213255720
Explanation: to correct previous incorrect entry							
2014	Other	0	0	0	0.0	CCTR Transf From 2100-3941.000	RPISANES20161109213606677
Explanation: Costs are now captured in Kearny Operations Services workpaper, cost center 2100-0238.							
2014 Total		0	0	0	0.0		
2015	Other	119	26	0	1.5	CCTR Transf From 2100-3941.000	RPISANES20161109214246940
Explanation: costs are now captured in Kearny Operations Services workpaper, cost center 2100-0238							
2015	Other	9	0	0	0.1	1-Sided Adj	RPISANES20161112094113710
Explanation: Dec 2015 MyTime Missing Labor Accrual							
2015 Total		128	26	0	1.6		
2016	Other	56	17	0	0.6	CCTR Transf From 2100-3941.000	RPISANES20170224193115193

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
 2019 GRC - APP
 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: E. Kearny Operations Services
 Category-Sub: 1. Kearny Operations Services
 Workpaper: 1ED006.000 - Kearny Operations Services

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation: costs from cost center 3941 are now captured in Kearny Operations Services workpaper 1ED006, cost center 0238							
2016 Total		56	17	0	0.6		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: F. Grid Operations
 Workpaper: 1ED008.000

Summary for Category: F. Grid Operations

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	332	332	332	332
Non-Labor	335	235	449	235
NSE	0	0	0	0
Total	667	567	781	567
FTE	2.8	2.8	2.8	2.8

Workpapers belonging to this Category:

1ED008.000 Grid Operations

Labor	332	332	332	332
Non-Labor	335	235	449	235
NSE	0	0	0	0
Total	667	567	781	567
FTE	2.8	2.8	2.8	2.8

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED008.000 - Grid Operations

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: F. Grid Operations
 Category-Sub: 1. Grid Operations
 Workpaper: 1ED008.000 - Grid Operations

Activity Description:

The Electronic Control Technician is responsible for all Supervisory, Control & Data Acquisition (SCADA) equipment that interfaces with both the Transmission Emergency Management Systems (EMS) and Distribution Operations master stations, system totals & major intertie load reads to the Independent System Operator (ISO), as well as the A- & AV signals from customer facilities to SDG&E. The Mission Control Training Team provides initial and continual training for Distribution System Operators, Transmission System Operators and Operations Shift Supervisors as well as Authorization training for all operating districts personnel and contractors that work on the SDG&E electrical systems for distribution and transmission, including Generator Operators within SDG&E footprint.

Forecast Explanations:

Labor - Base YR Rec

The labor forecast utilized the base year 2016. Base year 2016 includes the Labor associate with the new Mission Control Training Section that was developed at the beginning of 2016, making base year the most representative estimate for the next three years.

Non-Labor - Base YR Rec

Non-Labor costs are also based on the 2016 base year methodology plus incremental pressure adjustments, because it best reflects current and future operating requirements due to a new Mission Control Training Section that was developed at the beginning of 2016. There is an incremental downward adjustment for non-labor is due to a non-recurring costs associated with developing a new training group in the Base Year.

NSE - Base YR Rec

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		276	98	109	200	332	332	332	332	
Non-Labor		26	36	39	46	335	235	449	235	
NSE		0	0	0	0	0	0	0	0	
Total		303	134	148	246	667	567	781	567	
FTE		2.4	1.3	1.1	1.8	2.8	2.9	2.9	2.9	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: F. Grid Operations
Category-Sub: 1. Grid Operations
Workpaper: 1ED008.000 - Grid Operations

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	332	332	332	0	0	0	332	332	332
Non-Labor	Base YR Rec	335	335	335	-100	114	-100	235	449	235
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
Total		667	667	667	-100	114	-100	567	781	567
FTE	Base YR Rec	2.8	2.8	2.8	0.0	0.0	0.0	2.8	2.8	2.8

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	Other	0	-100	0	-100	0.0	1-Sided Adj	ALLLACUN20170511140153917	
Explanation:		2016 one time O&M non-labor cost associated with new training program. This downward adjustment is to remove a one time cost from 2016 that will not be seen in future years, given a 2016 base year estimate was utilized.							
2017 Total		0	-100	0	-100	0.0			
2018	RAMP Incremental	0	214	0	214	0.0	1-Sided Adj	ALLLACUN20170302143308120	
Explanation:		RAMP proposed activity:Energy Management System (EMS) Modernization Project - Upgrade antiquated EMS visualization tool and control room. Tool will help improve situational awareness for the system operators. Forecast based on vendor estimate for a standard service agreement.							
2018	Other	0	-100	0	-100	0.0	1-Sided Adj	ALLLACUN20170511140222653	
Explanation:		2016 one time O&M non-labor cost associated with new training program. This downward adjustment is to remove a one time cost from 2016 that will not be seen in future years, given a 2016 base year estimate was utilized.							
2018 Total		0	114	0	114	0.0			
2019	Other	0	-100	0	-100	0.0	1-Sided Adj	ALLLACUN20170511140242843	
Explanation:		2016 one time O&M non-labor cost associated with new training program. This downward adjustment is to remove a one time cost from 2016 that will not be seen in future years, given a 2016 base year estimate was utilized.							
2019 Total		0	-100	0	-100	0.0			

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: F. Grid Operations
Category-Sub: 1. Grid Operations
Workpaper: 1ED008.000 - Grid Operations

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	221	79	90	143	282
Non-Labor	26	57	32	39	334
NSE	0	0	0	0	0
Total	247	136	122	182	616
FTE	2.1	1.1	0.9	1.3	2.4
Adjustments (Nominal \$) **					
Labor	0	0	0	26	3
Non-Labor	0	-21	6	8	1
NSE	0	0	0	0	0
Total	0	-21	6	34	4
FTE	0.0	0.0	0.0	0.2	0.0
Recorded-Adjusted (Nominal \$)					
Labor	221	79	90	169	285
Non-Labor	26	36	39	46	335
NSE	0	0	0	0	0
Total	247	115	129	215	620
FTE	2.1	1.1	0.9	1.5	2.4
Vacation & Sick (Nominal \$)					
Labor	32	13	14	26	47
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	32	13	14	26	47
FTE	0.3	0.2	0.2	0.3	0.4
Escalation to 2016\$					
Labor	23	6	5	5	0
Non-Labor	1	0	0	0	0
NSE	0	0	0	0	0
Total	24	7	5	5	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	276	98	109	200	332
Non-Labor	26	36	39	46	335
NSE	0	0	0	0	0
Total	303	134	148	246	667
FTE	2.4	1.3	1.1	1.8	2.8

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: F. Grid Operations
Category-Sub: 1. Grid Operations
Workpaper: 1ED008.000 - Grid Operations

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	26	3
Non-Labor	0	-21	6	8	0.920
NSE	0	0	0	0	0
Total	0	-21	6	34	4
FTE	0.0	0.0	0.0	0.2	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012 Total		0	0	0	0.0		
2013	Other	0	-23	0	0.0	1-Sided Adj	RPISANES20161112121443470
Explanation: CAISO Settlement (\$18k) and NERC Invoice (\$5k); Transmission-related charges							
2013	Other	0	2	0	0.0	CCTR Transf From 2100-0232.000	RPISANES20161122173928750
Explanation: move costs to reflect transfer to new organization where future costs will incur							
2013 Total		0	-21	0	0.0		
2014	Other	0	4	0	0.0	1-Sided Adj	RPISANES20161112121651543
Explanation: Adjust to include FC920 to FC 925 charges not included in cost center 2100-0231.							
2014	Other	0	8	0	0.0	1-Sided Adj	RPISANES20161112121817663
Explanation: Adjust to include FC920 to FC 925 charges not included in cost center 2100-0231.							
2014	Other	0	2	0	0.0	CCTR Transf From 2100-0232.000	RPISANES20161122174231283
Explanation: move costs to reflect transfer to new organization where future costs will be incurred.							
2014	Other	0	-8	0	0.0	1-Sided Adj	RPISANES20161112121934883
Explanation: correct prior entry (should be reflected in 2015)							
2014 Total		0	6	0	0.0		
2015	Other	26	0	0	0.2	1-Sided Adj	RPISANES20161112094314397
Explanation: Dec 2015 MyTime Missing Labor Accrual							

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: F. Grid Operations
 Category-Sub: 1. Grid Operations
 Workpaper: 1ED008.000 - Grid Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2015	Other	0	8	0	0.0	1-Sided Adj	RPISANES20161112122041933
Explanation: Adjust to include FC920 to FC 925 charges not included in cost center 2100-0231							
2015	Other	0	0	0	0.0	CCTR Transf From 2100-0232.000	RPISANES20161122174322610
Explanation: move costs to reflect transfer to new organization where future costs will be incurred.							
2015 Total		26	8	0	0.2		
2016	Other	3	1	0	0.0	CCTR Transf From 2100-0232.000	RPISANES20170224195436823
Explanation: move costs from workpaper 1ED024 cost center 0232 to workpaper 1ED008, cost center 0230 to reflect transfer where future costs will be incurred.							
2016 Total		3	1	0	0.0		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: F. Grid Operations
Category-Sub: 1. Grid Operations
Workpaper: 1ED008.000 - Grid Operations

RAMP Item # 1

Ref ID: ALLLACUN20170302144556650

RAMP Chapter: SDG&E-6

Program Name: Energy Management System Modernization Project

Program Description: Upgrade antiquated EMS visualization tool and control room. Addresses potential scenarios where tools and/or systems our operators utilize are not adequate for blackstart situation

Risk/Mitigation:

Risk: Fail to Blackstart

Mitigation: Modernization of Grid Control Centers

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	144	59	0
High	160	65	0

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation:

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: F. Grid Operations
Category-Sub: 1. Grid Operations
Workpaper: 1ED008.000 - Grid Operations

RAMP Item # 2

Ref ID: TSWETEK20170305111135417

RAMP Chapter: SDG&E-17

Program Name: Engineer • EMS Software Supv • Grid Busn Proc Mgr • Grid Ops Svcs Mgr • Mission Ctrl Trng Mgr

Program Description: Engineer summer intern program

Risk/Mitigation:

Risk: "Workforce Planning": Loss of employees with deep

Mitigation: 'Knowledge transfer tools and processes are available; Workforce planning tools and templates availa

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	3	3	2
High	5	5	4

Funding Source: CPUC-GRC

Forecast Method: Other

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 4

Explanation:

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: G. Officer
 Workpaper: 1ED009.000

Summary for Category: G. Officer

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	675	675	675	675
Non-Labor	97	97	97	97
NSE	0	0	0	0
Total	<u>772</u>	<u>772</u>	<u>772</u>	<u>772</u>
FTE	3.0	3.0	3.0	3.0

Workpapers belonging to this Category:

1ED009.000 Officer

Labor	675	675	675	675
Non-Labor	97	97	97	97
NSE	0	0	0	0
Total	<u>772</u>	<u>772</u>	<u>772</u>	<u>772</u>
FTE	3.0	3.0	3.0	3.0

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED009.000 - Officer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: G. Officer
 Category-Sub: 1. Officer
 Workpaper: 1ED009.000 - Officer

Activity Description:

This workgroup includes the non-labor costs for an officer (One Vice President) and one administrative assistant. The total salaries are a direct labor charge and the amount allocated to electric transmission is excluded from this account as an indirect charge and not included in the requested expenses. Typical activities included in this account include officer activities in support of electric distribution. Non-labor expenses typically include consulting fees, benchmarking studies, office supply expenses and officer travel expenses.

Forecast Explanations:

Labor - Base YR Rec

Labor costs utilize the base year methodology. The base year methodology is most indicative of the current and future forecasted spending of this group.

Non-Labor - Base YR Rec

Non-labor costs utilize the base year methodology. The base year methodology is most indicative of the current and future forecasted spending of this group.

NSE - Base YR Rec

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		353	671	550	653	675	675	675	675	
Non-Labor		1,791	1,311	1,107	911	97	97	97	97	
NSE		0	0	0	0	0	0	0	0	
Total		2,144	1,983	1,657	1,564	772	772	772	772	
FTE		1.6	1.8	2.4	2.8	3.0	3.0	3.0	3.0	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: G. Officer
 Category-Sub: 1. Officer
 Workpaper: 1ED009.000 - Officer

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	675	675	675	0	0	0	675	675	675
Non-Labor	Base YR Rec	97	97	97	0	0	0	97	97	97
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
Total		772	772	772	0	0	0	772	772	772
FTE	Base YR Rec	3.0	3.0	3.0	0.0	0.0	0.0	3.0	3.0	3.0

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
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Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: G. Officer
Category-Sub: 1. Officer
Workpaper: 1ED009.000 - Officer

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	282	542	453	758	933
Non-Labor	1,752	1,298	1,107	1,041	1,142
NSE	0	0	0	0	0
Total	2,034	1,840	1,560	1,799	2,074
FTE	1.4	1.5	2.0	3.4	4.1
Adjustments (Nominal \$) **					
Labor	0	0	0	-205	-354
Non-Labor	0	0	0	-131	-1,045
NSE	0	0	0	0	0
Total	0	0	0	-336	-1,399
FTE	0.0	0.0	0.0	-1.0	-1.6
Recorded-Adjusted (Nominal \$)					
Labor	282	542	453	553	579
Non-Labor	1,752	1,298	1,107	910	97
NSE	0	0	0	0	0
Total	2,034	1,840	1,560	1,463	676
FTE	1.4	1.5	2.0	2.4	2.5
Vacation & Sick (Nominal \$)					
Labor	41	86	72	85	96
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	41	86	72	85	96
FTE	0.2	0.3	0.4	0.4	0.5
Escalation to 2016\$					
Labor	30	44	25	15	0
Non-Labor	39	14	0	1	0
NSE	0	0	0	0	0
Total	69	57	25	16	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	353	671	550	653	675
Non-Labor	1,791	1,311	1,107	911	97
NSE	0	0	0	0	0
Total	2,144	1,983	1,657	1,564	772
FTE	1.6	1.8	2.4	2.8	3.0

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: G. Officer
 Category-Sub: 1. Officer
 Workpaper: 1ED009.000 - Officer

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	-205	-354
Non-Labor	0	0	0	-131	-1,045
NSE	0	0	0	0	0
Total	0	0	0	-336	-1,399
FTE	0.0	0.0	0.0	-1.0	-1.6

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012 Total		0	0	0	0.0		
2013 Total		0	0	0	0.0		
2014 Total		0	0	0	0.0		
2015	Other	-205	-131	0	-1.0	CCTR Transf To 2100-3626.000	RPISANES20161128091651033
Explanation:		Move costs from cost center 2100-3958 to 2100-3626 to accurately reflect future charges.					
2015 Total		-205	-131	0	-1.0		
2016	Other	-354	-216	0	-1.6	CCTR Transf To 2100-3626.000	RPISANES20170225121403823
Explanation:		Move costs from 2100-3958 (Chief Energy Delivery) to workpaper 1HR008, cost center 2100-3626 to align future charging					
2016	Other	0	-829	0	0.0	1-Sided Adj	RPISANES20170225122048923
Explanation:		Removal of 2016 one-time costs for termination of uniform agreement					
2016 Total		-354	-1,045	0	-1.6		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: H. Project Management
Workpaper: 1ED010.000

Summary for Category: H. Project Management

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	589	957	1,279	1,079
Non-Labor	70	137	151	267
NSE	0	0	0	0
Total	659	1,094	1,430	1,346
FTE	7.1	10.9	13.8	11.8

Workpapers belonging to this Category:

1ED010.000 Project Management

Labor	589	957	1,279	1,079
Non-Labor	70	137	151	267
NSE	0	0	0	0
Total	659	1,094	1,430	1,346
FTE	7.1	10.9	13.8	11.8

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED010.000 - Project Management

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: H. Project Management
Category-Sub: 1. Project Management
Workpaper: 1ED010.000 - Project Management

Activity Description:

Project Management's responsibilities vary widely, but all relate to the preparation of construction orders. Department personnel perform the design and engineering necessary to developing comprehensive construction orders, from which additions and modifications to electric distribution systems are constructed. Such construction orders range from simple services for individual customers to large complex distribution systems that serve subdivisions, commercial centers and high-rise towers. Also included are construction orders for converting electric overhead lines to underground under various programs and relocating existing facilities to accommodate both private party requestors and governmental agencies. The construction order development process includes meeting with customers, governmental agencies and other utilities in planning and coordinating additions and modifications to the electric distribution system. Department personnel perform a variety of engineering calculations and analytical assessments and secure contracts and special agreements. In addition, Project Management personnel prepare and assemble the construction order job packages for distribution to customers, contractors, other utilities and all participating departments within SDG&E.

The construction orders developed by Project Management represent capital work. However, many capital projects include a small component of O&M. There are also some small construction orders for which the work is considered O&M as a result of its limited scope. As such, Project Management's time is generally split between Capital and O&M, with 98% of personnel time charged to Capital and 2% charged to O&M. The relatively small O&M component of Project Management is addressed here.

Forecast Explanations:

Labor - Base YR Rec

Labor costs use Base Year forecast methodology Plus Incremental Increases, rather than a 3-, 4- or 5-YR Average. This most closely represents the annual O&M expense that is only 2% of Project Management's total budget. In years when Project Management conducts Planner Training Classes, the class cost is charged 100% O&M, creating an impact on O&M expenditures. As no class was conducted in 2016, this most accurately represents expected annual costs. Incremental labor increases are a result of ongoing attrition and the resulting understaffing within the organization to adequately address demand.

Non-Labor - Base YR Rec

Non-Labor projected costs use the Base Year forecast methodology Plus Incremental Increases. 2016 is most reflective of costs moving forward, as it does not include any costs related to training classes, which are not held every year.

NSE - Base YR Rec

N/A

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: H. Project Management
 Category-Sub: 1. Project Management
 Workpaper: 1ED010.000 - Project Management

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		319	307	360	434	589	957	1,279	1,079	
Non-Labor		110	197	46	129	70	137	151	267	
NSE		0	0	0	0	0	0	0	0	
Total		429	504	405	564	660	1,094	1,430	1,346	
FTE		4.0	3.7	4.7	5.3	7.1	10.9	13.8	11.8	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: H. Project Management
Category-Sub: 1. Project Management
Workpaper: 1ED010.000 - Project Management

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	589	589	589	368	690	490	957	1,279	1,079
Non-Labor	Base YR Rec	70	70	70	67	81	197	137	151	267
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
Total		660	660	660	435	771	687	1,095	1,431	1,347
FTE	Base YR Rec	7.1	7.1	7.1	3.8	6.7	4.7	10.9	13.8	11.8

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	FOF-Implementation	0	1	0	1	0.0	1-Sided Adj	RPISANES20161201093137017	
Explanation:		Cost of FOF implementation							
2017	Other	301	6	0	307	2.5	1-Sided Adj	RPISANES20161204213442053	
Explanation:		Project Management is seeking to fill positions made vacant by recent retirements. The customer project planner needs are as follows: Hire 14 Mgmt Customer Project Planners who will need training. Classes are 100% O&M. Class time = 23 weeks, The rest of productive hours is 2% O&M. Non-productive hours = 224. Total = \$301k. Minimal nonlabor class costs.							
2017	Other	8	0	0	8	0.1	1-Sided Adj	RPISANES20161204213732417	
Explanation:		Project Management is seeking to fill positions made vacant by recent retirements. The service planner needs are as follows: 1 C&T Service Planner (SP) at 2% O&M and 224 nonproductive hours = \$8k							
2017	Other	10	0	0	10	0.3	1-Sided Adj	RPISANES20161204223602193	
Explanation:		Project Management is seeking to fill positions made vacant by recent retirements. The staff assistant needs are as follows: 2 C&T Staff Assistant at 2% O&M and 224 nonproductive hours = \$10k							
2017	Other	49	0	0	49	0.9	1-Sided Adj	RPISANES20161204223718690	
Explanation:		Project Management is seeking to fill positions made vacant by recent retirements. The project management assistant needs are as follows: 7 C&T Project Management Assistants (PMA) at 2% O&M and 224 nonproductive hours = \$49k.							
2017	Other	0	60	0	60	0.0	1-Sided Adj	RPISANES20161204223847840	
Explanation:		The non-labor in this group is 2% O&M. The amount needed relates to 2% of construction contract labor that is increasing due to increasing capital jobs.							

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: H. Project Management
 Category-Sub: 1. Project Management
 Workpaper: 1ED010.000 - Project Management

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2017 Total		368	67	0	435	3.8		

2018 FOF-Implementation		0	9	0	9	0.0	1-Sided Adj	RPISANES20161201093210027
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Explanation: Cost of FOF implementation

2018 Other		602	11	0	613	5.0	1-Sided Adj	RPISANES20161204224056610
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Explanation: Project Management is seeking to fill positions made vacant by recent retirements. The customer project planner needs are as follows: Hire 14 Mgmt Customer Project Planners who will need training. Classes are 100% O&M. Class time = 23 weeks, The rest of productive hours is 2% O&M. Non-productive hours = 224. Total = \$602k. The cost is double in 2018 due to second half of 2017 class plus first half of 2018 class. Minimal nonlabor class costs.

2018 Other		8	0	0	8	0.1	1-Sided Adj	RPISANES20161204224501780
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Explanation: Project Management is seeking to fill positions made vacant by recent retirements. The service planner needs are as follows: 1 C&T Service Planner (SP) at 2% O&M and 224 nonproductive hours = \$8k

2018 Other		10	0	0	10	0.3	1-Sided Adj	RPISANES20161204224641740
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Explanation: Project Management is seeking to fill positions made vacant by recent retirements. The staff assistant needs are as follows: 2 C&T Staff Assistant at 2% O&M and 224 nonproductive hours = \$10k

2018 Other		49	0	0	49	0.9	1-Sided Adj	RPISANES20161204224815877
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Explanation: Project Management is seeking to fill positions made vacant by recent retirements. The project management assistant needs are as follows: 7 C&T Project Management Assistants (PMA) at 2% O&M and 224 nonproductive hours = \$49k.

2018 Other		21	0	0	21	0.4	1-Sided Adj	RPISANES20161204224924123
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Explanation: Project Management is seeking to fill positions made vacant by recent retirements. The project management assistant needs are as follows: 3 C&T Project Management Assistants (PMA) at 2% O&M and 224 nonproductive hours = \$21k.

2018 Other		0	60	0	60	0.0	1-Sided Adj	RPISANES20161204225050690
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Explanation: The non-labor in this group is 2% O&M. The amount needed relates to 2% of construction contract labor that is increasing due to increasing capital jobs.

2018 FOF-Ongoing		0	1	0	1	0.0	1-Sided Adj	TSWETEK20170222150129670
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Explanation: FOF cost for 2019 and ongoing savings

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: H. Project Management
Category-Sub: 1. Project Management
Workpaper: 1ED010.000 - Project Management

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2018 Total		690	81	0	771	6.7		

2019 FOF-Implementation		0	110	0	110	0.0	1-Sided Adj	RPISANES20161201093317377
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Explanation: Cost of FOF implementation

2019 Other		602	11	0	613	5.0	1-Sided Adj	RPISANES20161204225332753
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Explanation: Project Management is seeking to fill positions made vacant by recent retirements. The customer project planner needs are as follows: Hire 14 Mgmt Customer Project Planners who will need training. Classes are 100% O&M. Class time = 23 weeks, The rest of productive hours is 2% O&M. Non-productive hours = 224. Total = \$602k. The cost is double in 2019 due to second half of 2018 class plus first half of 2019 class. Minimal nonlabor class costs.

2019 Other		8	0	0	8	0.1	1-Sided Adj	RPISANES20161204225731240
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Explanation: Project Management is seeking to fill positions made vacant by recent retirements. The service planner needs are as follows: 1 C&T Service Planner (SP) at 2% O&M and 224 nonproductive hours = \$8k

2019 Other		10	0	0	10	0.3	1-Sided Adj	RPISANES20161204225829033
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Explanation: Project Management is seeking to fill positions made vacant by recent retirements. The staff assistant needs are as follows: 2 C&T Staff Assistant at 2% O&M and 224 nonproductive hours = \$10k

2019 Other		49	0	0	49	0.9	1-Sided Adj	RPISANES20161204225936990
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Explanation: Project Management is seeking to fill positions made vacant by recent retirements. The project management assistant needs are as follows: 7 C&T Project Management Assistants (PMA) at 2% O&M and 224 nonproductive hours = \$49k.

2019 Other		21	0	0	21	0.4	1-Sided Adj	RPISANES20161204230032473
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Explanation: Project Management is seeking to fill positions made vacant by recent retirements. The project management assistant needs are as follows: 3 C&T Project Management Assistants (PMA) at 2% O&M and 224 nonproductive hours = \$21k.

2019 Other		0	60	0	60	0.0	1-Sided Adj	RPISANES20161204230123507
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Explanation: The non-labor in this group is 2% O&M. The amount needed relates to 2% of construction contract labor that is increasing due to increasing capital jobs.

2019 FOF-Ongoing		-200	16	0	-184	-2.0	1-Sided Adj	TSWETEK20170222150203710
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Explanation: FOF ongoing savings

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: H. Project Management
Category-Sub: 1. Project Management
Workpaper: 1ED010.000 - Project Management

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2019 Total		490	197	0	687	4.7		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: H. Project Management
Category-Sub: 1. Project Management
Workpaper: 1ED010.000 - Project Management

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	255	248	296	367	505
Non-Labor	107	195	46	129	70
NSE	0	0	0	0	0
Total	363	442	342	497	576
FTE	3.4	3.1	4.0	4.5	6.0
Adjustments (Nominal \$) **					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	255	248	296	367	505
Non-Labor	107	195	46	129	70
NSE	0	0	0	0	0
Total	363	442	342	497	576
FTE	3.4	3.1	4.0	4.5	6.0
Vacation & Sick (Nominal \$)					
Labor	37	39	47	57	84
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	37	39	47	57	84
FTE	0.5	0.5	0.7	0.8	1.1
Escalation to 2016\$					
Labor	27	20	16	10	0
Non-Labor	2	2	0	0	0
NSE	0	0	0	0	0
Total	30	22	16	10	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	319	307	360	434	589
Non-Labor	110	197	46	129	70
NSE	0	0	0	0	0
Total	429	504	405	564	660
FTE	3.9	3.6	4.7	5.3	7.1

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: H. Project Management
 Category-Sub: 1. Project Management
 Workpaper: 1ED010.000 - Project Management

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
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Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Workpaper: 1ED011.000

Summary for Category: I. Electric Regional Operations

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	21,321	22,568	22,007	23,055
Non-Labor	14,292	15,170	13,857	19,737
NSE	0	0	0	0
Total	35,613	37,738	35,864	42,792
FTE	181.2	188.0	182.2	190.9

Workpapers belonging to this Category:

1ED011.000 Electric Regional Operations

Labor	21,321	22,568	22,007	23,055
Non-Labor	14,292	15,170	13,857	19,737
NSE	0	0	0	0
Total	35,613	37,738	35,864	42,792
FTE	181.2	188.0	182.2	190.9

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED011.000 - Electric Regional Operations

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

Activity Description:

The Electric Regional Operations organization consists of the electric distribution crews within six districts and other operating centers. These crews provide coverage for all of SDG&E's electric distribution system throughout its service territory. The ERO group consists of electric linemen, apprentices, line assistants, schedulers, aviation services, office support personnel, and management supervision. Their primary job functions are to maintain the electric distribution system, restore service due to outages, and fix service problems and other customer issues.

Forecast Explanations:

Labor - Base YR Rec

The Base Year Recorded Plus Incremental Increases methodology was utilized in order to capture current funding requirements based on underlying activities and addressing future demands and other priorities including RAMP items, safety and reliability, compliance requirements, system growth, and workforce development.

Non-Labor - Base YR Rec

The Base Year Recorded Plus Incremental Increases methodology records existing funding requirements, along with upward pressures to address other priorities including RAMP items, safety and reliability, compliance requirements, and system growth.

NSE - Base YR Rec

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		24,001	22,812	21,551	21,384	21,321	22,568	22,007	23,055	
Non-Labor		11,859	10,869	10,716	12,731	14,292	15,170	13,857	19,737	
NSE		0	0	0	0	0	0	0	0	
Total		35,860	33,681	32,267	34,115	35,613	37,738	35,864	42,792	
FTE		200.6	194.6	181.7	186.3	181.2	187.9	182.1	190.8	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	21,321	21,321	21,321	1,247	686	1,734	22,568	22,007	23,055
Non-Labor	Base YR Rec	14,292	14,292	14,292	878	-435	5,445	15,170	13,857	19,737
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
Total		35,613	35,613	35,613	2,125	251	7,179	37,738	35,864	42,792
FTE	Base YR Rec	181.2	181.2	181.2	6.8	1.0	9.7	188.0	182.2	190.9

Forecast Adjustment Details:

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>	
2017	RAMP Incremental	40	0	0	40	0.4	1-Sided Adj	RPISANES20161201094025347	
Explanation:		RAMP proposed activity: Switch Inspection and High-Risk Replacement (OH) - Proactively test, repair, or replace switches on the OH system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades. See supplemental work paper for estimate methodology.							
2017	Other	0	63	0	63	0.0	1-Sided Adj	TSWETEK20170626080841433	
Explanation:		Additional HCOR filter socks to allow crews to pump water from subsurface structures while meeting environmental regulations. (100/year at \$630 per sock)							
2017	Other	80	0	0	80	1.0	1-Sided Adj	TSWETEK20170626082909977	
Explanation:		Additional Manager Project Manager and Business Analyst for new EDO Project Management Organization (PMO), handling efficiency initiatives. (40% O&M). The additional oversight provided by this group will more successful and cost-effective implementation of projects.							
2017	Other	0	772	0	772	0.0	1-Sided Adj	TSWETEK20170626084252690	
Explanation:		Two additional months of air-crane fire support due to ongoing drought conditions. Costs represent monthly contract costs at 66.5% O&M.							
2017	FOF-Ongoing	-817	-1,120	0	-1,937	-8.1	1-Sided Adj	RPISANES20161201095442770	
Explanation:		FOF- ongoing savings							
2017	Other	88	0	0	88	1.0	1-Sided Adj	RPISANES20161205113504227	
Explanation:		Additional supervisor and two permit coordinators for a new permitting group. Cities/counties have increased permit requirements. As a result, there is an expectation of more face-to-face interaction with dedicated permit resources. O&M calculation based on expected 7% O&M plus non-productive labor.							

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2017	Other	1,800	0	0	1,800	12.0	1-Sided Adj	RPISANES20161205132912630
Explanation:		O&M portion of 20 lineman (90k per). Labor rate is \$55/hr for linemen. For each lineman, projections include \$35k in O&M related straight time work, \$30k for non-productive labor and training costs, and \$25k for O&M-related overtime. Additional lineman will improve outage response times and reliability.						
2017	FOF-Implementation	0	692	0	692	0.0	1-Sided Adj	TSWETEK20170222150734603
Explanation:		FOF implementation costs						
2017	RAMP Incremental	0	37	0	37	0.0	1-Sided Adj	RPISANES20170307180451897
Explanation:		RAMP proposed activity: Utilize an aviation safety contractor to develop governing documents for internal and external aviation operations. Based on \$35k for creation of documents and \$2k for misc. costs (e.g. travel expenses). These documents will provide further, standardized guidance on safe and effective aviation-related activities.						
2017	RAMP Incremental	13	2	0	15	0.1	1-Sided Adj	RPISANES20170307182237007
Explanation:		RAMP baseline and proposed activity- Staff Aviation Services Department (ASD) to include a position dedicated to observing internal and external aviation construction operations. Position will provide oversight and spot correction and have the authority to "shut down" operations if an unsafe condition persists -Operations Advisor. Labor calculation based on 10% O&M allocation; Non-labor covers misc. costs to support position requirements (e.g. travel expenses, supplies).						
2017	RAMP Incremental	0	16	0	16	0.0	1-Sided Adj	RPISANES20170307193251227
Explanation:		RAMP proposed activity: Annual audit to ensure the Aviation Services Department (ASD) is adhering to industry best practices to mitigate risk. Costs intended to cover outside audit fees. By continuously identifying and evaluating industry practices, SDG&E can stay current as the industry evolves.						
2017	RAMP Incremental	0	264	0	264	0.0	1-Sided Adj	RPISANES20170307195430520
Explanation:		RAMP proposed activity: Utilize a twin-engine helicopter to improve the safety of flight operations. Costs represent increased utilization rate and operating costs for the helicopter. 12% of overall operations are expected to be associated with O&M activities. Expanded use of a twin-engine helicopter takes advantage of the enormous safety benefits associated with this type of aircraft.						
2017	RAMP Incremental	0	23	0	23	0.0	1-Sided Adj	RPISANES20170307201835987
Explanation:		RAMP baseline and proposed activity: Conduct currency and proficiency training with helicopter. Based on 10 hours of flight training. This training will ensure pilots continue to fly in a safe and effective manner.						

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2017	RAMP Incremental	0	49	0	49	0.0	1-Sided Adj	RPISANES20170307220531033
Explanation: RAMP proposed activity: Develop and implement Unmanned Aerial Systems (UAS) SMS which is inclusive of standard operating procedures and risk mitigation matrix. These operating procedures, along with efforts to further refine associated risks and effective mitigation measures will enhance safety for employees, contractors, and the general public.								
2017	RAMP Incremental	0	29	0	29	0.0	1-Sided Adj	RPISANES20170307220758047
Explanation: RAMP proposed activity: Develop Unmanned Aerial Services (UAS) privacy policy. This policy will provide guidance and protect the general public regarding information gathered during operations.								
2017	RAMP Incremental	0	34	0	34	0.0	1-Sided Adj	RPISANES20170307221555337
Explanation: RAMP proposed activity: Develop contractor qualification, oversight, and audit program. Based on \$30k for creation of documents and \$4k for misc. costs (e.g. travel expenses). This program will ensure that contractors are adhering to the safety and performance standards set forth by SDG&E.								
2017	RAMP Incremental	0	13	0	13	0.0	1-Sided Adj	RPISANES20170307222000050
Explanation: RAMP proposed activity: Estimated contractor costs to develop flight management controls to guarantee real time tracking and deconfliction with company aircraft. These controls will provide direct safety benefits to employees, contractors, and the general public.								
2017	RAMP Incremental	10	4	0	14	0.1	1-Sided Adj	RPISANES20170307222308217
Explanation: RAMP proposed activity: Evaluation and implementation of technology advances in Unmanned Aerial Services (UAS). The UAS field continues to evolve and adapting to new technologies allows for more effective, efficient, and safe operations. Covers O&M related costs for additional analyst, as well as associated equipment costs.								
2017	RAMP Incremental	33	0	0	33	0.3	1-Sided Adj	SGAHAGAN20170308092154497
Explanation: RAMP proposed activity: Switch Inspection and High-Risk Replacement (UG) - Proactively test, repair, or replace switches on the UG system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades. See supplemental work paper for estimate methodology.								
2017 Total		1,247	878	0	2,125	6.8		

2018 RAMP Incremental 198 0 0 198 2.0 1-Sided Adj RPISANES20161201094039800

Note: Totals may include rounding differences.

