ORA DATA REQUEST
ORA-SDGE-089-GAW
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 16, 2018
DATE RESPONDED: FEBRUARY 9, 2018

This response contains Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023. Confidential information has been shaded in yellow.

Exhibit Reference: SDG&E-14, Chapter IV. K, pages AFC-110 through 126

SDG&E Witness: Alan F. Colton
Subject: Questions Regarding Safety and Risk Management Projects

Please provide the following:

On page AFC-110 of Exhibit SDG&E-14, SDG&E begins its testimony on Safety and Risk Management Projects. The following questions seek clarification and/or additional information on various capital projects in this area; page references to SDG&E's testimony (Exhibit SDG&E-14) are prefaced by "AFC," while page references to SDG&E's workpapers (Exhibit SDG&E-14-CWP) are prefaced by WP.

1. SDG&E begins its discussion of the FiRM GRC Blanket project (Budget Code project 13247) on page AFC-111. On workpaper page WP-703, SDG&E states that its forecast "is based on detailed cost estimates." It further states that "any significant variances between the estimated costs for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects."

   a. Please provide the detailed cost estimates that are discussed on page WP-703.
   b. Please provide detailed calculations that show how these cost estimates (provided in response to Question 1.a) were used to derive SDG&E's FiRM forecasts for 2017, 2018, and 2019.
   c. For each of the years 2017 through 2019, please break down the yearly total forecast costs into functional totals, such as the costs for replacing conductors, wood pole replacements, replacing aged splices, etc.
   d. Workpaper page WP-701 shows that FiRM expenditures began in 2013. Please provide calculations showing how variances between the estimated and recorded expenditures were used to adjust project forecasts for 2017, 2018, and 2019.

SDG&E Response 01:

a. SDG&E detailed cost estimates utilize prior year actual costs to quantify a representative per pole unit cost. The per pole unit cost is then divided into the following year annual budget to determine the approximate total amount of poles targeted for replacement in the coming year. Specific projects (i.e. typically a distribution circuit broken down into sections with 20-50 poles), are identified and prioritized by the Wildfire Risk Reduction Model (WRRM) as further described in SDGE-14-CWP, p. 702 of 1,041. The output of the WRRM provides a ranking of the poles and conductors that should pose the greatest risk.

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SDG&E Response 01.a:-Continued

The results of the WRRM are discussed, and the detailed scope of each circuit is finalized, by engaging the internal stakeholders (Engineering and Operations). Changes to the forecast are made if there are significant changes to the scope of the project after the internal stakeholder engagement. There are other costs specific to each project that become known through the detailed design and construction phases of the project, such as underground conversions, underground replacements, relocations, removals, and changes based on field conditions. Once these scope changes are known, they are factored into the project cost estimate, and adjustments to the schedule of each project are made to ensure the overall budget is maintained each year.

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Actual Costs with in-Service Dates in 2017			
Job Type	Poles	Total Direct Costs	Material Costs
OH	1,732		
UG	N/A		
IT	N/A		

Total Direct Cost/Pole	Material Cost

b. The costs estimates used to derive the FiRM forecasts for 2017, 2018, and 2019 were derived using the per pole unit cost estimate as described in response to 1.a. Based on the current per pole unit costs, the FiRM program targets the replacement of approximately 1,841 poles each year to meet the forecasts for 2017, 2018, and 2019. Adjustments to the pole replacement quantities and project schedules are made as actuals costs are compared to previous estimates each year.

c. The breakdown of the yearly total forecasts costs into functional totals, such as cost of replacing conductors, wood pole replacements, replacing aged splices cannot be made as the costs for each of these functions are aggregated throughout the entire design, engineering, and construction process. However, the response to question 1.a. provides a table that breaks down the per pole unit costs from actual costs incurred in 2017. ***The information shaded in yellow is Confidential and Protected Material Pursuant to PUC Section 583, GO 66-D, and D.17-09-023.*** It is estimated that approximately 1,841 poles and approximately 91 circuit miles of conductor will be replaced each year, which equates to an average per pole cost of approximately [redacted] (including labor and materials) and an

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SDG&E Response 01.c:

average circuit mile of conductor replaced of approximately [redacted] (including labor and materials).

