CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 5, 2018

2. Please provide a copy of each data request received by SDG&E from any party other than CUE, together with SDG&E's responses to that data request, and any attachments to those responses.

SDG&E Response 2:

DVDs are provided for this response, as well as the response to question 164 of CUE DR-03, which include the discovery responded to by SDG&E and SoCalGas as of January 24, 2018. Public DVDs include the question that was posed by the party propounding the discovery (e.g., intervenor), the public response and any public attachments. Confidential DVDs, indicated by confidentiality language on the label, include responses and attachments that are entirely or partially confidential, which can only be viewed by Reviewing Representatives who have executed the Protective Order's Non-Disclosure Certificate. Those confidential responses and attachments are ***Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023.*** Parties' requests seeking all the discovery requests and responses to date are excluded.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE PARTIAL
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: JANUARY 30, 2018

3. Please identify and quantify the dollar change in each component (e.g., depreciation, ratebase, ADIT, NOLs, return, etc.) of SDG&E's forecasted 2019 revenue requirement that will be different from the level in SDG&E's application due to the impact of the tax law changes passed and signed in December 2017. If possible, for each such change please identify the particular tax law change causing the revenue requirement change (e.g., expensing provisions retroactively effective in September 2017, future expensing provisions, change in corporate tax rate from 35% to 21%, etc.).

SDG&E Response 3:

On December 22, 2017, the Tax Cuts and Jobs Act (the "Tax Act") was enacted into law. The Tax Act represents the first major overhaul of the federal tax code in over 30 years. At the January 10, 2018 prehearing conference for our Test Year 2019 General Rate Case ("GRC"), SDG&E agreed to serve supplemental tax testimony with the Commission by April 6, 2018, which will reflect the Tax Act's impact. SDG&E is in the process of analyzing the legislation in preparation of the supplemental tax testimony. Therefore, SDG&E requests that questions related to the Tax Act be propounded after SDG&E has served the supplemental tax testimony.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE PARTIAL
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: JANUARY 30, 2018

4. In SDG&E's Application, Appendix A, p. 20, SDG&E says that "The 'planned' values were not intended to be used as metrics for accountability reporting purposes."

a. Why not?

b. Please explain why, without regard to SDG&E's intent, it is or is not appropriate to use the "planned" values as metrics.

SDG&E Response 4:

a. As stated on page 10 of Appendix A, "Generally, the planned levels represent what the Utilities put forth or 'proposed,' in their direct testimony and workpapers from the TY 2016 GRC, which may be the underlying methodology or assumptions used to derive the Utilities' GRC forecasts. In other words, the 'planned' metrics are the planning or forecasting assumptions of SoCalGas and SDG&E."

The interim spending accountability report was ordered after SoCalGas and SDG&E prepared such planning or forecasting assumptions for the Test Year 2016 GRC Applications. Thus, it is not possible for the planned values to have been intended to be used as metrics for accountability reporting purposes. Rather, the assumptions were made to arrive at a forecast for the Test Year. The planning and forecast assumptions are now being used after the fact to measure variances in spending or authorized levels.

b. There are several reasons why it is not appropriate to use "planned" values as metrics for purposes of accountability reporting.
   - First, SoCalGas and SDG&E recognize on page 10 of Appendix A that "…the planned metrics are not reflective of either the final GRC decision or the adopted settlement." Thus, planned metrics do not reflect authorized values.
   - Second, planning assumptions are not standardized across witness areas or even across projects within a given witness area. Meaning, some witness areas may estimate their needs for the Test Year based on unit costs or number of widgets while others do not.
   - Similarly, planning assumptions are not documented in a consistent manner across GRC witness areas or may not be available. For example, some witness areas select an average or trend to forecast their Test Year needs. In these cases, per unit or per widget estimates were likely not derived or known since trending or averaging typically focuses on the dollar request rather than units. In other words, witness areas that develop forecasts using averages or trends may not translate into metrics per widget.
   - Lastly, the use of planning assumptions as metrics is not consistent with metrics currently being contemplated in the Metrics Working Group efforts taking place in the S-MAP proceeding.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 2, 2018

5. In SDG&E's Application, Appendix A, p. 21 regarding SF6 switches, SDG&E refers to "all known units that are exhibiting pressure losses."

a. How many units is that?

b. How many units are there in total, including units not known to be exhibiting pressure losses and units known to not be exhibiting pressure losses.

c. In the following sentence from the one quoted, which calendar years are meant by "five years or more"?

d. In the sentence after that, which calendar years are meant by "over the following few years"?

e. By what year does SDG&E plan to have removed or replaced all SF6 switches?

f. How many SF6 switches were removed or replaced in 2017?

SDG&E Response 5:

a. There are approximately 165 units that are exhibiting pressure losses.

b. There are approximately 1000 units in total.

c. Given anticipated resources, SDG&E estimates replacing approximately 100 switches a year from 2018-2028 or sooner.

d. “Over the following few years” is intended to be 2018-2028

e. SDG&E currently plans on removing and/or replacing all switches by approximately 2028.

f. Total figures for 2017 are not yet available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 12, 2018

6. In SDG&E's Application, Appendix A, pp. 19, 20, 22, 27, 33, 38, and 44, please provide corresponding tables with 2017 data rather than the 2016 data shown on in the tables on those pages. If not available, please indicate when 2017 data will be available, and commit to providing it at that time.

SDG&E Response 6:

In D.16-06-054, the Commission ordered SDG&E and SoCalGas to file interim Spending Accountability Reports limited to the years of 2014, 2015, and 2016 (*see* Ordering Paragraph 11) "[t]o gain some familiarity and understanding with the reporting requirements imposed by D.14-12-025, and to obtain data and metrics on safety" (D.16-06-054 at Conclusions of Law 4). D.16-06-054 also discusses future accountability reporting on page 41: "Subsequent reporting requirements beyond what is being required above will be supplanted by the direction provided in D.14-12-025, a decision in either or both the S-MAP and RAMP proceedings, or in the next GRC proceedings of the Applicants." Therefore, SDG&E and SoCalGas have not performed the requested analysis, and it is neither in the scope of this proceeding nor consistent with what was ordered by the Commission. Moreover, the requested analysis would be an extraordinary effort to perform. SDG&E and SoCalGas thus object to this request under Rule 10.1 of the Commission's Rules of Practice and Procedure, on the grounds that the burden and expense of this request clearly outweigh the likelihood that the information sought will lead to the discovery of admissible evidence.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 8, 2018
DATE RESPONDED: FEBRUARY 8, 2018

7. In SDG&E's Application, Appendix A, p. 19 refers to "major event days" and "MED", while p. 24 refers to "Threshold Major Event Days" and "TMED." Please define the difference, if any, between these two kinds of days.

SDG&E Response 7:

A Major Event Day (MED) is an identified day that falls within the IEEE 1366 criteria. The Threshold for a Major Event Day is the specific SAIDI number threshold that identifies an individual day as MED.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 8, 2018
DATE RESPONDED: FEBRUARY 8, 2018

8. In SDG&E's Application, Appendix A, p. 25, SDG&E blames increase in SAIDI and SAIFI in 2016 on "an increase in connector failures in underground systems."

a. Please provide breakdowns of SAIDI and SAIFI for each of the years 2012-17, inclusive, showing the minutes of SAIDI and components of SAIFI attributable to each known cause (e.g., UG cable failure, UG connector failure, transmission system failure, breaker failure, transformer failure, substation-caused failure, etc.).

b. Please provide any forecasts SDG&E has made of SAIDI and SAIFI for any of the years 2018-2022 (i.e., through the proposed duration of this GRC cycle), either in toto or for any of the components identified in part (a) of this question.

SDG&E Response 8:

a.) Please see the attached "CUE-DR-02 Q8a" spreadsheet which breaks down SAIDI and SAIFI by cause categories.

b.) SDG&E utilizes a five-year moving average to forecast SAIDI and SAIFI. The forecast for 2018 is 63.4 minutes SAIDI and .544 SAIFI, based on this methodology. SDG&E does not forecast beyond the current year, as it utilizes a five-year moving average. The forecast for 2019 will include the results from 2018, and remove the results from 2013.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 6, 2018

9. Ex. SDGE-1, p. 1:24-26 references the planned replacement of more than 10,000 wood poles with steel poles by the end of 2017. Please provide the actual number of wood distribution poles replaced by steel poles in each of the years 2012-17, inclusive.

SDG&E Response 9:

Below are approximate counts of SDG&E owned steel distribution-only (including stub) poles that are replacement poles installed (i.e. not newly installed) between 2012 and 2017.

YEAR	POLE COUNT
2017	2,292
2016	2,847
2015	1,523
2014	962
2013	889
2012	858
Total	9,371

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 6, 2018

10. Ex. SDGE-1, p. 3:24 says that SDG&E has undergrounded more than 60% of its electric distribution system. For each of the years 2012-17, inclusive, please provide:

a. Miles of underground facilities

b. Miles of overhead facilities

c. Percentage of system undergrounded (and workpapers to support that percentage, if not based on the responses to subparts (a) and (b) of this question).

d. SAIDI and SAIFI attributable to UG facilities

e. SAIDI and SAIFI attributable to OH facilities

f. SAIDI and SAIFI, if any, attributable to neither UG nor OH facilities

SDG&E Response 10:

a. Miles of underground facilities for 2012-2017 are shown below.

Year	OH Dist	UG Dist	Total Dist
2012	6631	10274	16905
2013	6572	10280	16852
2014	6558	10340	16898
2015	6542	10431	16973
2016	6529	10508	17037
2017	6519	10606	17125

b. Miles of overhead facilities for 2012-2017 are shown above.

c. Percentages of the system undergrounded based on subparts a and b.

- 2012 – 60.77%
- 2013 – 61.00%
- 2014 – 61.19%
- 2015 – 61.46%
- 2016 – 61.68%
- 2017 – 61.93%

SDG&E Response 10 Continued:

d. SAIDI and SAIFI attributable to UG facilities is shown below.

Year	SAIDI	SAIFI
2012	37.05	0.2403
2013	32.42	0.2136
2014	31.11	0.2310
2015	32.09	0.2449
2016	36.61	0.2690

e. SAIDI and SAIFI attributable to OH facilities

Year	SAIDI	SAIFI
2012	27.32	0.2925
2013	27.54	0.2584
2014	33.49	0.3718
2015	25.83	0.2812
2016	36.14	0.3505

f. This data does not exist as all outages are categorized as either UG or OH.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 12, 2018

11. Ex. SDGE-1, p. 17:13-16 describes "pressures associated with maintaining a highly-trained and qualified workforce. Ex. SDGE-4, pp. 4:23-5:2 also addresses workforce issues. Please provide any studies performed by or for SDG&E, as well as any memos or other documents provided to SDG&E management, quantifying any of the items identified in these two paragraphs.

SDG&E Response 11:

The increased pressures SDG&E is experiencing are associated with maintaining a highly-trained and qualified operations workforce in critical roles as described in SDG&E's RAMP Report in the Workforce Planning RAMP Chapter, SDG&E-17, p. 2. Retirement rates and projected future retirements for these critical roles were analyzed and explained on pp. 3-10. As retirements occur in these critical roles, replacing those may trigger various employee movements and transfers throughout the company. A variety of specialized training, compliance and inspection programs, knowledge transfer, and other risk mitigation plans have been put in place, continue to evolve, and/or are newly created. (Please see RAMP Chapter, SDG&E-17, pp. 14-19.)

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 12, 2018

12. Ex. SDGE-4-WP, p. 6, shows a forecast based on 5-year average spending.

    a. Why did SDG&E forecast based on average rather than trend, when there is a trend of cost increases in every historical year but one?

    b. Why is SDG&E forecasting a 44% decline in spending from 2016 to 2017?

    c. What was the actual 2017 spending?

SDG&E Response 12:

a. The Other Services workgroup consists of miscellaneous expenses associated with Gas Distribution field operations not captured in other major workgroups. Past experience has shown that due to the wide range of activities included, the expenses in this workgroup can fluctuate from year to year. Therefore, the 5-year average was selected to project future costs.

b. When a five-year average is selected, it is normal for the forecasted average values to be above or below the base year actual value since an average will differ from an actual expense value, which fluctuates from year to year.

c. Financial data for year-end 2017 is not yet available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 12, 2018

13. Ex. SDGE-4-WP, p. 13, shows a $255K cost increase in 2019 to pay for 3 extra leak patrollers in order to increase leak survey frequency for high pressure pipelines and Aldyl- pipelines.

a. How many incremental miles per year of high pressure pipeline will these three patrollers survey?

b. How many incremental miles per year of Aldyl-A pipeline will these three patrollers survey?

c. What if any advanced technologies (e.g., Picarro) will these patrollers use?

d. What are the current average miles per year per person of high pressure pipeline surveyed by SDG&E patrollers?

e. What are the current average miles per year per person of Aldyl-A pipelines surveyed by SDG&E patrollers? Please provide annual data for 2012-17, inclusive.

f. Where in SDG&E workpapers are the costs shown for repairing the incremental leaks that are expected to be found by performing incremental surveys in 2019 that would otherwise not have been done until subsequent years? If not shown already, please provide the estimated incremental leak repair costs for 2019 and indicate where they should have been included.

g. How many incremental leaks per mile are expected to be found on high pressure pipelines in 2019 due to the increase in surveys that year?

h. How many incremental leaks per mile are expected to be found on Aldyl-A pipelines in 2019 due to the increase in surveys that year?

SDG&E Response 13:

a. The incremental length of pipeline added to the survey to be done bi-annually is the balance of the high-pressure pipelines that are not > 20% SMYS (already surveyed bi-annually). This length is 291 miles.
b. The total length of Aldyl-A pipeline to be patrolled by these three patrollers is 1,560 miles.

SDG&E Response 13 Continued:

c. Picarro or other advanced gas leak detection technologies have not been evaluated or implemented at SDG&E.

d. SDG&E does not have miles/person metrics for a specific class of pipeline. The total length of high-pressure pipelines (including transmission pipelines) surveyed is 592.2 miles.

e. Aldyl-A pipe is currently surveyed along with all other pipe on a 5-year survey cycle. Specific miles/person per year surveyed is not available.

f. The expenses for repairs to leaks in mains and services are in work groups 1GD000.003 and 1GD000.004. A description including historical expenses and forecast expenses can be found in Exhibit SDG&E-04-WP-R on pages 29 to 39. In 2018, Aldyl-A leak survey and leak repairs resulting from an incremental survey will be DIMP funded. Going forward, the forecast methodology chosen for these two groups is a 5-year linear trend. The forecast expense for TY 2019 is expected to accommodate leak repairs as a result of additional incremental surveys.

g. SDG&E does not forecast the number of expected leaks over future years.

h. SDG&E does not forecast the number of expected leaks over future years.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 12, 2018

14. Ex. SDGE-4-WP, p. 21 says that "SDG&E expects a continued rise" in the labor component of Locate and Mark activities, but then on p. 22 SDG&E forecasts a drop of more than 4% in labor costs from 2016 to 2017. Please:

a. Explain why the 2017 labor forecast should not be (according to SDG&E) an increase from 2016.

b. Provide 2017 actual costs for this activity.

SDG&E Response 14:

a. SDGE did not state that it expects a continued rise in the labor component of "Locate and Mark" activities. SDG&E stated the following in the forecast explanation on p. 21 of SDGE-4-WP "The cumulative expense trend of labor and non-labor has increased from 2012 to 2016 due to increased outsourcing of locate and mark services (non-labor contract resources) in order to meet compliance requirements; increased stand-by and mark-out requests to meet city franchise work; and an increased amount of customer Dig Alert tickets. SDG&E expects a continued rise in this activity." The term "continued rise" refers to the overall level of locate and mark services. The value for the 2017 labor forecast is lower than the corresponding value for 2016 as a result of the linear trend calculation that was used for developing these forecasted values.

b. Financial data for year-end 2017 is not yet available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 12, 2018

15. Ex. SDGE-4-WP, p. 23, please provide:

a. A disaggregation of the combined expenses in 2018 and 2019 for training and standby personnel into the training dollars and the standby dollars.

b. An explanation of and calculation underlying the downward expense adjustments of $95K in 2018 and $140K in 2019 for "Other".

c. Actual 2017 expenses for this activity.

SDG&E Response 15:

a. Expenses for Locate and Mark in 2018 and 2019 include combined expenses of mark-out field activities, staff support, training and standby observations. The manner in which hours are logged and expenses derived for all these activities is in a format that does not allow a readily available or accurate way to break out each contribution individually.

b. The adjustments of -$95,000 in 2018 and -$140,000 in 2019 are the estimated amounts of labor in the incremental RAMP addition (for Locate and Mark training, standby and staff support) already captured in the five-year linear trend base expense forecast. These amounts were deducted from the total incremental RAMP expense resulting in the net RAMP expense of $285,000 for 2018 and $420,000 for TY 2019. This would avoid a double accounting for this labor in the base and in the incremental addition. The overlapping labor amount was estimated to be 25% of the total RAMP incremental addition. This is also explained in Exhibit SDG&E-04-R on page GOM-38.

c. Financial data for year-end 2017 is not yet available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 12, 2018

16. Please confirm that Ex. SDGE-4-WP pp. 61 and 89, and Ex. SDGE-4-CWP pp. 118, 159, and 192 are all identical, and if not identify all differences between them.

SDG&E Response 16:

Yes, the table that appears on the pages cited is SDG&E-GOM-Capital-SUP-006 and is identical on each of these pages.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 12, 2018

17. Ex. SDGE-4-WP, p. 69 shows that "labor and non-labor expenses have collectively increased year over year" for every year from 2012-2016.

a. Given the steady upward trend SDG&E identifies, why did it use a base forecast on p. 70 equal to 2016 levels rather than using a linear trend for the base forecast?

b. If SDG&E had used a linear trend for its base forecast, what would the base forecast values and adjusted forecast amounts have been on p. 70?

c. What were the actual expenses for 2017 for this cost category?

SDG&E Response 17:

a. Labor and non-labor expenses have collectively increased year over year with notable spikes in 2015 and 2016 due to increased overtime in order to meet code compliance requirements and the preliminary field verification work associated with the separately protected service line remediation project. Because of these recent expense level changes, a historical average would not adequately represent future resource needs. Future expense levels is better represented by the expense levels in the base year, rather than other methodologies, including the linear trend. Therefore, 2016 was chosen as the base expense for the TY 2019 GRC period as it best represents the new normal base course of business. To this base are added incremental expenses.

b. SDG&E objects to this request on the grounds that it calls for speculation. SDG&E has not calculated a linear trend for its forecast, and thus cannot speculate as to base forecast values and adjusted forecast amounts if it had been used. CUE has been provided with five years of historical data upon which it can calculate a linear trend.

c. Financial data for year-end 2017 is not yet available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 12, 2018

18. Ex. SDGE-04, p. 3, says that SDG&E has approximately "385 distribution employees" who are responsible for "maintaining safe and reliable operation of the gas distribution system."

a. Please confirm that this is an accurate statement.

b. For year end 2012-2017, inclusive, please provide:

i. The number of SDG&E employees who "are responsible for maintaining safe and reliable operation of the gas distribution system"

ii. The number of customers on the SDG&E gas distribution system.

iii. The ratio of customers per SDG&E employee for the SDG&E gas distribution system

c. On a forecast basis, for year end 2018-2022 (i.e., through the proposed GRC period), please provide SDG&E's forecast of:

i. The number of SDG&E employees "responsible for maintaining safe and reliable operation of the gas distribution system"

ii. The number of customers on the SDG&E gas distribution system.

iii. The ratio of customers per SDG&E employee for the SDG&E gas distribution system

SDG&E Response 18:

a. Yes, as of the end of 2016, the workforce of gas distribution employees including front-line construction crews, technical planners, and engineers located at five operating bases and one technical office totaled 385. These employees are responsible for maintaining safe and reliable operation of the gas distribution system.

SDG&E Response 18 Continued:

b. The response to Question 18.b is provided in Table 1 below:

Table 1

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Gas Distribution Employee and Customer Count

	2012	2013	2014	2015	2016	2017
a. Gas Employees	345	334	374[2]	373	385	383
b. Gas Customers[1]	859,314	864,157	867,449	872,883	878,100	883,206
Ratio of b/a	2491	2587	2319	2340	2281	2306

Notes:
1/ From SDG&E R2 Report - Report of Customers, Sales and Revenues
2/ Starting from 2014, the Traffic Control group was added to the Gas Distribution cost centers

c. SDG&E objects to all portions of this question requesting 2020-2022 forecasts under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E has forecasted Gas Distribution Operations and Maintenance (O&M) expenses necessary to support the GRC filing, as presented in Ex SDG&E-4-WP-R and the direct testimony of Gina Orozco-Mejia Ex SDG&E-04-R.

i. This data is not available.

ii. Customer forecasts, their description and methodology can be found in the testimony of Rose-Marie Payan, Exhibit SDG&E-37

iii. SDG&E does not forecast the ratio of customers per SDG&E employee for the SDG&E gas distribution system (from part i); therefore, this data is not available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

19. Ex. SDGE-4, p. 3 says that SDG&E has 8130 miles of gas mains. Please provide the following data, as of year-end 2017:

a. How many miles of gas main are high pressure?

b. How many miles of gas main are 60 psi and below?

c. For the high-pressure mains, please provide an age/mileage distribution showing how many miles were installed in 2017, in 2016, and so on for every installation year.

d. For the mains operated at 60 psi and below, please provide an age/mileage distribution showing how many miles were installed in 2017, in 2016, and so on for every installation year.