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 Workpaper: 1ED011.000 - Electric Regional Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
Explanation: RAMP Proposed Activity: Switch Inspection and High-Risk Replacement (OH) - Proactively test, repair, or replace switches on the OH system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades. See supplemental work paper for estimate methodology.								
2018	Other	0	63	0	63	0.0	1-Sided Adj	TSWETEK20170626081033053
Explanation: Additional HCOR filter socks to allow crews to pump water from subsurface structures while meeting environmental regulations. (100/year at \$630 per sock)								
2018	RAMP Incremental	200	0	0	200	2.0	1-Sided Adj	RPISANES20161201094339000
Explanation: RAMP Long Span Inspection and Repair: All long spans were inspected and repaired several years ago. We started with all spans over 1000 feet and then went down to over 900 feet and 800 feet. What was found as potential issues were repaired or intercepted and made shorter. However these spans should be re-inspected on a defined basis and repaired as needed. The average cost for one long span replacement project is \$200k. This cost is based on the average of similar projects we have completed in the past. We will perform one of these projects in 2018.								
2018	Other	80	0	0	80	1.0	1-Sided Adj	TSWETEK20170626083042563
Explanation: Additional Manager Project Manager and Business Analyst for new EDO Project Management Organization (PMO), handling efficiency initiatives. (40% O&M). The additional oversight provided by this group will more successful and cost-effective implementation of projects.								
2018	Other	0	772	0	772	0.0	1-Sided Adj	TSWETEK20170626083609390
Explanation: Two additional months of air-crane fire support due to ongoing drought conditions. Costs represent monthly contract costs at 66.5% O&M.								
2018	FOF-Ongoing	-2,794	-1,772	0	-4,566	-28.0	1-Sided Adj	RPISANES20161201095515707
Explanation: FOF- ongoing savings								
2018	Other	1,800	0	0	1,800	12.0	1-Sided Adj	RPISANES20161205132945263
Explanation: O&M portion of 20 lineman (90k per). Labor rate is \$55/hr for linemen. For each lineman, projections include \$35k in O&M related straight time work, \$30k for non-productive labor and training costs, and \$25k for O&M-related overtime. Additional lineman will improve outage response times and reliability.								
2018	FOF-Implementation	1,000	20	0	1,020	10.0	1-Sided Adj	TSWETEK20170222150816010
Explanation: FOF implementation costs								
2018	RAMP Incremental	0	37	0	37	0.0	1-Sided Adj	RPISANES20170307181013910

Note: Totals may include rounding differences.

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 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation: RAMP proposed activity: Utilize an aviation safety contractor to develop governing documents for internal and external aviation operations. Based on \$35k for creation of documents and \$2k for misc. costs (e.g. travel expenses). These documents will provide further, standardized guidance on safe and effective aviation-related activities.								
2018	RAMP Incremental	13	2	0	15	0.1	1-Sided Adj	RPISANES20170307182729980
Explanation: RAMP baseline and proposed activity- Staff Aviation Services Department (ASD) to include a position dedicated to observing internal and external aviation construction operations. Position will provide oversight and spot correction and have the authority to "shut down" operations if an unsafe condition persists -Operations Advisor. Labor calculation based on 10% O&M allocation; Non-labor covers misc. costs to support position requirements (e.g. travel expenses, supplies).								
2018	RAMP Incremental	0	16	0	16	0.0	1-Sided Adj	RPISANES20170307193601883
Explanation: RAMP proposed activity: Annual audit to ensure the Aviation Services Department (ASD) is adhering to industry best practices to mitigate risk. Costs intended to cover outside audit fees. By continuously identifying and evaluating industry practices, SDG&E can stay current as the industry evolves.								
2018	RAMP Incremental	0	264	0	264	0.0	1-Sided Adj	RPISANES20170307200932653
Explanation: RAMP proposed activity: Utilize a twin-engine helicopter to improve the safety of flight operations. Costs represent increased utilization rate and operating costs for the helicopter. 12% of overall operations are expected to be associated with O&M activities. Expanded use of a twin-engine helicopter takes advantage of the enormous safety benefits associated with this type of aircraft.								
2018	RAMP Incremental	0	23	0	23	0.0	1-Sided Adj	RPISANES20170307201849407
Explanation: RAMP baseline and proposed activity: Conduct currency and proficiency training with helicopter. Based on 10 hours of flight training. This training will ensure pilots continue to fly in a safe and effective manner.								
2018	RAMP Incremental	0	49	0	49	0.0	1-Sided Adj	RPISANES20170307220547173
Explanation: RAMP proposed activity: Develop and implement Unmanned Aerial Systems (UAS) SMS which is inclusive of standard operating procedures and risk mitigation matrix. These operating procedures, along with efforts to further refine associated risks and effective mitigation measures will enhance safety for employees, contractors, and the general public.								
2018	RAMP Incremental	0	29	0	29	0.0	1-Sided Adj	RPISANES20170307220812040
Explanation: RAMP proposed activity: Develop Unmanned Aerial Services (UAS) privacy policy. This policy will provide guidance and protect the general public regarding information gathered during operations.								
2018	RAMP Incremental	12	11	0	23	0.1	1-Sided Adj	RPISANES20170307221042937
Explanation: RAMP- Incremental - Develop UAS training program for SDG&E employees. Costs to cover both labor associated with development of the program, as well as relevant training materials.								

Note: Totals may include rounding differences.

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 Witness: William H. Speer
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 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2018	RAMP Incremental	0	34	0	34	0.0	1-Sided Adj	RPISANES20170307221609610
Explanation:		RAMP proposed activity: Develop contractor qualification, oversight, and audit program. Based on \$30k for creation of documents and \$4k for misc. costs (e.g. travel expenses). This program will ensure that contractors are adhering to the safety and performance standards set forth by SDG&E.						
2018	RAMP Incremental	0	13	0	13	0.0	1-Sided Adj	RPISANES20170307222015147
Explanation:		RAMP proposed activity: Estimated contractor costs to develop flight management controls to guarantee real time tracking and deconfliction with company aircraft. These controls will provide direct safety benefits to employees, contractors, and the general public.						
2018	RAMP Incremental	10	4	0	14	0.1	1-Sided Adj	RPISANES20170307222352427
Explanation:		RAMP proposed activity: Evaluation and implementation of technology advances in Unmanned Aerial Services (UAS). The UAS field continues to evolve and adapting to new technologies allows for more effective, efficient, and safe operations. Covers O&M related costs for additional analyst, as well as associated equipment costs.						
2018	RAMP Incremental	167	0	0	167	1.7	1-Sided Adj	SGAHAGAN20170308092456103
Explanation:		RAMP Proposed Activity: Switch Inspection and High-Risk Replacement (UG) - Proactively test, repair, or replace switches on the UG system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades. See supplemental work paper for estimate methodology.						
2018 Total		686	-435	0	251	1.0		
2019	RAMP Incremental	564	0	0	564	5.6	1-Sided Adj	RPISANES20161201094049750
Explanation:		RAMP Proposed Activity: Switch Inspection and High-Risk Replacement (OH) - Proactively test, repair, or replace switches on the OH system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades. See supplemental work paper for estimate methodology.						
2019	Other	0	772	0	772	0.0	1-Sided Adj	TSWETEK20170626084554537
Explanation:		Two additional months of air-crane fire support due to ongoing drought conditions. Costs represent monthly contract costs at 66.5% O&M.						
2019	RAMP Incremental	600	0	0	600	5.0	1-Sided Adj	RPISANES20161201094433037

Note: Totals may include rounding differences.

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<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation: RAMP Long Span Inspection and Repair: All long spans were inspected and repaired several years ago. We started with all spans over 1000 feet and then went down to over 900 feet and 800 feet. What was found as potential issues were repaired or intercepted and made shorter. However these spans should be re-inspected on a defined basis and repaired as needed. The average cost for one long span replacement project is \$150k. This cost is based on the average of similar projects we have completed in the past. We will perform three of these projects in 2019.								
2019	RAMP Incremental	13	2	0	15	0.1	1-Sided Adj	RPISANES20170628101152557
Explanation: RAMP baseline and proposed activity- Staff Aviation Services Department (ASD) to include a position dedicated to observing internal and external aviation construction operations. Position will provide oversight and spot correction and have the authority to "shut down" operations if an unsafe condition persists -Operations Advisor. Labor calculation based on 10% O&M allocation; Non-labor covers misc. costs to support position requirements (e.g. travel expenses, supplies).								
2019	FOF-Ongoing	-2,898	-1,872	0	-4,770	-29.0	1-Sided Adj	RPISANES20161201095640740
Explanation: FOF- ongoing savings								
2019	Other	80	0	0	80	1.0	1-Sided Adj	RPISANES20161205112453510
Explanation: Additional Manager Project Manager and Business Analyst for new EDO Project Management Organization (PMO), handling efficiency initiatives. (40% O&M). The additional oversight provided by this group will more successful and cost-effective implementation of projects.								
2019	Other	88	0	0	88	1.0	1-Sided Adj	RPISANES20161205113529280
Explanation: Additional supervisor and two permit coordinators for a new permitting group. Cities/counties have increased permit requirements. As a result, there is an expectation of more face-to-face interaction with dedicated permit resources. O&M calculation based on expected 7% O&M plus non-productive labor.								
2019	Other	2,790	0	0	2,790	21.0	1-Sided Adj	RPISANES20161205133000857
Explanation: O&M portion of 20 lineman (90k per). Labor rate is \$55/hr for linemen. For each lineman, projections include \$35k in O&M related straight time work, \$30k for non-productive labor and training costs, and \$25k for O&M-related overtime. Also includes additional labor resulting from incremental apprentice class. Additional lineman will improve outage response times and reliability.								
2019	Other	0	63	0	63	0.0	1-Sided Adj	RPISANES20161205135309313
Explanation: Additional HCOR filter socks to allow crews to pump water from subsurface structures while meeting environmental regulations. (100/year at \$630 per sock)								
2019	RAMP Incremental	0	37	0	37	0.0	1-Sided Adj	RPISANES20170307181359767

Note: Totals may include rounding differences.

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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation: RAMP proposed activity: Utilize an aviation safety contractor to develop governing documents for internal and external aviation operations. Based on \$35k for creation of documents and \$2k for misc. costs (e.g. travel expenses). These documents will provide further, standardized guidance on safe and effective aviation-related activities.								
2019	RAMP Incremental	0	16	0	16	0.0	1-Sided Adj	RPISANES20170307193619573
Explanation: RAMP proposed activity: Annual audit to ensure the Aviation Services Department (ASD) is adhering to industry best practices to mitigate risk. Costs intended to cover outside audit fees. By continuously identifying and evaluating industry practices, SDG&E can stay current as the industry evolves.								
2019	RAMP Incremental	0	264	0	264	0.0	1-Sided Adj	RPISANES20170307201249583
Explanation: RAMP proposed activity: Utilize a twin-engine helicopter to improve the safety of flight operations. Costs represent increased utilization rate and operating costs for the helicopter. 12% of overall operations are expected to be associated with O&M activities. Expanded use of a twin-engine helicopter takes advantage of the enormous safety benefits associated with this type of aircraft.								
2019	RAMP Incremental	0	23	0	23	0.0	1-Sided Adj	RPISANES20170307201902460
Explanation: RAMP baseline and proposed activity: Conduct currency and proficiency training with helicopter. Based on 10 hours of flight training. This training will ensure pilots continue to fly in a safe and effective manner.								
2019	RAMP Incremental	0	49	0	49	0.0	1-Sided Adj	RPISANES20170307220607063
Explanation: RAMP proposed activity: Develop and implement Unmanned Aerial Systems (UAS) SMS which is inclusive of standard operating procedures and risk mitigation matrix. These operating procedures, along with efforts to further refine associated risks and effective mitigation measures will enhance safety for employees, contractors, and the general public.								
2019	RAMP Incremental	0	29	0	29	0.0	1-Sided Adj	RPISANES20170307220830950
Explanation: RAMP proposed activity: Develop Unmanned Aerial Services (UAS) privacy policy. This policy will provide guidance and protect the general public regarding information gathered during operations.								
2019	RAMP Incremental	12	11	0	23	0.1	1-Sided Adj	RPISANES20170307221116280
Explanation: RAMP- Incremental - Develop UAS training program for SDG&E employees. Costs to cover both labor associated with development of the program, as well as relevant training materials.								
2019	RAMP Incremental	0	34	0	34	0.0	1-Sided Adj	RPISANES20170307221625787
Explanation: RAMP proposed activity: Develop contractor qualification, oversight, and audit program. Based on \$30k for creation of documents and \$4k for misc. costs (e.g. travel expenses). This program will ensure that contractors are adhering to the safety and performance standards set forth by SDG&E.								

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2019	RAMP Incremental	0	13	0	13	0.0	1-Sided Adj	RPISANES20170307222032317
Explanation:		RAMP proposed activity: Estimated contractor costs to develop flight management controls to guarantee real time tracking and deconfliction with company aircraft. These controls will provide direct safety benefits to employees, contractors, and the general public.						
2019	RAMP Incremental	10	4	0	14	0.1	1-Sided Adj	RPISANES20170307222411237
Explanation:		RAMP proposed activity: Evaluation and implementation of technology advances in Unmanned Aerial Services (UAS). The UAS field continues to evolve and adapting to new technologies allows for more effective, efficient, and safe operations. Covers O&M related costs for additional analyst, as well as associated equipment costs.						
2019	RAMP Incremental	475	0	0	475	4.8	1-Sided Adj	SGAHAGAN20170308092526067
Explanation:		RAMP Proposed Activity: Switch Inspection and High-Risk Replacement (UG) - Proactively test, repair, or replace switches on the UG system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades. See supplemental work paper for estimate methodology.						
2019	RAMP Incremental	0	6,000	0	6,000	0.0	1-Sided Adj	RPISANES20161205092949917
Explanation:		RAMP proposed activity: Customer Communications Safety - Communications campaign (outreach and education) geared toward "wire down awareness but also other electric safety issues (e.g. car-pole contacts, tree contacts, ladder contact, etc.).						
2019 Total		1,734	5,445	0	7,179	9.7		

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	19,649	19,030	18,334	18,013	18,863
Non-Labor	11,645	10,824	10,772	12,755	14,329
NSE	0	0	0	0	0
Total	31,294	29,854	29,106	30,768	33,192
FTE	178.8	173.4	161.4	159.0	160.5
Adjustments (Nominal \$) **					
Labor	-464	-619	-585	82	-576
Non-Labor	-46	-67	-59	-36	-37
NSE	0	0	0	0	0
Total	-510	-685	-644	46	-613
FTE	-6.0	-7.8	-7.3	-0.3	-7.0
Recorded-Adjusted (Nominal \$)					
Labor	19,186	18,411	17,749	18,094	18,287
Non-Labor	11,598	10,757	10,713	12,719	14,292
NSE	0	0	0	0	0
Total	30,784	29,169	28,461	30,814	32,579
FTE	172.8	165.6	154.1	158.7	153.5
Vacation & Sick (Nominal \$)					
Labor	2,780	2,920	2,834	2,794	3,034
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	2,780	2,920	2,834	2,794	3,034
FTE	27.9	29.0	27.6	27.6	27.7
Escalation to 2016\$					
Labor	2,035	1,480	968	496	0
Non-Labor	261	112	3	11	0
NSE	0	0	0	0	0
Total	2,296	1,592	971	508	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	24,001	22,812	21,551	21,384	21,321
Non-Labor	11,859	10,869	10,716	12,731	14,292
NSE	0	0	0	0	0
Total	35,860	33,681	32,267	34,115	35,613
FTE	200.7	194.6	181.7	186.3	181.2

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	-464	-619	-585	82	-576
Non-Labor	-46	-67	-59	-36	-37
NSE	0	0	0	0	0
Total	-510	-685	-644	46	-613
FTE	-6.0	-7.8	-7.3	-0.3	-7.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012	Other	-70	-8	0	-1.2	CCTR Transf To 2100-0129.000	RPISANES20161121051049283
Explanation: move dispatch-related costs to customer service as part of reorganization							
2012	Other	-229	-23	0	-2.4	CCTR Transf To 2100-0129.000	RPISANES20161121051302140
Explanation: move dispatch-related costs to customer service as part of reorganization							
2012	Other	-165	-16	0	-2.4	1-Sided Adj	RPISANES20161121051438767
Explanation: move dispatch-related costs to customer service as part of reorganization							
2012	Other	165	16	0	2.4	1-Sided Adj	RPISANES20161121051619063
Explanation: fix incorrect posting (needs to be transfer vs 1-sided)							
2012	Other	-165	-16	0	-2.4	CCTR Transf To 2100-0129.000	RPISANES20161121051755123
Explanation: move dispatch-related costs to customer service as part of reorganization							
2012 Total		-464	-46	0	-6.0		
2013	Other	-174	-22	0	-1.6	CCTR Transf To 2100-0129.000	RPISANES20161121051935080
Explanation: move dispatch-related costs to customer service as part of reorganization							
2013	Other	-289	-31	0	-3.4	CCTR Transf To 2100-0129.000	RPISANES20161121052523723
Explanation: move dispatch-related costs to customer service as part of reorganization							
2013	Other	-156	-14	0	-2.8	CCTR Transf To 2100-0129.000	RPISANES20161121052758250
Explanation: move dispatch-related costs to customer service as part of reorganization							
2013 Total		-619	-67	0	-7.8		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2014	Other	-42	-17	0	-0.5	CCTR Transf To 2100-0129.000	RPISANES20161121053203130
Explanation: move dispatch-related costs to customer service as part of reorganization							
2014	Other	-308	-25	0	-4.0	CCTR Transf To 2100-0129.000	RPISANES20161121053341473
Explanation: move dispatch-related costs to customer service as part of reorganization							
2014	Other	-236	-17	0	-2.8	CCTR Transf To 2100-0129.000	RPISANES20161121053505237
Explanation: move dispatch-related costs to customer service as part of reorganization							
2014 Total		-585	-59	0	-7.3		
2015	Other	682	0	0	6.5	1-Sided Adj	RPISANES20161112094546100
Explanation: Dec 2015 MyTime Missing Labor Accrual							
2015	Other	-36	-4	0	-0.4	CCTR Transf To 2100-0129.000	RPISANES20161121053734377
Explanation: move dispatch-related costs to customer service as part of reorganization							
2015	Other	-357	-16	0	-3.6	CCTR Transf To 2100-0129.000	RPISANES20161121053901130
Explanation: move dispatch-related costs to customer service as part of reorganization							
2015	Other	-207	-16	0	-2.8	CCTR Transf To 2100-0129.000	RPISANES20161121054025473
Explanation: move dispatch-related costs to customer service as part of reorganization							
2015 Total		82	-36	0	-0.3		
2016	Other	-73	-37	0	-0.9	CCTR Transf To 2100-0129.000	RPISANES20170226172514473
Explanation: move dispatch-related costs to customer service as part of reorganization							
2016	Other	-251	0	0	-3.0	CCTR Transf To 2100-0129.000	RPISANES20170226172618157
Explanation: move dispatch-related costs to customer service as part of reorganization							
2016	Other	-251	0	0	-3.1	CCTR Transf To 2100-0129.000	RPISANES20170226172706937
Explanation: move dispatch-related costs to customer service as part of reorganization							
2016 Total		-576	-37	0	-7.0		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 1

Ref ID: ALLLACUN20170308160402527

RAMP Chapter: SDG&E-3

Program Name: Personal Protection Equipment (PPE)

Program Description: Includes stock items and non stock items. Forecast methodology - Fixed contract price through 2018, with 4% assumed increase for 2019

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety.

Mitigation: SDG&E Employee Contractor & Public Safety

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	232	232	232
High	278	278	278

Funding Source: CPUC-GRC

Forecast Method: Other

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 232

Explanation: 2015 actuals of 232

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 2

Ref ID: ALLLACUN20170308165010543

RAMP Chapter: SDG&E-3

Program Name: Fire Retardent Uniform Costs

Program Description: Supplying and laundering of FR clothing

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety.

Mitigation: Safety Policies & Programs

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	501	501	501
High	601	601	601

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 562

Explanation: 2015 actuals of 561 escalated to 2016 by dividing by 0.9991

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 3

Ref ID: ALLLACUN20170308170210457

RAMP Chapter: SDG&E-3

Program Name: Behavior Based Safety (BBS) Program

Program Description: A proactive approach to safety and health management focusing on principles that recognize at-risk as a frequent cause of both minor and serious injuries. The purpose is to reduce the occurrence of at-risk behaviors by modifying individuals actions and/or behaviors through observation, feedback and positive interventions aimed at developing safe work habits.

Risk/Mitigation:

Risk: Employee, Contractor, and Public Safety

Mitigation: Field Observation and Behavior Based Safety Programs

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	872	872	872
High	1,046	1,046	1,046

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 639

Explanation: 2015 actuals of 631 escalated to 2016 by dividing by 0.98795

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 4

Ref ID: ALLLACUN20170308172632850

RAMP Chapter: SDG&E-3

Program Name: Customer Communications - Safety

Program Description: Communications campaign (outreach and education) geared toward “wire down awareness but also other electric safety issues (e.g. car-pole contacts, tree contacts, ladder contact, etc.).

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety.

Mitigation: Customer Communications and First Responder Training

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	1,000	3,000	5,000
High	1,200	3,600	6,000

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 101

Explanation: 2015 actuals of 100 escalated to 2016 by dividing by 0.98795

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 5

Ref ID: ALLLACUN20170628100938417

RAMP Chapter: SDG&E-3

Program Name: Regular safety meetings

Program Description: Regular Safety Meetings, which includes safety stand downs, safety tailgates, safety meetings and safety committees.

Risk/Mitigation:

Risk: Employee, Contractor, and Public Safety.

Mitigation: Regular safety meetings with Field employees.

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	3,524	3,524	3,524
High	4,229	4,229	4,229

Funding Source: CPUC-GRC

Forecast Method: Base Year

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 3600

Explanation: 2015 actuals of 3,524 escalated to 2016 by dividing by 0.9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 6

Ref ID: RPISANES20161201094025347

RAMP Chapter: SDG&E-12

Program Name: Switch Inspection and High-Risk Replacement

Program Description: Proactively test, repair, or replace switches on the OH system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades.

Risk/Mitigation:

Risk: Electric Infrastructure Integrity

Mitigation: Distribution Switch Maintenance Program - OH

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	1,030	1,030	1,030
High	1,339	1,339	1,339

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 7

Ref ID: RPISANES20161201094331893

RAMP Chapter: SDG&E-1

Program Name: Long Span Inspection and Repair

Program Description: All long spans were inspected and repaired several years ago. We started with all spans over 1000 feet and then went down to over 900 feet and 800 feet. What was found as potential issues were repaired or intercepted and made shorter. However these spans should be re-inspected on a defined basis and repaired as needed.

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Inspection & Repair Programs

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	500	500	500
High	650	650	650

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical spend noted in RAMP workpapers.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 8

Ref ID: RPISANES20170307171140290

RAMP Chapter: SDG&E-8

Program Name: Aviation Services Department SMS

Program Description: Comprehensive safety management approach consisting of policies and procedures applicable for aviation

Risk/Mitigation:

Risk: SDG&E Aviation Incident

Mitigation: Aviation Safety Management System SMS which is inclusive of a contractor qualification process and f

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	28	28	28
High	39	39	39

Funding Source: CPUC-GRC

Forecast Method: Trend

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 34

Explanation: 2015 costs of \$33k divided by .9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 9

Ref ID: RPISANES20170307180451897

RAMP Chapter: SDG&E-8

Program Name: Governing Document Development

Program Description: Development of separate policies for internal and external aviation operations

Risk/Mitigation:

Risk: SDG&E Aviation Incident

Mitigation: Aviation Safety Management System (SMS)

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	29	29	29
High	37	37	37

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 10

Ref ID: RPISANES20170307182237007

RAMP Chapter: SDG&E-8

Program Name: Aviation Job Site Observation Program

Program Description: Program that provides SDG&E aviation oversight of internal and contractor aviation construction operations

Risk/Mitigation:

Risk: SDG&E Aviation Incident

Mitigation: Job Site Observation Program

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	11	11	11
High	15	15	15

Funding Source: CPUC-GRC

Forecast Method: Trend

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 11

Explanation: 2015 baseline costs of \$11k divided by .9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 11

Ref ID: RPISANES20170307184101760

RAMP Chapter: SDG&E-8

Program Name: Service Provided Audit Program

Program Description: Third party oversight program that provides an independent perspective regarding how to meet a standard of safety recognized through the aviation industry

Risk/Mitigation:

Risk: SDG&E Aviation Incident
 Mitigation: Service Provider Audit Program

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	6	6	6
High	7	7	7

Funding Source: CPUC-GRC
 Forecast Method: Trend
 Work Type: Non-Mandated
 Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 6
 Explanation: 2015 costs of \$6k divided by .9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 12

Ref ID: RPISANES20170307193251227

RAMP Chapter: SDG&E-8

Program Name: Audit of Aviation Services Department's SMS

Program Description: Annual audit of Aviation Services Department's SMS utilizing a reputable aviation audit service

Risk/Mitigation:

Risk: SDG&E Aviation Incident

Mitigation: Services Provider Audit Program

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	13	13	13
High	16	16	16

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
 2019 GRC - APP
 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 13

Ref ID: RPISANES20170307194921453

RAMP Chapter: SDG&E-8

Program Name: Best Practices Training

Program Description: Training implementing best safety practices from throughout the aviation industry from a variety of sources

Risk/Mitigation:

Risk: SDG&E Aviation Incident
 Mitigation: Best Practices Training

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	0	0	0
High	0	0	0
Funding Source: CPUC-GRC			
Forecast Method: Zero-Based			
Work Type: Non-Mandated			
Work Type Citation: N/A			

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 4
 Explanation: 2015 costs of \$4k divided by .9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 14

Ref ID: RPISANES20170307195430520

RAMP Chapter: SDG&E-8

Program Name: Purchase a Twin-Engine Helicopter

Program Description: Helicopter enables a dual-redundant system where single-point failure exists; thereby cutting the frequency of an accident (if one were to occur) by half

Risk/Mitigation:

Risk: SDG&E Aviation Incident

Mitigation: Purchase a Twin-Engine Helicopter

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	203	203	203
High	264	264	264

Funding Source: CPUC-GRC

Forecast Method: Trend

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 15

Ref ID: RPISANES20170307201835987

RAMP Chapter: SDG&E-8

Program Name: Aviation Safety Training

Program Description: Policy and procedure foundation consisting of an initial training manual for internal use of pilot development, continued training costs for currency and performance development, and case-by-case skills performance development.

Risk/Mitigation:

Risk: SDG&E Aviation Incident
 Mitigation: Aviation Safety Training

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	18	18	18
High	23	23	23

Funding Source: CPUC-GRC

Forecast Method: Trend

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 16

Ref ID: RPISANES20170307205231870

RAMP Chapter: SDG&E-11

Program Name: UAS Weight Limitations

Program Description: SDG&E restricted the acquisition of any UAS with a weight in excess of 55 pounds to lessen the severity of an aircraft incident

Risk/Mitigation:

Risk: Unmanned Aircraft System Incident

Mitigation: UAS Weight Limitations

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	0	0	0
High	0	0	0

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 17

Ref ID: RPISANES20170307213133960

RAMP Chapter: SDG&E-11

Program Name: Pilot in Command Experience and Training Requirements

Program Description: Federal Aviation Administration regulations required licensed recreational pilots to operate a commercial UAS

Risk/Mitigation:

Risk: Unmanned Aircraft System Incident

Mitigation: Pilot in Command Experience and Training Requirements

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	0	0	0
High	0	0	0

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 18

Ref ID: RPISANES20170307214138193

RAMP Chapter: SDG&E-11

Program Name: UAS Software and Hardware Checked Prior to Flight

Program Description: SDG&E systematically checked UAS software and hardware for latest upgrades as a best practice

Risk/Mitigation:

Risk: Unmanned Aircraft System Incident

Mitigation: UAS Software and Hardware Checked Prior to Flight

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	0	0	0
High	0	0	0

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 19

Ref ID: RPISANES20170307214907270

RAMP Chapter: SDG&E-11

Program Name: Flights not conducted near aircraft or people or within five miles of an airport without air traffic

Program Description: SDG&E UAS maintained distance from the general public and private property, and suspended flight operations as safety measures

Risk/Mitigation:

Risk: Unmanned Aircraft System Incident

Mitigation: Flights not conducted near aircraft or people or within five miles of an airport without air traffic

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	0	0	0
High	0	0	0

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 20

Ref ID: RPISANES20170307215338540

RAMP Chapter: SDG&E-11

Program Name: Complied with state and federal UAS regulations

Program Description: SDG&E monitored state and federal rules and regulations concerning UAS

Risk/Mitigation:

Risk: Unmanned Aircraft System Incident

Mitigation: Complied with state and federal UAS regulations

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	0	0	0
High	0	0	0

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 21

Ref ID: RPISANES20170307220531033

RAMP Chapter: SDG&E-11

Program Name: UAS SMS

Program Description: A systematic approach to managing safety to better capture, analyze, and understand performance information and flight data, leading to programmatic changes that prevent failures.

Risk/Mitigation:

Risk: Unmanned Aircraft System Incident

Mitigation: UAS Safety Management System

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	34	34	34
High	49	49	49

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 22

Ref ID: RPISANES20170307220758047

RAMP Chapter: SDG&E-11

Program Name: UAS Privacy Policy

Program Description: A policy to be created in compliance with industry best practices. The development of this policy will drive changes to the Aviation Operations Manual and Training Documentation.

Risk/Mitigation:

Risk: Unmanned Aircraft System Incident

Mitigation: UAS Safety Management System

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	20	20	20
High	29	29	29

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 23

Ref ID: RPISANES20170307221020903

RAMP Chapter: SDG&E-11

Program Name: UAS Training Program for SDG&E Employees

Program Description: Policy and procedure foundation for SDG&E employees upon which all operations would be based.

Risk/Mitigation:

Risk: Unmanned Aircraft Systems Incident

Mitigation: UAS Training Program for SDG&E employees

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	16	16	16
High	23	23	23

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 24

Ref ID: RPISANES20170307221555337

RAMP Chapter: SDG&E-11

Program Name: Contractor Qualification, Oversight, and Audit Program

Program Description: A third party assessment of SDG&E's operational processes allowing external input into an otherwise internal workflow.

Risk/Mitigation:

Risk: Unmanned Aircraft System Incident

Mitigation: Contractor Qualification, Oversight, and Audit Program

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	23	23	23
High	34	34	34

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 25

Ref ID: RPISANES20170307222000050

RAMP Chapter: SDG&E-11

Program Name: Flight Management Controls

Program Description: Fleet management software to monitor, track, and maintain aircraft data

Risk/Mitigation:

Risk: Unmanned Aircraft Systems Incident

Mitigation: Flight management controls

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	9	9	9
High	13	13	13

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 26

Ref ID: RPISANES20170307222308217

RAMP Chapter: SDG&E-11

Program Name: Research Bet Use Cases for Specific Systems as Technology advances

Program Description: The utilization of outside vendors and consultants to incorporate the latest opportunities for safety, efficiency, and efficacy into SDG&E's UAS operations.

Risk/Mitigation:

Risk: Unmanned Aircraft System Incident

Mitigation: Research Best Use cases for specific systems as technology advances

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	10	10	10
High	14	14	14

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 27

Ref ID: SGAHAGAN20170222091920230

RAMP Chapter: SDG&E-1

Program Name: QA/QC Program - HRFA

Program Description: The QA/QC program is an annual inspection and repair program of the overhead facilities within the HRFA. Every year 1/3 of the facilities within the HRFA are inspected for potential sources of ignition. Once found these issues are then repaired before the start of the fire season which is usually determined to be Sept 1 of the same year.

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Inspection, Repair, Maintenance & Replacement Programs

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	370	370	370
High	481	481	481

Funding Source: CPUC-GRC

Forecast Method: Trend

Work Type: Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 379

Explanation: 2015 actuals in RAMP of \$370k, escalated to 2016 by dividing by 0.9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 28

Ref ID: SGAHAGAN20170227135827327

RAMP Chapter: SDG&E-1

Program Name: Helo and Sunbird Availability

Program Description: Contract helo support during high fire season to support fire suppression

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Fire Potential Index; weather network; firefighting contractors/crew staging/sunbird availability; c

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	1,750	1,750	1,750
High	2,275	2,275	2,275

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 2220

Explanation: 2015 actuals of \$2,218k escalated to 2016 by dividing by 0.9991

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 29

Ref ID: SGAHAGAN20170227140137213

RAMP Chapter: SDG&E-1

Program Name: Crew Staging & Mobilization

Program Description: During Red Flag events, crews are stationed in high wind areas and are ready to react in the event of an outage

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Fire Potential Index; weather network; firefighting contractors/crew staging/sunbird availability; c

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	1,300	1,300	1,300
High	1,690	1,690	1,690

Funding Source: CPUC-GRC

Forecast Method: Trend

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 819

Explanation: 2015 actuals of \$800 escalated to 2016 by dividing by 0.9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 30

Ref ID: SGAHAGAN20170228151326640

RAMP Chapter: SDG&E-1

Program Name: Field Patrols

Program Description: Crew required when circuit is de-energized to visually confirm the continuity of the circuit before it is re-energized for safety

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Improved operational response to varying conditions; de-energization (high winds during fire weather

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	55	55	55
High	72	72	72

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 56

Explanation: 2015 actuals of \$55k escalated to 2016 by dividing by 0.9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 31

Ref ID: SGAHAGAN20170302135745543

RAMP Chapter: SDG&E-1

Program Name: Coordination with communications infrastructure providers

Program Description: Telecommunications Equipment Attachment Management System (TEAMS) program to communicate/coordinate with CIP providers to clear CIP facilities safety issues attached to SDG&E poles

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Improved operational response to varying conditions; de-energization (high winds during fire weather

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	20	20	20
High	26	26	26

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 20

Explanation: 2015 actuals of \$20k escalated to 2016

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 32

Ref ID: SGAHAGAN20170306152146143

RAMP Chapter: SDG&E-12

Program Name: Annual Pole Reinforcement

Program Description: Cyclical program aimed to reinforce pole bases with "C-Truss" devices for added structural support.