d. Referring to the table below, over the last five years the FiRM program has replaced approximately 5,461 poles and has seen an evolution in the per unit pole costs. Over the course of the program, the experience level has risen for our staff, consultants, and construction contractors, and efficiency measures are continually being implemented. These gains in experience and efficiency have increased production and reduced cost since the early years of FiRM program. ***The information shaded in yellow is Confidential and Protected Material Pursuant to PUC Section 583, GO 66-D, and D.17-09-023.*** In 2017 the per unit pole costs came to be approximately [redacted] per pole. It is important to note the costs in the table include all direct costs, including overhead, underground, IT and other miscellaneous costs; however, the bulk of the costs are related to pole replacements and provides a good estimate for budgetary purposes. The costs for replacing a pole are also driven by the type of access (truck accessible versus walk-in/helicopter sets) and pole hole digging (soft soil versus rock). In some cases, overhead lines are relocated or undergrounded to avoid culture sites, avoid lengthy or difficult land rights acquisitions, or to improve access for the safety of our crews for construction and maintenance. These challenges in construction can cause drastic swings in pole replacement costs, however, these costs are averaged out in the values provided below and are looked at each year to help with future budgetary forecasts.
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Year	Approx. Poles Replaced (Actual/**Estimate**)	Direct Total Capital Cost - Estimate ($1,000)	Direct Total Capital Cost - Actuals ($1,000)	Approximate Per Pole Costs ($1,000) (Actual/**Estimate**)
2013	43	[redacted]	[redacted]	[redacted]
2014	393	[redacted]	[redacted]	[redacted]
2015	1883	[redacted]	[redacted]	[redacted]
2016	1410	[redacted]	[redacted]	[redacted]
2017	1732	[redacted]	[redacted]	[redacted]
2018	**1841**	[redacted]	[redacted]	[redacted]
2019	**1841**	[redacted]	[redacted]	[redacted]
Total/Avg =	5461	[redacted]	[redacted]	[redacted]

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2. For the SF6 Switch Replacement project, SDG&E is estimating a 4-fold increase in 2018 and 2019 forecast expenditures, as compared to 2017.

a. Please provide detailed calculations showing how SDG&E derived its forecasts for 2018 and 2019.
b. Please explain why SDG&E believes that this 4-fold increase in 2018 is necessary and justified.
c. If SF6 switch replacements are an urgent project for SDG&E, please explain why forecast replacement costs for 2017 are not as high as 2018 or 201

SDG&E Response 02:

a. Manually-operated replacements are estimated at $100k each, for a total of 60. SCADA-operated replacements are estimated at $225k each for a total of 40.

b. In 2017, SDG&E completed ramping up activities for SF6 Switch Replacement, including design preparations and prioritization assessment, and thus did not complete as many replacements as are forecasted in the following years. The increase in funding reflects SDG&E's forecast to complete the SF6 replacement of 1000 switches in the 10-year period following 2017, consistent with the per-switch cost estimates shown in response to 2.a.

c. See response to 2.b. 2017 activities included design preparations and confirmation of prioritization from the SF6 assessment; whereas forecasted costs for 2018 and 2019 are based on SF6 switch replacements.

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3. SDG&E discusses its Electric Integrity Ramp program (Budget Code project 16252) on pages AFC-117 through 119. SDG&E states that its forecast "is based on detailed cost estimates." It further states that "any significant variances between the estimated costs for a project and the actual costs are scrutinized to determine if cost estimate inputs need to be adjusted for future projects."

a. Please provide the detailed cost estimates that are discussed on page AFC-118.
b. Please provide detailed calculations that show how these cost estimates (provided in response to Question 3.a) were used to derive Electric Integrity Ramp forecasts for 2017, 2018, and 2019.
c. For each of the years 2017 through 2019, please break down the yearly total forecast costs into functional totals, such as the costs for enhanced switch inspections, corrosion mitigation, strategic undergrounding, etc.
d. Please discuss how SDG&E proposes to adjust its 2019 forecast (which is many times larger than proposed expenditures in previous years), if variances between forecast and actual expenditures occur in 2017 and/or 2018.