SDG&E Response 19:

Note: Year 2017 confirmed pipeline totals data are not yet available until the end of first quarter of 2018 when we file the "Annual report on Calendar year 2017 – Gas Distribution System" to the DOT. Note: Some 2017 pipeline totals, not yet confirmed may be provided where available by extraction from SDG&E's GIS system throughout this data request.

a. The total miles of high-pressure gas main at the end of 2017 is 361 miles (not including transmission pipelines).
b. Total miles of gas main that are 60 psi and below at the end of 2017 is 7,817 miles.
c. An age/mileage distribution table for high-pressure mains is shown below in Table 2.
d. An age/mileage distribution table for mains operated at 60 psi and below (medium pressure) is shown below in Table 2.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

SDG&E Response 19 Continued:

Table 2

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Age/Mileage Distribution Table

Installation Year	Medium Pressure Mains Installed (Miles)	High Pressure Mains Installed (Miles)
1900	7.5	0.0
1930	5.6	0.1
1931	29.8	3.5
1932	4.4	0.1
1933	2.8	0.0
1934	4.2	0.0
1935	8.5	0.8
1936	7.8	0.4
1937	9.2	0.0
1938	13.1	0.0
1939	12.4	0.0
1940	13.3	0.0
1941	36.5	0.0
1942	14.8	2.2
1943	5.1	0.1
1944	11.0	0.0
1945	20.3	0.6
1946	30.3	1.6
1947	29.8	0.1
1948	52.6	4.5
1949	51.0	2.8
1950	86.6	9.0
1951	106.1	5.5
1952	73.2	2.4
1953	120.7	3.5
1954	85.0	1.5
1955	97.4	2.1
1956	108.6	0.1
1957	121.6	8.2
1958	141.1	16.4
1959	205.5	3.0
1960	173.4	8.4
1961	116.2	5.6
1962	94.0	8.7
1963	114.8	3.5
1964	99.4	7.8
1965	87.3	5.0
1966	86.8	1.3
1967	78.8	1.2
1968	102.5	6.4
1969	111.6	7.2
1970	137.0	6.1
1971	141.0	13.1
1972	173.3	14.0
1973	167.6	7.1
1974	170.3	4.8
1975	107.9	2.5
1976	102.9	2.3
1977	151.0	0.5
1978	138.3	1.3
1979	144.0	2.1
1980	136.0	8.3
1981	102.3	11.5
1982	79.7	7.6
1983	79.8	10.3
1984	113.4	5.4
1985	173.3	4.2
1986	180.7	12.4
1987	176.5	8.2
1988	226.0	6.9
1989	200.6	13.9
1990	182.1	7.1
1991	106.7	3.5
1992	58.6	7.3
1993	69.4	3.7
1994	71.0	8.1
1995	74.0	2.4
1996	78.5	1.6
1997	98.9	6.7
1998	115.4	1.9
1999	143.8	4.3
2000	110.8	1.8
2001	133.4	3.0
2002	137.2	3.4
2003	132.4	3.7
2004	125.5	2.3
2005	91.6	1.0
2006	115.0	2.5
2007	73.5	2.1
2008	35.3	1.8
2009	24.5	1.6
2010	28.9	0.6
2011	33.3	1.4
2012	27.4	1.7
2013	22.5	1.1
2014	32.8	2.9
2015	46.2	8.0
2016	55.7	5.5
2017	27.5	0.8
Unassigned	81.7	4.9

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

20. Ex. SDGE-4, p. 3 says that SDG&E has 6018 miles of service lines. Please provide an age/mileage distribution showing how many miles of service lines were installed in 2017, in 2016, and so on for every installation year.

SDG&E Response 20:

An age/mileage distribution table showing the miles of active service lines installed by year as of year-end 2017 is shown in Table 3 below:

Table 3

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Number of miles of Service Pipe Installed Since 2017

Year	Installed length of Service Pipe[1] (Miles)	Year	Installed length of Service Pipe[1] (Miles)	Year	Installed length of Service Pipe[1] (Miles)
1918	0.2	1953	108.4	1988	224.5
1919	0.1	1954	83.7	1989	263.7
1920	0.4	1955	103.1	1990	189.6
1921	0.9	1956	113.6	1991	106.5
1922	1.1	1957	121.0	1992	97.9
1923	1.7	1958	145.8	1993	89.7
1924	1.9	1959	208.5	1994	103.8
1925	2.3	1960	173.6	1995	101.8
1926	4.1	1961	121.7	1996	104.0
1927	4.4	1962	101.0	1997	140.4
1928	4.3	1963	118.4	1998	165.5
1929	4.7	1964	117.8	1999	175.4
1930	3.3	1965	89.2	2000	159.8
1931	4.2	1966	81.1	2001	170.5
1932	2.7	1967	83.6	2002	151.1
1933	2.3	1968	115.0	2003	135.4
1934	2.6	1969	123.4	2004	130.7
1935	5.2	1970	147.6	2005	108.0
1936	8.6	1971	148.8	2006	99.3
1937	10.1	1972	174.7	2007	58.9
1938	13.1	1973	185.5	2008	42.4
1939	13.9	1974	172.0	2009	33.2
1940	16.8	1975	111.3	2010	31.4
1941	39.9	1976	153.9	2011	51.4
1942	17.4	1977	214.7	2012	60.5
1943	9.1	1978	189.6	2013	32.5
1944	15.4	1979	195.8	2014	34.8
1945	11.9	1980	143.7	2015	35.3
1946	20.9	1981	101.1	2016	52.8
1947	37.7	1982	85.4	2017	28.2
1948	51.2	1983	98.3	UNKNOWN	67.4
1949	49.4	1984	158.1		
1950	78.6	1985	213.2		
1951	92.6	1986	237.9		
1952	77.7	1987	214.3		

Note:
1/ Service pipe still active for the date indicated. Length based on the summation of shape length attributes.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

21. Ex. SDGE-4, p. 5:9-11 says that a "significant portion of the pipeline infrastructure has been in service for over 50 years."

a. As of year-end 2012-17, inclusive, what percentage of the SDG&E pipeline infrastructure had been in service for over 50 years? Please provide any workpapers underlying the calculation of the response to this question.

b. As of year-end 2018-2022, inclusive, what percentage of the pipeline infrastructure does SDG&E forecast will have been in service over 50 years? Please provide any workpapers underlying the calculation of the response to this question.

SDG&E Response 21:

a. For purposes of this response we will define the pipeline infrastructure as the total miles of pipeline mains and services.

Table 4 below contains the percentage of the SDG&E pipeline infrastructure as of the year-end 2012-2017 that has been in service over 50 years. Column 3 is the sum of mains and services still active in the date range in Column 2. This data was derived by a query of SDG&E's GIS pipeline mapped database and therefore the only calculation involved was to calculate the percentage of the total infrastructure (Column 4 in Table 4) by dividing Column 3 by the total miles of mains and services (14,089 miles).

Table 4

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Infrastructure in Service for Over 50 Years

1 Year	2 50 Year Date Range for Data:	3 Sum of Mains and Services to Date (miles)	4 % of total
2012	1900 - 1962	4082	29.0%
2013	1900 - 1963	4319	30.7%
2014	1900 - 1964	4544	32.3%
2015	1965 - 1900	4731	33.6%
2016	1966 - 1900	4900	34.8%
2017	1967 - 1900	5063	35.9%

SDG&E Response 21 Continued:

b. SDG&E objects to this question requesting 2020-2022 forecasts under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. SDG&E does not forecast the age of the pipeline infrastructure into the future.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

22. Ex. SDGE-4, p. 5:11-12 indicates that even good maintenance practices cannot extend pipeline infrastructure lives indefinitely.

a. Please identify each category of equipment SDG&E considers part of "pipeline infrastructure."

b. For each category of equipment SDG&E includes as "pipeline infrastructure," and for "pipeline infrastructure" as a whole, what is SDG&E's expectation for:

i. The average age at which it should be proactively replaced because of failure risk

ii. The maximum age at which it should be proactively replaced because of failure risk

iii. The average age at which it will need to be reactively replaced due to in-service failure if not previously proactively replaced?

iv. The maximum average age at which it will need to be reactively replaced due to in-service failure if not previously proactively replaced?

SDG&E Response 22:

a. For purposes of this response, the principal “pipeline infrastructure” of SDG&E’s gas distribution system consists of mains and services. Additionally, there are the district regulator stations, the cathodic protection application and inspection equipment, pipeline odorization equipment, pipeline valves and fittings, equipment vaults, pipeline pressure monitoring equipment, and pipeline measurement equipment, including all meter set assemblies.
b. SDG&E does not forecast age or average age to failure of its infrastructure.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

23. Ex. SDGE-4, p. 5:13-14 indicates that maintenance cost increases with pipeline infrastructure age. Please provide:

a. As of the end of each year from 2012-17, inclusive, the average age of SDG&E's pipeline infrastructure.

b. For each year from 2012-2017, the maintenance expenditures for pipeline infrastructure.

c. SDG&E's forecast of the average age of its pipeline infrastructure as of the end of each year from 2018-2022, inclusive.

d. SDG&E's forecast of its annual expenditures for maintenance of its pipeline infrastructure for each year from 2018-22, inclusive.

e. SDG&E's best estimate(s) of the elasticity it describes in its testimony. In other words, what is the percentage increase in maintenance costs per percent increase in pipeline infrastructure age?

SDG&E Response 23:

a. SDG&E objects to this request under Rule 10.1 of the Commission's Rules of Practice and Procedure on the grounds that the burden, expense and intrusiveness of this request clearly outweigh the likelihood that the information sought will lead to the discovery of admissible evidence. Subject to and without waiving the foregoing objection, SDG&E responds as follows: The "average age" of the infrastructure for a specific year from 2012 through 2017 is not information that can be derived, as the data is not readily available or is in a format that does not allow an accurate assessment. As a substitute for this request, the following information is offered:

For purposes of this response we will define the pipeline infrastructure as the total miles of pipeline mains and services. Referring to Table 5 below, which is pipeline data by decade of installation (age) and available in the "Annual Report for Calendar Year 2016 Gas Distribution System" filed annually with the DOT, the sum of miles of mains and services (pipeline infrastructure) are shown. This Table therefore will present the age of the active infrastructure in decades along with the portion of the infrastructure at that age.

As an example, calculation to find the "average age" of the infrastructure in the 1980 to 1989 decade, use the average of 1985. 2016-1985 = 31 years. And to calculate the portion of the infrastructure at that age = 2700/14,089 = 19.2% of the infrastructure is 31 years old.

SDG&E Response 23 Continued:

Table 5

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Miles of Gas Mains and Services by Decade of Installation[1] - (End of 2016)

	UNKNOWN	Pre-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	TOTAL
Miles of Mains	0	187	276	1,157	1,113	1,494	1,556	1,047	1,013	228	8,071
Miles of Services[2]	0	47	194	965	815	1,230	1,144	741	695	186	6,018
Total Services and Mains	0	234	470	2,122	1,928	2,724	2,700	1,788	1,708	414	14,089

Notes:
1/ Data source - Annual Report for Calendar Year 2016 - Gas Distribution System SDG&E, DOT Report OMB No. 2137-0629
2/ Miles calculated using the average service length = 50 feet from the 2016 DOT Report

b. Historical Operations and Maintenance (O&M) expense for the period 2012 – 2016 can be found in workgroups 1GD000.000 through 1GD004.000 of Exhibit SDG&E-04-WP-R. This contains historical data for the complete set of the gas distribution workpapers. With the breakdown in O&M historical expense in these 12 groups, specific expenses of interest can be found by group. Financial data for year-end 2017 is not yet available.

c. SDG&E objects to this question requesting 2020-2022 forecasts under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. SDG&E does not forecast the average age of its pipeline infrastructure.

d. SDG&E objects to this question requesting 2020-2022 forecasts under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. Forecasted Operations and Maintenance (O&M) expense for the period 2017-2019 can be found in workgroups 1GD000.000 through 1GD004.000 of Exhibit SDG&E-04-WP-R. This contains the forecasts for the complete set of the gas distribution workpapers. With the breakdown in O&M expense forecasts in these 12 groups, specific forecasts of interest can be found by group. SDG&E did not forecast expenses beyond the 2019 test year.

SDG&E Response 23 Continued:

e. SDG&E does not forecast the percentage increase in maintenance costs per percent increase in pipeline infrastructure age.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

24. Ex. SDGE-4, p. 7:23-24, says that "SoCalGas is proposing to accelerate the 5-year leak cycle to a 3-year cycle."

a. Is this true?

b. Is it true for SDG&E?

c. Please confirm that neither Ex. SDGE-4 nor Ex. SDGE-23 contain any costs associated with accelerating the leak inspection cycle from 5 years to 3 years.

d. Please indicate where, if it all, costs for leak repairs associated with shortening leak inspection cycles can be found in the GRC testimony and/or workpapers.

e. Please explain why costs associated with changing the inspection cycle for Aldyl-A pipe from 5 years to 1 year are included in this GRC but costs associated with changing the general inspection cycle from 5 years to 3 years are not.

f. Please confirm that SDG&E has not sought funding for an acceleration of leak survey cycles from 5 years to 3 years in any proceedings outside of this GRC.

SDG&E Response 24:

a. No. Please see the revised testimony of Gina Orozco-Mejia, Exhibit SDG&E-04-R, p. GOM-7:23-28 served 12/20/2017.

b. No, please see response to Question 24.a above.

c. SDG&E's testimony does not contain any costs associated with accelerating from a 5-year to 3-year leak survey cycle.

d. In reference to the cited text provided by the CUE, SDG&E does not have any leak repairs associated with shortening leak inspections cycles from 5-year to 3-year leak survey cycles within this GRC testimony or workpapers.

SDG&E Response 24 Continued:

e. The cost associated with changing the leak survey cycle for Aldyl-A pipe from 5-years to annual is a RAMP mitigation measure for pre-1986 plastic pipe that can experience brittleness, increasing the risk for leakage. The purpose of this incremental increase is to reduce the risk related to leakage on vintage plastic pipe. The costs associated with potentially changing the general leak survey cycle from 5-year to 3-year are not included in this GRC because this is a proposed best practice developed to comply with the requirements of SB 1371, associated with decreasing methane emissions.

f. The costs associated with changing the leak survey cycle for Aldyl-A pipe from a 5-year to annual cycle are included in this GRC. Costs associated with changing the system-wide leak survey cycle from 5 years to 3 years are not included in this GRC, nor any proceedings outside of this GRC. See response to Question 24.a above.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

25. Ex. SDGE-4, p. 17:8-19 discusses Locate and Mark work by SDG&E, and also references the impact of SB 661 on SoCalGas.

a. Should the reference to SoCal Gas apply to SDG&E as well? If the answer is anything other than "yes," please indicate what SDG&E "anticipates".

b. For each of the years 2012-17, inclusive, how many USA notifications did SDG&E receive annually?

c. For each of the years 2018-22, inclusive, how many USA notifications does SDG&E anticipate receiving annually?

d. For each of the years 2018-22, inclusive, how many incremental USA notifications does SDG&E anticipate receiving annually?

i. Due to SB 611 effects?

ii. Due to increases in economic activity causing "an already increasing ticket volume", even if there were no SB 611.

SDG&E Response 25:

a. Yes, the "SoCalGas" reference should have been "SDG&E."
b. Shown below in Table 6 are the USA ticket notifications for the years 2012-2017:

Table 6

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
USA Ticket Notifications

	2012	2013	2014	2015	2016	2017
USA Ticket Notifications	88,207	93,898	106,027	115,340	123,726	135,282

c. SDG&E objects to this question requesting 2020-2022 forecasts under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the

SDG&E Response 25 Continued:

Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. SDG&E did not forecast USA notifications.

d. SDG&E objects to this question requesting 2020-2022 forecasts under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. SDG&E did not forecast incremental USA notifications.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

26. Ex. SDGE-4, p. 22:24-26, indicates that SDG&E plans to "increase the replacement of pre-1947 steel pipes with a history of corrosion leakage or other degradation issues." Ex. SDGE-4, p. 89:20-21, refers to "pre-1947 high pressure pipelines as well as early vintage medium-pressure steel mains."

a. What installation years does "early vintage" refer to?

b. What is the threshold for a pipe to be considered to have a "history of corrosion leakage or other degradation issues"?

c. Please provide an age/mileage table, in Excel format, showing (as of yearend 2017), for each installation year prior to 1947, and cumulatively for all installation years prior to 1947:

i. The total number of miles of steel pipe on SDG&E's system installed in that year

ii. The number of miles of steel pipe on SDG&E's system installed in that year that have a "history of corrosion leakage or other degradation issues."

iii. The number of miles of non-piggable high pressure pipeline installed in that year

iv. The number of miles of medium-pressure steel mains installed in that year.

SDG&E Response 26:

a. "Early vintage" is defined in the RAMP Report, Chapter SDG&E-16 – Catastrophic Damage Involving Medium-Pressure Pipeline Failure, on page 16-15:

- *<u>Early Vintage</u> Steel Replacement - This program is intended to remove pre-1947, non-piggable high pressure pipeline as well as pre-1955 medium pressure steel mains.*

SDG&E Response 26 Continued:

b. The threshold for a pipe to be considered to have a "history of corrosion leakage or other degradation issues" is complex in that it involves several parameters, evaluation of a pipeline's history, and prioritization of action among pipeline replacement candidates based on pipeline performance and safety risk to the public.

   A description of the evaluation criteria including leak history, observed condition of the pipe, coating deterioration, age of pipe, and location to the public to determine replacement is given in Exhibit SDG&E-04-R on page GOM-88 and in Exhibit SDG&E-04-CWP-R on page 96.

c. Age/mileage tables for steel pipe on SDG&E's system installed for each installation year prior to 1947 and cumulatively for all years prior to 1947 are shown in Table 7, 8, and 9 below (which can be converted to Excel format):

   i. The total number of miles of steel pipe (including mains and services) on SDG&E's system installed in each year prior to 1947 is shown in Table 7 below:

SDG&E Response 26 Continued:

Table 7

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Number of miles of Steel Pipe Installed Prior to 1947

Year	Installed length of Steel Pipe[1] (Miles)	Cumulative Installed Length from 1947	Number of pipeline Work Orders
Unknown	7.6	7.6	6
Pre-1911	0.3	7.9	17
1912	0.1	8.0	6
1913	0.1	8.1	7
1914	0.0	8.1	4
1915	0.5	8.6	6
1916	0.2	8.8	7
1917	0.4	9.2	14
1918	0.2	9.4	11
1919	0.1	9.4	5
1920	0.9	10.4	36
1921	1.9	12.3	80
1922	6.8	19.1	93
1923	9.7	28.8	119
1924	7.0	35.8	127
1925	6.7	42.5	145
1926	18.1	60.6	188
1927	14.5	75.1	195
1928	26.2	101.3	244
1929	23.9	125.3	235
1930	8.1	133.4	150
1931	35.2	168.6	113
1932	11.0	179.6	11
1933	5.5	185.1	7
1934	7.1	192.2	11
1935	15.1	207.4	6
1936	18.4	225.8	14
1937	21.0	246.8	10
1938	28.6	275.4	12
1939	28.2	303.6	7
1940	33.3	336.9	19
1941	48.8	385.7	4
1942	36.2	421.9	6
1943	15.7	437.6	7
1944	30.7	468.3	8
1945	35.4	503.7	8
1946	55.6	559.2	8
1947	72.5	631.7	12
Total Mileage-->	631.7		

Notes:

1/ Steel pipe still active for the date indicated

ii. The number of miles of steel pipe (mains and services) on SDG&E's system installed in the years prior to 1947 and still active that have at least one leak indicated in the pipeline work order segment (which can greatly vary in length depending on the size of the project) is shown in Table 8. Work order numbers are shown since pipeline replacement prioritization is often done on a work order basis. This is because the entire pipeline in each work order has similar material, construction, trench, and soil type characteristics.