Risk/Mitigation:

Risk: Electric Infrastructure Integrity
 Mitigation: GO165: Distribution Inspect and Repair program

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	1,232	1,232	1,232
High	1,602	1,602	1,602
Funding Source: CPUC-GRC			
Forecast Method: Average			
Work Type: Mandated			
Work Type Citation: GO 165			

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 1207
 Explanation: 2015 actuals of \$1179k escalated to 2016 (0.9768 escalation factor)

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 33

Ref ID: SGAHAGAN20170308092154497

RAMP Chapter: SDG&E-12

Program Name: Switch Inspection and High-Risk Replacement UG

Program Description: Proactively test, repair, or replace switches on the UG system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades.

Risk/Mitigation:

Risk: Electric Infrastructure Integrity

Mitigation: Distribution Switch Maintenance Program - UG

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	1,280	1,280	1,280
High	1,664	1,664	1,664

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: I. Electric Regional Operations
Category-Sub: 1. Electric Regional Operations
Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 34

Ref ID: TSWETEK20170305093846443

RAMP Chapter: SDG&E-13

Program Name: Employee Records Management training course.

Program Description: Course required biennially to train employees on records management policies and procedures.

Risk/Mitigation:

Risk: The risk of not having an effective records manage

Mitigation: Biennial required employee training on records management policies and procedures.

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	399	399	399
High	1,198	1,198	1,198

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 39

Explanation: Took 2015 Actual and escalated based on Labor Escalation Rate

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: I. Electric Regional Operations
 Category-Sub: 1. Electric Regional Operations
 Workpaper: 1ED011.000 - Electric Regional Operations

RAMP Item # 35

Ref ID: TSWETEK20170626085108070

RAMP Chapter: SDG&E-17

Program Name: Replace Critical Roles

Program Description: •Apprentice Lineman program

Risk/Mitigation:

Risk: "Workforce Planning": Loss of employees with deep knowledge, understanding and experience in Operat

Mitigation: 'Knowledge transfer tools and processes are available; Workforce planning tools and templates available to identify labor force gaps, and develop staffing and employee development solutions

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	1,256	1,481	1,884
High	2,758	3,039	3,542

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 1094

Explanation: 2015 escalated to 2016

Supplemental Workpapers for Workpaper 1ED011.000

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Electric Regional Operations
Work Group - 1ED011.000
Cost Center - Electric Regional Operations

Witness - D Weim
Cost Center Mgr - multiple

\$000's	2012 Actual			2013 Actual			2014 Actual			2015 Actual			2016 Actual		
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE
Recorded Historical	24,001	11,859	200.6	22,812	10,869	194.6	21,551	10,716	181.7	21,384	12,731	186.3	21,321	14,292	181.2
TOTAL	24,001	11,859	200.6	22,812	10,869	194.6	21,551	10,716	181.7	21,384	12,731	186.3	21,321	14,292	181.2

FORECAST	2017			2018			2019			FORECASTING METHODOLOGY		
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Base year recorded plus incremental increases identified		
	22,568	15,170	187.9	22,007	13,857	182.1	23,055	19,737	190.8			

Incremental Increases / Decreases for Future Years:

Category	2017			2018			2019			Explanation
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	
RAMP	40	0	0.4	198	0	2.0	564	0	5.6	RAMP proposed activity: Switch Inspection and High-Risk Replacement (OH) - Proactively test, repair, or replace switches on the OH system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades.
RAMP	0	37	0.0	0	37	0.0	0	37	0.0	RAMP proposed activity: Utilize an aviation safety contractor to develop governing documents for internal and external aviation operations. Based on \$35k for creation of documents and \$2k for misc. costs (e.g. travel expenses). These documents will provide further, standardized guidance on safe and effective aviation-related activities.
RAMP	13	2	0.1	13	2	0.1	13	2	0.1	RAMP baseline and proposed activity- Staff Aviation Services Department (ASD) to include a position dedicated to observing internal and external aviation construction operations. Position will provide oversight and spot correction and have the authority to "shut down" operations if an unsafe condition persists -Operations Advisor. Labor calculation based on 10% O&M allocation; Non-labor covers misc. costs to support position requirements (e.g. travel expenses, supplies).
RAMP	0	16	0.0	0	16	0.0	0	16	0.0	RAMP proposed activity: Annual audit to ensure the Aviation Services Department (ASD) is adhering to industry best practices to mitigate risk. Costs intended to cover outside audit fees. By continuously identifying and evaluating industry practices, SDG&E can stay current as the industry evolves.
RAMP	0	264	0.0	0	264	0.0	0	264	0.0	RAMP proposed activity: Utilize a twin-engine helicopter to improve the safety of flight operations. Costs represent increased utilization rate and operating costs for the helicopter. 12% of overall operations are expected to be associated with O&M activities. Expanded use of a twin-engine helicopter takes advantage of the enormous safety benefits associated with this type of aircraft.
RAMP	0	23	0.0	0	23	0.0	0	23	0.0	RAMP baseline and proposed activity: Conduct currency and proficiency training with helicopter. Based on 10 hours of flight training. This training will ensure pilots continue to fly in a safe and effective manner.
RAMP	0	49	0.0	0	49	0.0	0	49	0.0	RAMP proposed activity: Develop and implement Unmanned Aerial Systems (UAS) SMS which is inclusive of standard operating procedures and risk mitigation matrix. These operating procedures, along with efforts to further refine associated risks and effective mitigation measures will enhance safety for employees, contractors, and the general public.
RAMP	0	29	0.0	0	29	0.0	0	29	0.0	RAMP proposed activity: Develop Unmanned Aerial Services (UAS) privacy policy. This policy will provide guidance and protect the general public regarding information gathered during operations.
RAMP	0	34	0.0	0	34	0.0	0	34	0.0	RAMP proposed activity: Develop contractor qualification, oversight, and audit program. Based on \$30k for creation of documents and \$4k for misc. costs (e.g. travel expenses). This program will ensure that contractors are adhering to the safety and performance standards set forth by SDG&E.
RAMP	0	13	0.0	0	13	0.0	0	13	0.0	RAMP proposed activity: Estimated contractor costs to develop flight management controls to guarantee real time tracking and deconfliction with company aircraft. These controls will provide direct safety benefits to employees, contractors, and the general public.
RAMP	10	4	0.1	10	4	0.1	10	4	0.1	RAMP proposed activity: Evaluation and implementation of technology advances in Unmanned Aerial Services (UAS). The UAS field continues to evolve and adapting to new technologies allows for more effective, efficient, and safe operations. Covers O&M related costs for additional analyst, as well as associated equipment costs.
RAMP	33	0	0.3	167	0	1.7	475	0	4.8	RAMP proposed activity: Switch Inspection and High-Risk Replacement (UG) - Proactively test, repair, or replace switches on the UG system with notable potential for failure. Program excludes do not operate energized (DOE), sulfur hexafluoride (SF6), and other switches already slated for SCADA upgrades.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Incremental Increases / Decreases for Future Years:

Category	2017			2018			2019			Explanation
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	
RAMP				200	0	2.0	600	0	5.0	RAMP Long Span Inspection and Repair: All long spans were inspected and repaired several years ago. We started with all spans over 1000 feet and then went down to over 900 feet and 800 feet. What was found as potential issues were repaired or intercepted and made shorter. However these spans should be re-inspected on a defined basis and repaired as needed. The average cost for one long span replacement project is \$200k. This cost is based on the average of similar projects we have completed in the past. We will perform three of these projects in 2019.
RAMP				12	11	0.1	12	11	0.1	RAMP- Incremental - Develop UAS training program for SDG&E employees. Costs to cover both labor associated with development of the program, as well as relevant training materials.
RAMP							0	6000	0.0	RAMP proposed activity: Customer Communications Safety - Communications campaign (outreach and education) geared toward wire down awareness but also other electric safety issues (e.g. car-
Environmental and Regulatory Compliance	0	63	0.0	0	63	0.0	0	63	0.0	Additional HCOR filter socks to allow crews to pump water from subsurface structures while meeting environmental regulations. (100/yr at \$630 per sock).
Safety and Reliability	0	772	0.0	0	772	0.0	0	772	0.0	Two additional months of air-crane fire support due to ongoing drought conditions. Costs represent monthly contract costs at 66.5% O&M.
Safety and Reliability	1800	0	12.0	1800	0	12.0	2790	0	21.0	O&M portion of 20 lineman (90k per). Labor rate is \$55/hr for linemen. For each lineman, projections include \$35k in O&M related straight time work, \$30k for non-productive labor and training costs, and \$25k for O&M-related overtime. Also includes additional labor resulting from incremental apprentice class. Additional lineman lineman will improve outage response times and reliability.
System Growth	88	0	1.0				88	0	1.0	Additional supervisor and two permit coordinators for a new permitting group. Cities/counties have increased permit requirements. As a result, there is an expectation of more face-to-face interaction with dedicated permit resources. O&M calculation based on expected 7% O&M plus non-productive labor.
Workforce Development	80	0	1.0	80	0	1.0	80	0	1.0	Additional Manager Project Manager and Business Analyst for new EDO Project Management Organization (PMO), handling efficiency initiatives. (40% O&M). The additional oversight provided by this group will more successful and cost-effective implementation of projects.
Fueling Our Future Initiatives	-817	-1120	-8.1	-2794	-1772	-28.0	-2898	-1872	-29.0	FOF- ongoing savings
Fueling Our Future Initiatives	0	692	0.0	1000	20	10.0				FOF implementation costs

San Diego Gas & Electric Company
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Public Safety Campaign

Objective: inform and educate people about what they can do to stay safe around gas and electricity. Historically, we've relied on low-cost and no-cost channels to communicate safety messaging. There have been specific incidents involving electricity or natural gas where people have been hurt or injured. To help people understand certain situations can be dangerous, a year-long effort is proposed.

	2017	2018	2019
Videos			
Safety around downed power lines	\$0	\$0	\$50,000
Tree trimming	\$0	\$0	\$50,000
Electric Safety	\$0	\$0	\$50,000
Furnace/Carbon Monoxide Safety	\$0	\$0	\$50,000
Dig Alert, call 8-1-1	\$0	\$0	\$50,000
Dangers of Reverse Power Flow	\$0	\$0	\$50,000
Safety for kids	\$0	\$0	\$50,000
Total	\$0	\$0	\$350,000
TV spots			
Cut downs from videos (5-7 spots)	\$0	\$0	\$105,000
Total	\$0	\$0	\$105,000
Billboards			
Creative/Production (5-7 boards)	\$0	\$0	\$100,000
Placement (avg \$50K/board x 3 boards per month)	\$0	\$0	\$1,800,000
Total	\$0	\$0	\$1,900,000
Advertising			
Planning	\$0	\$0	\$40,000
TV (four, six-week flights)	\$0	\$0	\$2,000,000
Radio (four, six-week flights)	\$0	\$0	\$800,000
Newspaper, includes U-T + ethnic & community pubs (four, six-week flights)	\$0	\$0	\$600,000
Digital (four, six-week flights)	\$0	\$0	\$430,000
Total	\$0	\$0	\$3,870,000
Direct Communication			
Email/Direct Mail (2xs per year)	\$0	\$0	\$100,000
Total	\$0	\$0	\$100,000
Collateral			
Brochures/fact sheets/pocket cards	\$0	\$0	\$30,000
Total	\$0	\$0	\$30,000
Website (sdge.com)			
Content development	\$0	\$0	\$75,000
Paid Social Media	\$0	\$0	\$25,000
Total	\$0	\$0	\$100,000
 GRAND TOTAL	 \$0	 \$0	 \$6,000,000

2019 TOTAL = \$6,000,000

Aviation Services Requests

SDG&E has identified risks associated with aviation operations incidents that damage electric transmission, distribution, and/or gas transmission facilities and may result in employee or customer injury or death. Accordingly, SDG&E is proposing a set of enhancement programs aimed at addressing aircraft or equipment failure, pilot error or inexperience, field error or ground crew inexperience, inadequate preflight planning. Collectively, these programs involve increased oversight of contractor/service providers, pilot currency and proficiency training, aviation construction observation/supervision, enhancements to existing policies and procedures, and utilization of an operationally safer helicopter. **For 2019, these requests total \$1,174,000.**

	2017			2018			2019		
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE
Aviation Services Totals	\$ 13	\$ 1,161	0.1	\$ 13	\$ 1,161	0.1	\$ 13	\$ 1,161	0.1

Unmanned Aerial Systems (UAS) Requests

As the utilization of Unmanned Aircraft Systems (UAS) continues to expand, additional controls and programs need to be instituted to ensure safe operations within the utility environment. Specifically, this includes the development of policies and procedures, training programs, operational oversight, and utilization of new technologies. **For 2019, these requests total \$115,000.**

	2017			2018			2019		
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE
UAS Totals	\$ 10	\$ 82	0.1	\$ 22	\$ 93	0.2	\$ 22	\$ 93	0.2

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: J. Skills & Compliance Training
Workpaper: 1ED013.000

Summary for Category: J. Skills & Compliance Training

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	3,451	3,591	3,619	3,897
Non-Labor	682	682	817	764
NSE	0	0	0	0
Total	4,133	4,273	4,436	4,661
FTE	31.6	33.6	34.5	37.5

Workpapers belonging to this Category:

1ED013.000 Skills & Compliance Training

Labor	3,451	3,591	3,619	3,897
Non-Labor	682	682	817	764
NSE	0	0	0	0
Total	4,133	4,273	4,436	4,661
FTE	31.6	33.6	34.5	37.5

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED013.000 - Skills & Compliance Training

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: J. Skills & Compliance Training
 Category-Sub: 1. Skills & Compliance Training
 Workpaper: 1ED013.000 - Skills & Compliance Training

Activity Description:

Skills Training is responsible for the development and training of the Electric Regional Operations (ERO) workforce, which consists of electric field personnel, non-electrical support personnel, and supervisory staff. The core training provided by this organization consists of the following: electric linemen development using a three-year apprenticeship program; compliance training to meet federal, state, local, safety, and environmental regulations; equipment operations and commercial drivers' training; and providing training support for other business units.

Forecast Explanations:

Labor - Base YR Rec

The Base Year Recorded Plus Incremental Increases methodology outlines the workforce and safety compliance program support along with a three-year projection for incorporating and additional apprentice program and establishing a Safety Center of Excellence.

Non-Labor - Base YR Rec

The Base Year recorded plus incremental increases methodology reflects costs associated with training programs to enhance safety and environmental concerns along with a three-year projection for incorporating and additional apprentice program.

NSE - Base YR Rec

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		2,469	2,578	2,321	2,936	3,451	3,591	3,619	3,897	
Non-Labor		674	775	450	783	682	681	816	763	
NSE		0	0	0	0	0	0	0	0	
Total		3,144	3,353	2,772	3,719	4,133	4,272	4,435	4,660	
FTE		22.3	23.1	21.2	26.4	31.5	33.6	34.5	37.5	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: J. Skills & Compliance Training
 Category-Sub: 1. Skills & Compliance Training
 Workpaper: 1ED013.000 - Skills & Compliance Training

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	3,451	3,451	3,451	140	168	446	3,591	3,619	3,897
Non-Labor	Base YR Rec	682	682	682	0	135	82	682	817	764
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
Total		4,133	4,133	4,133	140	303	528	4,273	4,436	4,661
FTE	Base YR Rec	31.6	31.6	31.6	2.0	2.9	5.9	33.6	34.5	37.5

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	Other	140	0	0	140	2.0	1-Sided Adj	RPISANES20161205131124690	
Explanation:		Two safety inspectors for Skills Safety Center of Excellence. These O&M positions assume annual salaries of \$70k each.							
2017 Total		140	0	0	140	2.0			
2018	Other	140	0	0	140	2.0	1-Sided Adj	RPISANES20161205131043100	
Explanation:		Two project coordinators for Skills Safety Center of Excellence. These O&M positions assume annual salaries of \$70k each.							
2018	Other	140	0	0	140	2.0	1-Sided Adj	RPISANES20161205131134457	
Explanation:		Two safety inspectors for Skills Safety Center of Excellence. These O&M positions assume annual salaries of \$70k each.							
2018	FOF-Implementation	0	135	0	135	0.0	1-Sided Adj	TSWETEK20170615135200683	
Explanation:		Cost of FOF implementation							
2018	FOF-Ongoing	-112	0	0	-112	-1.1	1-Sided Adj	TSWETEK20170615135343643	
Explanation:		FOF ongoing savings							
2018 Total		168	135	0	303	2.9			
2019	Other	140	0	0	140	2.0	1-Sided Adj	RPISANES20161205131052990	
Explanation:		Two project coordinators for Skills Safety Center of Excellence. These O&M positions assume annual salaries of \$70k each.							

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: J. Skills & Compliance Training
 Category-Sub: 1. Skills & Compliance Training
 Workpaper: 1ED013.000 - Skills & Compliance Training

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2019	Other	140	0	0	140	2.0	1-Sided Adj	RPISANES20161205131145573
Explanation:		Two safety inspectors for Skills Safety Center of Excellence. These O&M positions assume annual salaries of \$70k each.						
2019	Other	278	82	0	360	3.0	1-Sided Adj	TSWETEK20170512154810117
Explanation:		An extra apprentice class to support the hiring of 15 additional apprentices in 2019.						
2019	FOF-Ongoing	-112	0	0	-112	-1.1	1-Sided Adj	TSWETEK20170615135409833
Explanation:		FOF ongoing savings						
2019 Total		446	82	0	528	5.9		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: J. Skills & Compliance Training
Category-Sub: 1. Skills & Compliance Training
Workpaper: 1ED013.000 - Skills & Compliance Training

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	1,974	2,081	1,912	2,449	2,960
Non-Labor	659	767	450	782	682
NSE	0	0	0	0	0
Total	2,633	2,848	2,362	3,232	3,642
FTE	19.2	19.7	18.0	22.2	26.7
Adjustments (Nominal \$) **					
Labor	0	0	0	35	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	35	0
FTE	0.0	0.0	0.0	0.3	0.0
Recorded-Adjusted (Nominal \$)					
Labor	1,974	2,081	1,912	2,484	2,960
Non-Labor	659	767	450	782	682
NSE	0	0	0	0	0
Total	2,633	2,848	2,362	3,267	3,642
FTE	19.2	19.7	18.0	22.5	26.7
Vacation & Sick (Nominal \$)					
Labor	286	330	305	384	491
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	286	330	305	384	491
FTE	3.1	3.4	3.2	3.9	4.9
Escalation to 2016\$					
Labor	209	167	104	68	0
Non-Labor	15	8	0	1	0
NSE	0	0	0	0	0
Total	224	175	104	69	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	2,469	2,578	2,321	2,936	3,451
Non-Labor	674	775	450	783	682
NSE	0	0	0	0	0
Total	3,144	3,353	2,772	3,719	4,133
FTE	22.3	23.1	21.2	26.4	31.6

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: J. Skills & Compliance Training
 Category-Sub: 1. Skills & Compliance Training
 Workpaper: 1ED013.000 - Skills & Compliance Training

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	35	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	35	0
FTE	0.0	0.0	0.0	0.3	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012 Total		0	0	0	0.0		
2013 Total		0	0	0	0.0		
2014 Total		0	0	0	0.0		
2015	Other	35	0	0	0.3	1-Sided Adj	RPISANES20161112094733773
2015 Total		35	0	0	0.3		
2016 Total		0	0	0	0.0		

Explanation: Dec 2015 MyTime Missing Labor Accrual

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: J. Skills & Compliance Training
 Category-Sub: 1. Skills & Compliance Training
 Workpaper: 1ED013.000 - Skills & Compliance Training

RAMP Item # 1

Ref ID: ALLLACUN20170308062732160

RAMP Chapter: SDG&E-3

Program Name: Job Skills Training and STC - Electric

Program Description: Mandatory employee training programs and standardized policies are in place.

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety.

Mitigation: Mandatory employee training programs and standardized policies are in place.

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	7,324	7,324	7,324
High	8,789	8,789	8,789

Funding Source: CPUC-GRC

Forecast Method: Other

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 7497

Explanation: 2015 actuals of 7324 escalated to 2016 by dividing by 0.9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: J. Skills & Compliance Training
Category-Sub: 1. Skills & Compliance Training
Workpaper: 1ED013.000 - Skills & Compliance Training

RAMP Item # 2

Ref ID: ALLLACUN20170308071254093

RAMP Chapter: SDG&E-3

Program Name: Training, Supervision, PPE, Tools

Program Description: Training, Supervision, PPE, Tools

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety.

Mitigation: Ongoing maintenance programs

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	2,808	2,808	2,808
High	3,370	3,370	3,370

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 2727

Explanation: 2015 actuals of 2,664 escalated to 2016 by dividing by 0.9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: J. Skills & Compliance Training
 Category-Sub: 1. Skills & Compliance Training
 Workpaper: 1ED013.000 - Skills & Compliance Training

RAMP Item # 3

Ref ID: RPISANES20161205131029860

RAMP Chapter: SDG&E-3

Program Name: Apprentice Program

Program Description: ON the job Training with journeyman linemen.

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety.

Mitigation: Mandatory employee training programs and standardized policies are in place.

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	6,050	6,050	6,050
High	7,260	7,260	7,260

Funding Source: CPUC-GRC

Forecast Method: Base Year

Work Type: Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 6194

Explanation: 2015 actuals of 6,050 escalated to 2016 by dividing by 0.9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: K. Service Order Team (SOT)
Workpaper: 1ED014.000

Summary for Category: K. Service Order Team (SOT)

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	76	76	76	76
Non-Labor	85	85	85	85
NSE	0	0	0	0
Total	161	161	161	161
FTE	1.1	1.1	1.1	1.1

Workpapers belonging to this Category:

1ED014.000 Service Order Team (SOT)

Labor	76	76	76	76
Non-Labor	85	85	85	85
NSE	0	0	0	0
Total	161	161	161	161
FTE	1.1	1.1	1.1	1.1

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED014.000 - Service Order Team (SOT)

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: K. Service Order Team (SOT)
 Category-Sub: 1. Service Order Team (SOT)
 Workpaper: 1ED014.000 - Service Order Team (SOT)

Activity Description:

The Service Order Team (SOT) is responsible for planning, overseeing and managing new additions and modifications to the electric and gas distribution systems, primarily related to services. The Service Order Team acts as the SDG&E customer representative on these projects. The O&M costs associated with this team are for its support of construction operations, storm recovery, construction maintenance programs, labor for training activities, and preparing orders to replace property.

Forecast Explanations:

Labor - Base YR Rec

The Base Year Recorded Plus Incremental Increases methodology was utilized to record current manning levels in Service Order Team Service Planners. No incremental requests are being made for this area.

Non-Labor - Base YR Rec

The Base Year Recorded Plus Incremental Increases methodology records the current expenses. No incremental requests are being made for this area.

NSE - Base YR Rec

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		328	339	303	215	76	76	76	76	
Non-Labor		320	535	370	71	85	86	86	86	
NSE		0	0	0	0	0	0	0	0	
Total		647	874	674	287	161	162	162	162	
FTE		3.9	4.0	3.2	2.8	1.1	1.0	1.0	1.0	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: K. Service Order Team (SOT)
 Category-Sub: 1. Service Order Team (SOT)
 Workpaper: 1ED014.000 - Service Order Team (SOT)

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	76	76	76	0	0	0	76	76	76
Non-Labor	Base YR Rec	85	85	85	0	0	0	85	85	85
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
Total		161	161	161	0	0	0	161	161	161
FTE	Base YR Rec	1.1	1.1	1.1	0.0	0.0	0.0	1.1	1.1	1.1

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
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Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: K. Service Order Team (SOT)
Category-Sub: 1. Service Order Team (SOT)
Workpaper: 1ED014.000 - Service Order Team (SOT)

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	262	273	250	182	65
Non-Labor	313	529	370	71	85
NSE	0	0	0	0	0
Total	574	803	620	253	150
FTE	3.4	3.4	2.7	2.4	0.9
Adjustments (Nominal \$) **					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	262	273	250	182	65
Non-Labor	313	529	370	71	85
NSE	0	0	0	0	0
Total	574	803	620	253	150
FTE	3.4	3.4	2.7	2.4	0.9
Vacation & Sick (Nominal \$)					
Labor	38	43	40	28	11
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	38	43	40	28	11
FTE	0.5	0.6	0.5	0.4	0.2
Escalation to 2016\$					
Labor	28	22	14	5	0
Non-Labor	7	6	0	0	0
NSE	0	0	0	0	0
Total	35	27	14	5	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	328	339	303	215	76
Non-Labor	320	535	370	71	85
NSE	0	0	0	0	0
Total	647	874	674	287	161
FTE	3.9	4.0	3.2	2.8	1.1

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: K. Service Order Team (SOT)
 Category-Sub: 1. Service Order Team (SOT)
 Workpaper: 1ED014.000 - Service Order Team (SOT)

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
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Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: L. Substation C&O
Workpaper: 1ED015.000

Summary for Category: L. Substation C&O

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	3,038	3,685	3,546	3,601
Non-Labor	1,544	2,007	1,771	1,722
NSE	0	0	0	0
Total	4,582	5,692	5,317	5,323
FTE	28.9	34.4	33.0	33.6

Workpapers belonging to this Category:

1ED015.000 Substation C&O

Labor	3,038	3,685	3,546	3,601
Non-Labor	1,544	2,007	1,771	1,722
NSE	0	0	0	0
Total	4,582	5,692	5,317	5,323
FTE	28.9	34.4	33.0	33.6

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED015.000 - Substation C&O

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: L. Substation C&O
 Category-Sub: 1. Substation C&O
 Workpaper: 1ED015.000 - Substation C&O

Activity Description:

The Substation Construction & Maintenance and associated support organizations are responsible for the installation, inspection and maintenance of 140 distribution substations on the SDG&E system. This includes the maintenance of 293 distribution power transformers and their associated load tap changers or voltage regulators. As well as 1300 circuit breakers including oil, air, and vacuum classifications, and their associated line and bus disconnects. This group inspects and maintains all substation equipment including batteries, buses, support structures, capacitor banks, reactors, grounding systems, fire suppression systems, and perimeter fences and gates. The substation construction and maintenance group is responsible for GO174 compliance, with regards to its inspection and corrective maintenance program, compliance with health and safety programs, and compliance with SDG&E's maintenance standards. These programs are critical to the safe and efficient installation, inspection, maintenance, and reliability of all distribution electric facilities managed and implemented within the Substation Construction and Maintenance section.

Forecast Explanations:

Labor - 5-YR Average

A five year average plus incremental adjustments was used to develop the labor forecast. Substation maintenance activities with associated labor charges are determined by time based cycles, with the amount of maintenance coming due varying from year to year. The amount of corrective maintenance resulting from inspections is also variable year to year. Given the variability of maintenance requirements, and average of historical costs smooths these factors and provides a good base estimate of a typical maintenance year.

Non-Labor - 5-YR Average

A five year average plus incremental adjustments was used to develop the non labor forecast. Substation maintenance activities with associated non labor charges are determined by time based cycles, with the amount of maintenance coming due varying from year to year. An average smooths this providing a good base estimate of a typical maintenance year.

NSE - 5-YR Average

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		4,622	3,993	3,657	3,499	3,038	3,685	3,546	3,601	
Non-Labor		2,388	2,185	1,960	1,707	1,544	2,006	1,770	1,721	
NSE		0	0	0	0	0	0	0	0	
Total		7,010	6,177	5,617	5,206	4,582	5,691	5,316	5,322	
FTE		41.8	38.4	34.2	32.7	28.8	34.4	33.0	33.6	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: L. Substation C&O
Category-Sub: 1. Substation C&O
Workpaper: 1ED015.000 - Substation C&O

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	3,762	3,762	3,762	-77	-216	-161	3,685	3,546	3,601
Non-Labor	5-YR Average	1,957	1,957	1,957	50	-186	-235	2,007	1,771	1,722
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		5,718	5,718	5,718	-27	-402	-396	5,691	5,316	5,322
FTE	5-YR Average	35.2	35.2	35.2	-0.8	-2.2	-1.6	34.4	33.0	33.6

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID
2017	FOF-Ongoing	-90	-75	0	-165	-0.9	1-Sided Adj	RPISANES20161201100512633

Explanation: FOF- ongoing savings

2017	RAMP Incremental	13	125	0	138	0.1	1-Sided Adj	SGAHAGAN20170510140758140
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Explanation: RAMP Proposed Activity: CBM - Distribution - Maintain specialized monitoring and communication devices on substation equipment in order to create a data-informed maintenance and replacement process for major substation assets. Distribution transformers (e.g. 69/12 kV) and their associated oil/gas measurements are monitored. The program to install these monitors began in 2007, and many of the sensors are reaching the end of their useful life. We are assuming approximately fifteen sensors/monitors will require replacement per year. The labor costs include crew time to remove the existing monitor and install a new one. 15 sensors x 2-man crew x 8 hour day x \$55/hr is \$13,200. The nonlabor costs include the costs for the sensors, monitors, piping, fittings, and other materials required to replace the failed unit. 15 units x \$8,500 is \$127,500.

2017 Total		-77	50	0	-27	-0.8		
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2018	FOF-Ongoing	-311	-319	0	-630	-3.1	1-Sided Adj	RPISANES20161201100535943
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Explanation: FOF- ongoing savings

2018	RAMP Incremental	13	125	0	138	0.1	1-Sided Adj	SGAHAGAN20170510141140127
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Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: L. Substation C&O
Category-Sub: 1. Substation C&O
Workpaper: 1ED015.000 - Substation C&O

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation: RAMP Proposed Activity: CBM - Distribution - Maintain specialized monitoring and communication devices on substation equipment in order to create a data-informed maintenance and replacement process for major substation assets. Distribution transformers (e.g. 69/12 kV) and their associated oil/gas measurements are monitored. The program to install these monitors began in 2007, and many of the sensors are reaching the end of their useful life. We are assuming approximately fifteen sensors/monitors will require replacement per year. The labor costs include crew time to remove the existing monitor and install a new one. 15 sensors x 2-man crew x 8 hour day x \$55/hr is \$13,200. The nonlabor costs include the costs for the sensors, monitors, piping, fittings, and other materials required to replace the failed unit. 15 units x \$8,500 is \$127,500.								
2018	RAMP Incremental	82	8	0	90	0.8	1-Sided Adj	SGAHAGAN20170512161116600
Explanation: RAMP Proposed Activity: 4kV Modernization - Substation - Proposed program aims to remove 4 KV assets and replace with 12 kV. Scope of work may include complete removal and rebuild of 4 KV substation facilities (including step-down units). At-risk example includes package/unit substations that feature single points of failure and long lead time to replace units, requiring temporary solutions. This is the O&M component of the capital cost of this project, which is estimated to be 5% of the capital cost. The O&M to capital split is based off of actuals from similar projects SDG&E has completed.								
2018 Total		-216	-186	0	-402	-2.2		
2019	FOF-Ongoing	-311	-375	0	-686	-3.1	1-Sided Adj	RPISANES20161201100545787
Explanation: FOF- ongoing savings								
2019	RAMP Incremental	137	15	0	152	1.4	1-Sided Adj	SGAHAGAN20170512161136943
Explanation: RAMP Proposed Activity: 4kV Modernization - Substation - Proposed program aims to remove 4 KV assets and replace with 12 kV. Scope of work may include complete removal and rebuild of 4 KV substation facilities (including step-down units). At-risk example includes package/unit substations that feature single points of failure and long lead time to replace units, requiring temporary solutions. This is the O&M component of the capital cost of this project, which is estimated to be 5% of the capital cost. The O&M to capital split is based off of actuals from similar projects SDG&E has completed.								
2019	RAMP Incremental	13	125	0	138	0.1	1-Sided Adj	SGAHAGAN20170510141156967

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: L. Substation C&O
 Category-Sub: 1. Substation C&O
 Workpaper: 1ED015.000 - Substation C&O

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation:	<p>RAMP Proposed Activity: CBM - Distribution - Maintain specialized monitoring and communication devices on substation equipment in order to create a data-informed maintenance and replacement process for major substation assets. Distribution transformers (e.g. 69/12 kV) and their associated oil/gas measurements are monitored.</p> <p>The program to install these monitors began in 2007, and many of the sensors are reaching the end of their useful life. We are assuming approximately fifteen sensors/monitors will require replacement per year.</p> <p>The labor costs include crew time to remove the existing monitor and install a new one. 15 sensors x 2-man crew x 8 hour day x \$55/hr is \$13,200.</p> <p>The nonlabor costs include the costs for the sensors, monitors, piping, fittings, and other materials required to replace the failed unit. 15 units x \$8,500 is \$127,500.</p>							
2019 Total		-161	-235	0	-396	-1.6		

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: L. Substation C&O
Category-Sub: 1. Substation C&O
Workpaper: 1ED015.000 - Substation C&O

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	3,695	3,223	3,012	2,855	2,662
Non-Labor	2,335	2,162	1,960	1,732	1,561
NSE	0	0	0	0	0
Total	6,030	5,385	4,972	4,587	4,223
FTE	35.9	32.7	29.0	27.2	25.1
Adjustments (Nominal \$) **					
Labor	0	0	0	105	-56
Non-Labor	0	0	0	-26	-17
NSE	0	0	0	0	0
Total	0	0	0	79	-73
FTE	0.0	0.0	0.0	0.6	-0.6
Recorded-Adjusted (Nominal \$)					
Labor	3,695	3,223	3,012	2,960	2,606
Non-Labor	2,335	2,162	1,959	1,705	1,544
NSE	0	0	0	0	0
Total	6,030	5,385	4,972	4,666	4,150
FTE	35.9	32.7	29.0	27.8	24.5
Vacation & Sick (Nominal \$)					
Labor	535	511	481	457	432
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	535	511	481	457	432
FTE	5.8	5.7	5.2	4.9	4.4
Escalation to 2016\$					
Labor	392	259	164	81	0
Non-Labor	53	23	1	2	0
NSE	0	0	0	0	0
Total	444	282	165	83	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	4,622	3,993	3,657	3,499	3,038
Non-Labor	2,388	2,185	1,960	1,707	1,544
NSE	0	0	0	0	0
Total	7,010	6,177	5,617	5,206	4,582
FTE	41.7	38.4	34.2	32.7	28.9

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: L. Substation C&O
Category-Sub: 1. Substation C&O
Workpaper: 1ED015.000 - Substation C&O

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	105	-56
Non-Labor	0	0	-0.037	-26	-17
NSE	0	0	0	0	0
Total	0	0	-0.037	79	-73
FTE	0.0	0.0	0.0	0.6	-0.6

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012 Total		0	0	0	0.0		
2013 Total		0	0	0	0.0		
2014	Other	0	0	0	0.0	CCTR Transf To 2100-0238.000	RPISANES20161109212257383
Explanation: Costs within Substation C&O workpaper materials management cost center 2100-3941, are now under Kearny Operations Services workpaper, cost center 2100-0238.							
2014	Other	0	0	0	0.0	CCTR Transf To 2100-0238.000	RPISANES20161109213255720
Explanation: to correct previous incorrect entry							
2014	Other	0	0	0	0.0	CCTR Transf To 2100-0238.000	RPISANES20161109213606677
Explanation: Costs are now captured in Kearny Operations Services workpaper, cost center 2100-0238.							
2014 Total		0	0	0	0.0		
2015	Other	-119	-26	0	-1.5	CCTR Transf To 2100-0238.000	RPISANES20161109214246940
Explanation: costs are now captured in Kearny Operations Services workpaper, cost center 2100-0238							
2015	Other	225	0	0	2.1	1-Sided Adj	RPISANES20161112095017613
Explanation: Dec 2015 MyTime Missing Labor Accrual							
2015 Total		105	-26	0	0.6		
2016	Other	-56	-17	0	-0.6	CCTR Transf To 2100-0238.000	RPISANES20170224193115193

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
 2019 GRC - APP
 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: L. Substation C&O
 Category-Sub: 1. Substation C&O
 Workpaper: 1ED015.000 - Substation C&O

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation: costs from cost center 3941 are now captured in Kearny Operations Services workpaper 1ED006, cost center 0238							
2016 Total		-56	-17	0	-0.6		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: L. Substation C&O
Category-Sub: 1. Substation C&O
Workpaper: 1ED015.000 - Substation C&O

RAMP Item # 1

Ref ID: SGAHAGAN20170510140758140

RAMP Chapter: SDG&E-12

Program Name: CBM - Distribution

Program Description: Maintain specialized monitoring and communication devices on substation equipment in order to create a data-informed maintenance and replacement process for major substation assets. Distribution transformers (e.g. 69/12 kV) and their associated oil/gas measurements are monitored.