SDG&E Response 03:

a. Please see the accompanying files:
   - "ORA-SDGE-089-Switch Inspection"
   - "ORA-SDGE-089-Strategic Undergrounding"
   - "ORA-SDGE-089-BC16252 Summary"

b. The 2017-2019 cost projections were based on a rapid ramp-up methodology, in order to accommodate incremental planning, design, and construction activities for risk-informed activities. The budget estimates were scaled accordingly in a 10%, 30%, 100% manner for 2017, 2018, and 2019, respectively, as shown below:

Activity	**2017 (10%)** *($ x1,000)*	**2018 (30%)** *($ x1,000)*	**2019 (100%)** *($ x1,000)*
Wire Safety Enhancement	0	8,701	29,002
Switch Inspection & Replacement – OH	364	1,091	3,638
Bridged Cutout Replacement	424	1,273	4,244
Switch Inspection & Replacement – UG	0	1,467	4,890
Strategic Undergrounding	0	2,326	6,977
Total	**788**	**14,858**	**48,751**

c. See response b.

d. SDG&E continues to produce and refine quantitative risk analyses to inform these capital development and inspection programs. SDG&E is constantly subject to constructability risks due to resource availability in engineering, design, jurisdictional and environmental permitting, and internal/external construction resources. The 2019 forecast will be adjusted based on any known limiting factors, as aforementioned, to the reasonable scale of projected constructability.

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1.1.1.1. **Exhibit Reference:** SDG&E-14, Chapter IV. K, pages AFC-110 through 126

SDG&E Witness: Alan F. Colton
Subject: Questions Regarding Safety and Risk Management Projects

Please provide the following:

On page AFC-110 of Exhibit SDG&E-14, SDG&E begins its testimony on Safety and Risk Management Projects. The following questions seek clarification and/or additional information on various capital projects in this area; page references to SDG&E's testimony (Exhibit SDG&E-14) are prefaced by "AFC," while page references to SDG&E's workpapers (Exhibit SDG&E-14-CWP) are prefaced by WP.

4. SDG&E is proposing to spend $10 million in 2017 for a new twin engine helicopter. On page AFC-122, SDG&E states that its forecast is based on detailed cost estimates.
Please provide the cost estimates that were used to develop the forecast for this helicopter.

SDG&E Response 04:

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Please see the accompanying file, "ORA-SDGE-089-GAW Q4 CONFIDENTIAL.pdf".

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5. SDG&E discusses its Pole Risk Mitigation and Engineering (PRiME) program (Budget Code project 17254) on pages AFC-123 through 126. This program is also discussed on workpaper page WP-804. SDG&E states that its forecasts for 2017, 2018, and 2019 are $0.270 million, $4.582 million, and $40.430 million, respectively.

a. On page WP-804, SDG&E states that "the pilot phase of PRiME will occur in 2018 where 1,600 poles will be analyzed." Page WP-804 goes on to state that in 2019, 3,000 poles will be analyzed. Please explain why, in 2018, 1,600 poles can be analyzed for $4.582 million, while in 2019, analyzing 3,000 poles will cost $40.430 million.
b. On page AFC-126, line 20, SDG&E states that its forecasts are based on detailed cost estimates. Please provide these detailed cost estimates.
c. Using the cost estimates provided in response to Question 5.b, please provide calculations showing how SDG&E derived its forecasts for 2017 through 2019.

SDG&E Response 05:

a. The approximate total number of poles to be analyzed is as follows:
   - 2017 = 0 poles
   - 2018 = 1,600 poles
   - 2019 = 22,600 poles

   2019 analysis costs per pole are less than 2018 due to economies of scale obtained by performing analysis on a larger quantity of poles. For example, economies of scale are obtained from analyzing a larger quantity of poles in the same location, minimizing drive times, etc.

b. Approximate Cost Details:

Capital Cost Details	2017 (0 poles)	2018 (1600 poles)	2019 (22600 poles)
Analysis & PM	$270,000	$1,610,000	$5,680,000
Construction	$0	$2,790,000	$34,590,000
SDG&E PM Support	$0	$180,000	$180,000
Total	**$270,000**	**$4,580,000**	**$40,450,000**

c. SDG&E used the following methodology to determine pole counts for the years 2018 and 2019:
   - The pilot phase of 1600 poles will allow SDG&E to achieve a higher confidence level to verify pole failure rates to further assist in project forecasting. SDG&E will ramp from 1600 poles in 2018 to 22,600 poles in 2019 in order to ensure SDG&E can complete pole analysis within SDG&E's Fire Threat Zone/Highest Risk Fire Areas by 2021.
   - The number of poles to be replaced and/or rearranged was determined as a result of data collected from SDG&E's GO 165 Corrective Maintenance Program (CMP).

SDG&E Response 05:-Continued

- Cost data was determined by using average costs based on other SDG&E programs for each activity required to meet the specific task e.g. pole analysis, pole replacement, or pole rearrangement.