Table 8

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Number of miles of Steel Pipe Installed Prior to 1947 with a leak history

Year	Installed length of Steel Pipe[1] (Miles)	Cumulative Installed Length from 1947	Number of pipeline Work Orders
Unknown	0.3	0.3	2
1913	0.0	0.3	2
1914	0.0	0.3	1
1915	0.0	0.3	0
1916	0.0	0.3	0
1917	0.0	0.3	1
1918	0.1	0.4	3
1919	0.0	0.4	0
1920	0.2	0.6	5
1921	0.2	0.8	11
1922	1.0	1.8	20
1923	2.9	4.7	21
1924	0.4	5.1	16
1925	1.6	6.7	16
1926	3.8	10.5	45
1927	2.0	12.5	32
1928	5.2	17.7	54
1929	4.2	21.9	54
1930	1.0	22.8	27
1931	1.7	24.5	14
1932	0.9	25.5	2
1933	0.3	25.8	2
1934	0.4	26.2	2
1935	3.8	29.9	4
1936	1.9	31.8	4
1937	2.3	34.1	4
1938	4.1	38.2	5
1939	3.2	41.4	4
1940	3.9	45.3	4
1941	7.6	52.9	3
1942	1.1	54.0	2
1943	0.8	54.8	2
1944	1.7	56.5	2
1945	1.1	57.6	2
1946	2.0	59.6	2
1947	0.1	59.7	1
Total Mileage-->	59.7		

Notes:

1/ Steel pipe still active for the date indicated

iii. The length of non-piggable pipelines is a parameter that is not possible to isolate from SDG&E's GIS pipeline database, however, medium-pressure mains and services are non-piggable.

iv. The number of miles of medium-pressure steel mains installed in the years prior to 1947 and still active are shown in Table 9:

Table 9

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Number of Miles of Medium Pressure Steel Mains Installed Prior to 1947

Year	Installed length of Medium Pressure Steel Mains[1] (Miles)
Unknown	1.0
Pre-1910	0.1
1911	0.0
1912	0.1
1913	0.0
1914	0.0
1915	0.4
1916	0.2
1917	0.3
1918	0.0
1919	0.0
1920	0.4
1921	0.8
1922	5.5
1923	7.8
1924	4.8
1925	3.9
1926	12.6
1927	9.3
1928	18.9
1929	18.4
1930	5.6
1931	30.0
1932	4.4
1933	2.8
1934	4.0
1935	8.5
1936	8.1
1937	9.5
1938	13.4
1939	12.2
1940	14.0
1941	37.5
1942	14.8
1943	5.2
1944	11.1
1945	21.3
1946	30.9
1947	29.7
Total Mileage-->	347.5

Notes:

1/ Steel pipe still active for the date indicated

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

27. Ex. SDGE-4, p. 23:1-3 refers to plans to "initiate a mitigation effort." When does SDG&E plan to complete that mitigation effort?

SDG&E Response 27:

This refers to the pre-1933 threaded steel pipe main removal RAMP incremental addition in the Replacement of Mains and Services (Budget Code 508) cost category in the capital portion of SDG&E's GRC forecast. A description can be found in Exhibit SDG&E-04-R, p. GOM-90 and in Exhibit SDG&E-04-CWP-R, pp. 96-97, and 106.

SDG&E plans to remove 7 miles of this pipe in 2018 and increase to a 15 miles/year removal target beginning in 2019. SDG&E proposes ongoing replacement of 15 miles per year; however, subsequent replacement mileage will depend on future GRC funding and prioritization with other risk-related projects.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

28. Ex. SDGE-4, p. 23:14-16, refers to various "alternatives." For each such alternative considered by SDG&E, please provide:

a. A description of the alternative and how it differs from the proposal in the GRC, and

b. An explanation for why the alternative was rejected.

SDG&E Response 28:

a,b. To clarify, SDG&E-4-R, page 23:14-16 states that "alternatives associated with the removal of Dresser mechanical couplings, oil drip piping, buried piping in vaults, and closed valves between medium- and high-pressure systems primarily consist of project timing and prioritization variations." SDG&E is committed to continuously look at risk mitigation priorities and timing that provide the most effective risk mitigation in alignment with SDG&E's safety culture, as discussed in SDG&E-4-R, p. 26:22-29. Alternatives to proposed risk mitigations as an outgrowth of timing and priority may emerge from this continuous process. Based on current risk mitigation priority and timing considerations, SDG&E is proposing to pursue the aforementioned mitigation activities as outlined throughout this request.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

29. Ex. SDGE-4, p. 26 asserts that "third party dig-ins pose the greatest hazard to our system and the safety of the communities we serve."

a. Please confirm, or provide corrected numbers, that the only money SDG&E is proposing to spend to deal with third-party dig-ins is a $563K increase above 2016 actual spending, to a total of $3.026 million (Ex. SDGE-4, p. 31:11, item 3).

b. For each of the years 2012-17, inclusive, please provide:

i. The number of deaths, if any, resulting from third party dig-ins on the SDG&E system.

ii. The number of injuries, if any, resulting from third party dig-ins on the SDG&E system.

iii. SDG&E expenses incurred responding to third party dig-ins on the SDG&E system.

iv. SDG&E capital expenditures incurred responding to third party dig-ins on the SDG&E system.

SDG&E Response 29:

a. The $536,000 expense described in the question is the change in the Locate and Mark expense from the 2016 recorded expense to the forecast expense for 2019. SDG&E plans to spend the forecasted $3,589,000 for 2019 on Locate and Mark, which is the principal damage prevention expense. What is included in the Locate and Mark activity is described in Exhibit SDG&E-04-R, pages GOM-36 to GOM-39. Also included is an additional RAMP incremental expense of $420,000 for additional training, surveillance, and staff support.

Additional expenses to help "deal with" or minimize third-party damage are for SDG&E's public awareness program aimed at educating excavators. Expenses for this program are included and discussed in the testimony of Omar Rivera, Exhibit SDG&E-05. Additionally, expenses for SDG&E's gas outreach program to community first responders are included in the Operations Management and Training portion of Exhibit SDG&E-04-R, which include the addition of an Emergency Response Technical Advisor.

SDG&E Response 29 Continued:

b. i., ii There were no deaths or injuries resulting from third-party dig-ins on the SDG&E system during the 2012-2017 period.

iii. Expenses for responding to third-party dig-ins by SDG&E's construction and maintenance crews are not in a format that allows them to be readily available nor be extracted accurately.

iv. There are no capital expenses incurred in responding to third-party dig-ins on the SDG&E system.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

30. Ex. SDGE-4, p. 34:19-21 indicates that leak surveys are performed "with a leak detector."

a. Please identify the principal technologies or leak detection devices referred to by "with a leak detector."

b. For each technology or device identified in response to subpart (a) of this question, please indicate the percentage of leak survey miles utilizing this technology in each of the years 2012-2017, inclusive.

c. For each technology or device identified in response to subpart (a) of this question, please indicate the percentage of leak survey miles forecasted to utilize this technology in each of the years 2018-22, inclusive.

d. Please explain why the percentage of advanced technologies (such as Picarro) is so low compared to PG&E.

SDG&E Response 30:

a. There are basically three "methodologies" or technologies that SDG&E employs in leak detection for leak survey activities:

1. Detecting leaks by an employee walking with a hand-held leak detection device monitoring for leaks directly above the target area with the device probe. The primary device used for the walking survey is the DP-IR Detecto Pack Infrared instrument by Heath Consultants. In addition, for coding leaks, a GMI, ppm Gas Surveyor SCG also by Heath Consultants is used.
2. Detecting leaks using a mobile leak detection device mounted on the front of a service vehicle driving above or alongside of a gas main. The device is called an Optical Methane Detector (OMD), by Heath Consultants. If leaks are detected, the operator returns to the site and confirms the leak with a hand-held device.
3. Detecting leaks by an employee using a hand-held device at a remote location and "shooting" an infrared laser beam to detect the presence of natural gas remotely when the target area is hard to reach or not readily accessible. This device is called a Remote Methane Leak Detector (RMLD) by Heath Consultants.

SDG&E Response 30 Continued:

b. SDG&E surveys on a continuously scheduled basis over many zones to cover the entire San Diego County service territory. The methods described in response to Question 30.a above are employed as needed to accomplish the required scheduled surveys. SDG&E does not keep the survey data in a format that allows the ability to derive a percentage of leak survey miles utilizing each of these technologies.

c. SDG&E objects to this question requesting 2020-2022 forecasts under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. SDG&E does not forecast leak survey miles for each leak survey technology used.

d. SDG&E objects to this request as vague and ambiguous with respect to the phrase "percentage of advanced technologies," and exceeding the scope of permissible discovery under Rule 10.1, of the Commission's Rules of Practice and Procedure. SDG&E further objects to the request on the grounds that it is unintelligible in that it assumes facts that are not in evidence and SDG&E does not have sufficient knowledge or information upon which to admit or deny the claim, and on that basis denies that it is true. SDG&E also objects to this request on the grounds that it calls for speculation. Subject to and without waiving the foregoing objections, SDG&E responds as follows: Picarro or other advanced gas leak detection technologies have not been evaluated or implemented at SDG&E

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

31. Ex. SDGE-4, p. 35:8-14 indicates that SDG&E plans to shorten the Aldyl-A pipe inspection cycle from 5 years to one at an incremental cost of $270K in 2019. Please provide historical data for each year from 2012-17, inclusive, and forecast data for each year from 2018-22, inclusive, showing:

a. Miles of Aldyl-A pipe surveyed, or forecast to be surveyed

b. Leaks detected (or expected to be detected)

c. Survey cost

d. Leak repair expense

e. Pipe removal and/or replacement capital cost

SDG&E Response 31:

SDG&E objects to all portions of this question requesting 2020-2022 forecasts under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism.

a. Historical data for miles of Aldyl-A pipe surveyed on an annual basis for 2012-2017 is shown in the table below. SDG&E does not forecast Aldyl-A pipe to be surveyed.

Table 10

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Miles of Aldyl A surveyed by Annual Survey Zone

	2012	2013	2014	2015	2016	2017
Miles Surveyed	388	353	366	243	210	388

Note: Miles surveyed based on current GIS count in survey zones

SDG&E Response 31 Continued:

b. Leaks repaired (detected then repaired) by year is shown in the table below:

Table 11

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Leaks Repaired in Aldyl A Pipelines by Year

	2012	2013	2014	2015	2016	2017
Gas Mains	68	59	79	50	33	61
Gas Services	210	181	172	91	76	133

Note: Shown are mapped repairs documented in the GIS system.

SDG&E does not forecast Aldyl-A leaks detected or repaired.

c. Aldyl-A pipe was historically surveyed in combination with steel pipe where both were present throughout the gas system under the 5-year survey cycle. It is not possible to break out the survey cost alone for Aldyl-A pipe.
SDG&E does not forecast leak survey costs for Aldyl-A pipe alone.

d. Leak repair data for steel or plastic pipe is collected under the same accounts. Historical leak repair expense data for Aldyl-A pipe alone is not available.

SDG&E does not forecast leak repair expense for Aldyl-A pipe alone.

e. Historical pipe removal and/or replacement capital cost data for Aldyl-A pipe is funded under the DIMP program. Historical and forecast costs for DIMP are sponsored by Ms. Maria Martinez, Exhibit SDG&E-11. Historical capital costs for removal and/or replacement of Aldyl- A pipe are provided in the Table below:

Table 11a

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Aldyl A Removal and/or Replacement Capital Costs $(000)

2012	2013	2014	2015	2016
$800	$1,200	$1,300	$4,100	$22,300

Note:
Financial date for year-end 2017 is not yet available

Forecast data and a description of underlying activities for DIMP including Aldyl A pipe removal and/or replacement capital costs can be found in the testimony of Ms. Maria Martinez, Exhibit SDG&E-11.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

32. Ex. SDGE-4, p. 38:6-13, indicates that three categories of incremental Mark and Locate activities will require incremental spending of $563K in 2019.

a. Please disaggregate the $563K to show the dollars for each of the three underlying activities.

b. Please provide the forecasted Locate and Mark costs associated with increased numbers of Locate and Mark tickets, by providing, for each year from 2017-19, inclusive:

i. Number of expected Locate and Mark tickets

ii. Unit price for tickets themselves

iii. Unit price for locate and mark activities resulting from each ticket

iv. Total expense associated with Locate and Mark tickets

v. Where the costs associated with the responses to this question are found in SDG&E's workpapers.

SDG&E Response 32:

a. The incremental increase cited by CUE of $563,000, as explained in Exhibit SDG&E-04-R, p. GOM-37 line 16 to GOM-38 line 7, was derived by using a linear trend. It represents the incremental change of the TY 2019 estimated value above the 2016 Adjusted Recorded value based on the linear trend. SDG&E explained in Exhibit SDG&E-04-R, Section III.A.3, Locate and Mark, some of the elements involved in the Locate and Mark activity. These elements were not forecast separately and therefore are not available in disaggregated amounts.

b.
   i. SDG&E did not forecast locate and mark tickets for 2017 through 2019. The forecast methodology is explained by reference in response to Question 32.a. However, based on historical trends, ticket growth is expected to be around 10% per year.
   ii. USA currently charges a rate of $1.65 per new ticket. This rate was effective July 2017. Prior to July 2017, the rate was $1.50 per new ticket. This rate was in place since 2008.
   iii. Currently, SDG&E's reporting system does not calculate and report locate and mark activities resulting from each ticket.

SDG&E Response 32 Continued:

iv. The total expense for the Locate and Mark activities as a result of all the USA tickets processed can be found as O&M expense group 1GD000.002. The historical and forecast expenses are located in Exhibit SDG&E-04-R, pages GOM-36 to GOM-39 and in the workpapers Exhibit SDG&E-04-WP-R, p. 21-28.

v. Please see the response to Question 32.iv above.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

33. Ex. SDGE-4, p. 39:13-26 indicates that "Main Maintenance" costs come in two broad categories, those "associated with investigating and repairing leaks", and those triggered by "municipalities and other outside agencies".

a. For each year from 2012-2017 (historical data) and 2018-2019 (forecast data), please disaggregate Main Maintenance costs into the costs associated with each of these two subcategories.

b. For the component of Main Maintenance costs associated with leaks, for each of the years 2012-19, inclusive, please provide:

i. Number of leaks investigated

ii. Number of leaks repaired

iii. Number of leaks investigated but not repaired as of year end

iv. The unit cost of leak investigations, in both nominal and 2016 dollars

v. The unit cost of leak repairs, in both nominal and 2016 dollars

SDG&E Response 33:

a. Main maintenance costs are not in a format that allows them to be readily available nor be extracted accurately to be segregated into the subcategories described; therefore, they are not available.

b. The responses to Question 33.b, subparts i through iv are provided in the table below:

Table 12

2019 GRC SDG&E Gas Dsitribution - CUE-SDG&E-DR-02
Main Maintenance Leak Investigation and Repair Costs

	2012	2013	2014	2015	2016	2017
Total Potential Leaks Investigated	3,431	3,642	4,169	4,288	4,161	4,431
Total Leaks Repaired	1,136	1,020	1,141	1,162	1,228	1,493
Outstanding Leaks at Year End	16	30	51	74	20	0
Unit Cost of Leak Investigations (nominal whole$)	$240	$255	$230	$249	$261	--[3]
Unit Cost of Leak Investigations (2016 whole $)[1]	$262	$273	$241	$255	$261	--[3]
Unit Cost of Leak Repairs (nominal whole $)	--[2]	--[2]	--[2]	$1,228	$1,878	--[3]
Unit Cost of Leak Repairs (2016 whole $)[1]	--[2]	--[2]	--[2]	$1,257	$1,878	--[3]
[1]GRID Escalation Code G Applied	0.9152	0.9351	0.9551	0.9768	1.0000	--

[2]Leak Repair costs were not coded separately within "Main Maintenance" until 2015.
[3]Financial data for year-end 2017 is not yet available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

34. Ex. SDGE-4, p. 40:20-24 refers twice to the amount $457K. Please confirm that the second $457K value should actually be $286K, consistent with Ex. SDGE-4-WP, p. 30.

SDG&E Response 34:

Yes, the correct value should be $286,000 on p. GOM-40, line 28 of Exhibit SDG&E-04-R. The value of the change from 2016 from line 24 ($457,000), was incorrectly repeated for this value.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

35. Ex. SDGE-4, pp. 43:21-44:9, lists four different causes of increases in Service Maintenance costs. Please provide, for each year from 2012-2017 (historical) and 2018-2019 (forecast), the expenses in both nominal and 20116 dollars associated with each of these four subcategories of Service Maintenance costs. Please include a reconciliation to the total Service Maintenance costs shown in Table GOM-08.

SDG&E Response 35:

Service maintenance costs for the years 2012-2017 are not in a format that allows the break down of subcategories of these costs to be readily available nor be extracted accurately; therefore, they are not available.

SDG&E's forecast of total Service Maintenance costs appears in Exhibit SDG&E-04-R, Table GOM-8 and in Exhibit SDG&E-04-WP-R, pp. 35-39. These costs were forecast in total using a five-year average methodology and were not broken down in the subcategories requested.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

36. Ex. SDGE-4, pp. 50:23-51:12, states that SDG&E has 481 regulator stations, 70 percent of them age 24 or older, with an average age of 29 years. Please provide an age distribution table, in Excel format, showing for each past year through 2017 the number of regulator stations installed that year.

SDG&E Response 36:

A regulator station age distribution table is provided in Table 13 below (which can be converted to Excel format). The data requested in this questioncan be found in Columns 1 and 2. Other columns are also provided in response to Question 42.

Table 13
2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02

Regulator Station Age Table

1 Year	2 Number Installed	3 Number Replaced[2]	4 Number Removed	5 Total at Year End
1961	1	N/A[1]	N/A[1]	1
1962	0	N/A[1]	N/A[1]	1
1963	0	N/A[1]	N/A[1]	1
1964	1	N/A[1]	N/A[1]	2
1965	0	N/A[1]	N/A[1]	2
1966	0	N/A[1]	N/A[1]	2
1967	0	N/A[1]	N/A[1]	2
1968	1	N/A[1]	N/A[1]	3
1969	1	N/A[1]	N/A[1]	4
1970	8	N/A[1]	N/A[1]	12
1971	16	N/A[1]	N/A[1]	28
1972	24	N/A[1]	N/A[1]	52
1973	31	N/A[1]	N/A[1]	83
1974	20	N/A[1]	N/A[1]	103
1975	20	N/A[1]	N/A[1]	123
1976	2	N/A[1]	N/A[1]	125
1977	13	N/A[1]	N/A[1]	138
1978	16	N/A[1]	N/A[1]	154
1979	13	N/A[1]	N/A[1]	167

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

1980	11	N/A[1]	N/A[1]	178
1981	5	N/A[1]	N/A[1]	183
1982	20	N/A[1]	N/A[1]	203
1983	11	N/A[1]	N/A[1]	214
1984	14	N/A[1]	N/A[1]	228
1985	15	N/A[1]	N/A[1]	243
1986	16	N/A[1]	N/A[1]	259
1987	16	N/A[1]	N/A[1]	275
1988	18	N/A[1]	N/A[1]	293
1989	20	N/A[1]	N/A[1]	313
1990	26	N/A[1]	N/A[1]	339
1991	10	N/A[1]	N/A[1]	349
1992	3	N/A[1]	N/A[1]	352
1993	5	N/A[1]	N/A[1]	357
1994	7	N/A[1]	N/A[1]	364
1995	6	N/A[1]	N/A[1]	370
1996	7	N/A[1]	N/A[1]	377
1997	12	N/A[1]	N/A[1]	389
1998	7	N/A[1]	N/A[1]	396
1999	9	N/A[1]	N/A[1]	405
2000	8	N/A[1]	N/A[1]	413
2001	4	N/A[1]	N/A[1]	417
2002	12	N/A[1]	N/A[1]	429
2003	10	N/A[1]	N/A[1]	439
2004	4	N/A[1]	N/A[1]	443
2005	9	N/A[1]	N/A[1]	452
2006	1	N/A[1]	N/A[1]	453
2007	4	N/A[1]	N/A[1]	457
2008	5	N/A[1]	N/A[1]	462
2009	4	N/A[1]	N/A[1]	466
2010	14	N/A[1]	1	479
2011	6	N/A[1]	7	478
2012	11	3	7	482
2013	2	N/A[1]	2	482
2014	2	N/A[1]	3	481
2015	2	2	4	479
2016	3	N/A[1]	2	480

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

2017	6	N/A[1]	6	480

NOTES:

1/ Data provided is from SAP (our system of record) and reflects what was entered in 2010. Any regulator stations removed or replaced prior to our go-live 2010 date in SAP are not represented in the data provided above. Please note, all active regulator stations are in our SAP system of record.

2/ Not all regulator stations removed will be replaced. If it is a replacement, this information is noted on the station record, when available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

37. Ex. SDGE-4, p. 54:15-21, explains that Cathodic Protection expenses have "increased year over year" so that "a historical average would not represent future resource needs." In light of this testimony, please explain why SDG&E rejected using the historical trend as the basis for its forecast of Cathodic Protection expenses.