Risk/Mitigation:

Risk: Electric Infrastructure Integrity

Mitigation: Condition Based Monitoring System

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	120	120	120
High	156	156	156

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: L. Substation C&O
Category-Sub: 1. Substation C&O
Workpaper: 1ED015.000 - Substation C&O

RAMP Item # 2

Ref ID: SGAHAGAN20170512160912067

RAMP Chapter: SDG&E-12

Program Name: 4kV Modernization - Substation

Program Description: Proposed program aims to remove 4 KV assets and replace with 12 kV. Scope of work may include complete removal and rebuild of 4 kV substation facilities (including step-down units). At-risk example includes package/unit substations that feature single points of failure and long lead time to replace units, requiring temporary solutions.

Risk/Mitigation:

Risk: Electric Infrastructure Integrity

Mitigation: Substation rebuild/replacements based on operational significance and SDG&E reliability standards

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	42	42	42
High	55	55	55

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: M. System Protection
Workpaper: 1ED017.000

Summary for Category: M. System Protection

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	1,132	1,319	1,408	1,501
Non-Labor	327	360	360	360
NSE	0	0	0	0
Total	1,459	1,679	1,768	1,861
FTE	9.8	11.8	12.7	13.6

Workpapers belonging to this Category:

1ED017.000 System Protection

Labor	1,132	1,319	1,408	1,501
Non-Labor	327	360	360	360
NSE	0	0	0	0
Total	1,459	1,679	1,768	1,861
FTE	9.8	11.8	12.7	13.6

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED017.000 - System Protection

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: M. System Protection
Category-Sub: 1. System Protection
Workpaper: 1ED017.000 - System Protection

Activity Description:

System Protection Maintenance maintains protective relays and control systems within SDG&E's substations. This involves routine preventive maintenance on time-based intervals - calibrating and trip-testing protective relays. This also involves corrective maintenance, or trouble-shooting, existing systems that alarm or fail to function properly. Cost Center staffing is on-call around the clock, and in addition, provides standby personnel for fire preparedness and responds to system emergencies, e.g., unscheduled load shedding and earthquakes. This is a technical group that uses computer driven test equipment. Databases are used to generate work orders and store test results. The aging infrastructure includes old electromechanical relays that are replaced with microprocessor based relays. These new relays have considerably more functionality than the older discrete single-function electromechanical units, but they also require a greater degree of technical expertise and skill to maintain. In particular, computer and logic skills are essential to work with these devices, whereas in the past, it was not required. The new, more complex, protection schemes are being implemented for these relays which take advantage of the increased functionality. As a result, the company has increased the training it provides to relay technicians.

The SCADA group, which was moved to SPM in 2012 works on installing and maintaining distribution voltage regulators, capacitors, distribution reclosers, installs weather stations, distribution SCADA controlled equipment and switchgear, maintains substation batteries, and aircraft warning lights.

Forecast Explanations:

Labor - 5-YR Average

A five year average plus incremental adjustments was used to develop both the labor forecast. System protection and maintenance activities with associated labor charges are driven by time based cycles, with the amount of maintenance coming due varying from year to year. Given the variability of maintenance requirements, an average of historical costs smooths these factors and provides a good base estimate of a typical maintenance year.

Non-Labor - 5-YR Average

A five year average plus incremental adjustments was used to develop both the non-labor forecast. System protection and maintenance activities with associated non-labor charges are driven by time based cycles, with the amount of maintenance coming due varying from year to year. Given the variability of maintenance requirements, an average of historical costs smooths these factors and provides a good base estimate of a typical maintenance year.

NSE - 5-YR Average

N/A

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: M. System Protection
 Category-Sub: 1. System Protection
 Workpaper: 1ED017.000 - System Protection

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		1,273	1,221	1,249	1,377	1,132	1,318	1,407	1,500	
Non-Labor		337	407	364	366	327	361	361	361	
NSE		0	0	0	0	0	0	0	0	
Total		1,610	1,628	1,614	1,742	1,460	1,679	1,768	1,861	
FTE		10.8	11.2	11.3	12.1	9.8	11.8	12.7	13.6	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: M. System Protection
Category-Sub: 1. System Protection
Workpaper: 1ED017.000 - System Protection

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	1,251	1,251	1,251	68	157	250	1,319	1,408	1,501
Non-Labor	5-YR Average	360	360	360	0	0	0	360	360	360
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		1,611	1,611	1,611	68	157	250	1,679	1,768	1,861
FTE	5-YR Average	11.1	11.1	11.1	0.7	1.6	2.5	11.8	12.7	13.6

Forecast Adjustment Details:

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>	
2017	Other	100	0	0	100	1.0	1-Sided Adj	TSWETEK20170309081617500	
Explanation:		Add two relay techs at 50% O&M 50% Capital Split assume \$100k per year salary. Needed for workforce capacity.							
2017	FOF-Ongoing	-32	0	0	-32	-0.3	1-Sided Adj	TSWETEK20170615105903427	
Explanation:		FOF ongoing savings							
2017 Total		68	0	0	68	0.7			
2018	Other	200	0	0	200	2.0	1-Sided Adj	TSWETEK20170309081731943	
Explanation:		Add two relay techs at 50% O&M 50% Capital Split assume \$100k per year salary. Needed for workforce capacity.							
2018	FOF-Ongoing	-43	0	0	-43	-0.4	1-Sided Adj	TSWETEK20170615105930147	
Explanation:		FOF ongoing savings							
2018 Total		157	0	0	157	1.6			
2019	FOF-Ongoing	-50	0	0	-50	-0.5	1-Sided Adj	RPISANES20161201100816380	
Explanation:		FOF ongoing savings							
2019	Other	300	0	0	300	3.0	1-Sided Adj	TSWETEK20170309081814687	
Explanation:		Add two relay techs at 50% O&M 50% Capital Split assume \$100k per year salary. Needed for workforce capacity.							

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
 2019 GRC - APP
 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: M. System Protection
 Category-Sub: 1. System Protection
 Workpaper: 1ED017.000 - System Protection

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2019 Total		250	0	0	250	2.5		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: M. System Protection
Category-Sub: 1. System Protection
Workpaper: 1ED017.000 - System Protection

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	1,018	986	1,029	1,113	971
Non-Labor	330	403	364	365	327
NSE	0	0	0	0	0
Total	1,347	1,389	1,393	1,479	1,299
FTE	9.3	9.6	9.5	9.8	8.3
Adjustments (Nominal \$) **					
Labor	0	0	0	52	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	52	0
FTE	0.0	0.0	0.0	0.5	0.0
Recorded-Adjusted (Nominal \$)					
Labor	1,018	986	1,029	1,165	971
Non-Labor	330	403	364	365	327
NSE	0	0	0	0	0
Total	1,347	1,389	1,393	1,530	1,299
FTE	9.3	9.6	9.5	10.3	8.3
Vacation & Sick (Nominal \$)					
Labor	147	156	164	180	161
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	147	156	164	180	161
FTE	1.5	1.7	1.7	1.8	1.5
Escalation to 2016\$					
Labor	108	79	56	32	0
Non-Labor	7	4	0	0	0
NSE	0	0	0	0	0
Total	115	83	56	32	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	1,273	1,221	1,249	1,377	1,132
Non-Labor	337	407	364	366	327
NSE	0	0	0	0	0
Total	1,610	1,628	1,614	1,742	1,460
FTE	10.8	11.3	11.2	12.1	9.8

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: M. System Protection
 Category-Sub: 1. System Protection
 Workpaper: 1ED017.000 - System Protection

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	52	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	52	0
FTE	0.0	0.0	0.0	0.5	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012 Total		0	0	0	0.0		
2013 Total		0	0	0	0.0		
2014 Total		0	0	0	0.0		
2015	Other	52	0	0	0.5	1-Sided Adj	RPISANES20161112095142790
2015 Total		52	0	0	0.5		
2016 Total		0	0	0	0.0		

Explanation: Dec 2015 MyTime Missing Labor Accrual

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: M. System Protection
Category-Sub: 1. System Protection
Workpaper: 1ED017.000 - System Protection

RAMP Item # 1

Ref ID: SGAHAGAN20170510141336977

RAMP Chapter: SDG&E-12

Program Name: Replace degraded or non-functioning Supervisory Control and Data Acquisition (SCADA) RTUs

Program Description: Proactively replace SCADA remote terminal units (RTU) with failed communications or bad sensors in order to improve data-informed operations of field switches and other equipment.

Risk/Mitigation:

Risk: Electric Infrastructure Integrity

Mitigation: Expand and Maintain Distribution Advanced SCADA infrastructure

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	52	52	52
High	68	68	68

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 54

Explanation: 2015 actuals of \$52k escalated to 2016 \$ (escalation factor of 0.9768)

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: M. System Protection
Category-Sub: 1. System Protection
Workpaper: 1ED017.000 - System Protection

RAMP Item # 2

Ref ID: TSWETEK20170510084727777

RAMP Chapter: SDG&E-17

Program Name: Relay Specialist critical position:

Program Description: 3rd Person on Crew rotation (job shadowing)

Risk/Mitigation:

Risk: "Workforce Planning": Loss of employees with deep

Mitigation: 'Knowledge transfer tools and processes are available; Workforce planning tools and templates availa

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	4	4	3
High	10	10	9

Funding Source: CPUC-GRC

Forecast Method: Base Year

Work Type: Mandated

Work Type Citation: NERC PRC5-002 maintenance of relays

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 6

Explanation: 2015 escalated to 2016

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: N. Distribution and Engineering
Workpaper: 1ED018.000

Summary for Category: N. Distribution and Engineering

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	1,124	1,200	1,171	1,172
Non-Labor	1,218	784	1,571	3,126
NSE	0	0	0	0
Total	2,342	1,984	2,742	4,298
FTE	11.8	13.3	13.0	13.0

Workpapers belonging to this Category:

1ED018.000 Distribution and Engineering

Labor	1,124	1,200	1,171	1,172
Non-Labor	1,218	784	1,571	3,126
NSE	0	0	0	0
Total	2,342	1,984	2,742	4,298
FTE	11.8	13.3	13.0	13.0

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED018.000 - Distribution and Engineering

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: N. Distribution and Engineering
 Category-Sub: 1. Distribution and Engineering
 Workpaper: 1ED018.000 - Distribution and Engineering

Activity Description:

The Electric Distribution and Engineering group is responsible for developing and maintaining overhead and underground construction standards to ensure safe and reliable customer service throughout the 4kV and 12kV electric distribution system. The group also develops and maintains electric standard practices to establish uniform and safe work methods, procedures and inspection requirements and ensure regulatory compliance with all governing agencies. Construction standards and standard practices are used by company and contractor construction forces throughout the SDG&E electric distribution system. The Associate Engineer program is also included in this group. The Associate Engineer program is an ongoing training program that is a key component of the effort to develop and maintain engineers in SDG&E's workforce.

Forecast Explanations:

Labor - 3-YR Average

The 3-year average appears to be the most reasonable forecasting methodology for labor. Labor costs consist of engineering positions that support these activities. This work group provides oversight over the technical areas and administers the associate engineer program.

Non-Labor - 3-YR Average

The 3-year average appears to be the most reasonable forecasting methodology for non-labor. The non-labor costs are for supporting project costs as well as memberships.

NSE - 3-YR Average

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		1,293	1,241	1,051	1,108	1,124	1,200	1,171	1,172	
Non-Labor		382	328	607	528	1,218	783	1,570	3,125	
NSE		0	0	0	0	0	0	0	0	
Total		1,675	1,569	1,658	1,636	2,342	1,983	2,741	4,297	
FTE		13.2	13.6	11.5	12.1	11.8	13.2	12.9	12.9	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: N. Distribution and Engineering
 Category-Sub: 1. Distribution and Engineering
 Workpaper: 1ED018.000 - Distribution and Engineering

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	3-YR Average	1,094	1,094	1,094	106	77	78	1,200	1,171	1,172
Non-Labor	3-YR Average	784	784	784	0	787	2,342	784	1,571	3,126
NSE	3-YR Average	0	0	0	0	0	0	0	0	0
Total		1,879	1,879	1,879	106	864	2,420	1,985	2,743	4,299
FTE	3-YR Average	11.9	11.9	11.9	1.4	1.1	1.1	13.3	13.0	13.0

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	RAMP Incremental	30	0	0	30	0.3	1-Sided Adj	RPISANES20161201101129350	
Explanation:		RAMP proposed activity: Post-Construction True-Up Quality Assurance and Quality Control (QA/QC) Program - AKA Pole Risk Mitigation & Engineering (PRIME) - PRIME is a 10-year program designed to address risks related to pole loading, specifically focused on wood poles. SDG&E will focus on the areas of highest risk first. During the first few years, SDG&E will aggressively analyze the poles based on a risk model where wood poles will be replaced and designed for known local wind conditions, and for all known attachments. See supplemental workpaper for estimate methodology.							
2017	Other	70	0	0	70	1.0	1-Sided Adj	ALLLACUN20170614105525763	
Explanation:		Increased headcount for the Associate Engineer Program. 5 additional Associate Engineers will be added to the program. 20% of their labor will be charged to O&M							
2017	Other	20	0	0	20	0.2	1-Sided Adj	ALLLACUN20170614105557513	
Explanation:		Increased headcount for EDE 2 positions. Labor split is 10% O&M and 90% Capital							
2017	RAMP Incremental	140	0	0	140	1.4	1-Sided Adj	TSWETEK20170305120434620	
Explanation:		RAMP proposed activity: Incremental activities to replace critical roles after retirements. Proposed activities to create formal training programs in distribution standards and substation engineering. Cost is the labor for 52 hours of training for 54 employees within the distribution and substation groups at an average cost of \$50 per hour.							
2017	FOF-Ongoing	-154	0	0	-154	-1.5	1-Sided Adj	TSWETEK20170615102559740	
Explanation:		FOF ongoing savings							
2017 Total		106	0	0	106	1.4			

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: N. Distribution and Engineering
 Category-Sub: 1. Distribution and Engineering
 Workpaper: 1ED018.000 - Distribution and Engineering

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2018	RAMP Incremental	32	537	0	569	0.3	1-Sided Adj	RPISANES20161201101140867
Explanation:		RAMP proposed activity: Post-Construction True-Up Quality Assurance and Quality Control (QA/QC) Program - AKA Pole Risk Mitigation & Engineering (PRiME) - PRiME is a 10-year program designed to address risks related to pole loading, specifically focused on wood poles. SDG&E will focus on the areas of highest risk first. During the first few years, SDG&E will aggressively analyze the poles based on a risk model where wood poles will be replaced and designed for known local wind conditions, and for all known attachments. See supplemental workpaper for estimate methodology.						
2018	Other	70	0	0	70	1.0	1-Sided Adj	RPISANES20170310054100670
Explanation:		Increased headcount for the Associate Engineer Program. 5 additional Associate Engineers will be added to the program. 20% of their labor will be charged to O&M						
2018	RAMP Incremental	0	250	0	250	0.0	1-Sided Adj	RPISANES20161203101218887
Explanation:		RAMP Proposed Activity: Increased Outreach Program - Addresses the impact DERs may have on emergency response of first responders such as police, fire departments, and others. See supplemental workpaper for estimate methodology.						
2018	FOF-Ongoing	-185	0	0	-185	-1.8	1-Sided Adj	TSWETEK20170222151702483
Explanation:		FOF ongoing savings						
2018	RAMP Incremental	140	0	0	140	1.4	1-Sided Adj	TSWETEK20170305120832937
Explanation:		RAMP proposed activity: Incremental activities to replace critical roles after retirements. Proposed activities to create formal training programs in distribution standards and substation engineering. Cost is the labor for 52 hours of training for 54 employees within the distribution and substation groups at an average cost of \$50 per hour.						
2018	Other	20	0	0	20	0.2	1-Sided Adj	RPISANES20170310054212247
Explanation:		Increased headcount for EDE 2 positions. Labor split is 10% O&M and 90% Capital						
2018 Total		77	787	0	864	1.1		

2019 RAMP Incremental 33 2,142 0 2,175 0.3 1-Sided Adj RPISANES20161201101147890

Explanation: RAMP proposed activity: Post-Construction True-Up Quality Assurance and Quality Control (QA/QC) Program - AKA Pole Risk Mitigation & Engineering (PRiME) - PRiME is a 10-year program designed to address risks related to pole loading, specifically focused on wood poles. SDG&E will focus on the areas of highest risk first. During the first few years, SDG&E will aggressively analyze the poles based on a risk model where wood poles will be replaced and designed for known local wind conditions, and for all known attachments. See supplemental workpaper for estimate methodology.

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: N. Distribution and Engineering
 Category-Sub: 1. Distribution and Engineering
 Workpaper: 1ED018.000 - Distribution and Engineering

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2019	Other	70	0	0	70	1.0	1-Sided Adj	RPISANES20170310054118920
Explanation:		Increased headcount for the Associate Engineer Program. 5 additional Associate Engineers will be added to the program. 20% of their labor will be charged to O&M						
2019	RAMP Incremental	0	500	0	500	0.0	1-Sided Adj	RPISANES20161203101229637
Explanation:		RAMP Proposed Activity: Increased Outreach Program - Addresses the impact DERs may have on emergency response of first responders such as police, fire departments, and others. See supplemental workpaper for estimate methodology.						
2019	FOF-Ongoing	-185	-300	0	-485	-1.8	1-Sided Adj	TSWETEK20170222151730357
Explanation:		FOF on going savings						
2019	RAMP Incremental	140	0	0	140	1.4	1-Sided Adj	TSWETEK20170305121047563
Explanation:		RAMP proposed activity: Incremental activities to replace critical roles after retirements. Proposed activities to create formal training programs in distribution standards and substation engineering. Cost is the labor for 52 hours of training for 54 employees within the distribution and substation groups at an average cost of \$50 per hour.						
2019	Other	20	0	0	20	0.2	1-Sided Adj	RPISANES20170310054225450
Explanation:		Increased headcount for EDE 2 positions. Labor split is 10% O&M and 90% Capital						
2019 Total		78	2,342	0	2,420	1.1		

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: N. Distribution and Engineering
Category-Sub: 1. Distribution and Engineering
Workpaper: 1ED018.000 - Distribution and Engineering

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	1,034	1,002	866	938	964
Non-Labor	374	325	606	528	1,218
NSE	0	0	0	0	0
Total	1,407	1,327	1,472	1,465	2,182
FTE	11.4	11.6	9.8	10.3	10.0
Adjustments (Nominal \$) **					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	1,034	1,002	866	938	964
Non-Labor	374	325	606	528	1,218
NSE	0	0	0	0	0
Total	1,407	1,327	1,472	1,465	2,182
FTE	11.4	11.6	9.8	10.3	10.0
Vacation & Sick (Nominal \$)					
Labor	150	159	138	145	160
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	150	159	138	145	160
FTE	1.8	2.0	1.8	1.8	1.8
Escalation to 2016\$					
Labor	110	81	47	26	0
Non-Labor	8	3	0	0	0
NSE	0	0	0	0	0
Total	118	84	47	26	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	1,293	1,241	1,051	1,108	1,124
Non-Labor	382	328	607	528	1,218
NSE	0	0	0	0	0
Total	1,675	1,569	1,658	1,636	2,342
FTE	13.2	13.6	11.6	12.1	11.8

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: N. Distribution and Engineering
 Category-Sub: 1. Distribution and Engineering
 Workpaper: 1ED018.000 - Distribution and Engineering

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
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Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: N. Distribution and Engineering
 Category-Sub: 1. Distribution and Engineering
 Workpaper: 1ED018.000 - Distribution and Engineering

RAMP Item # 1

Ref ID: RPISANES20161201101129350

RAMP Chapter: SDG&E-12

Program Name: Post-Construction True-Up Quality Assurance and Quality Control (QA/QC) Program

Program Description: AKA Pole Risk Mitigation & Engineering (PRiME); new process creation and enhancements aimed to improve data quality, true up as-built designs, and correct field failures based on overloaded pole calculations. Corrective actions may include minor unit additions or rearrangements and major unit replacements (i.e. poles).

Risk/Mitigation:

Risk: Electric Infrastructure Integrity

Mitigation: Inspection and preventative maintenance programs

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	6,055	6,055	6,055
High	7,872	7,872	7,872

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: N. Distribution and Engineering
 Category-Sub: 1. Distribution and Engineering
 Workpaper: 1ED018.000 - Distribution and Engineering

RAMP Item # 2

Ref ID: RPISANES20170310054044087

RAMP Chapter: SDG&E-3

Program Name: Work Standards and Methods

Program Description: Business functions related to developing and maintaining construction standards, standards practices, and system design for electric service, secondary and primary system

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety. The risk

Mitigation: Safety Policies & Programs

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	2,907	2,907	2,907
High	3,488	3,744	3,488

Funding Source: CPUC-GRC

Forecast Method: Base Year

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 2942

Explanation: 2015 actuals of 2907 escalated to 2016 by dividing by 0.98795

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: N. Distribution and Engineering
 Category-Sub: 1. Distribution and Engineering
 Workpaper: 1ED018.000 - Distribution and Engineering

RAMP Item # 3

Ref ID: SGAHAGAN20170227135046090

RAMP Chapter: SDG&E-1

Program Name: Mylar Balloon Replacement

Program Description: Mylar balloons are conductive and when in contact with electric lines result in sources of ignition. SDG&E has developed a non-conductive mylar balloon that needs marketing and adoption so that the threat of a mylar balloon getting into contact with OH electric lines is eliminated and thereby eliminating a source of ignition from mylar balloon contact.

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Marker balls; aviation protection; spacer cables; tree guard wires; pursue mylar balloon replacement

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	150	100	75
High	195	130	98

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 191

Explanation: 2015 actuals of \$187k escalated to 2016 by dividing by 0.9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: N. Distribution and Engineering
 Category-Sub: 1. Distribution and Engineering
 Workpaper: 1ED018.000 - Distribution and Engineering

RAMP Item # 4

Ref ID: SGAHAGAN20170628104037373

RAMP Chapter: SDG&E-4

Program Name: Increased Outreach Program

Program Description: Addresses the impact DERs may have on emergency response of first responders such as police, fire departments, and others.

Risk/Mitigation:

Risk: Distributed Energy Resources (DERs) Safety and Operational Concerns

Mitigation: Aggressive outreach program to educate first responders on DER types, characteristics, and potential

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	300	300	300
High	500	500	500

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: N. Distribution and Engineering
Category-Sub: 1. Distribution and Engineering
Workpaper: 1ED018.000 - Distribution and Engineering

RAMP Item # 5

Ref ID: SGAHAGAN20170628105021833

RAMP Chapter: SDG&E-4

Program Name: Anti-Islanding Testing Program

Program Description: Perform routine testing of inverters to verify proper operation of anti-islanding functionality

Risk/Mitigation:

Risk: Distributed Energy Resources (DERs) Safety and Operational Concerns

Mitigation: Anti-Islanding Testing Program

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	200	200	200
High	300	300	300

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: N. Distribution and Engineering
 Category-Sub: 1. Distribution and Engineering
 Workpaper: 1ED018.000 - Distribution and Engineering

RAMP Item # 6

Ref ID: TSWETEK20170305120434620

RAMP Chapter: SDG&E-17

Program Name: Constrn Stds Admtr (incls. Sr.) • Elect Dist Analyst (incls. Sr.) • Ld Substn Proj Designer • Prin En

Program Description: SDG&E Project Management/Planner training class • Proposed: Utility technology training program • On the job training • Mentoring • Substation design training program • Supervisor Toolkit (now called High Performing Leader I) • Leadership classes • Formalize QA/QC program

Risk/Mitigation:

Risk: "Workforce Planning": Loss of employees with deep

Mitigation: 'Knowledge transfer tools and processes are available; Workforce planning tools and templates availa

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	137	137	153
High	193	193	213

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 65

Explanation: Escalated 2015 historical to 2016 dollars.

Supplemental Workpapers for Workpaper 1ED018.000

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Distribution and Engineering
Work Group - 1ED018.000

Witness - D Weim

\$000's	2012 Actual			2013 Actual			2014 Actual			2015 Actual			2016 Actual		
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE
Recorded Historical	1,293	382	13.3	1,241	328	13.6	1,051	607	11.6	1,108	528	12.1	1,124	1,218	11.8
Adjustments															
TOTAL	1,293	382	13.3	1,241	328	13.6	1,051	607	11.6	1,108	528	12.1	1,124	1,218	11.8

FORECAST	2017			2018			2019			FORECASTING METHODOLOGY
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	
	1,200	784	13.3	1,199	1,494	13.3	1,172	3,126	13.0	Three year average plus incremental increases identified

Incremental Increases / Decreases for Future Years:

Category	2017			2018			2019			Explanation
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	
RAMP	140	0	1.4	140	0	1.4	140	0	1.4	RAMP proposed activity: Incremental activities to replace critical roles after retirements. Proposed activities to create formal training programs in distribution standards and substation engineering. Cost is the labor for 52 hours of training for 54 employees within the distribution and substation groups at an average cost of \$50 per hour.
RAMP	30	0	0.3	60	460	0.6	33	2142	0.3	RAMP proposed activity: Post-Construction True-Up Quality Assurance and Quality Control (QA/QC) Program - AKA Pole Risk Mitigation & Engineering (PRIME) - PRIME is a 10-year program designed to address risks related to pole loading, specifically focused on wood poles. SDG&E will focus on the areas of highest risk first. During the first few years, SDG&E will aggressively analyze the poles based on a risk model where wood poles will be replaced and designed for known local wind conditions, and for all known attachments. Detailed methodology attached.
RAMP	0	0	0.0	0	250	0.0	0	500	0.0	RAMP Proposed Activity: Increased Outreach Program - Addresses the impact DERs may have on emergency response of first responders such as police, fire departments, and others. The cost estimate was provided by our Customer Communication group and are attached as a separate sheet.
Workforce Development	70	0	1.0	70	0	1.0	70	0	1.0	Increased headcount for the Associate Engineer Program. 5 additional Associate Engineers will be added to the program. 20% of their labor will be charged to O&M
Workforce Development	20	0	0.2	20	0	0.2	20	0	0.2	Increased headcount for EDE to backfill 2 vacant positions. Labor split is 10% O&M and 90% Capital
Fueling Our Future Efficiencies	-154	0	-1.5	-185	0	-1.8	-185	-300	-1.8	FOF ongoing savings

San Diego Gas & Electric Company
2019 GRC - APP
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PRIME: Engineering Contract Support and Internal Labor

Non-Labor Engineering Support

	Years	2017	2018	2019
	Number of poles	-	1,850	22,600
ANALYSIS AND ASSESSMENTS	Detailed Analysis: \$200 per pole	\$ -	\$ 370,000	\$ 4,520,000
	As-built true up of construction work: 10% of all poles \$250 per pole	\$ -	\$ 46,250	\$ 565,000
	PLS CADD model: 5% of all poles \$350 per pole	\$ -	\$ 32,375	\$ 395,500
	TOTAL	\$ -	\$ 1,987,825	\$ 7,477,300
CONTRACTOR STAFFING	Project Manager	\$ -	\$ 270,400	\$ 270,400
	QA/QC Checker	\$ -	\$ 228,800	\$ 228,800
	QA/QC Checker	N/A	\$ 228,800	\$ 228,800
	QA/QC Checker	N/A	N/A	\$ 228,800
	Customer Project Planner	\$ -	\$ 228,800	\$ 228,800
	Customer Project Planner	\$ -	\$ 228,800	\$ 228,800
	Customer Project Planner	N/A	N/A	\$ 228,800
	Project Specialist	\$ -	\$ 135,200	\$ 135,200
	OSMOSE Onsite Tech	\$ -	\$ 218,400	\$ 218,400
	TOTAL	\$ -	\$ 1,987,825	\$ 7,477,300
	73% Capital	\$0	\$1,451,112	\$5,458,429
27% O&M	\$0	\$536,713	\$2,018,871	

Internal FTE Labor Costs

Internal Labor	Project Manager	\$ 103,000	\$ 106,090	\$ 109,273
	Project Manager	\$ 103,000	\$ 106,090	\$ 109,273
	Project Manager	\$ 103,000	\$ 106,090	\$ 109,273
	TOTAL	\$ 309,000	\$ 318,270	\$ 327,818
	90% Capital	\$278,100	\$286,443	\$295,036
	10% O&M	\$30,900	\$31,827	\$32,782

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

RAMP - Increased Outreach Program

Item	Frequency	Cost
Educational Video (2-4 minutes)	Once	\$50,000
Emails to homeowners and contractors	Quarterly	\$5,000
Radio Ads	Quarterly	\$20,000
Print Advertising (newspapers, trade publications, magazines)	Quarterly	\$160,000
Digital Advertising (video pre-roll, paid search, banner ads)	Quarterly	\$300,000
Ad agency creative development	Once	\$40,000
CALSEIA (California Solar Energy Industries Association) sponsorship	Once	\$15,000
	Total	\$590,000

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: O. Troubleshooting
Workpaper: 1ED020.000

Summary for Category: O. Troubleshooting

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	7,476	7,376	7,376	7,376
Non-Labor	421	421	421	421
NSE	0	0	0	0
Total	7,897	7,797	7,797	7,797
FTE	50.3	49.3	49.3	49.3

Workpapers belonging to this Category:

1ED020.000 Troubleshooting

Labor	7,476	7,376	7,376	7,376
Non-Labor	421	421	421	421
NSE	0	0	0	0
Total	7,897	7,797	7,797	7,797
FTE	50.3	49.3	49.3	49.3

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED020.000 - Troubleshooting

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: O. Troubleshooting
 Category-Sub: 1. Troubleshooting
 Workpaper: 1ED020.000 - Troubleshooting

Activity Description:

The Troubleshooting organization is responsible for ensuring safe and reliable electric service to SDG&E's customer. The group covers six districts and two satellite locations within the service territory. Each of the six districts has electric troubleshooters, engineers, a planner, technical assistants, and management supervision. The troubleshooters are the primary contact with customers who are experiencing service problems, and work closely with emergency response agencies to protect the public and SDG&E employees from potentially hazardous conditions.

Forecast Explanations:

Labor - Base YR Rec

The Base Year recorded plus incremental increases methodology reflects current spend levels for this area. There are no incremental funding requests.

Non-Labor - Base YR Rec

The Base Year recorded plus incremental increases methodology reflects current spend levels for this area. There are no incremental funding requests.

NSE - Base YR Rec

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		8,251	7,716	6,990	7,090	7,476	7,376	7,376	7,376	
Non-Labor		388	313	299	363	421	420	420	420	
NSE		0	0	0	0	0	0	0	0	
Total		8,639	8,029	7,289	7,453	7,896	7,796	7,796	7,796	
FTE		61.0	55.8	50.3	50.6	50.3	49.3	49.3	49.3	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: O. Troubleshooting
 Category-Sub: 1. Troubleshooting
 Workpaper: 1ED020.000 - Troubleshooting

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	7,476	7,476	7,476	-100	-100	-100	7,376	7,376	7,376
Non-Labor	Base YR Rec	421	421	421	0	0	0	421	421	421
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
Total		7,896	7,896	7,896	-100	-100	-100	7,796	7,796	7,796
FTE	Base YR Rec	50.3	50.3	50.3	-1.0	-1.0	-1.0	49.3	49.3	49.3

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	FOF-Ongoing	-100	0	0	-100	-1.0	1-Sided Adj	RPISANES20161201101824247	
Explanation:		FOF- efficiencies related to work practices							
2017 Total		-100	0	0	-100	-1.0			
2018	FOF-Ongoing	-100	0	0	-100	-1.0	1-Sided Adj	RPISANES20161201101847750	
Explanation:		FOF- efficiencies related to work practices							
2018 Total		-100	0	0	-100	-1.0			
2019	FOF-Ongoing	-100	0	0	-100	-1.0	1-Sided Adj	RPISANES20161201102019293	
Explanation:		FOF- efficiencies related to work practices							
2019 Total		-100	0	0	-100	-1.0			

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: O. Troubleshooting
Category-Sub: 1. Troubleshooting
Workpaper: 1ED020.000 - Troubleshooting

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	6,596	6,227	5,756	5,765	6,412
Non-Labor	380	310	299	362	421
NSE	0	0	0	0	0
Total	6,975	6,538	6,056	6,128	6,833
FTE	52.5	47.5	42.6	41.0	42.6
Adjustments (Nominal \$) **					
Labor	0	0	0	234	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	234	0
FTE	0.0	0.0	0.0	2.2	0.0
Recorded-Adjusted (Nominal \$)					
Labor	6,596	6,227	5,756	6,000	6,412
Non-Labor	380	310	299	362	421
NSE	0	0	0	0	0
Total	6,975	6,538	6,056	6,362	6,833
FTE	52.5	47.5	42.6	43.2	42.6
Vacation & Sick (Nominal \$)					
Labor	956	988	919	926	1,064
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	956	988	919	926	1,064
FTE	8.5	8.3	7.6	7.5	7.7
Escalation to 2016\$					
Labor	700	501	314	164	0
Non-Labor	9	3	0	0	0
NSE	0	0	0	0	0
Total	708	504	314	165	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	8,251	7,716	6,990	7,090	7,476
Non-Labor	388	313	299	363	421
NSE	0	0	0	0	0
Total	8,639	8,029	7,289	7,453	7,896
FTE	61.0	55.8	50.2	50.7	50.3

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: O. Troubleshooting
 Category-Sub: 1. Troubleshooting
 Workpaper: 1ED020.000 - Troubleshooting

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	234	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	234	0
FTE	0.0	0.0	0.0	2.2	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012 Total		0	0	0	0.0		
2013 Total		0	0	0	0.0		
2014 Total		0	0	0	0.0		
2015	Other	234	0	0	2.2	1-Sided Adj	RPISANES20161112095306663
2015 Total		234	0	0	2.2		
2016 Total		0	0	0	0.0		

Explanation: Dec 2015 MyTime Missing Labor Accrual

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: P. Vegetation Management
Workpaper: VARIOUS

Summary for Category: P. Vegetation Management

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	1,439	1,410	1,326	1,326
Non-Labor	25,017	25,089	25,121	25,089
NSE	0	0	0	0
Total	26,456	26,499	26,447	26,415
FTE	16.9	16.7	15.9	15.9

Workpapers belonging to this Category:

1ED021.000 Vegetation Management (Pole Brushing)

Labor	212	186	186	186
Non-Labor	3,238	3,555	3,555	3,555
NSE	0	0	0	0
Total	3,450	3,741	3,741	3,741
FTE	2.6	2.5	2.5	2.5

1ED021.001 Vegetation Management (Tree Trimming)

Labor	1,227	1,224	1,140	1,140
Non-Labor	21,779	21,534	21,566	21,534
NSE	0	0	0	0
Total	23,006	22,758	22,706	22,674
FTE	14.3	14.2	13.4	13.4

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED021.000 - Vegetation Management (Pole Brushing)

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: P. Vegetation Management
 Category-Sub: 1. Vegetation Management (Pole Brushing)
 Workpaper: 1ED021.000 - Vegetation Management (Pole Brushing)

Activity Description:

Pole brushing for SDG&E involves the clearing of flammable brush and vegetation away from SDG&E distribution poles subject to the California Public Resource Code (PRC), section 4292. PRC 4292 is intended to prevent energized electrical hardware from igniting a fire by keeping the area under the subject poles clear of flammable vegetation at all times.

Forecast Explanations:

Labor - 5-YR Average

Labor costs are based on a 5-year average. Labor includes a portion of several positions that administer the pole brush program. The most recent 5-year average appears most indicative of forecasted expenses for this group, because it represents the funding level needed to complete the forecasted level of pole brush activity while accounting for slight fluctuations in year-to-year costs.

Non-Labor - 5-YR Average

Non-labor includes field work performed by outside contractors plus the pole brushing share of contractor insurance coverage. The most recent 5-year average appears most indicative of forecasted expenses for this group, because it represents the funding level needed to complete the forecasted level of pole brush activity while accounting for slight fluctuations in year-to-year costs.

NSE - 5-YR Average

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		191	220	220	221	212	186	186	186	
Non-Labor		4,677	3,505	3,136	3,221	3,238	3,555	3,555	3,555	
NSE		0	0	0	0	0	0	0	0	
Total		4,868	3,725	3,356	3,442	3,450	3,741	3,741	3,741	
FTE		2.4	2.8	2.7	2.8	2.6	2.5	2.5	2.5	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: P. Vegetation Management
 Category-Sub: 1. Vegetation Management (Pole Brushing)
 Workpaper: 1ED021.000 - Vegetation Management (Pole Brushing)

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	213	213	213	-27	-27	-27	186	186	186
Non-Labor	5-YR Average	3,555	3,555	3,555	0	0	0	3,555	3,555	3,555
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		3,768	3,768	3,768	-27	-27	-27	3,741	3,741	3,741
FTE	5-YR Average	2.7	2.7	2.7	-0.2	-0.2	-0.2	2.5	2.5	2.5

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	Other	-56	0	0	-56	-0.5	1-Sided Adj	RPISANES20161130192246357	
Explanation:		O&M allocation plus non-productive labor for four employees transferring to Construction Services from Pole Brushing							
2017	RAMP Incremental	29	0	0	29	0.3	1-Sided Adj	RPISANES20161201102351370	
Explanation:		RAMP Proposed Activity: Joint Power Line Inspections with CalFire - SDG&E working jointly with CalFire to inspect lines that are going through areas of higher vegetation and known wind and discuss what their thoughts are about potential ignition with our knowledge of how the system is built and come to some agreements on which areas should be potentially re-engineered or perhaps moved or perhaps prescribed burns in areas to reduce vegetation/fuels under power lines etc. The labor costs are employee time to provide CalFire representatives with annual refresher training at Skills Training Center and field time with CalFire for joint inspections.							
2017 Total		-27	0	0	-27	-0.2			
2018	Other	-56	0	0	-56	-0.5	1-Sided Adj	RPISANES20161130192559600	
Explanation:		O&M allocation plus non-productive labor for four employees transferring to Construction Services from Pole Brushing							
2018	RAMP Incremental	29	0	0	29	0.3	1-Sided Adj	RPISANES20161201102359100	
Explanation:		RAMP Proposed Activity: Joint Power Line Inspections with CalFire - SDG&E working jointly with CalFire to inspect lines that are going through areas of higher vegetation and known wind and discuss what their thoughts are about potential ignition with our knowledge of how the system is built and come to some agreements on which areas should be potentially re-engineered or perhaps moved or perhaps prescribed burns in areas to reduce vegetation/fuels under power lines etc. The labor costs are employee time to provide CalFire representatives with annual refresher training at Skills Training Center and field time with CalFire for joint inspections.							

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: P. Vegetation Management
 Category-Sub: 1. Vegetation Management (Pole Brushing)
 Workpaper: 1ED021.000 - Vegetation Management (Pole Brushing)

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2018 Total		-27	0	0	-27	-0.2		
2019 Other		-56	0	0	-56	-0.5	1-Sided Adj	RPISANES20161130192639117
Explanation:	O&M allocation plus non-productive labor for four employees transferring to Construction Services from Pole Brushing							
2019 RAMP Incremental		29	0	0	29	0.3	1-Sided Adj	RPISANES20161201102414100
Explanation:	RAMP Proposed Activity: Joint Power Line Inspections with CalFire - SDG&E working jointly with CalFire to inspect lines that are going through areas of higher vegetation and known wind and discuss what their thoughts are about potential ignition with our knowledge of how the system is built and come to some agreements on which areas should be potentially re-engineered or perhaps moved or perhaps prescribed burns in areas to reduce vegetation/fuels under power lines etc. The labor costs are employee time to provide CalFire representatives with annual refresher training at Skills Training Center and field time with CalFire for joint inspections.							
2019 Total		-27	0	0	-27	-0.2		

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: P. Vegetation Management
 Category-Sub: 1. Vegetation Management (Pole Brushing)
 Workpaper: 1ED021.000 - Vegetation Management (Pole Brushing)

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	152	178	181	187	182
Non-Labor	3,589	2,999	2,985	3,078	3,106
NSE	0	0	0	0	0
Total	3,741	3,176	3,166	3,265	3,288
FTE	2.1	2.4	2.4	2.4	2.2
Adjustments (Nominal \$) **					
Labor	0	0	0	0	0
Non-Labor	985	470	150	140	132
NSE	0	0	0	0	0
Total	985	470	150	140	132
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	152	178	181	187	182
Non-Labor	4,574	3,469	3,135	3,218	3,238
NSE	0	0	0	0	0
Total	4,726	3,646	3,316	3,405	3,420
FTE	2.1	2.4	2.4	2.4	2.2
Vacation & Sick (Nominal \$)					
Labor	22	28	29	29	30
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	22	28	29	29	30
FTE	0.3	0.4	0.4	0.4	0.4
Escalation to 2016\$					
Labor	16	14	10	5	0
Non-Labor	103	36	1	3	0
NSE	0	0	0	0	0
Total	119	50	11	8	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	191	220	220	221	212
Non-Labor	4,677	3,505	3,136	3,221	3,238
NSE	0	0	0	0	0
Total	4,868	3,725	3,356	3,442	3,450
FTE	2.4	2.8	2.8	2.8	2.6

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: P. Vegetation Management
 Category-Sub: 1. Vegetation Management (Pole Brushing)
 Workpaper: 1ED021.000 - Vegetation Management (Pole Brushing)

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	985	470	150	140	132
NSE	0	0	0	0	0
Total	985	470	150	140	132
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012	Other	985	0	0	0.0	1-Sided Adj	RPISANES20161112103842190
Explanation:		To reflect the pole brush-associated portion of the insurance reimbursement made to vegetation management contractors.					
2012	Other	-985	0	0	0.0	1-Sided Adj	RPISANES20161112103956717
Explanation:		to correct previous adjustment (costs should be reflected as non-labor)					
2012	Other	0	985	0	0.0	1-Sided Adj	RPISANES20161112104427297
Explanation:		To reflect the pole brush-associated portion of the insurance reimbursement made to vegetation management contractors.					
2012 Total		0	985	0	0.0		
2013	Other	0	470	0	0.0	1-Sided Adj	RPISANES20161112104530357
Explanation:		To reflect the pole brush-associated portion of the insurance reimbursement made to vegetation management contractors.					
2013 Total		0	470	0	0.0		
2014	Other	0	150	0	0.0	1-Sided Adj	RPISANES20161112104644990
Explanation:		To reflect the pole brush-associated portion of the insurance reimbursement made to vegetation management contractors.					
2014 Total		0	150	0	0.0		
2015	Other	0	140	0	0.0	1-Sided Adj	RPISANES20161112104821953

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
 2019 GRC - APP
 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: P. Vegetation Management
 Category-Sub: 1. Vegetation Management (Pole Brushing)
 Workpaper: 1ED021.000 - Vegetation Management (Pole Brushing)

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation: To reflect the pole brush-associated portion of the insurance reimbursement made to vegetation management contractors.							
2015 Total		0	140	0	0.0		
2016	Other	0	132	0	0.0	1-Sided Adj	RPISANES20170227035902230
Explanation: Insurance reimbursement to Pole Brushing service providers							
2016 Total		0	132	0	0.0		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: P. Vegetation Management
 Category-Sub: 1. Vegetation Management (Pole Brushing)
 Workpaper: 1ED021.000 - Vegetation Management (Pole Brushing)

RAMP Item # 1

Ref ID: ALLLACUN20170308103248913

RAMP Chapter: SDG&E-3

Program Name: Pole Brushing

Program Description: Pole brushing for SDG&E involves the clearing of flammable brush and vegetation away from SDG&E distribution poles subject to California Public Resource Code (PRC), section 4292. PRC 4292 is intended to prevent energized electrical hardware from igniting a fire by keeping the area under the subject poles clear of flammable vegetation at all times.

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety

Mitigation: Safety Policies & Programs

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	3,373	3,373	3,373
High	4,048	4,048	4,048

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 3450

Explanation: 2016 actuals

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: P. Vegetation Management
 Category-Sub: 1. Vegetation Management (Pole Brushing)
 Workpaper: 1ED021.000 - Vegetation Management (Pole Brushing)

RAMP Item # 2

Ref ID: RPISANES20161201102351370

RAMP Chapter: SDG&E-1

Program Name: Joint Power Line Inspections with CalFire

Program Description: SDG&E working jointly with CalFire to inspect lines that are going through areas of higher vegetation and known wind and discuss what their thoughts are about potential ignition with our knowledge of how the system is built and come to some agreements on which areas should be potentially re-engineered or perhaps moved or perhaps prescribed burns in areas to reduce vegetation/fuels under power lines etc.

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Improved joint pole attachment agreements; Rule 18 (resolving safety hazards)

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	25	25	25
High	33	33	33

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

Beginning of Workpaper
1ED021.001 - Vegetation Management (Tree Trimming)

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: P. Vegetation Management
 Category-Sub: 2. Vegetation Management (Tree Trimming)
 Workpaper: 1ED021.001 - Vegetation Management (Tree Trimming)

Activity Description:

Vegetation Management Tree Trim program includes inspecting and maintaining an inventory of approximately 400,000 trees that have the potential to encroach within the minimum required compliance distance between vegetation and overhead power lines. This work includes pruning healthy trees growing into overhead power lines as well as the pruning or removal of dead, dying, diseased, or structurally unsound trees with the potential to fall into overhead lines. Associated program management, as well as administrative and information technology support, are also included as part of this activity.

Forecast Explanations:

Labor - 4-YR Average

Labor costs are based on the most recent 4-year historical average. Labor consists of Vegetation Management staff labor and other support activities.

Non-Labor - 4-YR Average

Non-labor costs are based on a 4-year historical average. Non-labor includes field work plus tree trim's share of contractor insurance. In spite of a host of potential upward cost pressures, the 4-year historical average appropriately represents forecasted expenses for this group.

NSE - 4-YR Average

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		980	980	1,363	1,325	1,227	1,224	1,140	1,140	
Non-Labor		25,385	22,423	21,449	20,484	21,779	21,534	21,566	21,534	
NSE		0	0	0	0	0	0	0	0	
Total		26,365	23,403	22,813	21,810	23,005	22,758	22,706	22,674	
FTE		12.3	12.1	15.3	15.1	14.3	14.2	13.4	13.4	

Note: Totals may include rounding differences.

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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: P. Vegetation Management
 Category-Sub: 2. Vegetation Management (Tree Trimming)
 Workpaper: 1ED021.001 - Vegetation Management (Tree Trimming)

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	4-YR Average	1,224	1,224	1,224	0	-84	-84	1,224	1,140	1,140
Non-Labor	4-YR Average	21,534	21,534	21,534	0	32	0	21,534	21,566	21,534
NSE	4-YR Average	0	0	0	0	0	0	0	0	0
Total		22,758	22,758	22,758	0	-52	-84	22,758	22,706	22,674
FTE	4-YR Average	14.2	14.2	14.2	0.0	-0.8	-0.8	14.2	13.4	13.4

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017 Total		0	0	0	0	0.0			
2018	FOF-Implementation	0	32	0	32	0.0	1-Sided Adj	TSWETEK20170222143301380	
Explanation:		FOF implementation costs							
2018	FOF-Ongoing	-84	0	0	-84	-0.8	1-Sided Adj	TSWETEK20170222143526773	
Explanation:		FOF savings							
2018 Total		-84	32	0	-52	-0.8			
2019	FOF-Ongoing	-84	0	0	-84	-0.8	1-Sided Adj	TSWETEK20170222143629320	
Explanation:		FOF savings							
2019 Total		-84	0	0	-84	-0.8			

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: P. Vegetation Management
Category-Sub: 2. Vegetation Management (Tree Trimming)
Workpaper: 1ED021.001 - Vegetation Management (Tree Trimming)

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	783	791	1,123	1,121	1,052
Non-Labor	19,406	19,607	20,577	19,696	21,016
NSE	0	0	0	0	0
Total	20,189	20,398	21,700	20,817	22,068
FTE	10.6	10.3	13.0	12.9	12.1
Adjustments (Nominal \$) **					
Labor	0	0	0	0	0
Non-Labor	5,420	2,585	866	770	763
NSE	0	0	0	0	0
Total	5,420	2,585	866	770	763
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	783	791	1,123	1,121	1,052
Non-Labor	24,826	22,192	21,443	20,466	21,779
NSE	0	0	0	0	0
Total	25,609	22,983	22,566	21,587	22,831
FTE	10.6	10.3	13.0	12.9	12.1
Vacation & Sick (Nominal \$)					
Labor	113	125	179	173	175
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	113	125	179	173	175
FTE	1.7	1.8	2.3	2.2	2.2
Escalation to 2016\$					
Labor	83	64	61	31	0
Non-Labor	558	231	6	18	0
NSE	0	0	0	0	0
Total	642	295	68	49	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	980	980	1,363	1,325	1,227
Non-Labor	25,385	22,423	21,449	20,484	21,779
NSE	0	0	0	0	0
Total	26,365	23,403	22,813	21,810	23,005
FTE	12.3	12.1	15.3	15.1	14.3

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: P. Vegetation Management
 Category-Sub: 2. Vegetation Management (Tree Trimming)
 Workpaper: 1ED021.001 - Vegetation Management (Tree Trimming)

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	5,420	2,585	866	770	763
NSE	0	0	0	0	0
Total	5,420	2,585	866	770	763
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012	Other	0	5,420	0	0.0	1-Sided Adj	RPISANES20161112105456700
Explanation:		To reflect the tree trimming-associated portion of the insurance reimbursement made to vegetation management contractors.					
2012 Total		0	5,420	0	0.0		
2013	Other	0	2,585	0	0.0	1-Sided Adj	RPISANES20161112105406030
Explanation:		To reflect the tree trimming-associated portion of the insurance reimbursement made to vegetation management contractors.					
2013 Total		0	2,585	0	0.0		
2014	Other	0	866	0	0.0	1-Sided Adj	RPISANES20161112105245407
Explanation:		To reflect the tree trimming-associated portion of the insurance reimbursement made to vegetation management contractors.					
2014 Total		0	866	0	0.0		
2015	Other	0	770	0	0.0	1-Sided Adj	RPISANES20161112105114670
Explanation:		To reflect the tree trimming-associated portion of the insurance reimbursement made to vegetation management contractors.					
2015 Total		0	770	0	0.0		
2016	Other	0	763	0	0.0	1-Sided Adj	RPISANES20170227035954283
Explanation:		Insurance reimbursement to Tree Trimming service providers					

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: P. Vegetation Management
Category-Sub: 2. Vegetation Management (Tree Trimming)
Workpaper: 1ED021.001 - Vegetation Management (Tree Trimming)

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2016 Total		0	763	0	0.0		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
 2019 GRC - APP
 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: P. Vegetation Management
 Category-Sub: 2. Vegetation Management (Tree Trimming)
 Workpaper: 1ED021.001 - Vegetation Management (Tree Trimming)

RAMP Item # 1

Ref ID: SGAHAGAN20170224150110287

RAMP Chapter: SDG&E-1

Program Name: Tree Trimming

Program Description: Inspect and maintain approx 400,000 trees that have the potential to encroach within the minimum required compliance distance between vegetation and overhead power lines

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Enhanced vegetation inspections

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	20,155	20,155	20,155
High	26,202	26,202	26,202

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 23005

Explanation: 2016 actuals

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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: Q. Regional Public Affairs
Workpaper: 1ED022.000

Summary for Category: Q. Regional Public Affairs

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	974	850	740	740
Non-Labor	990	1,062	1,097	1,062
NSE	0	0	0	0
Total	1,964	1,912	1,837	1,802
FTE	8.6	7.1	6.0	6.0

Workpapers belonging to this Category:

1ED022.000 Regional Public Affairs

Labor	974	850	740	740
Non-Labor	990	1,062	1,097	1,062
NSE	0	0	0	0
Total	1,964	1,912	1,837	1,802
FTE	8.6	7.1	6.0	6.0

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED022.000 - Regional Public Affairs

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: Q. Regional Public Affairs
 Category-Sub: 1. Regional Public Affairs
 Workpaper: 1ED022.000 - Regional Public Affairs

Activity Description:

SDG&E's Regional Public Affairs group primarily supports electric and gas distribution operations through its work with regional and local governments on issues regarding proposed regulations, permitting, and emergency preparedness and response. Regional Public Affairs also educates officials at the county and city levels about utility issues that could impact customers.

In addition to communicating with governments, Regional Public Affairs serves as the point of contact in the 125 communities SDG&E serves, educating stakeholders about utility operational activities, programs and services, responding to stakeholder inquiries, resolving customer complaints, and working with underserved communities.

Typical activities in this account include:

- Working with regional and local governments on issues regarding proposed regulations, permitting, and emergency preparedness and response;
- Educating officials at the county and city levels about SDG&E issues that could impact customers;
- Educating community stakeholders about SDG&E's operational activities, programs and services;
- Responding to customer and media inquiries;
- Resolving customer complaints; and
- Working with under-represented communities.

Forecast Explanations:

Labor - 3-YR Average

Labor costs use a three year average. The three year average best reflects current and future operating requirements. Fueling our future savings are captured as incremental reductions to the forecasted costs.

Non-Labor - 3-YR Average

Non-Labor costs use a three year average. The three year average best reflects current and future operating requirements. Fueling our future savings are captured as incremental reductions to the forecasted costs.

NSE - 3-YR Average

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		673	1,000	1,085	968	974	850	740	740	
Non-Labor		553	847	998	1,310	990	1,063	1,098	1,063	
NSE		0	0	0	0	0	0	0	0	
Total		1,226	1,847	2,082	2,278	1,965	1,913	1,838	1,803	
FTE		5.7	8.3	9.2	8.0	8.5	7.0	5.9	5.9	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: Q. Regional Public Affairs
 Category-Sub: 1. Regional Public Affairs
 Workpaper: 1ED022.000 - Regional Public Affairs

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	3-YR Average	1,009	1,009	1,009	-159	-269	-269	850	740	740
Non-Labor	3-YR Average	1,099	1,099	1,099	-37	-2	-37	1,062	1,097	1,062
NSE	3-YR Average	0	0	0	0	0	0	0	0	0
Total		2,108	2,108	2,108	-196	-271	-306	1,912	1,837	1,802
FTE	3-YR Average	8.7	8.7	8.7	-1.6	-2.7	-2.7	7.1	6.0	6.0

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	FOF-Ongoing	-159	-37	0	-196	-1.6	1-Sided Adj	TSWETEK20170310105900170	
Explanation:		FOF Ongoing Savings							
2017 Total		-159	-37	0	-196	-1.6			
2018	FOF-Implementation	0	35	0	35	0.0	1-Sided Adj	TSWETEK20170310105931613	
Explanation:		FOF Implementation Costs							
2018	FOF-Ongoing	-269	-37	0	-306	-2.7	1-Sided Adj	TSWETEK20170310105953737	
Explanation:		FOF Ongoing Savings							
2018 Total		-269	-2	0	-271	-2.7			
2019	FOF-Ongoing	-269	-37	0	-306	-2.7	1-Sided Adj	TSWETEK20170310110021367	
Explanation:		FOF Ongoing Savings							
2019 Total		-269	-37	0	-306	-2.7			

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: Q. Regional Public Affairs
Category-Sub: 1. Regional Public Affairs
Workpaper: 1ED022.000 - Regional Public Affairs

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	538	807	893	819	836
Non-Labor	440	752	926	1,261	935
NSE	0	0	0	0	0
Total	978	1,559	1,820	2,080	1,771
FTE	4.9	7.1	7.9	6.9	7.2
Adjustments (Nominal \$) **					
Labor	0	0	0	0	0
Non-Labor	101	86	71	48	55
NSE	0	0	0	0	0
Total	101	86	71	48	55
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	538	807	893	819	836
Non-Labor	541	838	997	1,309	990
NSE	0	0	0	0	0
Total	1,079	1,645	1,891	2,128	1,826
FTE	4.9	7.1	7.9	6.9	7.2
Vacation & Sick (Nominal \$)					
Labor	78	128	143	126	139
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	78	128	143	126	139
FTE	0.8	1.2	1.4	1.2	1.3
Escalation to 2016\$					
Labor	57	65	49	22	0
Non-Labor	12	9	0	1	0
NSE	0	0	0	0	0
Total	69	74	49	24	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	673	1,000	1,085	968	974
Non-Labor	553	847	998	1,310	990
NSE	0	0	0	0	0
Total	1,226	1,847	2,082	2,278	1,965
FTE	5.7	8.3	9.3	8.1	8.5

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: Q. Regional Public Affairs
 Category-Sub: 1. Regional Public Affairs
 Workpaper: 1ED022.000 - Regional Public Affairs

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	101	86	71	48	55
NSE	0	0	0	0	0
Total	101	86	71	48	55
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012	Other	985	0	0	0.0	1-Sided Adj	RPISANES20161112104026090
Explanation: To reflect the pole brush-associated portion of the insurance reimbursement made to vegetation management contractors.							
2012	Other	-985	0	0	0.0	1-Sided Adj	RPISANES20161112104130263
Explanation: to correct incorrect adjustment (costs should be reflected in non-labor)							
2012	Other	0	985	0	0.0	1-Sided Adj	RPISANES20161112104202150
Explanation: To reflect the pole brush-associated portion of the insurance reimbursement made to vegetation management contractors.							
2012	Other	0	-985	0	0.0	1-Sided Adj	RPISANES20161112104318703
Explanation: to correct previous posting (assigned to incorrect workpaper)							
2012	Other	0	101	0	0.0	CCTR Transf From 2100-3157.000	JBRODRIG20170222194527610
Explanation: Cost center 2100 -3157 will be eliminated as of 2016. Costs were split as following: 2100-4009: 60%; 2100-4008: 20%; 2100-3463: 20%							
2012 Total		0	101	0	0.0		
2013	Other	0	86	0	0.0	CCTR Transf From 2100-3157.000	JBRODRIG20170222195615510
Explanation: Cost center 2100 -3157 will be eliminated as of 2016. Costs were split as following: 2100-4009: 60%; 2100-4008: 20%; 2100-3463: 20%							
2013 Total		0	86	0	0.0		
2014	Other	0	71	0	0.0	CCTR Transf From 2100-3157.000	JBRODRIG20170222195817073

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: Q. Regional Public Affairs
 Category-Sub: 1. Regional Public Affairs
 Workpaper: 1ED022.000 - Regional Public Affairs

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation: Cost center 2100 -3157 will be eliminated as of 2016. Costs were split as following: 2100-4009: 60%; 2100-4008: 20%; 2100-3463: 20%							
2014 Total		0	71	0	0.0		
2015	Other	0	48	0	0.0	CCTR Transf From 2100-3157.000	JBRODRIG20170222200008617
Explanation: Cost center 2100 -3157 will be eliminated as of 2016. Costs were split as following: 2100-4009: 60%; 2100-4008: 20%; 2100-3463: 20%							
2015 Total		0	48	0	0.0		
2016	Other	0	55	0	0.0	CCTR Transf From 2100-3157.000	JBRODRIG20170222200153253
Explanation: Cost center 2100 -3157 will be eliminated as of 2016. Costs were split as following: 2100-4009: 60%; 2100-4008: 20%; 2100-3463: 20%							
2016 Total		0	55	0	0.0		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: Q. Regional Public Affairs
 Category-Sub: 1. Regional Public Affairs
 Workpaper: 1ED022.000 - Regional Public Affairs

RAMP Item # 1

Ref ID: SGAHAGAN20170228151024157

RAMP Chapter: SDG&E-1

Program Name: Community Outreach Programs

Program Description: Work with fire agencies and other community outreach groups for fire awareness, preparation, control and public education to reduce fire risk

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Fire Potential Index; weather network; firefighting contractors/crew staging/sunbird availability; c

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	75	75	75
High	98	98	98

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 102

Explanation: 2015 actuals of \$100k escalated to 2016 by dividing by 0.9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: R. Major Projects
Workpaper: 1ED023.000

Summary for Category: R. Major Projects

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	43	24	24	24
Non-Labor	76	86	86	86
NSE	0	0	0	0
Total	119	110	110	110
FTE	0.7	0.3	0.3	0.3

Workpapers belonging to this Category:

1ED023.000 Major Projects

Labor	43	24	24	24
Non-Labor	76	86	86	86
NSE	0	0	0	0
Total	119	110	110	110
FTE	0.7	0.3	0.3	0.3

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED023.000 - Major Projects

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: R. Major Projects
 Category-Sub: 1. Major Projects
 Workpaper: 1ED023.000 - Major Projects

Activity Description:

Major Projects is responsible for effectively managing distribution and substation projects by focusing on a clearly defined project scope, schedule and budget. This group manages projects from project inception to project conclusion, ensuring consistent project management responsibility throughout the life of the project.

Forecast Explanations:

Labor - 3-YR Average

Labor costs were forecasted using the three-year average methodology. The three-year average best reflects the current and future operating requirements.

Non-Labor - 3-YR Average

Labor costs were forecasted using the three-year average methodology. The three-year average best reflects the current and future operating requirements.

NSE - 3-YR Average

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		48	77	22	6	43	24	24	24	
Non-Labor		14	31	84	98	76	86	86	86	
NSE		0	0	0	0	0	0	0	0	
Total		62	108	106	104	119	110	110	110	
FTE		0.3	0.6	0.2	0.0	0.7	0.3	0.3	0.3	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: R. Major Projects
 Category-Sub: 1. Major Projects
 Workpaper: 1ED023.000 - Major Projects

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	3-YR Average	24	24	24	0	0	0	24	24	24
Non-Labor	3-YR Average	86	86	86	0	0	0	86	86	86
NSE	3-YR Average	0	0	0	0	0	0	0	0	0
Total		110	110	110	0	0	0	110	110	110
FTE	3-YR Average	0.3	0.3	0.3	0.0	0.0	0.0	0.3	0.3	0.3

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
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Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: R. Major Projects
Category-Sub: 1. Major Projects
Workpaper: 1ED023.000 - Major Projects

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	38	62	18	5	37
Non-Labor	14	31	84	46,898	76
NSE	0	0	0	0	0
Total	52	93	102	46,903	113
FTE	0.3	0.5	0.2	0.0	0.6
Adjustments (Nominal \$) **					
Labor	0	0	0	0	0
Non-Labor	0	0	0	-46,800	0
NSE	0	0	0	0	0
Total	0	0	0	-46,800	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	38	62	18	5	37
Non-Labor	14	31	84	98	76
NSE	0	0	0	0	0
Total	52	93	102	103	113
FTE	0.3	0.5	0.2	0.0	0.6
Vacation & Sick (Nominal \$)					
Labor	6	10	3	1	6
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	6	10	3	1	6
FTE	0.1	0.1	0.0	0.0	0.1
Escalation to 2016\$					
Labor	4	5	1	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	4	5	1	0	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	48	77	22	6	43
Non-Labor	14	31	84	98	76
NSE	0	0	0	0	0
Total	62	108	106	104	119
FTE	0.4	0.6	0.2	0.0	0.7

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: R. Major Projects
 Category-Sub: 1. Major Projects
 Workpaper: 1ED023.000 - Major Projects

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	-46,800	0
NSE	0	0	0	0	0
Total	0	0	0	-46,800	0
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012 Total		0	0	0	0.0		
2013 Total		0	0	0	0.0		
2014 Total		0	0	0	0.0		
2015	Other	0	-46,800	0	0.0	1-Sided Adj	RPISANES20161109180923227
2015 Total		0	-46,800	0	0.0		
2016 Total		0	0	0	0.0		

Explanation: Costs related to Sunrise 500KV Overhead. Should be excluded from GRC filing.

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: R. Major Projects
 Category-Sub: 1. Major Projects
 Workpaper: 1ED023.000 - Major Projects

RAMP Item # 1

Ref ID: ALLLACUN20170308182227857

RAMP Chapter: SDG&E-3

Program Name: Contractor Safety Costs - Major Projects

Program Description: Includes administration activities associated with managed construction work, oversight for construction, incident review and investigation, operations and maintenance activities that involve fixed wing aircraft and a wide range of highly skilled and experienced fire safety and fire preventative services.

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety.

Mitigation: Contractor Safety Program

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	7	7	7
High	8	8	8

Funding Source: CPUC-GRC

Forecast Method: Other

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 6

Explanation: 2015 actual 6K

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: S. Technology Utilization
Workpaper: 1ED024.000

Summary for Category: S. Technology Utilization

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	750	894	916	949
Non-Labor	292	277	277	277
NSE	0	0	0	0
Total	1,042	1,171	1,193	1,226
FTE	3.6	4.6	4.7	5.0

Workpapers belonging to this Category:

1ED024.000 Technology Utilization

Labor	750	894	916	949
Non-Labor	292	277	277	277
NSE	0	0	0	0
Total	1,042	1,171	1,193	1,226
FTE	3.6	4.6	4.7	5.0

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED024.000 - Technology Utilization

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: S. Technology Utilization
 Category-Sub: 1. Technology Utilization
 Workpaper: 1ED024.000 - Technology Utilization

Activity Description:

Technology Utilization group is responsible for furthering technological advancement of large-scale renewables, plug-in electric vehicles, and rooftop solar panels by incorporating energy storage and other technologies. Advanced technologies will support system stability and will help us operate our electric system more safely, reliably and efficiently.

Forecast Explanations:

Labor - 4-YR Average

The 4-year average plus incremental labor cost is most reflective of the cost due to organizational changes, a limited cost history and future projects needs within the organization, and to account for annual fluctuations in year-to-year costs.

Non-Labor - 4-YR Average

Non-labor costs are based on a 4-year average due organizational changes, a limited cost history and to account for annual fluctuations in year-to-year costs.