SDG&E Response 37:

This question is identical to Question 17.a of this data request (also for Cathodic Protection expense). Please refer to the response to Question 17.a for this response.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

38. Ex. SDGE-4, p. 22:24-26, indicates that SDG&E plans to "increase the replacement of pre-1947 steel pipes with a history of corrosion leakage or other degradation issues." Ex. SDGE-4, p. 89:20-21, refers to "pre-1947 high pressure pipelines as well as early vintage medium-pressure steel mains." Ex. SDGE-4, p. 89:27-28 identifies the proposed annual capital expenditures in each of the years 2017-19 for Early Vintage Steel Replacement." Please separately provide the cost per mile and number of miles of pipe SDG&E actually replaced in 2017, and proposes to replace in 2018, and in 2019, in each of the following categories:

a. Steel pipe installed before 1947

b. "early vintage medium-pressure steel mains"

c. Medium-pressure steel mains installed before 1947

d. "Pre-1947 non-piggable high pressure pipelines

e. " Pre-1947 steel pipes with a history of corrosion leakage or other degradation issues"

SDG&E Response 38:

a.,b.,c. The total length of early vintage steel pipe replaced in 2017 and forecast for replacement in 2018 and 2019 is shown in Table 14 below. Replacement construction for a 2.4 mile project was initiated in 2017 and will continue forward in 2018 and 2019. Note the breakout of high-pressure steel, mains or services, or medium-pressure steel is not available due to the format of the data kept for pipe replacements. Total steel pipe replaced is shown.

The cost (financial) data for 2017 is not yet available. The cost/mile forecast for 2018 and 2019 replacement is $1,000,000/mile, as indicated in Exhibit SDG&E-04-CWP-R on page 159.

Table 14

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Early Vintage Steel Pipe Replacement[1]

	2017	2018	2019
Steel Pipe Replaced (Miles)	2.4	5.5	7.4

NOTE:
1/ The 2018 and 2019 forecasted values are shown in SDG&E-GOM-Capital-SUP-006 on Exhibit SDG&E-04-CWP-R p.159

d. The condition of a pipeline's piggability is a parameter that is not available to query from SDGD&E's GIS pipeline database; however, distribution medium-pressure pipe is generally non-piggable.

SDG&E Response 38 Continued:

e. The total number of miles of " Pre-1947 steel pipe with a history of corrosion leakage or other degradation issues" is shown in the response to Question 26.c, in Table 7.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

39. What is SDG&E's planned replacement rate, in miles per year, of pre-1947 steel pipe during 2020-22?

SDG&E Response 39:

SDG&E objects to this question requesting 2020-2022 forecasts under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. SDG&E does not forecast pipeline replacement rates beyond the GRC test year of 2019.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

40. By what year does SDG&E anticipate completing replacement of all:

a. Steel pipe installed before 1947

b. Non-piggable high-pressure pipeline installed before 1947

c. Medium pressure steel mains installed before 1947.

SDG&E Response 40:

a., b., c. SDG&E cannot accurately forecast when the replacement of the pre-1947 pipelines will be completed. Replacement mileage will depend on future GRC funding and prioritization with other risk-related projects. Decisions on what pipelines to replace and how much is dependent on the performance of the pipe and priority of replacement based on the level of hazard it presents. As explained in the response to Question 26.b, replacement of a pipeline involves several criteria. These criteria must be evaluated for each pipe replacement candidate for a decision when to replace a pipeline. Therefore, SDG&E cannot accurately forecast what year each of the categories in Question 40, subparts a, b, and c will be completed. See also the response to Question 38 regarding the inability to break out high-pressure steel, mains or services, medium-pressure steel, or piggability due to the format of the data kept for pipe replacements.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

41. Ex. SDGE-4, p. 90:3-13, addresses pre-1933 threaded steel main removal.

a. How many miles of pre-1933 threaded steel main did SDG&E have as of the end of 2017? If the answer is anything other than 152 (see Ex. SDGE-4-CWP, p. 105), please explain.

b. When does SDG&E anticipate completing removal of all pre-1933 threaded steel pipe from its system? If the answer is anything other than 2028 (see Ex. SDGE-4-CWP, pp. 105 and 192), please explain.

SDG&E Response 41:

a. The current total length of pre-1933 threaded steel main indicated in SDG&E's GIS system at the end of 2017 is 167 miles of high-pressure and medium-pressure services and mains. This value changes as our GIS system continues to be validated against historical work order analysis for these older pipelines in the database.

b. Please see the response to Question 27.
.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

42. Ex. SDGE-4, p. 95:5-6, states that SDG&E has 481 regulator stations and replaces 3-5 stations annually. Please provide a table, in Excel format, showing for each year up to and including 2017:

a. The number of SDG&E regulator stations at year end

b. The number of new regulator stations installed that year

c. The number of pre-existing regulator stations replaced that year

d. The unit capital expenditure for new regulator stations that year

e. The unit capital expenditure to replace regulator stations that year

SDG&E Response 42:

a. Please refer to the Regulator Station Age Table provided in Table 13 of the response to Question 36. The number of stations at year end can be found in column 5.

b. Please refer to the Regulator Station Age Table provided in Table 13 of the response to Question 36. The number of new stations installed by year can be found in Column 2.

c. Please refer to the Regulator Station Age Table provided in Table 13 of the response to Question 36. The number of regulator stations replaced can be found in Column 3. Historical data on replacements is limited due to conversion of manual records to digital in 2010. Please see Note 1 in the table.

d., e. Capital expenditures by year for new regulator stations as well as replaced regulator stations is not in a format that would make it readily available or is not available at all.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

43. Please provide SDG&E's forecasts, for each year from 2018-22, inclusive, of:

a. The number of SDG&E regulator stations at year end

b. The number of new regulator stations to be installed that year

c. The number of pre-existing regulator stations to be replaced that year

d. The forecasted unit cost for new regulator stations

e. The forecasted unit cost for regulator station replacements

SDG&E Response 43:

SDG&E objects to all portions of this question requesting 2020-2022 forecasts under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism.

a., b., c., The number of new and replacement regulator stations cannot be forecasted year by year into the future as it depends on customer growth, pipeline system conditions, and response to material or component failures.

d., e. SDG&E's cost for new and replacement gas distribution district regulator stations can range from $500,000 to $1,500,000. Year-by-year unit costs cannot be forecasted accurately since station costs can widely vary due to many parameters, including station size, site-specific system tie-in requirements, and local municipal work time and street resurfacing requirements. Typically, SDG&E installs from three to five new district regulator stations annually.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

44. Ex. SDGE-4, pp. 95:26-96:5, addresses Dresser mechanical coupling removal.

a. How many Dresser mechanical couplings did SDG&E have as of the end of 2017?

b. When does SDG&E anticipate completing removal of all Dresser mechanical couplings from its system?

c. Please confirm that SDG&E plans to remove 2 couplings in 2019 and 25 in 2019, based on 2 fittings per coupling and removal of 4.3 (sic) fittings in 2018 and 49.1 (sic) fittings in 2019 (Ex. SDGE-4-CWP, p. 192).

SDG&E Response 44:

a. Removal of Dresser mechanical couplings will be completed in two phases. The first phase is the review and field evaluation of 195 work orders for installation locations that involve the use of a Dresser fitting. This phase is the O&M portion and is described in Exhibit SDG&E-04-R, pages GOM-60 to 61. The second phase, once the number of locations are determined, is the capital expense phase for the field removal of the couplings. That is described in the reference provided in this question.

   The first phase's purpose is to determine the exact number of coupling locations requiring removal through the work order and field review. That phase has not been completed yet, and therefore an exact number is unknown at this time. It is estimated that there are 100 locations with Dresser couplings requiring removal.

b. As indicated in response to Question 44.a, the first phase of review and field evaluation has not been completed. An estimate of the completion date for the all the removals is not possible until the number of couplings, locations, and the extent of work required have been determined in phase one.

c. Please note in SDG&E-GOM-Capital-SUP-006 on page 192 of Exhibit SDG&E-04-CWP-R contains a typographical error in column J, in the fourth row. The value indicated as 4.3 units should have been 43.5 units. Referring to this supplemental page, SDG&E plans, following completion of phase one described above in part a., to remove 44 couplings in 2018. The forecast is then to remove an additional 49 couplings in 2019.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

45. Ex. SDGE-4, p. 96:6-17, addresses oil drip piping removal.

a. How many oil drip lines and containers did SDG&E have as of the end of 2017?

b. When does SDG&E anticipate completing removal of all oil drip lines and containers from its system?

SDG&E Response 45:

a. Removal of oil drip piping facilities will be completed in two phases. The first phase is the review and field evaluation of 44 work orders for installation locations that have oil drip lines or containers. This phase is the O&M portion and is described in Exhibit SDG&E-04-R, p. GOM-60. The second phase, once the number of oil drip locations are determined, is the capital expense phase for the field removal of the oil drip facilities. That phase is described in Exhibit SDG&E-04-R, p. GOM-96.

   The first phase's purpose is to determine the exact number of oil drip locations requiring removal through the work order analysis and field review. That phase has not been completed yet, and therefore an exact number is unknown at this time. It is estimated that there are 120 locations with oil drip piping facilities requiring removal.

b. As indicated in response to Question 45.a, the first phase of review and field evaluation has not been completed. An estimate of the completion date for the removals is not possible until the number oil drip facilities and the extent of work required have been determined in phase one.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

46. Ex. SDGE-4, p. 96:18-27, addresses replacement of buried piping in vaults.

a. How many such vaults did SDG&E have as of the end of 2017?

b. When does SDG&E anticipate completing replacement of all buried pipeline in vaults from its system?

SDG&E Response 46:

a. Replacement of buried high-pressure piping in vaults will be completed in two phases. The first phase is the review and field evaluation of 1,357 work orders for installation locations that have piping that requires replacement. This phase is the O&M portion and is described in Exhibit SDG&E-04-R, p. GOM-61. The second phase, once the number of locations are determined with piping requiring replacement, is the capital expense phase for the field replacement of the vault piping. That phase is described in Exhibit SDG&E-04-R, p. GOM-96.

   The first phase's purpose is to determine the exact number of vault locations requiring piping replacement through the work order analysis and field review. That phase has not been completed yet, and therefore an exact number of affected vaults is unknown at this time. It is estimated that there are 50 vault locations with pipe and fittings requiring replacement.

b. As indicated in response to Question 46.a, the first phase of work order review and field evaluation has not been completed. An estimate of the completion date for all the vault replacement work is not possible until the number of vaults with piping requiring replacement and the extent of work required have been determined in phase one.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

47. Ex. SDGE-4, pp. 96:30-97:8, says that SDG&E has 51 closed valves separating high and medium pressure systems, explains why such valves are a safety risk, and says that SDGE will "remove" them. However, Ex. SDGE-4-CWP, p. 192 shows funding for 22.3 (sic) valve removals in 2018 but none in 2017 or 2019.

a. How many such valves does SDG&E have, as of the end of 2017?

b. How many does it plan to remove during each of the years 2018-22, inclusive?

c. When does SDG&E plan to complete removal of such valves?

d. Is the capital expenditure forecast in Ex. SDGE-04-CWP correct? If not, please provide corrected numbers.

SDG&E Response 47:

a. SDG&E currently has 149 closed valves between medium- and high-pressure systems.

b. SDG&E objects to this question requesting 2020-2022 forecasts under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. The forecast is to remove approximately 22 closed valves in 2018 and 0 valves in 2019. SDG&E did not forecast closed valve removals beyond the GRC 2019 test year.

c. A completion date for the closed valve removal has not been set. Work on this effort will continue beyond 2019.

d. The capital forecast for closed valves shown in Exhibit SDG&E-04-CWP-R within pp.141-159 is correct.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

48. CUE may propose capital expenditure levels different than those sought by SDG&E in its GRC application. In order to correctly identify the dollars associated with such changes, CUE understands that certain adders need to be applied, such as the Local Engineering Pool costs shown in Ex. SDGE-4, pp. 99-101. Please provide, for each capex category:

a. The percentage adjustment for local engineering overheads associated with incremental expenditures in that category (if different than 21.24% for local engineering, per Ex. SDGE-4-CWP, p. 191, please explain)

b. The percentage adjustment for engineering overheads associated with incremental expenditures in that category, other than local engineering overheads

c. The percentage adjustment for any other overheads associated with incremental expenditures for that category, besides engineering overheads

d. The percentage adjustment for inflation to convert 2016 dollar to 2019 dollars for that category

SDG&E Response 48:

a., b., c., SDG&E capital estimates appearing in witnesses' testimonies, such as Exhibit SDG&E-04-R Gas Distribution, are shown in direct labor and non-labor values only. The forecast for 'local engineering' is derived as a function of estimated forecast capital direct costs and is provided for later ratebase and Results of Operations modeling.

The source forecasts for other loaders and overheads are similarly obtained from other witness areas. Those loaders and overheads are applied in varying ways to direct capital depending on the type and characteristics of each project. If proposing different levels of capital spend, SDG&E first recommends simply proposing different direct-cost levels; it is unnecessary to estimate fully loaded values as that is accomplished in later modeling.

If it is desired to estimate fully-loaded values, SDG&E recommends applying an aggregate average percent to the direct dollar values in the witness testimony, which for Gas Distribution is 39.94%. Thus, a value of $100 of Gas Distribution capital direct costs (labor plus non-labor) would be estimated as $139.94 in total direct costs plus overheads and loaders.

SDG&E Response 48 Continued:

d. With respect to conversion of 2016 values to 2019, witnesses' estimates are all expressed as 2016$ and then the conversion to 2019$ takes place in the Results of Operations modeling. However, for SDG&E Gas Distribution Capital, that multiplier is 1.1015. Therefore, $1 in 2016$ becomes $1.1015 in 2019$ (see Exhibit SDG&E-39, Scott Wilder).

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

49. With regard to Main Replacement capital costs, please reconcile Ex. SDGE-4-CWP, pp. 96 (3-year average forecast methodology for non-labor), 95 (3-year average non-labor capex of $2.567 million per year), and 102 (changing and negative costs for ongoing non-labor main replacement costs).

SDG&E Response 49:

The negative values shown in the table in sub-workpaper 00508.001 on page 102 of Exhibit SDG&E-04-CWP-R are for informational purposes only and show the difference between the RAMP Report's forecast range mid-point and the selected GRC 3-year average methodology non-labor value. Please see the testimony of Jamie York, Exhibit SDG&E-02-R Chapter 3 beginning at page JKY-4 for a discussion of evaluation of RAMP risk mitigation activities for inclusion in the GRC.

Since the difference is informational, it has no impact on the requested funding described in BC 508. This difference is illustrated in the table below:

Table 15

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
BC 508 RAMP to GRC Base Comparison

	2017	2018	2019
RAMP Base mid-range values	$ 3,025	$ 3,320	$ 3,658
GRC 3-Year Average non-labor forecast	$ 2,567	$ 2,567	$ 2,567
Difference	$ (458)	$ (753)	$ (1,091)

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

50. Please provide the basis for forecast and historical main and service replacement costs of exactly $1000K per year on Ex. SDGGE-4-CWP, pp. 109 (2017-19 forecast) and 110 ("2016 RAMP base value").

SDG&E Response 50:

The value $1000K represents one component of Budget Code 508, Replacement of Mains and Services, and is the estimated historically embedded cost for the RAMP risk mitigating activity "Leak Repair" in 2016. Please see the testimony of Jamie York, Exhibit SDG&E-02 Chapter 3 beginning at page JKY-2 for a discussion of how RAMP was incorporated into the GRC, including the identification of 'embedded costs.'

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

51. Please provide the basis for forecast and historical main and service replacement costs of exactly $2000K per year on Ex. SDGGE-4-CWP, pp. 113 (2017-19 forecast) and 114 ("2016 RAMP base value").

SDG&E Response 51:

The value $2000K represents one component of Budget Code 508, Replacement of Mains and Services, and is the estimated historically embedded cost for the RAMP risk mitigating activity "EPOCH" in 2016. Please see the testimony of Jamie York, Exhibit SDG&E-02 Chapter 3 beginning at page JKY-2 for a discussion of how RAMP was incorporated into the GRC, including the identification of 'embedded costs.'

CUE DATA REQUEST
CUE-SDGE-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 26, 2018

52. Throughout the SDG&E workpapers there are numerous references to costs that are calculated on a "zero-based" methodology (e.g., Ex. SDGE-4-CWP, pp. 130, 137, 139, 151, 153, 155, 163; Ex. SDGE-11-WP, pp. 5, 6, 7, 10, 13, 14, 15, 18; Ex. SDGE-11-CWP, pp. 4, 5, 6, 11, 14, 15, 16, 21, 23). In virtually none of those cases is there a description of the zero-based methodology, nor are any calculations shown (Ex. SDGE-4-CWP, p. 163 is an exception). For all such instances, please supply workpapers showing the actual methodology and calculations that resulted in the published dollar amounts.

SDG&E response 52:

SDG&E utilized several forecasting methodologies, including average, trend, base year, and zero-based methods. Zero-based methods can include:

- An arithmetic method such as unit cost multiplied by expected volume
- Referencing a RFP response, an invoice, or other reference document
- Use of Subject Matter Expert judgment
- Reference to a like-kind project or activity performed elsewhere
- Reference to a similar project or work done in the past and updated for current conditions

Thus, zero-based methods can widely vary among witness areas depending on the activity involved. For many witnesses, any applicable calculations are shown in the workpapers, as noted below for each individual witness area. For some witnesses, however, a calculation is not necessarily available depending on the zero-based method used above, as arithmetic methods may have not appropriately nor accurately depicted forecasted needs.

Please see the responses from individual witness testimony volumes regarding explanations of their zero-based methods as follows:

Exhibit: SDGE-4-CWP-R
Witness: Ms. Gina Orozco-Mejia

Response:

The instances are:

a. BC 500 New Business – Please refer to the supplemental workpaper on page 15 of Ex. SDGE-4-CWP-R. This supplemental provides the calculations for the zero-based methodology total forecasts for 2017-2019. These forecasts are based on the projected gas customer growth forecast in the workpapers of Ms. Rose-Marie Payan, Exhibit SDGE-37-WP.
b. BC 502 Meters and Regulator Materials – Please refer to the supplemental workpaper on page 43 of Ex. SDGE-4-CWP-R. This supplemental provides a description of how the zero-based methodology was developed and shows the final "published" values for the zero-based methodology total forecasts for 2017-2019. Also shown are Tables for the meter quantities used in the zero-based calculations.

SDG&E response 52:-Continued

c. BC 506 – Tools and Equipment – A 5-year-average was used to forecast the entirety of BC 506. Sub-workpapers 005060.002 and 005060.003 detail specific risk-related items identified in the RAMP process and are informational only.
d. BC 508 – A 3-year-average was used to forecast the base portion of BC 508. Please refer to the supplemental workpaper on page 118 of Ex. SDGE-04-CWP-R for the unit cost basis of the zero-based forecast for RAMP Early Vintage Steel Replacement, sub-workpaper 005080.002 and RAMP Early Vintage Threaded Main Removal, sub-workpaper 005080.003. Sub-workpapers 005080.004, 005080.007 and 005080.008 detail specific risk-related items identified in the RAMP process and are informational only.
e. BC 12551 – Cathodic Protection Enhancements – Please see the descriptions and calculations in Table 16. Unit costs are based on actual costs of similar projects and subject matter expert information.

Table 16

2019 GRC SDG&E Gas Distribution - CUE-SDG&E-DR-02
Zero-based Descriptions and Calculations BC12551 - CP Enhancements

	Number of Units	Unit Cost $(000)	Annual Cost $(000) 2017	2018	2019
Service Replacements	1800	4	$2,436	$2,436	$2,436
Stranded Segments	217	13	$902	$902	$902
Steel Valves	511	3	$576	$576	$576
		Total/Year-->	$3,915	$3,915	$3,915

Note: Table contains rounded values

f. BC 902 Local Engineering – Please refer to the supplemental workpaper on page 191 of Ex. SDGE-4-CWP-R. This supplemental provides the calculations for the zero-based methodology forecasts for 2017-2019.

Exhibit: SDG&E-5-WP
Witness: Omar Rivera

Response:

The workpapers to Exhibit SDG&E-05 consist of support for the GRC requested funding as well as references provided for the corresponding chapters of SDG&E's RAMP Report.[1] Two workpapers used the zero-base method of forecasting, 'Gas Contractor

[1] I.16-10-015/I.16-10-016 Risk Assessment and Mitigation Phase Report of San Diego Gas & Electric Company and Southern California Gas Company, November 30, 2016. Please also refer to Exhibit SCG-02/SDG&E-02, Chapter 1 (Diana Day) for more details regarding the utilities' RAMP Report.