NSE - 4-YR Average

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		805	788	726	771	750	894	916	949	
Non-Labor		52	282	274	259	292	276	276	276	
NSE		0	0	0	0	0	0	0	0	
Total		857	1,070	999	1,030	1,042	1,170	1,192	1,225	
FTE		4.6	4.0	3.5	4.1	3.6	4.6	4.7	5.0	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: S. Technology Utilization
Category-Sub: 1. Technology Utilization
Workpaper: 1ED024.000 - Technology Utilization

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	4-YR Average	759	759	759	135	157	190	894	916	949
Non-Labor	4-YR Average	277	277	277	0	0	0	277	277	277
NSE	4-YR Average	0	0	0	0	0	0	0	0	0
Total		1,035	1,035	1,035	135	157	190	1,170	1,192	1,225
FTE	4-YR Average	3.8	3.8	3.8	0.8	0.9	1.2	4.6	4.7	5.0

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	Other	135	0	0	135	0.8	1-Sided Adj	RPISANES20161128175724913	
Explanation:		Exsiting staff will switch back to O&M work from Expedited Storage Procurement special project - from 0% O&M second half of 2016 back to total of 115K. Additional hire for energy storage projects at 100K with 20% spent in O&M work.							
2017 Total		135	0	0	135	0.8			
2018	Other	157	0	0	157	0.9	1-Sided Adj	RPISANES20161128175759897	
Explanation:		Exsiting staff will switch back to O&M work from Expedited Storage Procurement special project - from 0% O&M second half of 2016 back to total of 115K. Additional hire for energy storage projects at 100K with 20% spent in O&M work. Additional hire for supporting regulatory proceedings on energy storage at 110K with 20% spent in O&M							
2018 Total		157	0	0	157	0.9			
2019	Other	190	0	0	190	1.2	1-Sided Adj	RPISANES20161128175818520	
Explanation:		Exsiting staff will switch back to O&M work from Expedited Storage Procurement special project - from 0% O&M second half of 2016 back to total of 115K. Additional hire for energy storage projects at 100K with 20% spent in O&M work. Additional hire for supporting regulatory proceedings on energy storage at 110K with 20% spent in O&M. Additional hire for analyses of energy storage projects shift at 100k with 30% spend in O&M.							
2019 Total		190	0	0	190	1.2			

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: S. Technology Utilization
Category-Sub: 1. Technology Utilization
Workpaper: 1ED024.000 - Technology Utilization

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	880	964	678	625	615
Non-Labor	265	411	390	501	507
NSE	0	0	0	0	0
Total	1,145	1,375	1,068	1,126	1,123
FTE	6.9	7.0	4.0	3.3	2.8
Adjustments (Nominal \$) **					
Labor	-237	-328	-80	28	28
Non-Labor	-214	-132	-117	-243	-215
NSE	0	0	0	0	0
Total	-451	-460	-197	-215	-187
FTE	-2.9	-3.6	-1.0	0.2	0.2
Recorded-Adjusted (Nominal \$)					
Labor	643	636	598	653	643
Non-Labor	51	279	274	259	292
NSE	0	0	0	0	0
Total	694	915	871	911	935
FTE	4.0	3.4	3.0	3.5	3.0
Vacation & Sick (Nominal \$)					
Labor	93	101	95	101	107
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	93	101	95	101	107
FTE	0.6	0.6	0.5	0.6	0.6
Escalation to 2016\$					
Labor	68	51	33	18	0
Non-Labor	1	3	0	0	0
NSE	0	0	0	0	0
Total	69	54	33	18	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	805	788	726	771	750
Non-Labor	52	282	274	259	292
NSE	0	0	0	0	0
Total	857	1,070	999	1,030	1,042
FTE	4.6	4.0	3.5	4.1	3.6

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: S. Technology Utilization
Category-Sub: 1. Technology Utilization
Workpaper: 1ED024.000 - Technology Utilization

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	-237	-328	-80	28	28
Non-Labor	-214	-132	-117	-243	-215
NSE	0	0	0	0	0
Total	-451	-460	-197	-215	-187
FTE	-2.9	-3.6	-1.0	0.2	0.2

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012	Other	-501	-214	0	-5.2	CCTR Transf To 2100-3707.000	RPISANES20161121062147370
Explanation: moving costs to better align activities under Distributed Energy Programs							
2012	Other	264	0	0	2.3	CCTR Transf From 2100-3751.000	CSCHRAMM20161018180006733
Explanation: Transfer labor and FTE associated with the project titles Smart Grid Strategic Prgm. Mgr.; Chief Engineer; IT Architect; Smart Grid Policy Mgr; and Engineering Intern from cost center 2100-3751 (Sr. Director Clean Transportation) in work paper group 11N001 Residential Services to cost center 2100-3893 (Advanced Technology Integration) in work paper group 1ED024 Technology Utilization to align function/activity where it resides.							
2012 Total		-237	-214	0	-2.9		
2013	Other	-349	-130	0	-3.7	CCTR Transf To 2100-3707.000	RPISANES20161121062325510
Explanation: moving costs to better align activities under Distributed Energy Programs							
2013	Other	0	-2	0	0.0	CCTR Transf To 2100-0230.000	RPISANES20161122173928750
Explanation: move costs to reflect transfer to new organization where future costs will incur							
2013	Other	21	0	0	0.1	CCTR Transf From 2100-3751.000	CSCHRAMM20161018180117157
Explanation: Transfer labor and FTE associated with the project titles Smart Grid Strategic Prgm. Mgr.; Chief Engineer; Mgr. Smart Grid; and Smart Grid Policy Mgr. from cost center 2100-3751 (Sr. Director Clean Transportation) in work paper group 11N001 Residential Services to cost center 2100-3893 (Advanced Technology Integration) in work paper group 1ED024 Technology Utilization to align function/activity where it resides.							
2013 Total		-328	-132	0	-3.6		
2014	Other	-108	-115	0	-1.2	CCTR Transf To 2100-3707.000	RPISANES20161121062443883
Explanation: moving costs to better align activities under Distributed Energy Programs							

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: S. Technology Utilization
 Category-Sub: 1. Technology Utilization
 Workpaper: 1ED024.000 - Technology Utilization

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2014	Other	0	-2	0	0.0	CCTR Transf To 2100-0230.000	RPISANES20161122174231283
Explanation: move costs to reflect transfer to new organization where future costs will be incurred.							
2014	Other	28	0	0	0.2	CCTR Transf From 2100-3751.000	CSCHRAMM20161018180423817
Explanation: Transfer labor/FTE costs associated with the project title Chief Engineer from cost center 2100-3751 (Sr. Director Clean Transportation) in work paper group 1IN001 Residential Services to cost center 2100-3893 (Advanced Technology Integration) in work paper group 1ED024 Technology Utilization to align function/activity where it resides.							
2014 Total		-80	-117	0	-1.0		
2015	Other	0	11	0	0.0	CCTR Transf From 2100-3654.000	RPISANES20161112114220640
Explanation: moving rent charges to cost center 2100-3704 to reflect current area of responsibility							
2015	Other	0	-242	0	0.0	CCTR Transf To 2100-3707.000	RPISANES20161121062608480
Explanation: moving costs to better align activities under Distributed Energy Programs							
2015	Other	0	-11	0	0.0	CCTR Transf To 2100-3707.000	RPISANES20161121062907777
Explanation: moving remaining (adjusted) costs to better align activities under Distributed Energy Programs							
2015	Other	28	0	0	0.2	CCTR Transf From 2100-3751.000	CSCHRAMM20161018180530790
Explanation: Transfer labor and FTE costs associated with the project title Chief Engineer from cost center 2100-3751 (Sr. Director Clean Transportation) in work paper group 1IN001 Residential Services to cost center 2100-3893 (Advanced Technology Integration) in work paper group 1ED024 Technology Utilization to align function/activity where it resides.							
2015	Other	0	0	0	0.0	CCTR Transf To 2100-0230.000	RPISANES20161122174322610
Explanation: move costs to reflect transfer to new organization where future costs will be incurred.							
2015 Total		28	-243	0	0.2		
2016	Other	-3	-1	0	0.0	CCTR Transf To 2100-0230.000	RPISANES20170224195436823
Explanation: move costs from workpaper 1ED024 cost center 0232 to workpaper 1ED008, cost center 0230 to reflect transfer where future costs will be incurred.							
2016	Other	0	-214	0	0.0	CCTR Transf To 2100-3707.000	RPISANES20170225180521850
Explanation: moving costs from 1ED024 (cost center 2100-3704) to 1ED030 (cost center 2100-3707) to better align activities under Distributed Energy Programs.							
2016	Other	30	0	0	0.2	CCTR Transf From 2100-3751.000	CSCHRAMM20170221100000420

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
 2019 GRC - APP
 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: S. Technology Utilization
 Category-Sub: 1. Technology Utilization
 Workpaper: 1ED024.000 - Technology Utilization

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation: Transfer labor and FTE associated with the Chief Engineer from cost center 2100-3751 (Sr. Director Clean Transportation) in work paper group 1IN001 Residential Services to cost center 2100-3893 Advanced Technology Integration in work paper group 1ED024 to align function/activity where it resides.							
2016 Total		28	-215	0	0.2		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: T. Compliance & Asset Management
Workpaper: 1ED025.000

Summary for Category: T. Compliance & Asset Management

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	913	1,053	1,053	1,053
Non-Labor	1,782	1,804	1,804	1,804
NSE	0	0	0	0
Total	2,695	2,857	2,857	2,857
FTE	8.8	11.2	11.2	11.2

Workpapers belonging to this Category:

1ED025.000 Compliance Management

Labor	913	1,053	1,053	1,053
Non-Labor	1,782	1,804	1,804	1,804
NSE	0	0	0	0
Total	2,695	2,857	2,857	2,857
FTE	8.8	11.2	11.2	11.2

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED025.000 - Compliance Management

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: T. Compliance & Asset Management
 Category-Sub: 1. Compliance & Asset Management
 Workpaper: 1ED025.000 - Compliance Management

Activity Description:

The Compliance and Asset Management workgroups are focused on ensuring SDG&E maintains its compliance with internal and external regulations, policies, and procedures as they relate to operating and maintaining the electric distribution system in a safe and efficient manner. The main subsections that comprise the Compliance and Asset Management Workgroup are the "Compliance Management Group" and the "Program Management Group",

Forecast Explanations:

Labor - 3-YR Average

Labor costs recorded to this workpaper group include the manager and supporting project managers and business analysts salary and personal expenses; salaries of employees supporting general administration and recording keeping. The 3-year average forecast appears to be the most representative methodology in estimating the future labor costs associated with this group.

Non-Labor - 3-YR Average

Non-labor expenditures include costs for consultants, training, prototyping new systems, testing materials and limited purchase of tools in support of field Mobile Data Terminals (MDT's). The 3-year average forecast appears to be the most representative methodology in estimating the future non labor costs associated with this group.

NSE - 3-YR Average

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		839	749	736	714	913	1,052	1,052	1,052	
Non-Labor		1,754	1,776	1,848	1,782	1,782	1,804	1,804	1,804	
NSE		0	0	0	0	0	0	0	0	
Total		2,594	2,525	2,584	2,496	2,694	2,856	2,856	2,856	
FTE		8.5	8.2	8.0	7.3	8.7	11.2	11.2	11.2	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: T. Compliance & Asset Management
 Category-Sub: 1. Compliance & Asset Management
 Workpaper: 1ED025.000 - Compliance Management

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	3-YR Average	788	788	788	265	265	265	1,053	1,053	1,053
Non-Labor	3-YR Average	1,804	1,804	1,804	0	0	0	1,804	1,804	1,804
NSE	3-YR Average	0	0	0	0	0	0	0	0	0
Total		2,591	2,591	2,591	265	265	265	2,856	2,856	2,856
FTE	3-YR Average	8.0	8.0	8.0	3.2	3.2	3.2	11.2	11.2	11.2

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	Other	340	0	0	340	4.0	1-Sided Adj	RPISANES20161130194708213	
Explanation:		New CMRS decision will allow ATT and cable companies to attach to our poles and use the right of way and that will require more maintenance and will need higher volume of field validations and information processing. Funding request for these O&M activities is for two office support personnel (\$70k each) and two field quality assurance (QA) leads (\$100k each).							
2017	Other	-75	0	0	-75	-0.8	1-Sided Adj	RPISANES20161130194922217	
Explanation:		five employees transferring to workpaper 1ED026							
2017 Total		265	0	0	265	3.2			
2018	Other	340	0	0	340	4.0	1-Sided Adj	RPISANES20161130194722337	
Explanation:		New CMRS decision will allow ATT and cable companies to attach to our poles and use the right of way and that will require more maintenance and will need higher volume of field validations and information processing. Funding request for these O&M activities is for two office support personnel (\$70k each) and two field quality assurance (QA) leads (\$100k each).							
2018	Other	-75	0	0	-75	-0.8	1-Sided Adj	RPISANES20161130194937273	
Explanation:		five employees transferring to workpaper 1ED026							
2018 Total		265	0	0	265	3.2			
2019	Other	340	0	0	340	4.0	1-Sided Adj	RPISANES20161130194737683	
Explanation:		New CMRS decision will allow ATT and cable companies to attach to our poles and use the right of way and that will require more maintenance and will need higher volume of field validations and information processing. Funding request for these O&M activities is for two office support personnel (\$70k each) and two field quality assurance (QA) leads (\$100k each).							

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
 2019 GRC - APP
 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: T. Compliance & Asset Management
 Category-Sub: 1. Compliance & Asset Management
 Workpaper: 1ED025.000 - Compliance Management

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2019	Other	-75	0	0	-75	-0.8	1-Sided Adj	RPISANES20161130194953590

Explanation: five employees transferring to workpaper 1ED026

2019 Total		265	0	0	265	3.2		
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Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: T. Compliance & Asset Management
Category-Sub: 1. Compliance & Asset Management
Workpaper: 1ED025.000 - Compliance Management

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	671	604	606	604	783
Non-Labor	1,716	1,758	1,848	1,780	1,782
NSE	0	0	0	0	0
Total	2,387	2,362	2,453	2,385	2,564
FTE	7.3	7.0	6.8	6.2	7.5
Adjustments (Nominal \$) **					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	671	604	606	604	783
Non-Labor	1,716	1,758	1,848	1,780	1,782
NSE	0	0	0	0	0
Total	2,387	2,362	2,453	2,385	2,564
FTE	7.3	7.0	6.8	6.2	7.5
Vacation & Sick (Nominal \$)					
Labor	97	96	97	93	130
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	97	96	97	93	130
FTE	1.2	1.2	1.2	1.1	1.4
Escalation to 2016\$					
Labor	71	49	33	17	0
Non-Labor	39	18	1	2	0
NSE	0	0	0	0	0
Total	110	67	34	18	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	839	749	736	714	913
Non-Labor	1,754	1,776	1,848	1,782	1,782
NSE	0	0	0	0	0
Total	2,594	2,525	2,584	2,496	2,694
FTE	8.5	8.2	8.0	7.3	8.9

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
 2019 GRC - APP
 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: T. Compliance & Asset Management
 Category-Sub: 1. Compliance & Asset Management
 Workpaper: 1ED025.000 - Compliance Management

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
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Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: U. Tech Solutions and Reliability
Workpaper: 1ED026.000

Summary for Category: U. Tech Solutions and Reliability

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	1,656	1,663	2,025	2,025
Non-Labor	888	1,235	1,235	1,235
NSE	0	0	0	0
Total	2,544	2,898	3,260	3,260
FTE	16.2	17.2	21.1	21.1

Workpapers belonging to this Category:

1ED026.000 Tech Solutions and Reliability

Labor	1,656	1,663	2,025	2,025
Non-Labor	888	1,235	1,235	1,235
NSE	0	0	0	0
Total	2,544	2,898	3,260	3,260
FTE	16.2	17.2	21.1	21.1

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED026.000 - Tech Solutions and Reliability

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: U. Tech Solutions and Reliability
 Category-Sub: 1. Tech Solutions and Reliability
 Workpaper: 1ED026.000 - Tech Solutions and Reliability

Activity Description:

The Technology Solutions and Reliability workgroup is made up of several groups: Enterprise System Solutions (ESS), ESS Production Support SDGE, Electric Reliability, Construction Planning and Design, Electric Business Process, and Geographic Business Solutions (GBS) mobile, web, and desktop and Operations Technology Integration (OTI).

The Enterprise System Solutions (ESS) group provides system analyst support for Electric Operations. ESS Production Support SDGE provides field hardware support for SDGE field operations. The Reliability Engineering group is responsible for the tracking and reporting of the Electric Reliability indices, developing a capital strategy to improve reliability performance, and managing capital projects through completion to realize the reliability benefits. The Electric Business Process group manages projects around system enhancements, process improvements, and efficiency initiatives. Construction Planning and Design provide project management requirements development, system and user acceptance testing, change management planning and facilitation, coordination of software release activities, and post implementation/storm support. The Geographic Business Solutions (GBS) & Operations Technology Integration (OTI) workgroup is responsible for providing business analytics, (requirements, design, cost benefits, testing, development, etc.), associated with the maintenance and advancement of Geographic Information System (GIS) technology to support existing and future SDG&E enterprise business needs.

Forecast Explanations:

Labor - 5-YR Average

Labor costs are based on a five-year average. A five-year average was chosen to best represent the current and future structure of the organization, and account for annual fluctuations in cost pressures.

Non-Labor - 5-YR Average

Non-labor costs are based on a five-year average. A five-year average was chosen to best represent the current and future structure of the organization, and account for annual fluctuations in cost pressures.

NSE - 5-YR Average

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		1,168	1,816	1,408	1,536	1,656	1,663	2,025	2,025	
Non-Labor		1,370	1,291	1,081	844	888	1,234	1,234	1,234	
NSE		0	0	0	0	0	0	0	0	
Total		2,538	3,107	2,489	2,380	2,544	2,897	3,259	3,259	
FTE		12.9	19.5	14.2	15.0	16.2	17.2	21.1	21.1	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: U. Tech Solutions and Reliability
Category-Sub: 1. Tech Solutions and Reliability
Workpaper: 1ED026.000 - Tech Solutions and Reliability

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	1,517	1,517	1,517	146	508	508	1,663	2,025	2,025
Non-Labor	5-YR Average	1,095	1,095	1,095	140	140	140	1,235	1,235	1,235
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		2,612	2,612	2,612	286	648	648	2,898	3,260	3,260
FTE	5-YR Average	15.6	15.6	15.6	1.6	5.5	5.5	17.2	21.1	21.1

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	Other	79	0	0	79	0.8	1-Sided Adj	RPISANES20161130195851910	
Explanation:		Two additional Geographic Business Solutions (GBS) and Operations Technology Integration (OTI) analysts to address increased work as SDG&E relies more on GIS model applications and interfaces to support business requirements.							
2017	Other	75	0	0	75	0.8	1-Sided Adj	RPISANES20161130200052500	
Explanation:		five employees transferring from workpaper 1ED025							
2017	FOF-Ongoing	-8	15	0	7	0.0	1-Sided Adj	RPISANES20161201104642123	
Explanation:		FOF - Ongoing labor savings and non labor costs for capital savings							
2017	Other	0	40	0	40	0.0	1-Sided Adj	RPISANES20161205114103647	
Explanation:		Enhancements to ARCOS mobile functionality. These enhancements will allow managers, supervisors, and field personnel to utilize smart phones to view information during live callouts.							
2017	Other	0	35	0	35	0.0	1-Sided Adj	RPISANES20161205114145863	
Explanation:		Outage Management System (OMS) Damage assessment. This is a mobile solution that converts our existing paper process of reporting damages and leverages mobile technology transmit information. This will allow for a reduction in time for grid restoration during outages.							
2017	Other	0	50	0	50	0.0	1-Sided Adj	RPISANES20161205114244110	
Explanation:		Systems Functionality/Enhancements to improve the Outage Management System by supporting device or model changes as they relate to grid modernization.							
2017 Total		146	140	0	286	1.6			

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: U. Tech Solutions and Reliability
 Category-Sub: 1. Tech Solutions and Reliability
 Workpaper: 1ED026.000 - Tech Solutions and Reliability

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2018	Other	379	0	0	379	4.1	1-Sided Adj	RPISANES20161130195940147
Explanation:		16 new employees including open requisitions contractors to permanent, and understaffed groups. Specifically, SDG&E is requesting a total of six analysts for Enterprise Systems Solutions (ESS) and ESS Production Support to provide functional support for systems impacting field operations, product development and enhancement, as well as testing, training, and execution of business processes. Construction Planning and Design (CPD) is requesting three additional analysts to support the Organization Change Management (OCM) function for ERO. Electric Business Process (EBP) is requesting three project managers to support projects for ERO, as well as projects for other groups like Clean Transportation, Distribution Operations, and others. With the evolving DER integration and the associated business requirements, the Geographic Business Solutions (GBS) and Operations Technology Integration (OTI) team will need four additional analysts to enhance the current system to provide applications and integration along with, on an ongoing basis, changes that will continue to be made to the GIS model applications and interfaces to support advanced technology utilization business requirements.						
2018	Other	75	0	0	75	0.8	1-Sided Adj	RPISANES20161130200106760
Explanation:		five employees transferring from workpaper 1ED025						
2018	Other	62	0	0	62	0.6	1-Sided Adj	RPISANES20161130200447863
Explanation:		Two additional Geographic Business Solutions (GBS) and Operations Technology Integration (OTI) analysts to address increased work as SDG&E relies more on GIS model applications and interfaces to support business requirements.						
2018	FOF-Ongoing	-8	15	0	7	0.0	1-Sided Adj	RPISANES20161201104658200
Explanation:		FOF - Ongoing labor savings and non labor costs for capital savings						
2018	Other	0	40	0	40	0.0	1-Sided Adj	RPISANES20161205114111903
Explanation:		Enhancements to ARCOS mobile functionality. These enhancements will allow managers, supervisors, and field personnel to utilize smart phones to view information during live callouts.						
2018	Other	0	35	0	35	0.0	1-Sided Adj	RPISANES20161205114154310
Explanation:		Outage Management System (OMS) Damage assessment. This is a mobile solution that converts our existing paper process of reporting damages and leverages mobile technology transmit information. This will allow for a reduction in time for grid restoration during outages.						
2018	Other	0	50	0	50	0.0	1-Sided Adj	RPISANES20161205114252750
Explanation:		Systems Functionality/Enhancements to improve the Outage Management System by supporting device or model changes as they relate to grid modernization						
2018 Total		508	140	0	648	5.5		

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: U. Tech Solutions and Reliability
 Category-Sub: 1. Tech Solutions and Reliability
 Workpaper: 1ED026.000 - Tech Solutions and Reliability

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2019	Other	379	0	0	379	4.1	1-Sided Adj	RPISANES20161130200006240
Explanation:		16 new employees including open requisitions contractors to permanent, and understaffed groups. Specifically, SDG&E is requesting a total of six analysts for Enterprise Systems Solutions (ESS) and ESS Production Support to provide functional support for systems impacting field operations, product development and enhancement, as well as testing, training, and execution of business processes. Construction Planning and Design (CPD) is requesting three additional analysts to support the Organization Change Management (OCM) function for ERO. Electric Business Process (EBP) is requesting three project managers to support projects for ERO, as well as projects for other groups like Clean Transportation, Distribution Operations, and others. With the evolving DER integration and the associated business requirements, the Geographic Business Solutions (GBS) and Operations Technology Integration (OTI) team will need four additional analysts to enhance the current system to provide applications and integration along with, on an ongoing basis, changes that will continue to be made to the GIS model applications and interfaces to support advanced technology utilization business requirements.						
2019	Other	75	0	0	75	0.8	1-Sided Adj	RPISANES20161130200150370
Explanation:		five employees transferring from workpaper 1ED025						
2019	Other	62	0	0	62	0.6	1-Sided Adj	RPISANES20161130200552137
Explanation:		Two additional Geographic Business Solutions (GBS) and Operations Technology Integration (OTI) analysts to address increased work as SDG&E relies more on GIS model applications and interfaces to support business requirements.						
2019	FOF-Ongoing	-8	15	0	7	0.0	1-Sided Adj	RPISANES20161201104705997
Explanation:		FOF - Ongoing labor savings and non labor costs for capital savings						
2019	Other	0	40	0	40	0.0	1-Sided Adj	RPISANES20161205114119123
Explanation:		Enhancements to ARCOS mobile functionality. These enhancements will allow managers, supervisors, and field personnel to utilize smart phones to view information during live callouts.						
2019	Other	0	35	0	35	0.0	1-Sided Adj	RPISANES20161205114204000
Explanation:		Outage Management System (OMS) Damage assessment. This is a mobile solution that converts our existing paper process of reporting damages and leverages mobile technology transmit information. This will allow for a reduction in time for grid restoration during outages.						
2019	Other	0	50	0	50	0.0	1-Sided Adj	RPISANES20161205114301827
Explanation:		Systems Functionality/Enhancements to improve the Outage Management System by supporting device or model changes as they relate to grid modernization						
2019 Total		508	140	0	648	5.5		

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: U. Tech Solutions and Reliability
Category-Sub: 1. Tech Solutions and Reliability
Workpaper: 1ED026.000 - Tech Solutions and Reliability

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	934	1,466	1,160	1,300	1,420
Non-Labor	1,340	1,277	1,081	843	888
NSE	0	0	0	0	0
Total	2,274	2,743	2,241	2,143	2,308
FTE	11.1	16.6	12.0	12.8	13.7
Adjustments (Nominal \$) **					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	934	1,466	1,160	1,300	1,420
Non-Labor	1,340	1,277	1,081	843	888
NSE	0	0	0	0	0
Total	2,274	2,743	2,241	2,143	2,308
FTE	11.1	16.6	12.0	12.8	13.7
Vacation & Sick (Nominal \$)					
Labor	135	232	185	201	236
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	135	232	185	201	236
FTE	1.8	2.9	2.2	2.2	2.5
Escalation to 2016\$					
Labor	99	118	63	36	0
Non-Labor	30	13	0	1	0
NSE	0	0	0	0	0
Total	129	131	64	36	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	1,168	1,816	1,408	1,536	1,656
Non-Labor	1,370	1,291	1,081	844	888
NSE	0	0	0	0	0
Total	2,538	3,107	2,489	2,380	2,544
FTE	12.9	19.5	14.2	15.0	16.2

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: U. Tech Solutions and Reliability
 Category-Sub: 1. Tech Solutions and Reliability
 Workpaper: 1ED026.000 - Tech Solutions and Reliability

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
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Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Workpaper: 1ED027.000

Summary for Category: V. Emergency Management

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	1,025	1,125	1,562	1,562
Non-Labor	1,478	1,706	3,371	3,782
NSE	0	0	0	0
Total	2,503	2,831	4,933	5,344
FTE	10.0	11.0	15.4	15.4

Workpapers belonging to this Category:

1ED027.000 Emergency Management

Labor	1,025	1,125	1,562	1,562
Non-Labor	1,478	1,706	3,371	3,782
NSE	0	0	0	0
Total	2,503	2,831	4,933	5,344
FTE	10.0	11.0	15.4	15.4

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED027.000 - Emergency Management

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

Activity Description:

Emergency Management is made up of three groups: Emergency Services (ES), Meteorology, and Fire Coordination and Prevention (FCP). ES provides planning and guidance for responding in anticipation of, response to, or following an incident. ES supports the Company's ability to prevent, prepare for, respond to, and recover from incidents regardless of cause, size, or complexity. ES's work and responsibilities support the mitigation or response to other enterprise risks for which ES does not have direct management.

To assist in coordination and recovery efforts as a result of a variety of emergency events, SDGE has in place three 16' trailers and one 32' trailer containing necessary communications, networking and office supplies to establish a command and control center at an impromptu staging yard. Because these trailers are utilized for Emergency needs, they are required to be operational at any moment in time. Currently, SDG&E has three meteorologists. They provide daily reports critical to making real-time operating decisions to safely manage and operate the electric system, providing coverage on a 24/7 basis. The group also manages our nation's largest utility weather network and has developed a high performance computing program to integrated state-of-the-art analytical methods to provide superior decision support tools to our company and community.

The FCP team consists of individuals possessing broad expertise in a variety of firefighting disciplines from wildland fire control and municipal fire departments to aerial firefighting operations. Because of their Incident Command System experience, the FCP team can integrate with first responders at the Command level to ensure the emergency response is safe, efficient and coordinated.

Forecast Explanations:

Labor - Base YR Rec

The forecast method developed for this cost category is Base Year Recorded Plus Incremental Increases. 2016 represented the first full year that the Emergency Management Division existed in its current state, with all related organizations consolidated.

Non-Labor - Base YR Rec

The forecast method developed for this cost category is Base Year Recorded Plus Incremental Increases. 2016 represented the first full year that the Emergency Management Division existed in its current state, with all related organizations consolidated.

NSE - Base YR Rec

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Note: Totals may include rounding differences.

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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: V. Emergency Management
 Category-Sub: 1. Emergency Management
 Workpaper: 1ED027.000 - Emergency Management

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		1,126	1,057	885	1,028	1,025	1,125	1,562	1,562	
Non-Labor		1,685	1,805	1,572	1,508	1,478	1,706	3,371	3,782	
NSE		0	0	0	0	0	0	0	0	
Total		2,811	2,862	2,458	2,536	2,503	2,831	4,933	5,344	
FTE		10.9	10.3	9.1	10.0	10.0	11.0	15.4	15.4	

Note: Totals may include rounding differences.

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Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	1,025	1,025	1,025	100	537	537	1,125	1,562	1,562
Non-Labor	Base YR Rec	1,478	1,478	1,478	228	1,893	2,304	1,706	3,371	3,782
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
Total		2,503	2,503	2,503	328	2,430	2,841	2,831	4,933	5,344
FTE	Base YR Rec	10.0	10.0	10.0	1.0	5.4	5.4	11.0	15.4	15.4

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	Other	100	0	0	100	1.0	1-Sided Adj	RPISANES20161130210902910	
Explanation:		Training augmentation as a result of increased regulatory requirements around General Order 112F. Two Program Managers. Total for half year = \$100k							
2017	Other	0	30	0	30	0.0	1-Sided Adj	RPISANES20161130211448333	
Explanation:		Maintenance for the new Emergency Mobile Command Trailer (EMCT). Key monthly maintenance for the equipment and services inside and on the roof along with the trailer. This includes turning on all equipment (generator, computers, satellite, etc.) to ensure everything works and connecting to communications. If something is not working, the costs will be included on the "Materials for EMCT's".							
2017	Other	0	75	0	75	0.0	1-Sided Adj	RPISANES20161130211614313	
Explanation:		Materials for EMCT s. After key monthly maintenance is completed, nonworking materials and services need to be replaced.							
2017	Other	0	110	0	110	0.0	1-Sided Adj	RPISANES20161130211905460	
Explanation:		Fire Safety Contract labor. Fire Season has extended to 4 months and requires additional Capstone on duty.							
2017	RAMP Incremental	0	13	0	13	0.0	1-Sided Adj	RPISANES20161201105635187	
Explanation:		RAMP Proposed Activity: Web based situational tool for coordination with agencies during a wildfire. The non-labor costs are for contract resources to develop and maintain the tool.							
2017 Total		100	228	0	328	1.0			
2018	Other	200	0	0	200	2.0	1-Sided Adj	RPISANES20161130212454320	
Explanation:		Training augmentation as a result of increased regulatory requirements around General Order 112F. Two Program Managers. Total = \$200k							

Note: Totals may include rounding differences.

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<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>	
2018	Other	0	375	0	375	0.0	1-Sided Adj	RPISANES20161130212535667	
Explanation:		Emergency Response Training and Curriculum Development. Referencing industry rates for this specific training and development, the contract would be \$375k							
2018	Other	0	250	0	250	0.0	1-Sided Adj	RPISANES20161130212635523	
Explanation:		Incident Command System (ICS). Referencing industry rates for this specific training and development, the contract would be \$250k.							
2018	Other	0	50	0	50	0.0	1-Sided Adj	RPISANES20161130212746243	
Explanation:		EOC AV Maintenance. Ancillary costs for update and maintenance of the AV system in the EOC, display repairs etc.							
2018	Other	0	100	0	100	0.0	1-Sided Adj	RPISANES20161130212830993	
Explanation:		Software Services. New software packages that will enhance productivity and workflow process. There is a continually increasing demand to process and analyze situational awareness data when monitoring and responding to emergencies on the system. These additional software packages will help streamline the ability to anticipate and prepare for emergencies. When an emergency occurs, this new software will enhance the productivity and workflow of the responders supporting our reaction and recovery.							
2018	Other	0	300	0	300	0.0	1-Sided Adj	RPISANES20161130212918360	
Explanation:		Software Programming Services. Contracted IT Programming support to assist in the building of information and business analysis tools - Cost based on current market prices. This project will support the implementation and integration of new software services. Any new software technology that is implemented will need to be seamlessly integrated into our operations and be able to function and communicate with other company systems and this contracted IT Programming Service will support that effort.							
2018	Other	0	50	0	50	0.0	1-Sided Adj	RPISANES20161130213008670	
Explanation:		Sprinter Van Outfit. Costs are based on the costs not covered in previous years.							
2018	Other	0	30	0	30	0.0	1-Sided Adj	RPISANES20161130213050523	
Explanation:		Maintenance for the new Emergency Mobile Command Trailer (EMCT). Key monthly maintenance for the equipment and services inside and on the roof along with the trailer. This includes turning on all equipment (generator, computers, satellite, etc.) to ensure everything works and connecting to communications. If something is not working, the costs will be included on the "Materials for EMCT's".							
2018	Other	0	75	0	75	0.0	1-Sided Adj	RPISANES20161130213131463	
Explanation:		Materials for EMCT s. After key monthly maintenance is completed, nonworking materials and services need to be replaced.							

Note: Totals may include rounding differences.

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<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2018	Other	0	130	0	130	0.0	1-Sided Adj	RPISANES20161130213318167
Explanation:		Fire Safety Contract labor. Fire Season has extended to 4 months and requires additional Capstone on duty.						
2018	RAMP Incremental	0	25	0	25	0.0	1-Sided Adj	RPISANES20161130213556360
Explanation:		RAMP Proposed Activity: Santa Ana Wildfire Threat Index (SAWTI) - Maintain and upgrade SAWTI, which establishes data sharing between internal meteorologists and fire agencies. The non-labor costs are programming time by contract resources to integrate the latest wildfire science into this tool.						
2018	Other	0	100	0	100	0.0	1-Sided Adj	RPISANES20161130213701367
Explanation:		SDG&E Meteorology Cloud Computing. As our current high performance computing clusters come to end of life, we would like to transition our operations to the cloud with a 10% increase to account for the expansion of our operations.						
2018	Other	0	60	0	60	0.0	1-Sided Adj	RPISANES20161130213727913
Explanation:		Atmospheric Profiler Operations. Leidos has provided estimates for the operating costs, minus the set-up fees from 2017						
2018	RAMP Incremental	0	13	0	13	0.0	1-Sided Adj	RPISANES20161201105655933
Explanation:		RAMP Proposed Activity: Web based situational tool for coordination with agencies during a wildfire. The non-labor costs are for contract resources to develop and maintain the tool.						
2018	RAMP Incremental	337	133	0	470	3.4	1-Sided Adj	SGAHAGAN20170302141044220
Explanation:		RAMP Proposed Activity: Weather Stations - Use of weather stations and correlation with Fire Protection Index. The life span on weather equipment is 3-5 years and the sensors will need replacing periodically. There is also a web based forecasting system behind the FPI that needs maintenance. See supplemental workpaper for forecast methodology.						
2018	RAMP Incremental	0	127	0	127	0.0	1-Sided Adj	ALLLACUN20170307212059113
Explanation:		RAMP proposed activity: University Team - Investigating the latest science to inform system planning decisions. The university team base cost was structured according to a past research project with University of California, Los Angeles. To cover the scope of the research project, a faculty advisor, full-time post-doctoral student, and two full-time graduate students would be needed. Using the budgeted costs from the UCLA project results in: Faculty personnel (11%): \$109,230*11% = 12,015.30, Post-doctoral student (100%): \$55,931, Two graduate students (100%): \$43,116*2 = \$86,232, Total personnel cost: \$12,015.30 + \$55,931 + \$86,232 = \$154,178.3 Scripps Institution of Oceanography, who would be leading the research, also charges a 60% overhead fee, resulting in a base cost of near \$250,000. The activity is to be fully implementation by 2019.						