SDG&E response 52:-Continued

Controls' and 'Codes and Standards'. For a description of the derivation of cost estimates for Gas Contractor Controls please see the testimony Exhibit SDG&E-05 at page OR-16. For a description of the derivation of costs for Codes and Standards see page OR-23.

Other instances of the term 'zero-base' occur in supplemental workpapers identifying the corresponding chapter of SDG&E RAMP Report to which many of the requested activities apply. For additional information on the derivation of RAMP cost estimates please see the RAMP Chapters identified on those supplemental workpapers.

Exhibit: SDG&E-06
Witness: Beth Musich

Response:

Use of the label "zero-base" was only applied to the NSE (non-standard escalation) category of expense throughout the entirety of associated workpapers.
As reflected in the "Summary of Results" tables within the workpapers, $0 recorded expenses were recorded in NSE category of expense in any of the historical year periods (2012 – 2016), and $0 cost have been forecast in the NSE category in any of the "adjusted-Forecast/Test Year 2019 GRC period.

Use of the 'zero-base' designation for the NSE category of expense, for this witness area, resulted in the same derivation of cost as would have resulted applying any other generally acceptable forecasting methodologies.

Exhibit: SDG&E-07-CWP
Witness: Beth Musich / Mike Bermel

Response:

The Gas Transmission Testimony Exhibit SDG&E-07-CWP (Musich/Bermel) contains one workpaper with the zero-base methodology, workpaper 0041100- GT Pipeline New Additions – Externally Driven. This workpaper shows no historical or forecast costs and has no revenue requirement impact; it may be disregarded.

Exhibit: SDG&E-09
Witness: Deanna Haines

Response:

A single Budget Code 004170 Gas Transmission - Land Rights identifies labor costs as 'zero-based', however there is no forecasted labor associated with this budget.

Exhibit: SDG&E-11-CWP, SDG&E-11-WP
Witness: Maria Martinez

Response:

Exhibit SDG&E-11, pg. MTM-15, explains why the use of zero based forecasting was used for TIMP and pg. MTM-20, explains why the use of zero based forecasting was

SDG&E response 52:-Continued

used for DIMP. For TIMP forecasted cost is based upon the average costs incurred during 2016 for the four components to assess a pipeline: retrofit of the pipeline and capital replacement, installation of launcher and receiver facilities, in-line inspection, and excavations & remediation. The average cost is then applied to the number of assessments for the year to arrive at total costs. For DIMP forecasted cost is based on 2016 historic data for the average cost of replacement per foot for both steel and plastic. This average cost is then applied to the number of forecasted miles of replacement for the year to arrive at total costs.

Exhibit: SDG&E-14
Witness: Alan Colton

Response: Please see the accompanying file "CUE DR02 Q52 SDGE 14 Capital Zero Based.doc" and "CUE DR02 Q52 OH Pools Supporting Tables.xlsx"

Exhibit: SDG&E-15
Witness: Will Speer

Response:

Electric distribution O&M utilized one zero based estimate for a new work group being developed, the Asset Management Workgroup. The zero-based estimate was developed by creating a list of positions and roles that needed to be filled, assumptions around what could be filled internally, and what positions would be incremental, as well as consulting expenses. These costs and assumptions are presented in detail in SDG&E-15-WP pages 325-327.

Exhibit: SDG&E-16-WP
Witness: Daniel S. Baerman

Response:

Exhibit SDG&E-16-WP includes two Generation O&M workpapers that used the zero-based methodology for developing the O&M Adjusted-Forecast amounts. Shown below are the workpaper titles and methodology explanations.

- Workpaper: 1EG005.000 – Generation Plant Otay Mesa
  The O&M Adjusted-Forecast amount was based on the Base Forecast for the Palomar Energy Center, Workpaper 1EG003.000 – Generation Plant Palomar, which is most similar in size, power plant type, and age to OMEC. The Base Forecast for the Palomar Energy Center used the 5-Year Average methodology. Ground lease and property insurance costs from the 2016 Financial Statements of Otay Mesa Energy Center, LLC., were added as Forecast Adjustments as these costs are not included in the Palomar Energy Center Base Forecast. Reference Exhibit SDG&E-16, Pages DSB 5-7.
- Workpaper: 1EG010.000 – EG -SONGS Wkp_Grp_2
  Forecasting for labor and non-labor is based on non-standard escalation. This method was selected because the only GRC costs related to SONGS are O&M. The O&M

SDG&E response 52:-Continued

costs: Marine Mitigation and Workers Compensation can be reasonably forecasted so these planned costs have been used for the forecast.

As mentioned above, SONGS Marine Mitigation costs remain in SCE's TY2018 GRC. These costs are incurred for ongoing projects designed to mitigate the turbidity effects caused by the movement of ocean water used to cool SONGS when it was operational. SCE provides its 78.21% of Marine Mitigation expense forecast for SONGS in its TY2018 GRC.

The SONGS-related Worker's Compensation costs are included in SCE's worker's compensation revenue requirement forecast for the entire company. SCE provided SDG&E with a breakout of SONGS related Worker's Compensation for SCE's TY2018 GRC. For reference, please see the schedules in the accompanying file, "CUE DR02 Q52 Exhibit SDG&E-1EG010.pdf".

Exhibit: SDG&E-16-CWP
Witness: Daniel S. Baerman

Response:

Exhibit SDG&E-16-CWP includes four Generation Capital workpapers that used the zero-based methodology for developing the Adjusted-Forecast amounts. Below are the workpaper titles and methodology explanations.

- Workpaper Group 00011A – RAMP – Incremental Black Start – South Grid – CPEP
  The CPEP Blackstart Engine project budget is based on the original project estimate performed in 2012 and 2013. The original 2013 estimate was updated for 2016 to accommodate site conditions and add a contingency of approximately 10%.
- Workpaper Group 00011C – Otay Mesa Energy Center – Acquisition
  The Capital Adjusted-Forecast amount for the Otay Mesa Energy Center – Acquisition was based on the acquisition price referenced in the Purchase Power Tolling Agreement between Calpine and SDG&E for OMEC's local capacity and energy. The acquisition price of $280 million is based on the "put" option referenced in the Agreement. Refer to Exhibit SDG&E-16, Pages DSB 5-6.
- Workpaper Group 00011B – Otay Mesa Energy Center – Ongoing Capital
  The Capital Adjusted-Forecast amount for the Otay Mesa Energy Center – Ongoing Capital was based on the Capital Adjusted Forecast for the Palomar Energy Center, Workpaper Group 000090 – Palomar Plant Operational Enhancements, which is most similar in size, power plant type, and age to OMEC. The Adjusted Recorded Forecast for the Palomar Energy Center used the 5-Year Average methodology. Please reference Exhibit SDG&E-16, Pages DSB 5-7.
- Workpaper Group 080300 - Solar Photovoltaic Initiative
  The Capital Adjusted-Forecast amount for the Solar Photovoltaic Initiative was predicated on the expected work and cost to complete a project that was 90%

SDG&E response 52:-Continued
completed by the end of 2016. Reference SDG&E-Exhibit-CWP, page 61 of 67 for cashflows prior to 2017.

Exhibit: SDG&E-17-WP-R
Witness: Gwen Marelli

Response:

A zero-based methodology was used for the two workpapers listed below. The forecast explanation and supplemental workpapers showing the cost calculations are provided on the pages listed from Exhibit SDG&E-17-WP-R.

- 1FC001.000 - Customer Services Field – Operations: Explanation is on page 5 of 86. The supplemental workpaper is on pages 17 – 53 of 86.
- 1FC002.000 - Customer Services Field – Supervision: Explanation is on page 56 of 86. The supplemental workpaper is on page 64 of 86.

Two workpapers were mislabeled and a zero-based methodology was not used but the explanation of the forecast was also provided in Exhibit SDG&E-WP-R:

- 1FC003.000 Customer Services Field - Dispatch; Explanation is on page 66 of 86. Also, please refer to Exhibit SDG&E-17-R, Section III.C.2, page GRM-B-22.
- 2FC004.000 Customer Services Field - Support: Explanation is on page 75 of 86. Also, please refer to Exhibit SDG&E-17-R, Section III.D.2, page GRM-B-24.

Exhibit: SDG&E-20
Witness: Denita Willoughby

Response:

Three workpapers in this exhibit are identified as having used a 'zero-base' forecast methodology, all three of those workpapers are no longer in use and contain a forecast of $0 (zero). Those workpapers are 1SS008.000, 1SS099.000 and 2100-3327, found in Exhibit SDG&E-20-WP.

Exhibit: SDG&E-21
Witness: Carmen Herrera

Response:

Exhibit SDG&E-21-WP workpapers 1FS001.001 – 1FS001-006 utilized a zero-based forecast based on vehicle replacement planning, compliance requirements, and incremental vehicles for business needs. The methodology is documented in the individual workpapers with supplemental calculations provided in pages 12 – 15, 23, 30, 38, and 45.

Exhibit: SDG&E-22
Witness: Dale Tattersall

Response:

SDG&E response 52:-Continued

This response contains Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023.

Please refer to the Excel workbooks ("CUE DR02 Q52 2017 Estimated Rents CONFIDENTIAL.xlsx", "CUE DR02 Q52 2018 Estimated Rents CONFIDENTIAL.xlsx" and "CUE DR02 Q52 2019 Estimated Rents CONFIDENTIAL.xlsx") for the details of the zero-based forecast for workpaper 1RE003.000- SDG&E Rents to be provided shortly. A zero-based forecast methodology was used to more accurately capture the specific year-over-year contractual rent and operational expense increases for each location.

Exhibit: SDG&E-23
Witness: Nancy Clancy

Response:

A zero-base forecast methodology was used to determine cost requirements for this workpaper group. This forecast methodology was utilized due to the downsizing of the Lab that took place during the base year. As a result, of the reduction of headcount, utilizing a base year or average trending forecasting methodology would not be representative of forecasted costs. All other forecasting techniques produced a higher forecasted amount in the test year than the zero-base forecast methodology. For the zero-based labor forecast, we forecasted actual labor charges for each employee based upon actual wage rates. The 2017 actual labor charges were in line with the forecast. For the non-labor forecast, we used a zero-based methodology based upon an estimate of the number of lab samples and tests performed internally as well as outsourced. The 2017 actual non-labor charges were slightly lower than forecast due to lower than anticipated outsourcing charges. Please see the workpaper exhibit SDG&E-23-WP at page 107-108 for the description of the labor and nonlabor adjustments and FTE counts used in this forecast.

Exhibit: SDG&E-24-CWP-R
Witness: Chris Olmsted

Response:

The forecast methodology is discussed in the testimony of SDG&E IT witness Mr. Olmsted (Ex. SDG&E-24-R). Please refer to pages Ex. SDG&E-24-R pages CRO-17-18 and individual capital project workpapers in Exhibit SDG&E-24-CWP-R for details.

Exhibit: SDG&E-24-WP
Witness: Chris Olmsted

Response:

Use of the label "zero-based" was only applied to the NSE (non-standard escalation) category of expense throughout the entirety of associated workpapers.

As reflected in the "Summary of Results" tables within the workpapers, Zero recorded expenses were recorded in NSE category of expense in any of the historical year periods

SDG&E response 52:-Continued

(2012 – 2016), and no costs have been forecast in the NSE category in any of the "adjusted-Forecast/Test Year 2019 GRC period.

Use of the zero-based designation for the NSE category of expense, for this witness's area, provided the same derivation of cost as would have resulted applying any other generally acceptable forecasting methodologies.

Exhibit: SDG&E-25-CWP
Witness: Gavin Worden

Response:

The forecast methodology is discussed in the testimony of SDG&E IT witness Mr. Gavin Worden (Ex. SDG&E-25) throughout the testimony associated with each project under the heading 'Forecast Methodology', first appearing at page GW-41.

Exhibit: SDG&E-28-WP
Witness: Debbie Robinson

Response:

Each of the workpapers using a zero-base forecast methodology in Exhibit SDG&E-28-WP are derived from sources such as headcounts, current and future insurance premiums and self-insured equivalents. Each workpaper group forecast in this exhibit contains one or more 'supplemental workpapers' demonstrating that forecast derivation, for example workpaper group 1CP000.000 COMPENSATION - VARIABLE PAY (GRC USE ONLY) in Exhibit SDG&E-28-WP at page 4 is followed by detailed supplemental workpapers beginning at page 10. This continues throughout this workpaper volume.

Exhibit: SDG&E-29-WP
Witness: Debbie Robinson

Response:

Each of the workpapers using a zero-base forecast methodology in Exhibit SDG&E-29-WP are derived from values provided by the Company's certified actuary Willis Towers Watson. Each workpaper group forecast in this exhibit contains one or more 'supplemental workpapers' demonstrating that forecast derivation, for example workpaper group 1PN000.000 - EMPLOYEE PENSION in Exhibit SDG&E-29-WP at page 4 is followed by detailed supplemental workpapers beginning at page 9. This continues throughout this workpaper volume.

Exhibit: SDGE-30-WP
Witness: Tashonda Taylor

Response:

Please see the workpapers for derivation of zero-base values:

- Long-Term Disability (LTD) – SDG&E-30-WP, page 34

SDG&E response 52:-Continued

- Workers' Compensation (WC) – SDG&E-30-WP, page42

Exhibit: SDG&E-31-WP
Witness: Sandra Hrna

Response:

Exhibit SDG&E-31-WP (Hrna) contains one workpaper with the zero-base methodology, workpaper 1AG014.000 – Other 925 Damages. This workpaper shows no historical or forecast costs and has no revenue requirement impact; it may be disregarded.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

53. In Ex. SDGE-4-CWP, pp. 154 and 155, the year of expenditures for removal of buried piping in vaults is different. Please provide the correct year, and identify any changes throughout the GRC filing which result from that choice of year.

SDG&E Response 53:

The original forecast expenditure for purposes of the RAMP Report was an expense between $8,220,000 and $7,437,000 for the year 2018. For funding purposes in the GRC, SDG&E chose a mid-range value of $7,719,000 and scheduled the expense for 2019, which appears in Exhibit SDGE-4-CWP-R, p. 154. Please see the testimony of Diana Day, Exhibit SDG&E-02-R Chapter 1 beginning at page DD-14 for a discussion of RAMP's range of mitigation costs.

This move out to the year 2019 did not result in any other "changes" in the GRC filing.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 8, 2018
DATE RESPONDED: JANUARY 15, 2018

54. In Ex. SDGE-5-WP, p. 20, SDG&E states that "our damage prevention data demonstrates that when we perform public awareness activities ...damages decrease while the number of calls to 811 (Underground Service Alert [USA]) increases," while Ex. SDGE-5-WP, p. 22, shows a planned increase of $500K per year by 2019 for Damage Prevention Public Awareness. Please provide:

a. The "damage prevention data" referred to

b. The analysis which "demonstrates" that damage decreases while USA calls increase

c. The basis for choosing $500K per year as the targeted spending in 2019.

d. The expected increase in USA calls due to the planned incremental spending, and the year(s) in which that increase is expected to occur.

e. The expected decrease in damages due to the planned incremental spending, and the year(s) in which that decrease is expected to occur.

f. The expected annual increases in USA calls if the planned incremental spending were doubled.

g. The expected decreases in damages if the planned incremental spending were doubled.

SDG&E Response 54:

a. SDGE used the data below to compare the number of tickets received and number of damages reported for years 2014-2016 for both distribution and transmission.

2014	
Number of Excavation Damages	318
Number of Non-Release Damages	65
Total Excavation Damages	383
Number of Excavation Tickets	106,129

SDG&E Response 54:-Continued

Damages per 1000 Tickets	3.6
2015	
Number of Excavation Damages	336
Number of Non-Release Damages	28
Total Excavation Damages	364
Number of Excavation Tickets	65,096
Damages per 1000 Tickets	5.6
2016	
Number of Excavation Damages	367
Number of Non-Release Damages	38
Total Excavation Damages	405
Number of Excavation Tickets	123,726
Damages per 1000 Tickets	3.3

811 Public Awareness Zip Code Activity	2014	2015	2016
Number Of Zip Codes with Activity	36	32	38

b. The analysis which "demonstrates" that damage decreases while USA calls increase is based on the data provided in response a above. In 2014, 811 awareness posters were provided to 36 zip codes. There was an overall count of 106,129 tickets and damages per 1000 tickets were 3.6. In 2015, the number of 811 awareness posters decreased and were provided to only 32 zip codes, which decreased ticket count and increased damages per ticket. In 2016, the number of 811 awareness posters increased to 38, which increased tickets and decreased damages.

c. The basis for choosing $500K per year is for the ability to perform more frequent and targeted effectiveness surveys for our Public Awareness Program, as prescribed by API recommended practice 1162 (Public Awareness Programs for Pipeline Operators).

d. The projected increase in USA calls would be an 8% increase each year.

SDG&E Response 54:-Continued

e. The projected decrease in damages would be a 2% decrease each year.

f. The projected annual increase in USA calls would be an 8% increase.

g. The projected decrease in damages would be a 2% decrease each year.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 5, 2018

55. Ex. SDGE-7, p. 11:8, shows planned capital expenditures for transmission pipeline replacement dropping over 10% from $1688K in 2016 to $1505K per year in each of 2017-2019, inclusive. Ex. SDGE-7-WP, p. 22, shows that the 2017-2019 forecast spending is down more than 60 percent from 2015. Please

a. provide an age/mileage table, in Excel format, showing for each year up to and including 2017, the miles of transmission pipe installed that year that were in service as of the end of 2017.

b. Indicate the number of miles of transmission pipe actually replaced in 2017.

c. Indicate the number of miles of transmission pipeline SDG&E forecasts it will replace in each of the years 2018-2022, inclusive.

d. Provide the forecasted cost per mile in 2016 dollars to replace transmission pipeline in 2017-22 (annually, if the cost per mile is expected to change over time).

e. Explain why SDG&E used a 5-year average for forecasting rather than 3-year or 4-year average as used for other cost categories, given the outlier value for 2012 and the 2013 value that was less than one third of 2015 spending.

SDG&E Response 55:

a. From GIS:

2012	2013	2014	2015	2016	2017
0 miles	.019 miles	0 miles	.600 miles	0 miles	0 miles

b. There were no pipeline replacements in 2017. Please note that the GRC forecast/historical project costs do not include any pipeline replacements via TIMP and PSEP.

c. SDG&E objects to this request under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. Notwithstanding, there are currently no transmission pipelines forecasted to be replaced for years 2018-2022. Please note that the GRC forecast/historical project costs do not include any pipeline replacements via TIMP and PSEP.

SDG&E Response 55:-Continued

d. SDG&E objects to this request under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. The forecasts for the budget codes that are presented in Ex. SDGE-7 and Ex. SDGE-7-WP do not include the additional parameter requested and therefore they are not available. These budget codes also include other related activities that do not directly involve pipeline replacement.

e. The five-year average forecasting methodology was applied because SDG&E has found that in this case average spend is a reasonable indicator of future need. While SDG&E conducts a variety of surveys on a regular basis in an effort to predict what pipelines need to be replaced or repaired, some of these projects cannot be determined in advance. As such, SDG&E applies a blanket work order, which is a collection of many like-kind projects that are often similar in scope, and forecasts future activities on a five-year average to take into account variability in individual project scope, cost and schedule to complete.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 5, 2018

56. Ex. SDGE-7-CWP, p. 4, shows new gas pipeline capital costs of $6 million in 2015, dropping to $3.9 million per year in 2016-2019, inclusive. Please provide:

a. Actual capital expenditures in 2017.

b. Actual miles of new pipeline in each of the years 2012-17, inclusive.

c. Forecasted miles of new pipeline in each of the years 2018 and 2019.

d. Actual (2012-2017) and forecasted (2018-2019) cost per mile for new gas pipeline in each of the years 2012-2019, inclusive.

e. An explanation for why additions in 2015 were so much higher than in 2016, and why 2016 was chosen as representative of expected conditions in 2017-2019.

SDG&E Response 56:

a. The final financial data for 2017 is not currently available.

b. The following are the mileage/year:

2012	2013	2014	2015	2016	2017
0 miles	0 miles	0 miles	0 miles	1.934 miles	0 miles

Please note that the GRC forecast/historical project costs do not include any new pipeline via TIMP and PSEP.

c. SDG&E forecasts about 0.024 miles of new pipeline in 2018. There are currently no new pipeline projects identified for 2019.

d. SDG&E does not track the cost-per-mile in this budget category, the estimate is based on the scope of work and historic trends for labor and nonlabor. This budget code also includes other related activities that do not directly involve pipeline replacement.

e. In 2015 additions were higher due to a new peaker plant, which required new gas service line that went into construction. 2016 was chosen as representative of expected conditions in 2017-2019 because of another new peaker plant planned for this time period, which was estimated to have lower costs due to a shorter run of pipe.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 5, 2018

57. Ex. SDGE-7-CWP, p. 41, shows historical transmission compressor station capital costs related to environmental regulations increased every year from 2012 to 2016, but SDG&E proposes to use a 5-year average for its forecast, resulting in a forecasted drop in spending of over 40% from 2016 to 2017.

a. Given the annual increases in the historical data, why did SDG&E forecast based on an average rather than a trend?

b. What was the actual 2017 spending?

SDG&E Response 57:

a. The five-year average forecasting methodology was applied because SDG&E has found that in this case average spend is a reasonable indicator of future need. The drivers for the non-labor cost in 2015 and 2016 were due to multiple activities occurring primarily at the Moreno Compressor Station. In addition to extensive physical security enhancements, these activities include, but are not limited to, capital projects such as actuator replacement, catalyst repair, turbine repair, evaporative pond, water softener and cooling tower repairs, and relief valve upgrades.

b. The final financial data for 2017 is not currently available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 5, 2018

58. Ex. SDGE-7-CWP, p. 49, shows historical transmission compressor station capital costs related to aging equipment were more than 50% higher in 2016 than in 2012-2015 combined, but SDG&E proposes to use a 5-year average for its forecast, resulting in a forecasted drop in spending of over 60% from 2016 to 2017.

a. Given the outlier value for 2016, why did SDG&E forecast based on an average rather than accounting for whether 2016 was either a new baseline or not likely to be repeated?

b. What was the actual 2017 spending?

SDG&E Response 58:

a. The five-year average forecasting methodology was applied because SDG&E has found that in this case average spend is a reasonable indicator of future need. The primary capital cost driver for this budget category in 2016 was associated with turbocharger replacement on the Cooper compressors at the Moreno Compressor Station.

b. The final financial data for 2017 is not currently available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 5, 2018

59. Ex. SDGE-7-CWP, pp. 57-58, describes SDG&E's plan to invest $162 million over the 2016-2021 period to replace 4400 horsepower of compression capability with 10,000 horsepower of compression capability and 1 Mw of backup electric generators. Please:

a. Confirm that the 10,000 horsepower of new capacity is equivalent to less than 8 MW of electrical capacity.

b. Indicate how much of the $162 million total cost is associated with each of the five components of the project identified by bullets on p. 58.

c. Provide any analysis SDG&E has done of the economics of using solar plus storage as the source of energy for the planned new compressor units, rather than natural gas with attendant SCR emissions packages.

SDG&E Response 59:

a. 10,000 horsepower is equivalent to slightly less than 8MW of electric power. The station flow capacity of 800MMSCFD has not increased in capacity. The horsepower replacement is based on meeting design conditions (flow/head) pressures.

b.

Install two (2) new Siemens/Dresser SGT-100 Turbo-Compressor/ Driver Units with SCR Emissions Packages in a new Building (5,000 hp each)	$104,900,000*
Decommission four (4) existing Solar Saturn gas turbine-driven centrifugal compressors (1,100 hp each)	$800,000*
Install auxiliary systems to support two (2) new turbine units. Auxiliaries include combustion air inlet system and exhaust system (CO catalyst, SCRs, ammonia injection & vaporization skid, dilution air blowers, silencer, stack, and control panels).	$9,000,000*
Install overall infrastructure to support two (2) new turbine units plus future expansion to support four (4) new turbine units	$6,300,000*
Install two (2) 0.5MW backup Generators to serve the new Facility.	$36,500,000*

* Total Installed Cost (TIC) includes Engineering, equipment, construction cost /labor and taxes
***The 162M is based on factored ROM estimate.

SDG&E Response 59:-Continued

c. SDG&E has not performed an economic study of using solar and storage as the energy source for the planned new compressor units.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 5, 2018

60. Ex. SDGE-7-CWP, p. 61, shows planned cathodic protection capital expenditures have risen each year in the 2012-2016 period, yet SDG&E forecasts 2017-19 capex based the 5-7ear average.

a. Please explain the basis for using a five year average rather than a trend, given data with increases every year.

b. Please provide the actual 2017 capital expenditures.

SDG&E Response 60:

a. The five-year average forecasting methodology was applied because SDG&E has found that in this case average spend is a reasonable indicator of future need. The budget in question is a blanket budget, which is a collection of many like-kind cathodic protection projects of similar scope. Some of the drivers for 2016 recorded non-labor are due to a collection of anode bed and cathodic protection ground bed projects.

b. The final financial data for 2017 is not currently available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

61. Ex. SDGE-11, pp. 18:22-19:3, refers to 1600 miles of "early vintage plastic" and quotes a PHMSA Advisory Bulletin from 2007 that references plastic pipe installed "through the early 1980s." What years is SDG&E referring to with the term "early vintage plastic"?

SDG&E Response 61:

"Early vintage plastic" is pre-1986.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

62. Ex. SDGE-11, pp. 18:22-19:30 describes SDG&E's proposed Vintage Integrity Plastic Plan, or VIPP. Please confirm CUE's understanding that VIPP consists of the following three phases (or explain if CUE's understanding is incorrect):

a. Phase 1 expands annual leak surveys from 400 miles of early vintage plastic to all 1600 miles.

b. Phase 2 replaces all pre-1973 plastic pipe

c. Phase 3 replaces all pre-1986 plastic pipe, starting with incremental replacements of 27 miles in 2019, increasing annual replacements for the next 6-8years, and taking 25-30 year for "wholesale" (which CUE takes to mean "100 percent") replacement of pre-1986 plastic pipe to be complete.

SDG&E Response 62:

a. Yes, this is correct.

b. Yes, this is correct.

c. Yes, this is correct.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

63. Please provide data, in Excel format, showing for each year up to and including 2017:

a. The miles of plastic installed that year that were in service on SDG&E's distribution system as of the end of 2017.

b. The miles of plastic mains installed that year that were in service on SDG&E's distribution system as of the end of 2017.

c. The miles of plastic services installed that year that were in service on SDG&E's distribution system as of the end of 2017.

d. The miles of Aldyl-A plastic installed that year that were in service on SDG&E's distribution system as of the end of 2017.

e. The miles of Aldyl-A mains installed that year that were in service on SDG&E's distribution system as of the end of 2017.

f. The miles of Aldyl-A services installed that year that were in service on SDG&E's distribution system as of the end of 2017.

SDG&E Response 63:
SDG&E objects to this request under Rule 10.1 of the Commission's Rules of Practice and Procedure on the grounds that the burden, expense and intrusiveness of this request clearly outweigh the likelihood that the information sought will lead to the discovery of admissible evidence. Subject to and without waiving the foregoing objection, SDG&E responds as follows:

Please see the tables below in response to Questions 63.a-f, which can be converted to Excel format. The information is based on SDG&E's 2016 DOT Report with data reported for each decade as of the end of 2016. The DOT Report for 2017 will not be available until the end of first quarter of 2018. Installation by each year is not readily available.

SDG&E 2016 DOT Distribution Report, Part B Section 4

	Pre-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	Total
Miles of Main Installed (DOT Reported)	187	276	1,157	1,113	1,494	1,556	1,047	1,013	228	8,071
Miles of Early Vintage Aldyl-A Installed				0.1	996	620				1,616

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

SDG&E Response 63: -CONTINUED

Total Miles of Plastic Installed				0.1	996	1,371	944	969	199	4,479

	Pre-1940	**1940-1949**	**1950-1959**	**1960-1969**	**1970-1979**	**1980-1989**	**1990-1999**	**2000-2009**	**2010-2019**	**Total**
Number of Services Installed (DOT Reported)	5,006	20,444	101,949	86,080	129,927	120,829	78,259	73,385	19,601	635,480
Number of Early Vintage Aldyl-A Services Installed				35	84,959	50,277	0	0	0	135,271
Number of Total Plastic Services Installed				35	84,959	116,021	76,660	72,292	18,736	368,704

Average service Length – 50 Ft

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

64. Please indicate which calendar years SDG&E means by "the next 6-8 years" in Ex. SDGE-11, p. 19:25.

SDG&E Response 64:

It means starting in 2019, so it would be 2019 to 2024-2026.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

65. For each year starting in 2017 and continuing through the end of "the next 6-8 years," please provide SDG&E's planned annual miles of replacement of:

a. "Early vintage plastic"

b. Pre-1986 plastic

c. Pre-1973 plastic

d. Pre-1986 plastic mains

e. Pre-1986 plastic services

d. Pre-1986 Aldyl-A mains

e. Pre-1986 Aldyl-A services

f. Pre-1973 mains

g. Pre-1973 services

h. Pre-1973 Aldyl-A mains

i. Pre-1973 Aldyl-A services

SDG&E Response 65:

SDG&E objects to this request under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. The years 2023-2026 are beyond this GRC cycle.

The Vintage Integrity Plastic Plan (VIPP) is focused on replacement of mains, but the services associated to the mains will also be replaced. So, this program is not specifically targeting service replacements. SDG&E provides the planned annual miles of replacement below for vintage plastic; assumptions for the forecast years were not planned to the level of granularity requested in each subpart of Question 65 and thus the data is not available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

SDG&E Response 65: -CONTINUED

	2017	2018	2019-2022
Vintage Plastic	22 miles	15 miles	27 miles

Note that the miles includes mains and services

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

66. Please describe the extent of, and basis for, SDG&E's knowledge of whether mains and services installed before 1973 are Aldyl-A or not.

SDG&E Response 66:

SDG&E's knowledge is derived from review of Work Orders and purchase practices.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

67. Please describe the extent of, and basis for, SDG&E's knowledge of whether mains and services installed between 1973 and 1985 are Aldyl-A or not.

SDG&E Response 67:

SDG&E's knowledge is derived from review of Work Orders and purchase practices.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

68. With regard to the second phase of VIPP, please provide the total number of miles of pre-1973 plastic to be replaced each year from 2017 through the completion of Phase 2, divided between mains and services.

SDG&E Response 68:

See the response above to Question 65.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

69. With regard to the third phase of VIPP, SDG&E says it will start by replacing 27 miles in 2019 "above and beyond routine replacements" (Ex. SDGE-11, p. 19:22-23). For each year from 1985-2017, inclusive, how many miles of pre-1986 plastic has SDG&E replaced that year due to "routine replacements"? Please provide separate data for mains and services, or explain why the data is not available.

SDG&E Response 69:

SDG&E objects to this request under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence. Requests for historical data beyond a five-year timeframe are not relevant nor likely reasonably calculated to lead to the discovery of admissible evidence for the GRC's forecasting purposes. SDG&E further objects on the grounds that the burden, expense, and intrusiveness of this request clearly outweigh the likelihood that the information sought will lead to the discovery of admissible evidence. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

Routine replacements are included in the Gas Distribution testimony (Ex. SDG&E-04 Gina Orozco-Mejia, pp. 88-91). The records for routine replacement do not have information available to the level of granularity requested.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

70. For each year from 2018 until the end of "the next 6-8 years," please provide SDG&E's best estimate of the miles of pre-1986 plastic that will be replaced through "routine replacements." Please provide separate data for mains and services, or explain why the data is not available.

SDG&E Response 70:

The "routine replacements" are discussed in Ex. SDG&E-04, Gina Orozco-Mejia Gas Distribution direct testimony on pages GOM-88 to GOM-91. The forecast of routine replacement is based on a 3-year average spend and is not done on a unit replacement.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

71. Ex.SDGE-11-CWP, p. 4, shows annual costs as high as $31 million and a "zerobased" forecast of $4 million per year in 2017-2019, down more than 70 percent from the average 2012-2016 spending level.

a. Please explain why the zero-based forecast is so far below the historical average and even farther below the historical peak spending.

b. Please provide the actual 2017 capital expenditures for this category.

SDG&E Response 71:

a. Transmission pipelines under TIMP, at a minimum require an assessment (ILI, Pressure Test or ECDA) every 7 years. To meet deadlines for TIMP assessments, schedules may be modified each year to account for resource, inspection tools, and system availability. SDG&E use a zero-based forecast methodology because the number of assessment projects changes from year to year (SDG&E-11 Maria Martinez direct testimony pg. MTM-15). The mitigations following the assessments can vary greatly depending what repairs are needed. In the year 2012, there was increased need for repairs relative to other years during the historical five-year period.

b. 2017 data is not yet available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

72. Ex. SDGE-11-CWP, p. 21, shows 2019 zero-based spending for the DREAMS program ranging between $20 and $40 million, with an "Embedded Cost" of $22.346 million.

a. Please provide the actual workpapers showing the cost estimation methodology and the calculations that resulted in the large range of $20-40 million.

b. Please provide the source for and any calculations underlying the "Embedded Cost" figure of $22.346 million.

c. Please reconcile the BC 9546 costs for 2017 and 2018 shown on this page ($19-21 million per year) with those shown on the next page (zero). Which is SDG&E's actual proposal? Why was the other one rejected?

SDG&E Response 72:

a. The amounts stated are from RAMP capital workpapers, which are presented in a different format than the requested capital amount of $45M for this category shown on SDG&E-11-CWP, p. 16. The RAMP phase is not a ratemaking proceeding and the range derived from the RAMP Report is not to be relied upon for GRC funding purposes. The RAMP amounts do not have workpapers that include the calculations for the amounts shown. Please see the testimony of Jamie York, Exhibit SDG&E-02 Chapter 3 beginning at page JKY-2 for a discussion of how RAMP was incorporated into the GRC, including the identification of 'embedded costs.' Please also see the RAMP Report, Chapter SDG&E-16[1] Catastrophic Damage Involving Medium-Pressure Pipeline Failure.

b. As mentioned in response to Question 72.a, the RAMP workpapers are presented in a different format. The "Embedded Cost" figure of $22.346M is derived from the $45M requested amount, less the base year 2016 actual expenditure of $22.654M.

c. As mentioned in response to Question 72.a, the RAMP workpapers are presented in a different format. The $19-21 million per year is a range of forecasted spending at the time the RAMP Report was submitted. The zero amounts on p. 22 are the incremental amounts for 2017-2018 when compared to the base year 2016 actual spend of $22.654M. Since the base year spend is more than estimated amounts for 2017-2018, there is $0 incremental spend forecasted.

[1] I.16-10-015/I.16-10-016 Risk Assessment and Mitigation Phase Report of San Diego Gas & Electric Company and Southern California Gas Company, November 30, 2016.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

73. Ex. SDGE-11-CWP, p. 22, shows zero 2017-2018 spending, and then 2019 spending of $22.654 million (100% non-labor) for the DREAMS program.

a. How can labor spending be zero? Does SDG&E not spend any money on program oversight or management using SDG&E employees?

b. Please provide actual workpapers showing the scope of the program, the unit cost(s), the units of equipment installed or replaced or removed, the calculation methodology, etc.

SDG&E Response 73:

a. As mentioned in response to Question 72, the CWP, p. 22 are RAMP workpapers, which is a different presentation format than the requested $45M on p. 16. The amounts shown are the incremental amount of forecasted spending when compared to the base year 2016 actual spend of $22.654M. The incremental spend in 2019 of $22.654M is estimated to be all non-labor.

b. There are no workpapers showing backup for calculations for the RAMP forecast shown on p. 22.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 2, 2018

74. In Ex. SDGE-13, pp. 3:18-21 and 4:2, SDG&E provides data in NEM installations and capacity for each year from 2010 to 2016 and cumulatively through "July."

a. Please confirm that "July" refers to July 2017.

b. Please confirm that the average kw per installation has ranged from 6.2 kW to 8.7 kW over the 2010-2016 period, averaging 6.60 kW/installation *(694,561 kw/105,240 total installations) for the entire 2010-2016 period.

c. Please confirm that the SDG&E data imply approximately 5000 January-July 2017 installations (110,000+ minus 105,240) and approximately 55 January-July 2017 MW (750 MW minus 694,561 kW), for an average of over 11 kW per installation in 2017.

d. Please provide the actual number of installations and kW installed in January-July 2017 and in the full calendar year 2017.

SDG&E Response 74:

a. Yes

b. Yes, with the refinement that the low end of the average kW per installation range is 6.1 kW.

c. From January through July 2017, SDG&E authorized 10,039 Net Energy Metering customers that could produce 70.22 MW. The average was 6.99 kW per installation.

d. From January through July 2017, SDG&E authorized 10,039 Net Energy Metering customers that could produce 70.22 MW. In 2017, SDG&E authorized 18,983 Net Energy Metering customers that could produce 142.50 MW.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 2, 2018

75. In Ex. SDGE-13, p. 6:1, SDG&E claims that it "currently leads the state by providing 43% of its energy from renewable sources." Please provide the data (including the date of the data) which supports this claim.

SDG&E Response 75:

To clarify, this claim pertains to investor owned utilities. The source for this claim is the California Energy Commission's 2016 Power Content Label filings: http://www.energy.ca.gov/pcl/labels/

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 26, 2018

76. Ex. SDGE-1, p. 17:13-16 describes "pressures associated with maintaining a highly-trained and qualified workforce." Ex. SDGE-4, pp. 4:23-5:2 also addresses workforce issues, as does Ex. SDGE-14-CWP, p. 201. Please provide, in Excel format, a spreadsheet showing, as of the end of each year from 2012-2017 (actuals) and 2018-2022 (forecast):

a. The number of gas employees under 50 and the number of gas employees of each age 50 and above (i.e., number aged under 50, number aged 50, number aged 51, number aged 52, etc.)

b. The cumulative years of work experience at SDG&E of each age group (e.g., if there were 40 employees aged 52 at the end of a given year, with an average of 20 years working for SDG&E, that year's entry for work experience for 52-yearolds would show 40 x 20 = 800 years of work experience.)

c. The number of workers eligible to retire, whether due to age or length of employment at SDG&E, in each age group (e.g., if there were 40 employees aged 52 at the end of a given year, and 5 of them were eligible to retire that year, that year's entry for retirement eligibility would be 5).

d. The number of electric transmission and/or distribution employees under 50 and the number of electric transmission and/or distribution employees of each age 50 and above (i.e., number aged under 50, number aged 50, number aged 51, number aged 52, etc.)

e. The cumulative years of work experience at SDG&E of each age group (e.g., if there were 40 employees aged 52 at the end of a given year, with an average of 20 years working for SDG&E, that year's entry for work experience for 52-year-olds would show 40 x 20 = 800 years of work experience.)

f. The number of workers eligible to retire, whether due to age or length of employment at SDG&E, in each age group (e.g., if there were 40 employees aged 52 at the end of a given year, and 5 of them were eligible to retire that year, that year's entry for retirement eligibility would be 5).

SDG&E Response 76:

SDG&E objects to this question requesting 2020-2022 forecasts under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor

SDG&E Response to Question 76 Continued:

is likely reasonably calculated to lead to the discovery of admissible evidence, and is outside the scope of this proceeding. Subject to and without waiving these objections, SDG&E responds as follows: SDG&E's filed application follows the Rate Case Plan, which identifies forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism.

SDG&E does not forecast headcount in the manner requested in this data request, so 2018 – 2019 forecasted headcount is likewise unavailable.

Please see the Excel file: CUE-SDGE-DR-02 Q76 Attachment for 2012 – 2017 data.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

77. Ex. SDGE-14-CWP, p. 182, shows past and forecasted spending for the CMP.

a. Please explain why the forecast is based on the 2012-2016 average, when spending has increased annually from 2013-2016.

b. Please confirm that SDG&E is projecting a drop in spending from 2016 to 2017 of almost 15%

c. What was the actual capital spending for the CMP in 2017?

SDG&E Response 77:

a. Historically, SDG&E has forecasted this budget using a 5-year average. This is viewed as the most appropriate methodology because work load can vary from year to year.

b. Per the forecast, this is correct.

c. 2017 data is not yet available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

78. Ex. SDGE-14-CWP, p. 191, shows past and forecasted spending for underground switch replacement and manhole repair

a. Please explain why the forecast is based on the 2012-2016 average, when spending has increased annually from 2013-2016.

b. Please confirm that SDG&E is projecting a drop in spending from 2016 to 2017 of 16%, to the lowest level since 2013.

c. What was the actual capital spending UG switch replacement and manhole repair in 2017?

d. Please provide an age distribution table, in Excel format, showing (as of year-end 2017): The total number of UG switches on SDG&E's system, the number of UG switches on SDG&E's system that were installed in 2017, the number installed in 2016, and so on back to the earliest year of installation for UG switches still in service.

e. If the total number of UG switches shown in subpart (d) of this question is not equal to approximately 5000 (Ex. SDGE-15-WP, p. 35, sum of FMO and non-FMO UG switches), please include a quantitative reconciliation explaining the difference.

f. Please provide the actual number of UG switches replaced annually in each of the years 2012-2017

i. Through budget code 289 work

ii. Through each other SDG&E program that results in UG switch replacement (please identify any such programs in your response to this subpart, and indicate where they are described in SDG&E's testimony and workpapers)

iii. Reactively, after some kind of a failure

iv. Proactively, due to age or some other basis for anticipating a high risk of failure

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

Question 78 Continued:

g. Please provide the forecasted number of UG switches to be replaced annually in each of the years 2018-2022, inclusive.

i. Through budget code 289 work

ii. Through each other SDG&E program that results in UG switch replacement (please identify any such programs in your response to this subpart, and indicate where they are described in SDG&E's testimony and workpapers)

iii. Reactively, after some kind of a failure

iv. Proactively, due to age or some other basis for anticipating a high risk of failure

h. What is SDG&E's best estimate of the average life expectancy for the underground switches on its system?

i. SDG&E says the switch replacement budget is driven by "the number of switches that need to be removed or replaced due to being Mechanically Inoperable (MIO)" (Ex. SDGE-14, p. 48). Does this mean that it is SDG&E's policy to only replace switches reactively after they have already failed and are MIO?