Note: Totals may include rounding differences.

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Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj_Type	RefID
2018	RAMP Incremental	0	75	0	75	0.0	1-Sided Adj	ALLLACUN20170307213821990

Explanation: RAMP proposed activity: Consultant Support - Organizing the training of different working groups around SDG&E impacted by climate change. At the recommendation of a consulting firm, a climate-related consulting and research would entail one project management position, at \$200 per hour for roughly 225 hours, and a support/technical staff, at \$150 per hour for roughly 700 hours, resulting in a \$150,000 total. The activity is to be fully implementation by 2019.

2018 Total		537	1,893	0	2,430	5.4		
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2019	Other	200	0	0	200	2.0	1-Sided Adj	RPISANES20161130213854120
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Explanation: Training augmentation as a result of increased regulatory requirements around General Order 112F. Two Program Managers. Total = \$200k

2019	Other	0	100	0	100	0.0	1-Sided Adj	RPISANES20170511122434790
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Explanation: New software packages that will enhance productivity and workflow process. There is a continually increasing demand to process and analyze situational awareness data when monitoring and responding to emergencies on the system. These additional software packages will help streamline the ability to anticipate and prepare for emergencies. When an emergency occurs, this new software will enhance the productivity and workflow of the responders supporting our reaction and recovery.

2019	Other	0	50	0	50	0.0	1-Sided Adj	RPISANES20161130214103947
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Explanation: EOC AV Maintenance. Ancillary costs for update and maintenance of the AV system in the EOC, display repairs etc.

2019	Other	0	375	0	375	0.0	1-Sided Adj	RPISANES20161130214151213
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Explanation: Emergency Response Training and Curriculum Development. Referencing industry rates for this specific training and development, the contract would be \$375k.

2019	Other	0	250	0	250	0.0	1-Sided Adj	RPISANES20161130214235323
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Explanation: Incident Command System (ICS). Referencing industry rates for this specific training and development, the contract would be \$250k.

2019	Other	0	30	0	30	0.0	1-Sided Adj	RPISANES20161130214329743
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Explanation: Maintenance for the new Emergency Mobile Command Trailer (EMCT). Key monthly maintenance for the equipment and services inside and on the roof along with the trailer. This includes turning on all equipment (generator, computers, satellite, etc.) to ensure everything works and connecting to communications. If something is not working, the costs will be included on the "Materials for EMCT's".

2019	Other	0	75	0	75	0.0	1-Sided Adj	RPISANES20161130214406447
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Note: Totals may include rounding differences.

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<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation:		Materials for EMCT s. After key monthly maintenance is completed, nonworking materials and services need to be replaced.						
2019	Other	0	220	0	220	0.0	1-Sided Adj	RPISANES20161130214907203
Explanation:		SDG&E Meteorology Cloud Computing. As our current high performance computing clusters come to end of life, we would like to transition our operations to the cloud with a 10% increase to account for the expansion of our operations.						
2019	Other	0	300	0	300	0.0	1-Sided Adj	RPISANES20170901131820393
Explanation:		Software Programming Services. Contracted IT Programing support to assist in the building of information and business analysis tools - Cost based on current market prices. This project will support the implementation and integration of new software services. Any new software technology that is implemented will need to be seamlessly integrated into our operations and be able to function and communicate with other company systems and this contracted IT Programming Service will support that effort.						
2019	Other	0	150	0	150	0.0	1-Sided Adj	RPISANES20161130214643153
Explanation:		Fire Safety Contract labor. Fire Season has extended to 4 months and requires additional Capstone on duty.						
2019	RAMP Incremental	0	25	0	25	0.0	1-Sided Adj	RPISANES20161130214824680
Explanation:		RAMP Proposed Activity: Santa Ana Wildfire Threat Index (SAWTI) - Maintain and upgrade SAWTI, which establishes data sharing between internal meteorologists and fire agencies. The non-labor costs are programming time by contract resources to integrate the latest wildfire science into this tool.						
2019	Other	0	50	0	50	0.0	1-Sided Adj	RPISANES20170901131934277
Explanation:		Sprinter Van Outfit. Costs are based on the costs not covered in previous years.						
2019	Other	0	130	0	130	0.0	1-Sided Adj	RPISANES20161130215017397
Explanation:		Atmospheric Profiler Operations. Leidos has provided estimates for the operating costs, this is 2017 cost plus standard annual increase.						
2019	RAMP Incremental	0	13	0	13	0.0	1-Sided Adj	RPISANES20161201105705020
Explanation:		RAMP Proposed Activity: Web based situational tool for coordination with agencies during a wildfire. The non-labor costs are for contract resources to develop and maintain the tool.						
2019	RAMP Incremental	337	133	0	470	3.4	1-Sided Adj	SGAHAGAN20170302141221093
Explanation:		RAMP Proposed Activity: Weather Stations - Use of weather stations and correlation with Fire Protection Index. The life span on weather equipment is 3-5 years and the sensors will need replacing periodically. There is also a web based forecasting system behind the FPI that needs maintenance. See supplemental workpaper for forecast methodology.						

Note: Totals may include rounding differences.

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<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2019	RAMP Incremental	0	253	0	253	0.0	1-Sided Adj	ALLLACUN20170307212448323

Explanation: RAMP proposed activity: University Team - Investigating the latest science to inform system planning decisions. The university team base cost was structured according to a past research project with University of California, Los Angeles. To cover the scope of the research project, a faculty advisor, full-time post-doctoral student, and two full-time graduate students would be needed. Using the budgeted costs from the UCLA project results in:
 Faculty personnel (11%): $\$109,230 \times 11\% = 12,015.30$, Post-doctoral student (100%): $\$55,931$, Two graduate students (100%): $\$43,116 \times 2 = \$86,232$, Total personnel cost: $\$12,015.30 + \$55,931 + \$86,232 = \$154,178.3$
 Scripps Institution of Oceanography, who would be leading the research, also charges a 60% overhead fee, resulting in a base cost of near \$250,000. The activity is to be fully implemented by 2019.

2019	RAMP Incremental	0	150	0	150	0.0	1-Sided Adj	ALLLACUN20170307214151700
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Explanation: RAMP proposed activity: Consultant Support - Organizing the training of different working groups around SDG&E impacted by climate change. At the recommendation of a consulting firm, a climate-related consulting and research would entail one project management position, at \$200 per hour for roughly 225 hours, and a support/technical staff, at \$150 per hour for roughly 700 hours, resulting in a \$150,000 total. The activity is to be fully implemented by 2019.

2019 Total		537	2,304	0	2,841	5.4		
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Note: Totals may include rounding differences.

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Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	672	659	598	773	879
Non-Labor	883	867	689	764	1,478
NSE	0	0	0	0	0
Total	1,554	1,526	1,286	1,537	2,357
FTE	6.9	7.1	6.3	7.6	8.5
Adjustments (Nominal \$) **					
Labor	228	193	132	97	0
Non-Labor	765	920	883	743	0
NSE	0	0	0	0	0
Total	993	1,113	1,015	840	0
FTE	2.5	1.7	1.4	0.9	0.0
Recorded-Adjusted (Nominal \$)					
Labor	900	853	729	870	879
Non-Labor	1,648	1,787	1,572	1,506	1,478
NSE	0	0	0	0	0
Total	2,548	2,640	2,301	2,376	2,357
FTE	9.4	8.8	7.7	8.5	8.5
Vacation & Sick (Nominal \$)					
Labor	130	135	116	134	146
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	130	135	116	134	146
FTE	1.5	1.5	1.4	1.5	1.5
Escalation to 2016\$					
Labor	95	69	40	24	0
Non-Labor	37	19	0	1	0
NSE	0	0	0	0	0
Total	133	87	40	25	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	1,126	1,057	885	1,028	1,025
Non-Labor	1,685	1,805	1,572	1,508	1,478
NSE	0	0	0	0	0
Total	2,811	2,862	2,458	2,536	2,503
FTE	10.9	10.3	9.1	10.0	10.0

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

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Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	228	193	132	97	0
Non-Labor	765	920	883	743	0
NSE	0	0	0	0	0
Total	993	1,113	1,015	840	0
FTE	2.5	1.7	1.4	0.9	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012	Other	228	0	0	2.5	CCTR Transf From 2100-3616.000	RPISANES20161129101629430
Explanation: Costs dedicated to weather							
2012	Other	0	6	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129102934513
Explanation: Costs dedicated to weather							
2012	Other	0	-7	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129103114887
Explanation: Costs dedicated to weather							
2012	Other	0	7	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129103224620
Explanation: Costs dedicated to weather							
2012	Other	0	7	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129103427403
Explanation: reversal of previous adjustment (added when should have been subtracted)							
2012	Other	0	7	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129103521060
Explanation: Costs dedicated to weather							
2012	Other	0	11	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129103702747
Explanation: Costs dedicated to weather							
2012	Other	0	31	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129103821940
Explanation: Costs dedicated to weather							
2012	Other	0	40	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129103942040
Explanation: Costs dedicated to weather							
2012	Other	0	94	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129104135243
Explanation: Costs dedicated to weather							

Note: Totals may include rounding differences.

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<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2012	Other	0	114	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129104246397
Explanation: Costs dedicated to weather							
2012	Other	0	184	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129104401950
Explanation: Costs dedicated to weather							
2012	Other	0	229	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129104516093
Explanation: Costs dedicated to weather							
2012	Other	0	-44	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129104641717
Explanation: Costs dedicated to weather							
2012	Other	0	44	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129104805467
Explanation: correct previous adjustment (need to subtract rather than add)							
2012	Other	0	44	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129104849953
Explanation: Costs dedicated to weather							
2012 Total		228	765	0	2.5		
2013	Other	193	0	0	1.7	CCTR Transf From 2100-3616.000	RPISANES20161129105150133
Explanation: Costs dedicated to weather							
2013	Other	0	11	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129105435313
Explanation: Costs dedicated to weather							
2013	Other	0	909	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129110641120
Explanation: Costs dedicated to weather							
2013 Total		193	920	0	1.7		
2014	Other	132	0	0	1.4	CCTR Transf From 2100-3616.000	RPISANES20161129110824220
Explanation: Costs dedicated to weather							
2014	Other	0	883	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129110946767
Explanation: Costs dedicated to weather							
2014 Total		132	883	0	1.4		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
 2019 GRC - APP
 Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: V. Emergency Management
 Category-Sub: 1. Emergency Management
 Workpaper: 1ED027.000 - Emergency Management

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2015	Other	97	0	0	0.9	CCTR Transf From 2100-3616.000	RPISANES20161129111114970
Explanation: Costs dedicated to weather							
2015	Other	0	743	0	0.0	CCTR Transf From 2100-3616.000	RPISANES20161129111232710
Explanation: Costs dedicated to weather							
2015 Total		97	743	0	0.9		
2016 Total		0	0	0	0.0		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 1

Ref ID: ALLLACUN20170307204556203

RAMP Chapter: SDG&E-14

Program Name: Meteorology Support

Program Description: Meteorology labor to support addressing and identifying potential risks posed to SDG&E's system by climate change

Risk/Mitigation:

Risk: Climate Change Adaptation

Mitigation: Meteorology Support

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	23	23	23
High	28	28	28

Funding Source: CPUC-GRC

Forecast Method: Other

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 24

Explanation: 2015 actuals of 23 escalated to 2016 by dividing by 0.9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 2

Ref ID: ALLLACUN20170307211200733

RAMP Chapter: SDG&E-14

Program Name: University Team

Program Description: Investigating the latest science to inform system planning decisions

Risk/Mitigation:

Risk: Climate Change Adaptation

Mitigation: Studies

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	225	225	225
High	300	300	300

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 3

Ref ID: ALLLACUN20170307213224510

RAMP Chapter: SDG&E-14

Program Name: Consultant Support

Program Description: Organizing the training of different working groups around SDG&E impacted by climate change

Risk/Mitigation:

Risk: Climate Change Adaptation

Mitigation: Internal Education

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	120	120	120
High	180	180	180

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 4

Ref ID: ALLLACUN20170308111701583

RAMP Chapter: SDG&E-3

Program Name: Emergency Management First Responder Outreach Program

Program Description: Provide Safety and basic operational information about electricity and SDG&E's facilities as they relate to First Responder operations and activities.

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety.

Mitigation: Customer Communications and First Responder training

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	24	24	24
High	29	29	29

Funding Source: CPUC-GRC

Forecast Method: Other

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 24

Explanation: 2015 actual 24K

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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 5

Ref ID: ALLLACUN20170308174715433

RAMP Chapter: SDG&E-3

Program Name: Emergency Operations Center (EOC) First Responder Training

Program Description: Incident Response Training & Exercises.

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety.

Mitigation: Customer Communications and First Responder Training

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	651	651	651
High	781	781	781

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 631

Explanation: 2015 actuals of 623 escalated to 2016 by dividing by 0.98795

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 6

Ref ID: ALLLACUN20170308180651677

RAMP Chapter: SDG&E-3

Program Name: EOC Training-Student Costs

Program Description: Training for Emergency Operations Center support personnel

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety.

Mitigation: Customer Communications and First Responder Training

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	241	241	241
High	289	289	289

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 253

Explanation: 2015 actuals of 250 escalated to 2016 by dividing by 0.98795

San Diego Gas & Electric Company
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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: V. Emergency Management
 Category-Sub: 1. Emergency Management
 Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 7

Ref ID: ALLLACUN20170626143039593

RAMP Chapter: SDG&E-1

Program Name: Utility Wildfire Prevention Teams

Program Description: These teams are used to follow electric line crews at heightened fire risk times to make sure no errant spark as a result of active line work turns into a fire.

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment

Mitigation: Fire Potential Index; weather network; firefighting contractors/crew staging/sunbird availability; construction restrictions on fire weather days

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	2,170	2,170	2,170
High	2,821	2,871	2,871

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 2067

Explanation: 2067 2015 actual.

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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 8

Ref ID: RPISANES20161130212132367

RAMP Chapter: SDG&E-1

Program Name: Santa Ana Wildfire Threat Index (SAWTI)

Program Description: Maintain and upgrade SAWTI, which establishes data sharing between internal meteorologists and fire agencies

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Advanced Detection

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	20	20	20
High	26	26	26

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 9

Ref ID: RPISANES20161201105635187

RAMP Chapter: SDG&E-1

Program Name: NICS/Scout

Program Description: Web based situational tool for coordination with agencies during a wildfire.

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Advanced Detection

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	10	10	10
High	13	13	13

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: V. Emergency Management
 Category-Sub: 1. Emergency Management
 Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 10

Ref ID: RPISANES20161201105825677

RAMP Chapter: SDG&E-1

Program Name: Mobile Command Centers

Program Description: Field mobile command centers assist in fighting active fires so they can be suppressed and controlled quickly

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Fire Potential Index; weather network; firefighting contractors/crew staging/sunbird availability; c

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	500	500	500
High	650	650	650

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 11

Ref ID: RPISANES20161201105925837

RAMP Chapter: SDG&E-1

Program Name: Partnership with Fuego/Fireball

Program Description: Fire imaging equipment that would provide near real-time fire perimeter data

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Advanced Detection

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	900	900	900
High	1,170	1,170	1,170

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: V. Emergency Management
 Category-Sub: 1. Emergency Management
 Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 12

Ref ID: SGAHAGAN20170227144817433

RAMP Chapter: SDG&E-1

Program Name: Utility Wildfire Prevention Teams

Program Description: These teams are used to follow electric line crews at heightened fire risk times to make sure no errant spark as a result of active line work turns into a fire.

Risk/Mitigation:

Risk: Wildfires caused by SDG&E (including third party p

Mitigation: Fire Potential Index; weather network; firefighting contractors/crew staging/sunbird availability; c

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	2,170	2,170	2,170
High	2,821	2,821	2,821

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 2116

Explanation: 2015 actuals of \$2,067k escalated to 2016 by dividing by 0.9768

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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 13

Ref ID: SGAHAGAN20170227145749033

RAMP Chapter: SDG&E-1

Program Name: Fire Brigade

Program Description: Fight substation and structure fire using typical fire control facilities and fire suppression foam trailers.

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Fire Potential Index; weather network; firefighting contractors/crew staging/sunbird availability; c

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	482	482	482
High	627	627	627

Funding Source: CPUC-GRC

Forecast Method: Trend

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 400

Explanation: 2015 actuals of \$400k. Escalation factor of 0.9991 doesn't affect value when converting to 2016

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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 14

Ref ID: SGAHAGAN20170302140756827

RAMP Chapter: SDG&E-1

Program Name: Weather Stations

Program Description: Use of weather stations and correlation with Fire Protection Index. The life span on weather equipment is 3-5 years and the sensors will need replacing periodically. There is also a web based forecasting system behind the FPI that needs maintenance.

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Advanced Detection

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	425	425	425
High	553	553	553

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: V. Emergency Management
 Category-Sub: 1. Emergency Management
 Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 15

Ref ID: SGAHAGAN20170302143059007

RAMP Chapter: SDG&E-1

Program Name: Weather Forecasting Models

Program Description: Maintain, replace, recalibrate and check over 170 weather stations within service territory.
 Regular upgrade of computer hardware and processors to run data analytics

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi
 Mitigation: Advanced Detection

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	118	118	118
High	153	153	153

Funding Source: CPUC-GRC

Forecast Method: Trend

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 121

Explanation: 2015 actuals of \$118 escalated to 2016 by dividing by 0.9768

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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 16

Ref ID: SGAHAGAN20170302144651020

RAMP Chapter: SDG&E-1

Program Name: Weather Awareness System

Program Description: Maintain and upgrade communication tool that allows for real time weather information to support system operations

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Advanced Detection

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	60	66	73
High	78	86	95

Funding Source: CPUC-GRC

Forecast Method: Trend

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 90

Explanation: 2015 actuals of \$90k (escalation factor to 2016 of 0.9991 does not change cost)

San Diego Gas & Electric Company
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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: V. Emergency Management
 Category-Sub: 1. Emergency Management
 Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 17

Ref ID: SGAHAGAN20170302144929630

RAMP Chapter: SDG&E-1

Program Name: Wildfire Risk Reduction Model (WRRM)

Program Description: Licensing agreement payments and enhancements to make model more usable and for ease of navigation

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi
 Mitigation: Advanced Detection

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	50	55	61
High	65	72	79

Funding Source: CPUC-GRC

Forecast Method: Trend

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 212

Explanation: 2015 actuals of \$212k (2016 escalation factor of 0.9991 does not affect cost)

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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 18

Ref ID: SGAHAGAN20170302145411640

RAMP Chapter: SDG&E-1

Program Name: Fire Prevention Index (FPI) Components

Program Description: The FPI contains inputs that need regular updating and awareness on information such as the greenness of grass layer and fuel moisture

Risk/Mitigation:

Risk: Wildfires caused by SDG&E Equipment (including thi

Mitigation: Advanced Detection

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	31	31	31
High	40	40	40

Funding Source: CPUC-GRC

Forecast Method: Average

Work Type: Non-Mandated

Work Type Citation:

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 32

Explanation: 2015 actuals of \$31k escalated to 2016 using factor of 0.9768

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: V. Emergency Management
Category-Sub: 1. Emergency Management
Workpaper: 1ED027.000 - Emergency Management

RAMP Item # 19

Ref ID: TSWETEK20170305104409540

RAMP Chapter: SDG&E-15

Program Name: Emergency Management 1st Responder Outreach Program

Program Description: Provide Safety and basic operational information about electricity and SDG&E's facilities as they relate to First Responder operations and activities. SEE Appendix PSE_6_A1 Summary 2015 Fire Coordination.docx. Forecast based on base year as the Outreach Program is to respected to stay at 2015 levels

Risk/Mitigation:

Risk: Public Safety Events - Electric

Mitigation: Customer Communications and First Responder training

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	24	24	24
High	29	29	29

Funding Source: CPUC-GRC

Forecast Method: Other

Work Type: Non-Mandated

Work Type Citation: N/A

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: 0

Supplemental Workpapers for Workpaper 1ED027.000

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Emergency Management
Work Group - 1ED027.000

Witness - D Weim

\$000's	2012 Actual			2013 Actual			2014 Actual			2015 Actual			2016 Actual		
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE
Recorded Historical	1,126	1,685	10.9	1,057	1,805	10.3	885	1,572	9.0	1,028	1,508	10.0	1,025	1,478	10.0
Adjustments															
TOTAL	1,126	1,685	10.9	1,057	1,805	10.3	885	1,572	9.0	1,028	1,508	10.0	1,025	1,478	10.0

FORECAST	2017			2018			2019			FORECASTING METHODOLOGY
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	
	1,125	2,666	11.0	1,470	3,483	14.5	1,470	3,544	14.5	Base year recorded plus incremental increases identified

Incremental Increases / Decreases for Future Years:

Category	2017			2018			2019			Explanation
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	
RAMP	0	0	0.0	245	245	2.5	245	245	2.5	RAMP Proposed Activity: Weather Stations - Use of weather stations and correlation with Fire Protection Index. The life span on weather equipment is 3-5 years and the sensors will need replacing periodically. There is also a web based forecasting system behind the FPI that needs maintenance.
RAMP	0	0	0.0	0	127	0.0	0	253	0.0	RAMP proposed activity: University Team - Investigating the latest science to inform system planning decisions. The university team base cost was structured according to a past research project with University of California, Los Angeles. To cover the scope of the research project, a faculty advisor, full-time post-doctoral student, and two full-time graduate students would be needed. Using the budgeted costs from the UCLA project results in: Faculty personnel (11%): \$109,230*11% = 12,015.30, Post-doctoral student (100%): \$55,931, Two graduate students (100%): \$43,116*2 = \$86,232, Total personnel cost: \$12,015.30 + \$55,931 + \$86,232 = \$154,178.3 Scripps Institution of Oceanography, who would be leading the research, also charges a 60% overhead fee, resulting in a base cost of near \$250,000. The activity is to be fully implemented by 2019.
RAMP	0	0	0.0	0	75	0.0	0	150	0.0	RAMP proposed activity: Consultant Support - Organizing the training of different working groups around SDG&E impacted by climate change. At the recommendation of a consulting firm, a climate-related consulting and research would entail one project management position, at \$200 per hour for roughly 225 hours, and a support/technical staff, at \$150 per hour for roughly 700 hours, resulting in a \$150,000 total. The activity is to be fully implemented by 2019.
RAMP	0	25	0.0	0	25	0.0	0	25	0.0	RAMP Proposed Activity: Santa Ana Wildfire Threat Index (SAWTI) - Maintain and upgrade SAWTI, which establishes data sharing between internal meteorologists and fire agencies. The non-labor costs are programming time by contract resources to integrate the latest wildfire science into this tool.
RAMP	0	13	0.0	0	13	0.0	0	13	0.0	RAMP Proposed Activity: Web based situational tool for coordination with agencies during a wildfire. The non-labor costs are for contract resources to develop and maintain the tool.
Environmental and Regulatory Compliance	100	0	1.0	200	0	2.0	200	0	2.0	Increased workload as a result of increased regulatory requirements around General Order 112F. Two Program Managers. The average wage (excluding V&S) across the company is \$100k. 2 x \$100k = \$200k. For half year = \$100k
Environmental and Regulatory Compliance	0	0	0.0	0	100	0.0	0	100	0.0	New software packages that will enhance productivity and workflow process. There is a continually increasing demand to process and analyze situational awareness data when monitoring and responding to emergencies on the system. These additional software packages will help streamline the ability to anticipate and prepare for emergencies. When an emergency occurs, this new software will enhance the productivity and workflow of the responders supporting our reaction and recovery.
Environmental and Regulatory Compliance	0	0	0.0	0	300	0.0	0	300	0.0	Software Programming Services. Contracted IT Programming support to assist in the building of information and business analysis tools - Cost based on current market prices. This project will support the implementation and integration of new software services. Any new software technology that is implemented will need to be seamlessly integrated into our operations and be able to function and communicate with other company systems and this contracted IT Programming Service will support that effort.
Safety and Reliability	0	160	0.0	0	60	0.0	0	130	0.0	Atmospheric Profiler Operations. Leidos has provided estimates for the operating costs.
Safety and Reliability	0	375	0.0	0	375	0.0	0	375	0.0	Emergency Response Training and Curriculum Development. Referencing industry rates for this specific training and development, the contract would be \$375k.
Safety and Reliability	0	50	0.0	0	50	0.0	0	50	0.0	EOC AV Maintenance. Ancillary costs for updates and maintenance of the AV system in the EOC, display repairs, etc.

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Incremental Increases / Decreases for Future Years:

Category	2017			2018			2019			Explanation
	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	Labor	Non-Labor	FTE	
Safety and Reliability	0	30	0.0	0	30	0.0	0	30	0.0	Maintenance for the new Emergency Mobile Command Trailer (EMCT). Key monthly maintenance for the equipment and services inside and on the roof along with the trailer. This includes turning on all equipment (generator, computers, satellite, etc.) to ensure everything works and connecting to communications. If something is not working, the costs will be included on the "Materials for EMCT's."
Safety and Reliability	0	75	0.0	0	75	0.0	0	75	0.0	Materials for EMCT's. After key monthly maintenance is completed, nonworking materials and services need to be replaced.
Safety and Reliability	0	250	0.0	0	250	0.0	0	250	0.0	Incident Command System (ICS). Referencing industry rates for this specific training and development, the contract would be \$250k.
Safety and Reliability	0	110	0.0	0	130	0.0	0	150	0.0	Fire Safety Contract Labor. Fire Season has extended to 4 months and requires additional Capstone on duty.
Safety and Reliability	0	100	0.0	0	100	0.0	0	100	0.0	SDG&E Meteorology Cloud Computing. As our current high performance computing clusters come to end of life, we would like to transition our operations to the cloud with a 10% increase to account for the expansion of our operations.

Weather Stations Methodology

Cost to Rebuild Weather Station

Weather Station Equipment:	\$5,500
SCADA Technician Labor:	\$2,000

SDG&E has 170 Weather Stations in its service territory

Total Cost for Weather Station Equipment:	\$935,000
Total Cost for SCADA Technician Labor:	\$340,000

The weather stations will be rebuilt over a three-year period:

Cost per year for Weather Station Equipment:	\$311,667
Cost per year for SCADA Technician Labor:	\$113,333

The web based forecasting system behind the FPI has costs associated with annual maintenance .

Annual maintenance costs:	\$25,000
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The total annual costs are:

Non-Labor: Weather Station Equipment and software maintenance:	\$336,667
Labor: SCADA Technician Labor	\$113,333

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: W. Strategic Planning and Business Optimization
 Workpaper: 1ED028.000

Summary for Category: W. Strategic Planning and Business Optimization

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	1,191	1,345	1,345	1,345
Non-Labor	439	1,045	1,045	1,045
NSE	0	0	0	0
Total	1,630	2,390	2,390	2,390
FTE	11.3	11.7	11.7	11.7

Workpapers belonging to this Category:

1ED028.000 Strategic Planning and Business Optimization

Labor	1,191	1,345	1,345	1,345
Non-Labor	439	1,045	1,045	1,045
NSE	0	0	0	0
Total	1,630	2,390	2,390	2,390
FTE	11.3	11.7	11.7	11.7

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED028.000 - Strategic Planning and Business Optimization

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: W. Strategic Planning and Business Optimization
 Category-Sub: 1. Strategic Planning and Business Optimization
 Workpaper: 1ED028.000 - Strategic Planning and Business Optimization

Activity Description:

Strategic Planning and Business Optimization consists of three main functional work groups, Strategic Planning, Business Optimization and Financial Analysis. The department supports and facilitates the implementation of strategies intended to deliver the best value for customers and financial stability for the utility.

Forecast Explanations:

Labor - 5-YR Average

Labor costs are based on a 5-year average. Labor includes the O&M portion of several employees whose costs are split among various plan categories.

Non-Labor - 5-YR Average

Non-Labor costs are also based on a 5-year average to smooths the variable costs from year to year and provides a good estimation for future year forecasts.

NSE - 5-YR Average

N/A

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		1,277	1,633	1,374	1,247	1,191	1,344	1,344	1,344	
Non-Labor		230	1,360	2,120	1,078	439	1,046	1,046	1,046	
NSE		0	0	0	0	0	0	0	0	
Total		1,508	2,993	3,494	2,324	1,630	2,390	2,390	2,390	
FTE		10.1	13.1	12.5	11.4	11.4	11.7	11.7	11.7	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: W. Strategic Planning and Business Optimization
 Category-Sub: 1. Strategic Planning and Business Optimization
 Workpaper: 1ED028.000 - Strategic Planning and Business Optimization

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	1,345	1,345	1,345	0	0	0	1,345	1,345	1,345
Non-Labor	5-YR Average	1,045	1,045	1,045	0	0	0	1,045	1,045	1,045
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
Total		2,390	2,390	2,390	0	0	0	2,390	2,390	2,390
FTE	5-YR Average	11.7	11.7	11.7	0.0	0.0	0.0	11.7	11.7	11.7

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
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Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: W. Strategic Planning and Business Optimization
Category-Sub: 1. Strategic Planning and Business Optimization
Workpaper: 1ED028.000 - Strategic Planning and Business Optimization

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	1,021	1,328	1,132	1,055	1,022
Non-Labor	225	1,346	2,119	1,077	439
NSE	0	0	0	0	0
Total	1,246	2,674	3,251	2,132	1,460
FTE	8.7	11.1	10.6	9.7	9.5
Adjustments (Nominal \$) **					
Labor	0	-10	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	-10	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	1,021	1,318	1,132	1,055	1,022
Non-Labor	225	1,346	2,119	1,077	439
NSE	0	0	0	0	0
Total	1,246	2,664	3,251	2,132	1,460
FTE	8.7	11.1	10.6	9.7	9.5
Vacation & Sick (Nominal \$)					
Labor	148	209	181	163	170
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	148	209	181	163	170
FTE	1.4	2.0	1.9	1.7	1.7
Escalation to 2016\$					
Labor	108	106	62	29	0
Non-Labor	5	14	1	1	0
NSE	0	0	0	0	0
Total	113	120	62	30	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	1,277	1,633	1,374	1,247	1,191
Non-Labor	230	1,360	2,120	1,078	439
NSE	0	0	0	0	0
Total	1,508	2,993	3,494	2,324	1,630
FTE	10.1	13.1	12.5	11.4	11.2

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: W. Strategic Planning and Business Optimization
 Category-Sub: 1. Strategic Planning and Business Optimization
 Workpaper: 1ED028.000 - Strategic Planning and Business Optimization

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	0	-10	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	-10	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012 Total		0	0	0	0.0		
2013	Other	10	0	0	0.0	1-Sided Adj	RPISANES20161128181249697
Explanation: signing bonus							
2013	Other	-10	0	0	0.0	1-Sided Adj	RPISANES20161129061557527
Explanation: correct previous entry (should be negative)							
2013	Other	-10	0	0	0.0	1-Sided Adj	RPISANES20161129061635263
Explanation: removal of signing bonus							
2013	Other	10	0	0	0.0	1-Sided Adj	RPISANES20161129062859833
Explanation: reversal of previous correction (needs to be attributed to only one cost center)							
2013	Other	-10	0	0	0.0	1-Sided Adj	RPISANES20161129062935880
Explanation: removal of signing bonus							
2013 Total		-10	0	0	0.0		
2014 Total		0	0	0	0.0		
2015 Total		0	0	0	0.0		
2016 Total		0	0	0	0.0		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: X. Distributed Energy Resources
 Workpaper: 1ED030.000

Summary for Category: X. Distributed Energy Resources

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	47	97	167	167
Non-Labor	1,257	1,442	1,392	1,532
NSE	0	0	0	0
Total	1,304	1,539	1,559	1,699
FTE	0.5	1.0	1.7	1.7

Workpapers belonging to this Category:

1ED030.000 Distributed Energy Resources

Labor	47	97	167	167
Non-Labor	1,257	1,442	1,392	1,532
NSE	0	0	0	0
Total	1,304	1,539	1,559	1,699
FTE	0.5	1.0	1.7	1.7

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED030.000 - Distributed Energy Resources

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: X. Distributed Energy Resources
 Category-Sub: 1. Distributed Energy Resources
 Workpaper: 1ED030.000 - Distributed Energy Resources

Activity Description:

SDG&E is leveraging technology to integrate renewables and distributed energy to enhance electric reliability, operational flexibility and public safety. SDG&E operates and maintains a Microgrid that has the capability to leverage 100% renewables to provide electric continuity to a remote community during emergencies and outages. Additional installations of energy storage systems throughout the SDG&E service territory have deferred traditional infrastructure improvements and have reinforced safety for community evacuation facilities. Future public purpose installations will benefit from the improved reliability, power quality and the overall customer experience. Customers will also benefit from a Distributed Energy Resource Management System (DERMS) an advanced control systems that will allow for renewable integration and intelligent electronic devices into a traditional electric system. SDG&E is installing advanced technologies and energy storage, whenever feasible, and its deployment is maximized through safe, proactive testing and analysis at the Integrated Test Facility (ITF). This facility allows SDG&E to understand system characteristics and device behavior before it is installed on the electric grid. The ITF serves as a platform to drive industry standards, promote collaboration and develop institutional knowledge to operate the electric system more safe, reliable and efficient. SDG&E is a responsible partner that is pioneering the future of the electric industry through the use of Microgrids, energy storage, advanced control systems and proactive engineering, testing and demonstration.

Forecast Explanations:

Labor - Base YR Rec

Labor costs were forecasted using the base year methodology. Base year forecasting best reflects the current and future forecasted spending.

Non-Labor - Base YR Rec

Labor costs were forecasted using the base year methodology. Base year forecasting best reflects the current and future forecasted spending.

NSE - Base YR Rec

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		673	508	147	41	47	97	167	167	
Non-Labor		227	256	210	371	1,257	1,442	1,392	1,532	
NSE		0	0	0	0	0	0	0	0	
Total		900	765	357	412	1,304	1,539	1,559	1,699	
FTE		6.7	5.3	1.6	0.5	0.5	1.0	1.7	1.7	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: X. Distributed Energy Resources
 Category-Sub: 1. Distributed Energy Resources
 Workpaper: 1ED030.000 - Distributed Energy Resources

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	47	47	47	50	120	120	97	167	167
Non-Labor	Base YR Rec	1,257	1,257	1,257	185	135	275	1,442	1,392	1,532
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
Total		1,304	1,304	1,304	235	255	395	1,539	1,559	1,699
FTE	Base YR Rec	0.5	0.5	0.5	0.5	1.2	1.2	1.0	1.7	1.7

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	Other	50	50	0	100	0.5	1-Sided Adj	SGAHAGAN20170308104720870	
Explanation:		New FTE starting in 2017. In 2017 this employee will be a contract employee for 6 months and an internal employee for 6 months. This is a highly-specialized position, and this role will be responsible for power system modeling and testing new technology and equipment with the Real-Time Digital Simulator. This Sr. Engineer will also support daily operations and management of the ITF. The labor costs are the employee's salary during the six months as an internal employee. The non-labor costs are the employee's salary during the six months as a contract employee.							
2017	Other	0	135	0	135	0.0	1-Sided Adj	SGAHAGAN20170308105351650	
Explanation:		Increased battery maintenance costs. \$15k for annual Borrego Microgrid Generator Maintenance, \$20k for Annual Permit to Operate (PTO) testing and certification, \$100k for annual energy storage maintenance (\$20k/unit, 5 units in the fleet)							
2017 Total		50	185	0	235	0.5			
2018	Other	100	0	0	100	1.0	1-Sided Adj	SGAHAGAN20170308104812880	
Explanation:		New FTE starting in 2017. This is a highly-specialized position, and this role will be responsible for power system modeling and testing new technology and equipment with the Real-Time Digital Simulator. This Sr. Engineer will also support daily operations and management of the ITF.							
2018	Other	20	0	0	20	0.2	1-Sided Adj	SGAHAGAN20170308104933597	
Explanation:		New FTE starting in 2018 (20% O&M) - This engineering position will support deployment of new microgrids, energy storage and asset engineering for the DERMS Solution. The position will also support the ITF and demonstration of EPIC projects.							
2018	Other	0	135	0	135	0.0	1-Sided Adj	SGAHAGAN20170308105404350	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: X. Distributed Energy Resources
 Category-Sub: 1. Distributed Energy Resources
 Workpaper: 1ED030.000 - Distributed Energy Resources

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
Explanation:		Increased battery maintenance costs. \$15k for annual Borrego Microgrid Generator Maintenance, \$20k for Annual Permit to Operate (PTO) testing and certification, \$100k for annual energy storage maintenance (\$20k/unit, 5 units in the fleet.)						
2018 Total		120	135	0	255	1.2		
2019 Other		100	0	0	100	1.0	1-Sided Adj	SGAHAGAN20170308104829893
Explanation:		New FTE starting in 2017. This is a highly-specialized position, and this role will be responsible for power system modeling and testing new technology and equipment with the Real-Time Digital Simulator. This Sr. Engineer will also support daily operations and management of the ITF.						
2019 Other		20	0	0	20	0.2	1-Sided Adj	SGAHAGAN20170308104943537
Explanation:		New FTE starting in 2018 (20% O&M) - This engineering position will support deployment of new microgrids, energy storage and asset engineering for the DERMS Solution. The position will also support the ITF and demonstration of EPIC projects.						
2019 Other		0	120	0	120	0.0	1-Sided Adj	SGAHAGAN20170308105054583
Explanation:		New maintenance activities associated with expanding the Integrated Test Facility (ITF.) This includes RTDS maintenance, equipment calibration, lab tooling and safety supplies.						
2019 Other		0	155	0	155	0.0	1-Sided Adj	SGAHAGAN20170308105414600
Explanation:		Increased battery maintenance costs. \$15k for annual Borrego Microgrid Generator Maintenance, \$20k for Annual Permit to Operate (PTO) testing and certification, \$100k for annual energy storage maintenance (\$20k/unit, 6 units in the fleet.)						
2019 Total		120	275	0	395	1.2		

Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: X. Distributed Energy Resources
Category-Sub: 1. Distributed Energy Resources
Workpaper: 1ED030.000 - Distributed Energy Resources

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	270	633	499	757	117
Non-Labor	674	1,484	4,518	10,415	1,045
NSE	0	0	0	0	0
Total	944	2,117	5,018	11,172	1,162
FTE	3.2	6.1	4.8	6.9	1.1
Adjustments (Nominal \$) **					
Labor	268	-223	-378	-722	-77
Non-Labor	-452	-1,231	-4,308	-10,045	213
NSE	0	0	0	0	0
Total	-184	-1,453	-4,686	-10,766	135
FTE	2.6	-1.6	-3.4	-6.6	-0.7
Recorded-Adjusted (Nominal \$)					
Labor	538	410	121	35	40
Non-Labor	222	254	210	371	1,257
NSE	0	0	0	0	0
Total	760	664	331	405	1,297
FTE	5.8	4.5	1.4	0.3	0.4
Vacation & Sick (Nominal \$)					
Labor	78	65	19	5	7
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	78	65	19	5	7
FTE	0.9	0.8	0.2	0.1	0.1
Escalation to 2016\$					
Labor	57	33	7	1	0
Non-Labor	5	3	0	0	0
NSE	0	0	0	0	0
Total	62	36	7	1	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	673	508	147	41	47
Non-Labor	227	256	210	371	1,257
NSE	0	0	0	0	0
Total	900	765	357	412	1,304
FTE	6.7	5.3	1.6	0.4	0.5

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: X. Distributed Energy Resources
 Category-Sub: 1. Distributed Energy Resources
 Workpaper: 1ED030.000 - Distributed Energy Resources

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	268	-223	-378	-722	-77
Non-Labor	-452	-1,231	-4,308	-10,045	213
NSE	0	0	0	0	0
Total	-184	-1,453	-4,686	-10,766	135
FTE	2.6	-1.6	-3.4	-6.6	-0.7

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012	Other	501	214	0	5.2	CCTR Transf From 2100-3704.000	RPISANES20161121062147370
Explanation: moving costs to better align activities under Distributed Energy Programs							
2012	Other	-233	-666	0	-2.6	1-Sided Adj	RPISANES20161129062330460
Explanation: RD&D Balancing Account							
2012	Other	233	666	0	2.6	1-Sided Adj	RPISANES20161129063329037
Explanation: reversal of previous entry (needs to be attributed to only one cost center)							
2012	Other	-233	-666	0	-2.6	1-Sided Adj	RPISANES20161129063741050
Explanation: RD&D Balancing Account							
2012 Total		268	-452	0	2.6		
2013	Other	349	130	0	3.7	CCTR Transf From 2100-3704.000	RPISANES20161121062325510
Explanation: moving costs to better align activities under Distributed Energy Programs							
2013	Other	0	-67	0	0.0	1-Sided Adj	RPISANES20161129062542787
Explanation: Canceled project; write off							
2013	Other	0	67	0	0.0	1-Sided Adj	RPISANES20161129064010837
Explanation: reversal of previous adjustment; needs to hit only one cost center							
2013	Other	0	-67	0	0.0	1-Sided Adj	RPISANES20161129064242350
Explanation: Canceled project; write off							
2013	Other	0	-7	0	0.0	1-Sided Adj	RPISANES20161129064350240
Explanation: Canceled Project. Write off.							

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: X. Distributed Energy Resources
 Category-Sub: 1. Distributed Energy Resources
 Workpaper: 1ED030.000 - Distributed Energy Resources

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>FTE</u>	<u>Adj Type</u>	<u>RefID</u>
2013	Other	0	-22	0	0.0	1-Sided Adj	RPISANES20161129064438633
Explanation: Canceled project. Write off.							
2013	Other	-572	-1,167	0	-5.3	1-Sided Adj	RPISANES20161129064841773
Explanation: RD&D Balancing Account							
2013	Other	0	-97	0	0.0	1-Sided Adj	RPISANES20161129064931320
Explanation: RD&D Balancing Account							
2013 Total		-223	-1,231	0	-1.6		
2014	Other	108	115	0	1.2	CCTR Transf From 2100-3704.000	RPISANES20161121062443883
Explanation: moving costs to better align activities under Distributed Energy Programs							
2014	Other	-486	-4,423	0	-4.6	1-Sided Adj	RPISANES20161129065205680
Explanation: RD&D Balancing Account							
2014 Total		-378	-4,308	0	-3.4		
2015	Other	-722	-10,298	0	-6.6	1-Sided Adj	RPISANES20161129065439930
Explanation: RD&D Balancing Account							
2015	Other	0	242	0	0.0	CCTR Transf From 2100-3704.000	RPISANES20161121062608480
Explanation: moving costs to better align activities under Distributed Energy Programs							
2015	Other	0	11	0	0.0	CCTR Transf From 2100-3704.000	RPISANES20161121062907777
Explanation: moving remaining (adjusted) costs to better align activities under Distributed Energy Programs							
2015 Total		-722	-10,045	0	-6.6		
2016	Other	-77	-1	0	-0.7	1-Sided Adj	RPISANES20170306164412953
Explanation: Remove RD&D costs							
2016	Other	0	214	0	0.0	CCTR Transf From 2100-3704.000	RPISANES20170225180521850
Explanation: moving costs from 1ED024 (cost center 2100-3704) to 1ED030 (cost center 2100-3707) to better align activities under Distributed Energy Programs.							
2016 Total		-77	213	0	-0.7		

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
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Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: Y. Asset Management
Workpaper: 1ED019.000

Summary for Category: Y. Asset Management

	In 2016\$ (000) Incurred Costs			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	0	349	3,144	3,610
Non-Labor	0	500	1,100	1,000
NSE	0	0	0	0
Total	0	849	4,244	4,610
FTE	0.0	3.0	27.0	31.0

Workpapers belonging to this Category:

1ED019.000 Asset Management

Labor	0	349	3,144	3,610
Non-Labor	0	500	1,100	1,000
NSE	0	0	0	0
Total	0	849	4,244	4,610
FTE	0.0	3.0	27.0	31.0

Note: Totals may include rounding differences.

Beginning of Workpaper
1ED019.000 - Asset Management

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: Y. Asset Management
 Category-Sub: 1. Asset Management
 Workpaper: 1ED019.000 - Asset Management

Activity Description:

Forecast Explanations:

Labor - Base YR Rec

Non-Labor - Base YR Rec

NSE - Base YR Rec

Summary of Results:

		In 2016\$ (000) Incurred Costs								
		Adjusted-Recorded					Adjusted-Forecast			
Years		2012	2013	2014	2015	2016	2017	2018	2019	
Labor		0	0	0	0	0	349	3,144	3,610	
Non-Labor		0	0	0	0	0	500	1,100	1,000	
NSE		0	0	0	0	0	0	0	0	
Total		0	0	0	0	0	849	4,244	4,610	
FTE		0.0	0.0	0.0	0.0	0.0	3.0	27.0	31.0	

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: Y. Asset Management
Category-Sub: 1. Asset Management
Workpaper: 1ED019.000 - Asset Management

Summary of Adjustments to Forecast:

In 2016 \$(000) Incurred Costs										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	0	0	0	349	3,144	3,610	349	3,144	3,610
Non-Labor	Base YR Rec	0	0	0	500	1,100	1,000	500	1,100	1,000
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
Total		0	0	0	849	4,244	4,610	849	4,244	4,610
FTE	Base YR Rec	0.0	0.0	0.0	3.0	27.0	31.0	3.0	27.0	31.0

Forecast Adjustment Details:

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	Adj Type	RefID	
2017	RAMP-Post Filing Incr	0	500	0	500	0.0	1-Sided Adj	TSWETEK20170507105946300	
Explanation:		RAMP post filing activity: Assumes 500k in consulting support to kick off the program.							
2017	RAMP Incremental	349	0	0	349	3.0	1-Sided Adj	TSWETEK20170510081809487	
Explanation:		RAMP baseline and proposed activity. Upward pressure value is the proposed component of cost only. This expands self-assessment of departments compliance with records management policies and procedures.							
2017 Total		349	500	0	849	3.0			

2018 RAMP-Post Filing Incr 1,863 1,100 0 2,963 16.0 1-Sided Adj TSWETEK20170507110205837

Explanation: RAMP post filing activity: Hire an additional 7 employees in 2018 as the program becomes more established. Hire 1.1M in consultant support as we continue to work towards implementation.

2018 RAMP Incremental 1,281 0 0 1,281 11.0 1-Sided Adj TSWETEK20170510083852123

Explanation: RAMP baseline and proposed activity. Upward pressure value is the proposed component of cost only. This expands self-assessment of departments compliance with records management policies and procedures.

2018 Total 3,144 1,100 0 4,244 27.0

2019 RAMP-Post Filing Incr 2,329 1,000 0 3,329 20.0 1-Sided Adj TSWETEK20170507110423883

Explanation: RAMP post filing activity: Hire an additional 4 employees as the program becomes fully implemented in 2019. Consultant firms are on board at \$1 million to help ensure certification with ISO 5500

Note: Totals may include rounding differences.

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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: Y. Asset Management
 Category-Sub: 1. Asset Management
 Workpaper: 1ED019.000 - Asset Management

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>Adj_Type</u>	<u>RefID</u>
2019	RAMP Incremental	1,281	0	0	1,281	11.0	1-Sided Adj	TSWETEK20170510083917150

Explanation: RAMP baseline and proposed activity. Upward pressure value is the proposed component of cost only. This expands self-assessment of departments compliance with records management policies and procedures.

2019 Total		3,610	1,000	0	4,610	31.0		
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Note: Totals may include rounding differences.

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: Y. Asset Management
Category-Sub: 1. Asset Management
Workpaper: 1ED019.000 - Asset Management

Determination of Adjusted-Recorded (Incurred Costs):

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
Recorded (Nominal \$)*					
Labor	37	0	0	0	51
Non-Labor	0	1	1	3	6
NSE	0	0	0	0	0
Total	37	1	1	3	57
FTE	0.3	0.0	0.0	0.0	0.6
Adjustments (Nominal \$) **					
Labor	-37	0	0	0	-51
Non-Labor	0	-1	-1	-3	-6
NSE	0	0	0	0	0
Total	-37	-1	-1	-3	-57
FTE	-0.3	0.0	0.0	0.0	-0.6
Recorded-Adjusted (Nominal \$)					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0
Vacation & Sick (Nominal \$)					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0
Escalation to 2016\$					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2016\$)					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	0	0	0	0	0
FTE	0.0	0.0	0.0	0.0	0.0

* After company-wide exclusions of Non-GRC costs

** Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

San Diego Gas & Electric Company
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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: Y. Asset Management
Category-Sub: 1. Asset Management
Workpaper: 1ED019.000 - Asset Management

Summary of Adjustments to Recorded:

In Nominal \$ (000) Incurred Costs					
Years	2012	2013	2014	2015	2016
Labor	-37	0	0	-0.039	-51
Non-Labor	-0.352	-0.519	-0.649	-3	-6
NSE	0	0	0	0	0
Total	-37	-0.519	-0.649	-3	-57
FTE	-0.3	0.0	0.0	0.0	-0.6

Detail of Adjustments to Recorded:

Year	Adj Group	Labor	NLbr	NSE	FTE	Adj Type	RefID
2012	Other	-37	0	0	-0.3	1-Sided Adj	RPISANES20161121064936953
Explanation:		removal of transmission-related costs					
2012 Total		-37	0	0	-0.3		
2013	Other	0	-1	0	0.0	1-Sided Adj	RPISANES20161121065053577
Explanation:		removal of transmission-related costs					
2013 Total		0	-1	0	0.0		
2014	Other	0	-1	0	0.0	1-Sided Adj	RPISANES20161121065158403
Explanation:		removal of transmission-related costs					
2014 Total		0	-1	0	0.0		
2015	Other	0	-3	0	0.0	1-Sided Adj	RPISANES20161121065255187
Explanation:		removal of transmission-related costs					
2015 Total		0	-3	0	0.0		
2016	Other	-51	-6	0	-0.6	1-Sided Adj	RPISANES20170225165745277
Explanation:		Removing transmissison-related costs (cost center 2100-0226)					
2016 Total		-51	-6	0	-0.6		

Note: Totals may include rounding differences.

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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer
Category: Y. Asset Management
Category-Sub: 1. Asset Management
Workpaper: 1ED019.000 - Asset Management

RAMP Item # 1

Ref ID: TSWETEK20170507105946300

RAMP Chapter: SDG&E-12

Program Name: ISO 55000 Certification

Program Description: Estimated costs to obtain ISO55000 certification of standards for utility asset management.

Risk/Mitigation:

Risk: Employee, Contractor and Public Safety

Mitigation: Utility Asset Management

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	0	0	0
High	0	0	0

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: ISO 55000

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 0

Explanation: No historical costs

San Diego Gas & Electric Company
2019 GRC - APP
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Area: ELECTRIC DISTRIBUTION
 Witness: William H. Speer
 Category: Y. Asset Management
 Category-Sub: 1. Asset Management
 Workpaper: 1ED019.000 - Asset Management

RAMP Item # 2

Ref ID: TSWETEK20170510081809487

RAMP Chapter: SDG&E-13

Program Name: Performance of the annual self-assessment by coordinators and sub-coordinators.

Program Description: Coordinators for each VP, assisted by sub-coordinators, perform a self-assessment of the department's compliance with the records management policies and procedures. The assessments are then reviewed by the Records Management group.

Risk/Mitigation:

Risk: The risk of not having an effective records manage

Mitigation: Annual departmental self-assessments of compliance with the records management program

Forecast CPUC Cost Estimates (\$000)

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	6,205	6,205	6,205
High	7,446	7,446	7,446

Funding Source: CPUC-GRC

Forecast Method: Base Year

Work Type: Non-Mandated

Work Type Citation: Na

Historical Embedded Cost Estimates (\$000)

Embedded Costs: 4816

Explanation: Adjusted 2015 cost to 2016 dollars.

Supplemental Workpapers for Workpaper 1ED019.000

	FTE Resources Required					Notes
	2017 (6 months)	2018	2019	2020 (Certification)	2021	
Program Management	2	4	6	3	3	Centralized project management team in place to ensure consistency and integration of approach
4.1 Understanding the Organization and its Context	1	1	1	1	1	Strategy team member to ensure connection with 5 year plans, construction of line of sight goals
4.2 Understanding the Needs and Expectations of Stakeholders	-	-	-	-	-	Covered as part of 4.1
4.3 Determining the Scope of the Asset Management System	-	-	-	-	-	Management decision
4.4 Asset Management System	3	4	6	6	6	Creation of asset family owners and principals
5.1 Leadership and Commitment	-	-	-	-	-	Covered as part of 4.1
5.2 Policy	1	1	1	1	1	Asset Management strategist
5.3 Organizational Roles, Responsibilities, and Authorities	-	-	-	-	-	Covered as part of 4.1 and 4.2
6.1 Actions to Address Risks and Opportunities for the Asset Management System	1	3	5	5	5	Risk team expanded to grow maturity
6.2 Asset Management Objectives	-	-	-	-	-	Asset family owners responsibility
7.1 Resources	-	-	-	-	-	Nil
7.2 Competence	2	2	2	2	2	Training organization expanded to ensure asset mgt requirements fulfilled in employee workforce
7.3 Awareness	1	1	1	1	1	As 7.2 but covered for communication also
7.4 Communication	-	-	-	-	-	As 7.3
7.5 Information Requirements	2	5	5	5	5	Major IT/GIS enhancements for distribution
7.6 Documented Information	-	-	-	-	-	Records Management effort (Taken to zero to reflect accounting through the RAMP filing) Will

						be staffed in this group
8.1 Operational Planning and Control	1	2	2	2	2	Metrics and measurement team
8.2 Management of Change	0	1	1	1	1	Design and implementation of requirements for management of change
8.3 Outsourcing	-	-	-	-	-	
9.1 Monitoring, Measurement, Analysis and Evaluation	1	1	1	1	1	KPI team
9.2 Internal audit	-	-	-	-	-	
9.3 Management review	-	-	-	-	-	
10.1 Nonconformity and corrective action	2	5	7	10	10	Stand up of Corrective action program and cause evaluation team
10.2 Preventive action	-	-	-	-	-	
10.3 Continual improvement	0	1	1	1	1	Process improvement liason with overall tracking of the CI landscape
Total FTE's	17	31	39	39	39	
Assumed 50% Incremental in 2018, and 2019. 0% in 2017	0	16	20	20	20	
Cost (\$m)	\$0	\$1.86	\$2.32	\$2.32	\$2.32	Assume \$116k/FTE
Consulting Support	3	4	2	1	0	Consulting support to set up program structure, provide skilled help in closing major non conformance areas and ensure cross clause integration
Independent 3rd party support/assessment	0	2	2	2	2	FTE equivalent (\$300k/year)
Non Labor Cost (Consultants)	\$0.5	\$0.8	\$0.7	\$0.7	\$0.0	See calculations below
Non Labor Cost (3rd party assessments)	\$0.0	\$0.3	\$0.3	\$0.3	\$0.3	FTE equivalent (\$300k/year) includes ongoing assessments

TOTAL COST (LAB & NON LAB)	\$5	\$2.96	\$3.32	\$3.32	\$2.62
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San Diego Gas & Electric Company
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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer

Appendix A: List of Non-Shared Cost Centers

Cost Center	Sub	Description
2100-0043	000	C&O CENTER TRAINING - OH TRAINERS
2100-0076	000	METRO CONSTRUCTION & OPER MANAGER
2100-0077	000	METRO C&O-ELECTRIC OH
2100-0080	000	METRO C&O-INSP/PROJ COORD
2100-0082	000	METRO C&O-EQUIPMENT ORDERS
2100-0083	000	METRO C&O-ENGR
2100-0084	000	METRO C&O-TROUBLEMEN
2100-0085	000	NORTH COAST CONST & OPER MANAGER
2100-0086	000	NORTH COAST C&O CENTER - ELEC
2100-0088	000	NORTH COAST C&O-ENG & OPS
2100-0089	000	NORTH COAST C&O-TROUBLEMEN
2100-0090	000	NORTHEAST CONSTRUCTION & OPER MANAGER
2100-0091	000	NORTHEAST C&O-ELECT OH
2100-0095	000	NORTHEAST C&O-EQUIPMENT OPER
2100-0096	000	NORTHEAST C&O-INSP/PROJ COORD
2100-0097	000	NORTHEAST C&O-ENG & OPS
2100-0098	000	NORTHEAST C&O-TROUBLEMEN
2100-0099	000	NORTHEAST C&O-RAMONA SATELLITE
2100-0100	000	BEACH CITIES CONST & OPER MANAGER
2100-0101	000	BEACH CITIES C&O CENTER-ELEC
2100-0103	000	BEACH CITIES C&O-ENG & OPS
2100-0104	000	BEACH CITIES C&O-TROUBLEMEN
2100-0105	000	EASTERN CONST & OPS MANAGER
2100-0106	000	EASTERN C&O CENTER-ELEC
2100-0108	000	C&O SERVICES-MTN EMPIRE
2100-0109	000	EASTERN C&O-ENG & OPS
2100-0110	000	EASTERN C&O-TROUBLEMEN
2100-0111	000	ORANGE COUNTY CONST & OPER MANAGER
2100-0112	000	PROJECT MGMT ORANGE COUNTY
2100-0113	000	ORANGE CO CONST & OPERATIONS MANAGER
2100-0114	000	ORANGE CO CONST & OPS-ELEC
2100-0115	000	ORANGE CO C&O-GAS
2100-0116	000	ORANGE CO C&O-ENG & OPS
2100-0117	000	ORANGE CO C&O-TROUBLEMEN
2100-0119	000	T&D ASSET MGMT DIR
2100-0120	000	DISTRIB STANDARDS & COST MGMT
2100-0121	000	ENTERP SYS SOLUS
2100-0122	000	ELE DIST PLANNING
2100-0124	000	DISTRIB PROJECTS & PROG
2100-0126	000	ENERGY MGMT & SERVICE STANDARDS
2100-0127	000	ELE DIST OPERATIONS DIR
2100-0128	000	DIST SWITCHING
2100-0130	000	ELE GEOGRAPHIC INFO MGMT
2100-0131	000	PROJECT MGMT TRAINING
2100-0132	000	PROJECT MGMT METRO A

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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer

Appendix A: List of Non-Shared Cost Centers

Cost Center	Sub	Description
2100-0133	000	METRO C&O SOT ORDER TEAM
2100-0134	000	PROJECT MGMT METRO B
2100-0135	000	NORTHEAST C&O SORT ORDER TEAM
2100-0136	000	PROJECT MGMT NORTHERN
2100-0137	000	CS PROJ CONTRACT ADMIN
2100-0138	000	PROJECT MANAGEMENT POLICY & PROCEDURES
2100-0150	000	CONSTRUCTION SERVICES DIRECTOR
2100-0152	000	PROJ CONTR METRO ELECTRIC
2100-0153	000	PROJ CONTR - BEACH CITIES ELE
2100-0154	000	PROJ CONTR NORTHEAST ELE
2100-0155	000	PROJ CONTR EASTERN ELE
2100-0156	000	PROJ CONTR NORTH COAST ELE
2100-0157	000	PROJ CONTR ORANGE COUNTY ELE
2100-0158	000	PROJ CONTR-NON-DISTRICT ELE
2100-0159	000	PROJ CONTR METRO GAS
2100-0160	000	PROJ CONTR BEACH CITIES GAS
2100-0161	000	PROJ CONTR - NORTHEAST GAS
2100-0162	000	PROJ CONTR - EASTERN GAS
2100-0163	000	PROJ CONTR NORTH COAST GAS
2100-0164	000	PROJ CONTR ORANGE COUNTY GAS
2100-0165	000	PROJ CONTR NON-DISTRICT GAS
2100-0166	000	VEGETATION MGMT ADMIN
2100-0175	000	MATERIALS ANALYSIS LAB
2100-0189	000	FLEET EQUIPMENT OPERATIONS
2100-0205	000	EQUIPMENT TRAINING & OPERATIONS SERVICES
2100-0216	000	EMERGENCY SERVICES SOUTH
2100-0218	000	TREE TRIM PROGRAM
2100-0219	000	CHIEF DEVELOPMENT OFFICER
2100-0221	000	ELE TRANS & DIST ENGINEERING DIR
2100-0222	000	TRANS ENGINEERING
2100-0223	000	SUBSTATION ENG & DESIGN
2100-0224	000	SYSTEM PROTECTION ENGINEERING
2100-0225	000	CIVIL/STRUCTURAL ENGINEERING
2100-0226	000	ELE TRANS PLANNING
2100-0228	000	ELECTRIC GRID OPERATIONS DIRECTOR
2100-0229	000	ELECTRIC GRID CONTROL
2100-0230	000	ELECTRIC GRID OPERATIONS
2100-0231	000	ENERGY MGMT SYSTEMS OPERATIONS
2100-0232	000	GRID CONTRACT SERVICES
2100-0233	000	KEARNY MAINT & OPS DIRECTOR
2100-0234	000	SYSTEM PROTECTION MAINTENANCE
2100-0235	000	SUBSTATION CONST & MAINTENANCE
2100-0236	000	TRANSMISSION CONSTRUCTION & MAINTENANCE
2100-0237	000	TRANSMISSION MAINTENANCE & OPERATIONS
2100-0238	000	MAINTENANCE SHOPS

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Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer

Appendix A: List of Non-Shared Cost Centers

Cost Center	Sub	Description
2100-0368	000	INDUSTRY DUES & CONTRIBUTIONS
2100-0535	000	MATERIALS & SUPPLIES
2100-0560	000	ELECT RELIAB REPORTING
2100-0703	000	CONTRACT SUPPORT
2100-0720	000	ELE DIST OPS SYSTEM SERVICE
2100-0721	000	EASTERN C&O SORT ORDER TEAM
2100-0725	000	ELE TRANS & DIST VP
2100-3403	000	ELECTRIC REGIONAL OPERATIONS DIRECTOR
2100-3404	000	NORTH COAST C&O SORT ORDER TEAM
2100-3438	000	TECHNOLOGY DEVELOPMENT MANAGER
2100-3463	000	REGIONAL PUBLIC AFFAIRS SAN DIEGO
2100-3535	000	ESS PROD SUPPORT
2100-3540	000	ELE TRANS & DIST PROJECT MGMT
2100-3543	000	CONSTRUCTION OPERATIONS SUPPORT
2100-3557	000	EGIM STRATEGY
2100-3558	000	EGIM DISTRICT OPERATIONS
2100-3559	000	EGIM LAND
2100-3560	000	EGIM REGIONAL SUPPORT
2100-3561	000	EGIM - GIS MANAGEMENT
2100-3592	000	VP REGIONAL/EXTERNAL RELATIONS
2100-3604	000	SKILLS COMPLIANCE & TRAINING
2100-3616	000	ELECTIC DISTRIBUTION OPS TECH SUPPORT
2100-3643	000	C&O CENTER TRAINING - UG TRAINERS & ETS
2100-3651	000	TECH INNOV & DEVELOP
2100-3652	000	ASSET & INVEST STRGY
2100-3654	000	TECHNICAL ANALYSIS
2100-3655	000	PROGRAM MGMT
2100-3656	000	COMPLIANCE MGMT
2100-3663	000	FINANCIAL & STRATEGIC ANALYSIS
2100-3704	000	SMART ENERGY PROGRAM
2100-3707	000	DISTRIBUTED GENERATION PROGRAMS
2100-3724	000	UTILITY PLANNING - SDG&E
2100-3737	000	DIRECTOR SRPL GM CONST & ENGINEERING
2100-3738	000	MGR SRPL ENG PROCUREMENT & CONST SVCS
2100-3739	000	SRPL 230KV OVERHEAD PROJECT MANAGER
2100-3740	000	SRPL 230KV UNDERGROUND PROJECT MANAGER
2100-3741	000	SUNCREST SUBSTATION PROJECT MANAGER
2100-3742	000	SRPL 500KV OVERHEAD SD PROJECT MANAGER
2100-3743	000	SRPL 500KV OVERHEAD IV PROJECT MANAGER
2100-3745	000	SRPL SAFETY MANAGER
2100-3752	000	SUNRISE POWERLINK IV OFFICE
2100-3758	000	CPD
2100-3761	000	SDGE F. COORDINATION
2100-3771	000	ENTERPRISE SYSTEMS SUPPORT DIRECTOR
2100-3773	000	HELICOPTER UTILIZATION

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Witness: William H. Speer

Appendix A: List of Non-Shared Cost Centers

Cost Center	Sub	Description
2100-3788	000	Major Projects - Subsation
2100-3792	000	MANAGER - AREA RESOURCE SCHEDULING ORG
2100-3793	000	AREA RESOURCE SCHEDULING ORG - NORTH
2100-3794	000	AREA RESOURCE SCHEDULING ORG - SOUTH
2100-3819	000	ESS PRODUCTION SUPPORT SDGE
2100-3850	000	OPERATIONS & PROJECT MANAGEMENT TRAINING
2100-3853	000	Elec T&D - Kearny Maint & Ops
2100-3854	000	AIR COORDINATION
2100-3860	000	Elec T&D - Construction Ops
2100-3872	000	BUSINESS SOLUTIONS & TRAINING
2100-3873	000	FINANCE & OPERATIONS MGMT
2100-3874	000	Elec T&D - Major Projects
2100-3875	000	SAFETY & PROJECT COMPLIANCE MANAGER
2100-3876	000	DIRECTOR ASST MGMT & SMART GRID
2100-3877	000	SMART GRID PROJECTS
2100-3878	000	ADV ASSET PERF ANALYTICS & INTEGRATION
2100-3879	000	MAJOR PROJECT OUTREACH
2100-3881	000	MAJOR PROJECTS - TRANSMISSION
2100-3882	000	MAJOR PROJECTS - SUPPORT SERVICES
2100-3883	000	Elec T&D - T&D Tech Assessment
2100-3892	000	OPERATIONS ENGINEERING
2100-3893	000	ADVANCE TECHNOLOGY INTEGRATION
2100-3894	000	BEACH CITIES C&O SORT ORDER TEAM
2100-3908	000	MAJOR PROJECTS SUBST CONST MGMT
2100-3910	000	STRATEGIC PLANNING & BUS OPTIMIZATION
2100-3911	000	GEOGRAPHIC BUSINESS SOLUTIONS MOBILE/WEB
2100-3912	000	GEOGRAPHIC BUSINESS SOLUTIONS DESKTOP
2100-3925	000	APS/SRP PARTICIPATION AGREEMENT
2100-3931	000	MAJOR PROJECTS
2100-3932	000	FIRE & RISK MITIGATION
2100-3936	000	ELECTRIC BUSINESS PROCESS
2100-3937	000	VP ELECTRIC DISTRIBUTION OPERATIONS
2100-3939	000	ERO CONSTRUCTION
2100-3940	000	PROTECTIVE EQUIPMENT TESTING
2100-3941	000	MATERIALS MANAGEMENT
2100-3958	000	CHIEF ENERGY DELIVERY OFFICER
2100-3962	000	DIR EMERGENCY PREPAREDNESS & MANAGEMENT
2100-3963	000	METEOROLOGY
2100-3964	000	DISTRIBUTION OPERATIONS SERVICES
2100-3972	000	OPERATIONS TECHNOLOGY INTEGRATION
2100-3973	000	INTEGRATED TEST FACILITY
2100-3974	000	ET&DE PROJECT MANAGEMENT OPERATIONS
2100-3981	000	MISSION CONTROL TRAINING SECTION
2100-3982	000	GOOGLE FIBER PROJECT
2100-3986	000	Construction Services Business Controls

SDG&E/ELECTRIC DISTRIBUTION/Exh No:SDG&E-15-WP/Witness: W. Speer

San Diego Gas & Electric Company
2019 GRC - APP
Non-Shared Service Workpapers

Area: ELECTRIC DISTRIBUTION
Witness: William H. Speer

Appendix A: List of Non-Shared Cost Centers

Cost Center	Sub	Description
2100-3988	000	FUELING OUR FUTURE PMO ELECTRIC DISTRO
2100-3989	000	FORECASTING, COMPLIANCE & ANALYTICS
2100-4029	000	ELEC TRANS & DISTR PROJECT MANAGEMENT