SDG&E Response 78:

a. An expected offload of the DOE budget by the SF6 switch replacement budget is anticipated.
b. Yes, the forecasted methodology utilized for the budget was a five-year average which equates to a drop in expected spend from 2017 to 2016. .
c. 2017 data is not yet available.

SDG&E Response 78 Continued:

d.

UG switches installed	
Year	**Count**
2012	50
2013	32
2014	38
2015	48
2016	58
2017	68
Total in System	**3604**

e. Switches installed will not equal the total number in the system. It does not account for replacements (see below) and removals when no longer necessary.

f. Note that the 289 budget is used for structure repair/replacement as well as UG switch replacements.

UG Replacements						
Year	**289 - Structures**	**289 - Switches**	**14249**	**240**	**Reactive**	**CMP**
2012		50				
2013		32				
2014		38				
2015	5	48				
2016	460	53	5			
2017	181	49	19			

i. See table above
ii. See table above
iii. See table above
iv. See table above

SDG&E Response 78 Continued:

g.

Planned UG switch replacements						
Year	289 - Structures	289 - Switches	14249	240	Reactive	CMP
2018		50	100			
2019		50	100			
2020		30	100			
2021		30	100			
2022		30	100			

i. See table above
ii. See table above
iii. See table above
iv. See table above

h. SDG&E objects to this request on the grounds that it is vague and ambiguous as to the term "average life expectancy." Subject to and without waiving this objection, SDG&E responds as follows: Underground switches are capitalized to Federal Energy Regulatory Commission (FERC) Account E367 – Underground Conductors & Devices. Per Exhibit SDG&E-34-R (Revised Direct Testimony of Matthew Vanderbilt) at MCV-23, the proposed average service life for assets in FERC Account E367 is 49 years. Please refer to Exhibit SDG&E-34-R at page MCV-23 for more information.

i. SDG&E objects to this request to the extent that it assumes mistaken facts. Subject to and without waiving this objection, SDG&E states as follows: No. Further, MIO does not mean that they have necessarily failed. 'Do not Operate Energized', DOE, means that, for safety, they are not to be operated when energized. In effect, it is as if they are not there at all, rather than having failed.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

79. Ex. SDGE-14-CWP, pp. 200-201, address replacement of live front equipment

a. On p. 200, why are there 6 lines of text regarding SF6 switch replacement? Should this text be somewhere else?

b. On p. 201, the last sentence refers to a 5 year program to be completed "by 2020." Does this mean that SDG&E plans to replace all live front equipment by 2020? If not, what does it mean?

c. Please provide the documents and calculations which form the basis for the "zero-based" budget, including the units of work to be done and unit costs.

SDG&E Response 79:

a. Yes, that section of text was inadvertently added to the description on page 200. The passage below that is found on page 200 in 'Business Purpose' references SF6 Switch Replacement, and should appear on page 710, appended to the text in 'Business Purpose' in that section.

> While monitoring equipment does exist for substation switchgear, the cost to add monitoring equipment to distribution switches is close to what it would cost to replace SF6 switches with vacuum switches. In addition, the communications equipment necessary to send real-time information to a centralized location does not currently exist out on the distribution system, unless SCADA infrastructure is located nearby. SDG&E has approximately 1,000 SF6 distribution switches (padmounted and underground), and is currently proposing a program to replace the switches with non-SF6 switches over the next 5 years. One alternative is to not do anything, but the risk is a potential leak to the environment, thus causing harm to the environment and significant fines ($50k per day, per violation, and the total fine could be in the million dollar range, depending on the extent of the damage). Another alternative is to install monitoring equipment, but as described above, the cost and feasibility make it unviable.

b. This is an ongoing project that replaces live front equipment as it is encountered during regular SDG&E work. As such, it cannot address all instances of live front equipment that is installed in the system by any specific date.

SDG&E Response 79 Continued:

c.

Description	Unit	Quantity	Cost ($1000) (material, direct charges, contract costs)
Labor	HR	3,981	$219
Non-Labor	EA	1	$1836
Total			$2,055

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

80. Ex. SDGE-14-CWP, p. 210, says that SDG&E "will systematically inspect all distribution lines and poles ...that...lie within the Avian Protection Zone" and then modify its system as needed.

a. For each of the years 2012-2017, what percentage of the lines and poles that lie within the Avian Protection Zone" were inspected?

b. For each of the years 2012-2017, what percentage of the lines and poles that lie within the Avian Protection Zone" had needed mitigation completed?

c. For each of the years 2018-22, what is SDG&E's forecast for the percentage of the lines and poles that lie within the Avian Protection Zone" that will be inspected?

d. For each of the years 2018-22, what is SDG&E's forecast for the percentage of the lines and poles that lie within the Avian Protection Zone" that will have the needed mitigation completed?

e. When does SDG&E anticipate completing inspection of all lines and poles within the Avian Protection Zone?

f. When does SDG&E anticipate completing all required mitigation work under this program?

SDG&E Response 80:

a. On average, SDG&E inspects approximately (0.6%) 250 poles of the approximately 40,000 poles in the Avian Protection Zone per year.

b. On average, SDG&E completes mitigation plans on approximately (0.25%) 100 poles in the Avian Protection Zone per year.

c. SDG&E does not expect to deviate from the average of poles inspected in the Avian Protection Zone, therefore (0.6%) 250 poles is a good approximation per year from 2018 to 2022.

d. SDG&E does not expect to deviate from the average of poles mitigated in the Avian Protection Zone, therefore (0.25%) 100 poles is a good approximation per year from 2018 to 2022.

e. SDG&E is required to perform ongoing inspections in the Avian Protection Zone, so there is no current completion date of this program.

SDG&E Response 80 Continued:

f. See response in e. Since this program is ongoing, mitigation plans will continue as long as the program exists.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

81. Ex. SDGE-14-CWP, p. 236, shows past and forecasted spending for budget code 87232, annual pole replacement.

a. Please explain why SDG&E forecasts labor costs in 2017-2019 at the average of 2012-2016 costs, when labor costs rose every year from 2012-2016? Why did SDG&E not use a trended forecast?

b. Please confirm that SDG&E is forecasting a 26.5% drop from 2016 to 2017 in labor costs, to the lowest level since 2013.

c. Please provide actual labor, and non-labor, costs for BC87232 for 2017.

d. Please provide the actual number of wood pole replacements under this program for each year from 20112-2017, inclusive (actual data) and for each year from 2018-22, inclusive (forecasted data).

SDG&E Response 81:

a. The forecast methodology uses escalated values such that all historic and forecast costs are in 2016$, this incorporates labor escalation. SDG&E believes an average is more appropriate for this budget than a trend, because pole replacements are not driven by a function such as customer growth.

b. Correct.

c. 2017 data is not yet available.

d. The number of poles replaced from 2012 to 2017 are shown below. Forecasted numbers are not currently available, as the number of poles replaced are derived from field inspections.

# of pole replacements	2012	2013	2014	2015	2016	2017
	804	1,142	1,156	1,088	931	991

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

82. SDG&E has multiple programs that result in wood pole removal (e.g. wood-to steel conversions) or wood pole replacement. These include at least CMP, FiRM, PRiME, EII, CIP-driven replacements, CNF-required removals, and possibly others. Please provide a table showing:

a. Each SDG&E program which results in wood pole removal or replacement

b. For each year from 2012-2017, the number of wood distribution poles actually removed or replaced under that program

c. For each year from 2018-22, SDG&E's forecast of the number of wood distribution poles to be removed or replaced under that program

d. For SDG&E as a whole, for each year from 2012-2017, the number of wood distribution poles actually removed

e. For SDG&E as a whole, for each year from 2018-22, SDG&E's forecast of the number of wood distribution poles to be removed or replaced

f. a split of the data provided in subsections b-e of this question, between poles in fire zones and poles in non-fire zones.

g. SDG&E's expectation of the average life expectancy for a wood distribution pole

SDG&E Response 82:

a. SDG&E has multiple projects and initiatives that focus on wood pole removals and/or replacements/conversions. These include but are not limited to the following projects or programs:
   - CMP
   - FiRM
   - PRiME
   - EII
   - CIP
   - CNF Project
   - Other Wood to Steel, Fire Hardening or Conversion Projects

SDG&E Response 82 Continued:

b. These are approximate counts of SDG&E owned wood distribution-only (including stub) poles that were removed between 2012 and 2017. These wood poles could have been replaced by steel poles or could have been removed due to UG conversion or other reasons.

Approximate Number of Removed or Replaced Poles – 2012-2017

Year	SDG&E Total[1]	FiRM	CIP	CNF	PRiME
2017	3,112	1,732	0	84	0
2016	3,354	1,410	0	3	0
2015	3,921	1,883	0	0	0
2014	2,572	393	0	0	0
2013	3,123	43	0	0	0
2012	1,249	0	0	0	0
Total	**17,331**	**0**	**0**	**87**	**0**

c. Forecasted number of wood distribution poles to be removed or replaced is estimated below:

Approximate Number of Poles to be Removed or Replaced – 2018-2022

Year	FiRM	CIP	CNF	PRiME	Total[2]
2018	1841	250	381	112	2584
2019	1841	250	289	1582	3962
2020	1841	250	287	1582	3960
2021	1841	250	0	1582	3673
2022	1841	250	0	1582	3673
Total	**9205**	**1250**	**957**	**6440**	**17852**

d. See response b

e. The total anticipated distribution wood pole removal or replacements for all of SDG&E is not available but the table in response c includes projects or initiatives previously identified in this data request.

[1] This includes removals or replacements that may not associated with project or initiatives identified in question 82.
[2] This total only includes pole counts from FiRM, CIP, CNF and PRiME and may not include other SDG&E related removals or replacements associated with other projects or initiatives.

SDG&E Response 82 Continued:

f. Fire related initiatives including FiRM and CNF will be primarily removing or replacing poles all within the fire threat areas. PRiME related removals or replacements will be dependent upon ongoing analysis. It is not anticipated that any poles in the fire threat areas will be replaced due to CIP projects as the communication companies tend to target densely populated urban areas.

g. SDG&E objects to this request on the grounds that it is vague and ambiguous as to the term "average life expectancy." Subject to and without waiving this objection, SDG&E responds as follows: Distribution poles are capitalized to FERC Account E364 – Poles, Towers, and Fixtures. Per Exhibit SDG&E-34-R (Revised Direct Testimony of Matthew Vanderbilt) at MCV-22, the proposed average service life for assets in FERC Account E364 is 48 2/3 years. Please refer to Exhibit SDG&E-34-R at page MCV-22 for more information. Actual distribution pole life depends on a number of factors, including but not limited to, species, treatment type, location, above and below grade site conditions and maintenance.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

83. SDG&E says it has about 230,000 total poles (Ex. SDGE-14-CWP, p. 182; although Ex. SDGE-15, p. 1 says 225,697 poles), including 200,000 wood poles of which 170,000 are in non-fire zones (Ex. SDGE-14, p. 123; Ex. SDGE-15, p. 23). Please provide an age distribution table, in Excel format, showing (as of year-end 2017):

a. The total number of wood distribution poles on SDG&E's system, the number of wood distribution poles on SDG&E's system that were installed in 2017, the number installed in 2016, and so on back to the earliest year of installation for poles still in service.

b. A split of the data provided in subsection (a) of this question, between poles in fire zones and poles not in fire zones.

SDG&E Response 83:

These are approximate counts of SDG&E owned wood distribution-only (including stub) poles that are currently in the database categorized by installation year. Last two columns identify the number of poles that are inside the Highest Risk Fire Area (HRFA) and Outside.

YEAR	POLECOUNT	HRFA	OUTSIDE HRFA
2017	798	2	796
2016	1,320	5	1,315
2015	886	1	885
2014	1,073	11	1,062
2013	1,520	22	1,498
2012	853	39	814
2011	1,058	217	841
2010	2,208	613	1,595
2009	2,498	595	1,903
2008	2,308	432	1,876
2007	3,626	1,448	2,178
2006	2,271	452	1,819
2005	2,282	470	1,812
2004	2,575	808	1,767
2003	3,177	1,227	1,950
2002	2,283	374	1,909
2001	1,996	441	1,555
2000	1,948	237	1,711
1999	1,476	252	1,224
1998	1,664	279	1,385
1997	1,422	322	1,100

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

YEAR	POLECOUNT	HRFA	OUTSIDE HRFA
1996	1,575	294	1,281
1995	1,619	455	1,164
1994	1,704	405	1,299
1993	1,941	355	1,586
1992	2,204	424	1,780
1991	2,173	583	1,590
1990	2,328	659	1,669
1989	1,825	481	1,344
1988	2,421	669	1,752
1987	2,205	494	1,711
1986	2,195	484	1,711
1985	2,317	546	1,771
1984	2,093	533	1,560
1983	1,825	510	1,315
1982	2,206	504	1,702
1981	3,529	1,412	2,117
1980	2,224	549	1,675
1979	2,092	501	1,591
1978	3,128	828	2,300
1977	1,991	527	1,464
1976	2,276	509	1,767
1975	2,492	616	1,876
1974	2,592	675	1,917
1973	3,249	810	2,439
1972	2,878	661	2,217
1971	2,507	332	2,175
1970	2,905	515	2,390
1969	2,465	248	2,217
1968	2,359	220	2,139
1967	2,267	295	1,972
1966	2,431	253	2,178
1965	2,797	243	2,554
1964	3,052	217	2,835
1963	2,909	215	2,694
1962	3,078	147	2,931
1961	3,433	285	3,148
1960	4,567	221	4,346
1959	6,088	232	5,856
1958	5,175	224	4,951
1957	4,094	205	3,889
1956	4,129	203	3,926
1955	3,815	285	3,530

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

YEAR	POLECOUNT	HRFA	OUTSIDE HRFA
1954	3,103	192	2,911
1953	4,133	250	3,883
1952	2,812	181	2,631
1951	3,270	157	3,113
1950	2,738	213	2,525
1949	2,648	311	2,337
1948	3,044	358	2,686
1947	1,961	365	1,596
1946	888	88	800
1945	519	58	461
1944	428	15	413
1943	316	18	298
1942	473	11	462
1941	1,160	113	1,047
1940	472	104	368
1939	342	17	325
1938	328	26	302
1937	190	11	179
1936	144	6	138
1935	43	1	42
1934	24	4	20
1933	23	1	22
1932	21	3	18
1931	24	3	21
1930	50	3	47
1929	63		63
1928	53	1	52
1927	68	7	61
1926	69		69
1925	36	1	35
1924	26	1	25
1923	13		13
1922	18		18
1921	2		2
1920	7	3	4
1919	2		2
1918	1		1
1917	23		23
1916	4		4
1912	2		2
1910	1	1	
1908	1		1

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

YEAR	POLECOUNT	HRFA	OUTSIDE HRFA
1907	1		1
1906	1		1
1905	2	1	1
1904	1		1
1903	2		2
1900	4		4
UNKNOWN	684	40	644
Total	184,635	29,595	154,356

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

84. Please explain how SDG&E spent negative $3 million for electric meters and regulators in 2017, and negative $5.3 million in November and December 2016, as shown in Ex. SDGE-14-CWP, pp. 253, 256, and 257.

SDG&E Response 84:

In 2016, SDG&E used 2015 as a proxy as actual recorded data was not available at the time initial forecasting was performed. To estimate 2016 values, an adjustment was made to the 2015 proxy value resulting in the negative number shown. The adjustment should have been deleted once 2016 data was available, although the forecast did not rely on historical data. The correct actual recorded 2016 value without the adjustments was $2,370,851.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

85. SDG&E requests $4-6 million per year for both new and replacement meters and regulators (Ex. SDGE-14, p. 54). SDG&E says the forecasted requirements are zero-based, "based on detailed cost estimates that were developed based on the specific scope of work" (Ex. SCG-14-CWP, p. 254). With regard to meters only, please provide:

a. The number of meters installed on the SDG&E system as of year-end 2017.

b. The expected average life of a meter

c. The expected number of meter replacements required in each of the years 2018-22, inclusive.

d. The average unit cost of meters

e. The expected number of meters in inventory at SDG&E's electric distribution service centers as of the beginning of each year from 2018-2022, inclusive.

SDG&E Response 85:

a. The total active electric meters as of December 31st 2017 was 1,457,866.

b. SDG&E objects to this request on the grounds that it is vague and ambiguous as to the term "expected average life." Subject to and without waiving this objection, SDG&E responds as follows: Electric Smart Meters are capitalized to FERC Account E370.11 – Smart Meters. Per Exhibit SDG&E-34-R (Revised Direct Testimony of Matthew Vanderbilt) at MCV-25, the proposed average service life for assets in FERC Account E370.11 is 15 years. Please refer to Exhibit SDG&E-34-R at page MCV-25 for more information.

c. SDG&E currently does not forecast the amount of meters required for replacement per year.

d. The average unit cost of a meter is $361.20.

e. Meters are purchased based on historical usage and demand which is driven by jobs for new construction and change outs. Inventory is dynamic, therefore we cannot forecast inventory balance for any particular year.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

86. SDG&E seeks 20.7 - $21.7 million per year in 2017-2019 for distribution transformers (Ex. SDGE-14, p. 55). The budget is zero-based (Ex. SDGE-14, p. 55; Ex. SDGE-14-CWP, pp. 262, 263). Please provide:

a. The number of distribution transformers installed on the SDG&E system as of year-end 2017.

b. The expected average life of a distribution transformer

c. The actual number of distribution transformer replacements in each of the years 2012-2017, inclusive, and the expected number of distribution transformer replacements in each of the years 2018-22, inclusive.

d. The average unit cost of distribution transformers

e. The actual number of distribution transformers in inventory at SDG&E's electric distribution service centers as of the beginning of each year from 2012-2018, inclusive.

f. The expected number of distribution transformers in inventory at SDG&E's electric distribution service centers as of the beginning of each year from 2019-2022, inclusive.

g. An age distribution table, in Excel format, showing (as of year-end 2017): The total number of distribution transformers on SDG&E's system, the number of distribution transformers on SDG&E's system that were installed in 2017, the number installed in 2016, and so on back to the earliest year of installation for distribution transformer still in service.

SDG&E Response 86:

a. There are 167,208 distribution transformers on the SDG&E system.

b. SDG&E objects to this request on the grounds that it is vague and ambiguous as to the term "expected average life." Subject to and without waiving this objection, SDG&E responds as follows: Distribution transformers are capitalized to FERC Account E368.10 – Line Transformers. Per Exhibit SDG&E-34-R (Revised Direct Testimony of Matthew Vanderbilt) at MCV-23, the proposed average service life for assets in FERC Account E368.10 is 34 1/3 years. Please refer to Exhibit SDG&E-34-R at page MCV-23 for more information.

SDG&E Response 86 Continued:

c. Replacement below:

Year	Total
2012	4,342
2013	3,839
2014	3,805
2015	4,326
2016	4,814
2017	4,036
Grand Total	25,162

d. The average unit cost of a distribution transformer is $7,061.18.

e. Transformers are purchased based on historical usage and demand which is driven by jobs for new construction and change outs. Inventory is dynamic, therefore we cannot retroactively look up inventory balance for any particular year.

f. Transformers are purchased based on historical usage and demand which is driven by jobs for new construction and change outs. Inventory is dynamic, therefore we cannot forecast inventory balance for any particular year.

g. Please refer to "CUE DR02 Q77-135 Transformer Installations.xlsx".

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

87. Engineering overheads are subdivided into four separate pools, each described as "derived from the Base Year expenditures" (Ex. SDG&E-14-CWP, pp. 385, 397, 407, 417). In each case, the forecast is apparently a percentage of a subset of SDG&E's direct capital expenditures, but how that subset is determined, exactly what it includes, and what percentage adder is used for each overhead pool is not shown (Ex. SDGE-14-CWP, pp. 394, 404, 414, 422).

a. Please provide further documentation as to how the various overhead amounts are calculated, sufficient to enable SDG&E's results to be replicated.

b. As an alternative to subpart (a) of this question, please indicate for each budget code in Ex. SDGE-14-CWP that is not a new business code, the percentage that needs to be added to the costs shown for that code to account for its share of overhead pool costs.

SDG&E Response 87:

a. For workpapers, calculations, and assumption please refer to the accompanying Excel file “CUE DR02 Q77-135 OH Pools Supporting Tables.xlsx”.

b. For workpapers, calculations, and assumption please refer to the accompanying Excel file “CUE DR02 Q77-135 OH Pools Supporting Tables.xlsx”.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

88. Ex. SDGE-14-CWP, p. 437, shows historical and forecasted expenditures for budget code 226, management of OH distribution service, which is described as including installation of both fault indicators and fuses. Past SCE and PG&E GRCs have described both fault indicators and fuses as highly cost-effective means of improving reliability.

a. For each of the years 2012-2017, please provide the annual number of fuses and the annual number of fault indicators added to the SDG&E OH distribution system.

b. As of year-end 2017, how many fault indicators and how many fuses were installed on the SDG&E OH distribution system?

c. For each of the years 2018-2022, inclusive, how many fuses and how many fault indicators does SDG&E expect to add to its OH distribution system?

d. Please provide SDG&E's best estimate of the SAIDI and SAIFI reductions in each of the years 2012-2022 due to having fuses on its OH distribution system (i.e., how much higher would SAIDI and SAIFI each have been without fuses?

e. Please provide SDG&E's best estimate of the SAIDI and SAIFI reductions in each of the years 2012-2022 due to having fault indicators on its OH distribution system (i.e., how much higher would SAIDI and SAIFI each have been without fault indicators?

f. Please provide any analyses SDG&E has in its possession as to the benefit/cost ratio of the fuses and/or fault indicators on its OH distribution system.

g. Please provide any analyses SDG&E has in its possession as to the benefit/cost ratio of the fuses and/or fault indicators it proposes to add to its OH distribution system during this GRC cycle or any individual year(s) of this cycle.

SDG&E Response 88:

SDG&E objects to this request to the extent that it assumes mistaken facts. Subject to and without waiving this objection, SDG&E states as follows: SDG&E maintains separate capital budgets that specifically target the proactive installation of fault indicators and fuses. Budget 226 is not one of those budgets.

a. With respect to fusing, the table below indicates the total number of fusing requested done per year. SDG&E does not track fusing requests to allow the differentiation of OH from UG, new installation from existing fuse revision or budget allocation.

SDG&E Response 88 continued:

Year	2012	2013	2014	2015	2016	2017
Fuse Request	1,106	1,281	1,150	1,176	1,281	1,299

SDG&E does not track the reactive installation of OH fault indicators on budget 226 as the clear majority are captured on the specific budget for proactive installation of OH fault indicators.

b. Please see response to a.

c. Budget 226 is a reactive budget and only addresses issues in real time as they are identified. Fuses and fault indicators are not proactively planned on this budget.

d. This budget is reactive, which only installs fuses as needed. This budget is responsible for a very small portion of the overall fuses installed on the system. The overall impacts to SAIDI and SAIFI resulting from this budget with respect to the reactive install of fuses is negligible.

e. The purpose of fault indicators is to reduce the time required to locate faulted equipment which directly results in the quicker restoration of customers, positively impacting SAIDI. On average, the time taken to locate the faulted equipment is decreased by 25 -35% with the use of fault indicators. This budget is reactive, which only installs fault indicators as needed to address known issues. It is responsible for a very small portion of the overall OH fault indicators installed on the system. The overall impacts to SAIDI and SAIFI resulting from this budget with respect to the reactive install of fault indicators is negligible.

f. For this reactive budget, there is no Cost/Benefit analysis conducted for the installation of fuses and/or fault indicators.

g. For this reactive budget, there is no Cost/Benefit analysis conducted for the installation of fuses and/or fault indicators.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

89. Ex. SDGE-14-CWP, p. 445, shows historical and forecasted expenditures for budget code 227, management of UG distribution service, which is described as including installation of both fault indicators and fuses. Past SCE and PG&E GRCs have described both fault indicators and fuses as highly cost-effective means of improving reliability.

a. For each of the years 2012-2017, please provide the annual number of fuses and the annual number of fault indicators added to the SDG&E UG distribution system.

b. As of year-end 2017, how many fault indicators and how many fuses were installed on the SDG&E UG distribution system?

c. For each of the years 2018-2022, inclusive, how many fuses and how many fault indicators does SDG&E expect to add to its UG distribution system?

d. Please provide SDG&E's best estimate of the SAIDI and SAIFI reductions in each of the years 2012-2022 due to having fuses on its UG distribution system (i.e., how much higher would SAIDI and SAIFI each have been without fuses?

e. Please provide SDG&E's best estimate of the SAIDI and SAIFI reductions in each of the years 2012-2022 due to having fault indicators on its UG distribution system (i.e., how much higher would SAIDI and SAIFI each have been without fault indicators?

f. Please provide any analyses SDG&E has in its possession as to the benefit/cost ratio of the fuses and/or fault indicators on its UG distribution system.

g. Please provide any analyses SDG&E has in its possession as to the benefit/cost ratio of the fuses and/or fault indicators it proposes to add to its UG distribution system during this GRC cycle or any individual year(s) of this cycle.

SDG&E Response 89:

SDG&E objects to this request to the extent that it assumes mistaken facts. Subject to and without waiving this objection, SDG&E states as follows: SDGE maintains separate capital budgets that specifically target the proactive installation of fault indicators and fuses. Budget 227 is not one of those budgets.

a. With respect to fusing, the table indicates the total number of fusing requested done per year. SDG&E does not track fusing requests to allow the differentiation of OH from UG, new installation from existing fuse revision or budget allocation.

SDG&E Response 89 Continued:

Year	2012	2013	2014	2015	2016	2017
Fuse Request	1,106	1,281	1,150	1,176	1,281	1,299

With respect to UG fault indicators, the table indicates the total number of UG fault indicators installed per year system wide. SDG&E does not track UG fault indicators to allow the differentiation of budget allocation.

Year	2012	2013	2014	2015	2016	2017
UG FI	121	13	32	149	70	201

b. Please see response to a.

c. Budget 227 is a reactive budget and only addresses issues in real time as they are identified. Fuses and fault indicators are not proactively planned on this budget.

d. This budget is reactive, which only installs fuses as needed. This budget is responsible for a very small portion of the overall fuses installed on the system. The overall impacts to SAIDI and SAIFI resulting from this budget with respect to the reactive install of fuses is negligible.

e. The purpose of fault indicators is to reduce the time required to locate faulted equipment which directly results in the quicker restoration of customers, positively impacting SAIDI. On average, the time taken to locate the faulted equipment is decreased by 25 -35% with the use of fault indicators. This budget is reactive, which only installs fault indicators as needed to address known issues. This budget is responsible for a very small portion of the overall UG fault indicators installed on the system. The overall impacts to SAIDI and SAIFI resulting from this budget with respect to the reactive install of fault indicators is negligible.

f. For this reactive budget, there is no Cost/Benefit analysis conducted for the installation of fuses and/or fault indicators.

g. For this reactive budget, there is no Cost/Benefit analysis conducted for the installation of fuses and/or fault indicators.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

90. Ex. SDGE-14-CWP, p. 453, shows historical and forecasted expenditures for budget code 230, Replacement of UG Cables - RAMP, which consists of proactive replacement of some of SDG&E's "85 circuit miles of unjacketed feeder cable and 1809 miles of unjacketed lateral cable."

a. Please provide a table showing the following date, for each year from 2012-2017 (actuals) and 2018-2022 (forecasts):

i. Miles of unjacketed feeder cable replaced proactively

ii. Miles of unjacketed feeder cable replaced reactively after failure

iii. Miles of unjacketed lateral cable replaced proactively

iv. Miles of unjacketed lateral cable replaced reactively after failure

v. SAIDI due to unjacketed feeder cable failures

vi. SAIFI due to unjacketed feeder cable failures

viii. SAIDI due to unjacketed lateral cable failures

ix. SAIFI due to unjacketed lateral cable failures

b. As of yearend 2017:

i. How many miles of unjacketed feeder cable remain on SDG&E's system?

ii. How many miles of unjacketed lateral cable remain on SDG&E's system?

iii. What is the average age of the unjacketed feeder cable on SDG&E's system?

iv. What is the average age of the unjacketed lateral cable on SDG&E's system?
v. How old are the oldest and youngest unjacketed feeder cables on SDG&E's system?

vi. How old are the oldest and youngest unjacketed lateral cables on SDG&E's system?

SDG&E Question 90 continued:

c. By what year(s) does SDG&E plan to finish removal of all

i. unjacketed feeder cable on its system?

ii. unjacketed lateral cable on its system?

d. What is SDG&E's best estimate of the average expected service lives of

i. Unjacketed feeder cable

ii. Unjacketed lateral cable

e. Please provide any data SDG&E has (e.g. Weibull curves) as to the failure rate of UG cable as a function of its age for:

i. UG cable in general

ii. Jacketed UG cable

iii. Unjacketed UG cable

iv. Unjacketed UG feeder cable

v. Unjacketed UG lateral cable

SDG&E Response 90:

a.

i. See accompanying document "CUE DR02 Q77-135 Unjacketed Cable Replacement_2012_2022.xlsx"

ii. See accompanying document "CUE DR02 Q77-135 Unjacketed Cable Replacement_2012_2022.xlsx"

iii. See accompanying document "CUE DR02 Q77-135 Unjacketed Cable Replacement_2012_2022.xlsx"

iv. See accompanying document "CUE DR02 Q77-135 Unjacketed Cable Replacement_2012_2022.xlsx"

SDG&E Response 90 Continued:

v. SDG&E does not track SAIDI and SAIFI totals by unjacketed vs. jacketed cable failure. Total SAIDI and SAIFI for feeder failures in years 2012-2016 due to faulted cable are listed below. Year 2017 is not yet available.

Excludes Momentary & MED

UG Cable - Feeder		
Year	**SAIDI**	**SAIFI**
2012	4.27	0.0428
2013	4.63	0.0405
2014	3.45	0.0335
2015	4.83	0.0523
2016	4.17	0.0404

vi. See response in a.v.

viii. SDG&E does not track SAIDI and SAIFI totals by unjacketed vs. jacketed cable failure. Total SAIDI and SAIFI for lateral failures in years 2012-2016 due to faulted cable are listed below. Year 2017 is not yet available.

Excludes momentary & MED

UG Cable - Lateral		
Year	**SAIDI**	**SAIFI**
2012	14.65	0.0592
2013	11.00	0.0515
2014	13.21	0.0621
2015	10.24	0.0495
2016	10.27	0.0476

ix. See response to a.v.

b.

i. SDG&E has not differentiated the remaining unjacketed v. jacketed feeder cable miles in its last update. The total miles of unjacketed cable in SDG&E's system (mid-year 2017) is 1,639 miles.

SDG&E Response 90 Continued:

ii. See response to b.i.

iii. This information is not available.

iv. This information is not available.

v. The oldest is 1963. The youngest is 1979.

vi. The oldest is 1963. The youngest is 1984.

c.

i. Based on the current pace of removal of unjacketed cable, SDG&E expects to remove all unjacketed cable from its system by years 2040-2045. Feeder and lateral cable are not distinguished individually as SDG&E prioritizes cable replacement projects by the benefits for replacing each individual run of cable based on its system reliability risk.

ii. See response to c.i.

d.

i. SDG&E objects to this request on the grounds that it is vague and ambiguous as to the term "average expected service lives." Subject to and without waiving this objection, SDG&E responds as follows: Distribution cables are capitalized to FERC Account E367 – Underground Conductors & Devices. Per Exhibit SDG&E-34-R (Revised Direct Testimony of Matthew Vanderbilt) at MCV-23, the proposed average service life for assets in FERC Account E367 is 49 years. Please refer to Exhibit SDG&E-34-R at page MCV-23 for more information.

ii. See response to d.i.

e.

i. This information is not available.

ii. This information is not available.

iii. HMWPE - .109 failures/conductor mile, XLPE - .38 failures/conductor mile

iv. HMWPE - .102 failures/conductor mile, XLPE - .087 failures/conductor mile

v. HMWPE - .122 failures/conductor mile, XLPE - .538 failures/conductor mile

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

91. Please provide the "current detailed estimate" and the "new cable lifecycle update" referenced on Ex. SDGE-14-CWP, p. 455.

SDG&E Response 91:

The current detailed estimate for the replacement of underground cable is a 5-year average. Based on the 5-year average, the funding of the budget surpasses the lifecycle of the cable. In an effort to slowly trend towards the cable service life, SDG&E proposed an increase to the budget to replace additional miles of cable at an increased cost as shown in SDGE-14-CWP, p. 455.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

92. Please provide the expected unit cost per mile for:

a. Unjacketed feeder cable replaced under budget code 230

b. Unjacketed lateral cable replaced under budget code 230

SDG&E Response 92:

a. In 2016 the direct cost was $396,000 per mile.
b. In 2016 the direct cost was $92,000 per mile.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

93. Please provide a description of the work scope (including any miles of UG cable replacements, by cable type) for the $10.5 million proposed 2018 expenditure for a "Downtown Substation" (Ex. SDGE-14-CWP, pp. 455, 461), and identify any other places in SDG&E's workpapers where expenditures for the "Downtown Substation" are included.

SDG&E Response 93:

The costs presented in the 2017, 2018, and 2019 forecast for the Downtown Substation are for the distribution component of the land purchase only. Detailed engineering, equipment/material procurement, and construction have not been fully estimated, as the project is still in preliminary stages of engineering.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

94. SDG&E says it has 85 circuit miles of unjacketed feeder cable and 1809 miles of unjacketed lateral cable (Ex. SDGE-14, p. 81; Ex. SDGE-14-CWP, p. 453). It says that 1639 circuit miles of those total 1894 miles are "high-failure rate unjacketed cable" which has caused quarter of all distribution outage minutes in the last 5 years (Ex. SDGE-14, p. 75).

a. Please provide the number of miles of unjacketed feeder cable and the number of miles of unjacketed lateral cable that are "high-failure rate unjacketed cable" as of the end of 2017.

b. When and how does SDG&E propose to replace the 1894 - 1639 = 255 miles of unjacketed cable that are not "high-failure rate"?

SDG&E Response 94:

a. There is an error in the workpapers; 1639 miles of unjacketed UG cable stated in the testimony is correct. 1809 miles of unjacketed cable is a value from a prior period, and should be corrected to read “1639.” All 1639 miles of the unjacketed cable is considered high failure rate.
b. See response to a.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

95. Please further explain the "Explanation" in the last line of text on Ex. SDGE-14-CWP, p. 457, which seems to imply that the 2016 data in the workpapers is only based on 10 months of actual data.

SDG&E Response 95:

The data shown in the work papers for 2016 is based on 12 months actual recorded. The note shown was made during early forecasting efforts, and should have been removed.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

96. Please provide the actual expenditures for budget code 230 for the years 2016 and 2017.

SDG&E Response 96:

Actual expenditures for 2016 have been detailed and provided in the budget work papers. 2017 data is not yet available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

97. Please explain the negative values for 2012-2016 non-labor expenditures for restoration of service shown in Ex. SDGE-14-CWP, pp. 464 and 469.

SDG&E Response 97:

The negative values attributed to this budget are primarily revenues from salvage .

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

98. Ex. SDGE-14-CWP, p. 473, contains SDG&E's description of the proposed Pt. Loma substation rebuild.

a. Please provide the "full write-up" that SDG&E says "can be found on CBD."

b. Please provide the full table(s) of substation data that is the basis for the statements that the Pt. Loma substation "was originally built over 60 years ago" and "ranks in the ... upper fifth percentile of poor performing substations."

SDG&E Response 98:

This response contains Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023 and is provided under separate cover.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

99. Ex. SDGE-14-CWP, p. 479 appears to say that the Pt. Loma substation rebuild will remove and not replace the 4 kV equipment there, thus eliminating Pt. Loma as a 4kV substation.

a. Is this a correct reading?

b. If so, is this one of the 4 kV substation elimination projects discussed elsewhere by SDG&E (e.g., Ex. SDGE-14, pp. 84-85 and Ex. SDGE-4-CWP, p. 489), or is this in addition to those projects?

SDG&E Response 99:

a. This project replaced the 4kV substation equipment with distribution 12/4kV padmount equipment.

b. These 12/4kV padmounts will be on the list to cutover entirely to 12kV.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

100. Please explain how SDG&E can have negative expenditures for emergency substation equipment, for both labor and non-labor in 2017 and 2019, as shown in Ex. SDGE-14-CWP, p. 483.

SDG&E Response 100:

The negative values were initial values applied incorrectly to this budget, this has been corrected in the revised workpaper volume SDG&E-14-CWP-R at page 483.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

101. SDG&E says that half of its 4 kV substations are over 50 years old, and it plans to replace them all over the next 27 years, thereby improving both safety and reliability (Ex. SDGE-14, pp. 84-85). More specifically, it says that 22 out of 36 4 kV substations are over 40 years old (Ex. SDGE-14-CWP, p. 489. The budget for 4kV substation elimination is zero in 2017, $9 million in 2018, and $11.4 million in 2019 (Ex. SDGE-14, p. 84; Ex. SDGE-14-CWP, p. 489). Please provide a listing of the 36 4 kV substations, in Excel format, with the following information for each 4 kV substation. Note that equivalent information was supplied by SCE in its TY2018 GRC application for its 4KV elimination program.

a. Substation name

b. Substation installation year

c. Each transformer at the substation, showing its high-side voltage and its year of installation

d. Number of 4 kV circuits served by the substation

e. Planned year of elimination

f. Forecasted cost of elimination

g. Average SAIDI and SAIFI associated with the substation in 2012-17

h. Expected reduction in SAIDI and SAIFI after substation elimination

i. Any benefit/cost analysis SDG&E has performed for elimination of that substation

SDG&E Response 101:

a. See the accompanying Excel worksheet "CUE DR02 Q77-135 4kV Transformers.xlsx".
b. See the accompanying Excel worksheet "CUE DR02 Q77-135 4kV Transformers.xlsx".
c. See the accompanying Excel worksheet "CUE DR02 Q77-135 4kV Transformers.xlsx".
d. See the accompanying Excel worksheet "CUE DR02 Q77-135 4kV Transformers.xlsx".
e. See the accompanying Excel worksheet "CUE DR02 Q77-135 4kV Transformers.xlsx".

SDG&E Response 101 Continued:

f. See the accompanying Excel worksheet "CUE DR02 Q77-135 4kV Transformers.xlsx".

g. Below is a table showing average SAIDI/SAIFI metrics for 4kV substations as a part of this budget from 2012 to 2016. 2017 numbers are not yet available.

Substation		2012-2016 Ave	
		SAIDI	SAIFI
BA	BOSTONIA	0.054	0.00008
CV	CHULA VISTA	0.026	0.00012
ESCO	ESCO	0.004	0.00018
HP	HILLTOP	0.002	0.00018
NC	NATIONAL CITY	0.008	0.00008
PL	POINT LOMA	0.128	0.00062
SC	SAN CLEMENTE	0.040	0.00042
SF	RANCHO SANTA FE	0.016	0.00004
SHC	SHORECLIFFS	0.032	0.00012
SSC	SO. SAN CLEMENTE	0.010	0.00012

h. SDG&E expects to see the above SAIDI and SAIFI reduction per substation elimination.

i. Enterprise cost-benefit analyses were performed for entire 4kV infrastructure, itemized by circuit with included costs of substation removals. No standalone substation removal cost-benefit analyses were performed.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

102. Please provide documentation for the statements on Ex. SDGE-14-CWP, p. 496, that:

a. "OH 4 kV infrastructure is proven to be relatively more susceptible to wire down events than 12 kV"

b. "Both OH and UG 4 kV systems are antiquated"

c. "Several types of 4 kV equipment can no longer be stocked"

c. "4 kV is inherently less efficient than 12 kV by a factor of 9-10"

SDG&E Response 102:

a. The information below was summarized using data collected from mid-2011 through 2016. Some wire-down records were excluded due to data quality issues.

	4 kV	12 kV	Notes:
Total circuit miles of failed conductor	2.400378788	14.92310606	
Total circuit miles of conductor	583	5936	
# circuits	222	817	
# spans	21334	151232	
# wire down events*	67	313	
Ratio of failed to non-failed circuit miles	0.004117288	0.002514	Relative to 12 kV: 1.638
W/D per circuit	0.301801802	0.383108935	Relative to 12 kV: 0.788
W/D per foot conductor	2.17657E-05	9.98657E-06	Relative to 12 kV: 2.179
W/D per span	0.003140527	0.002069668	Relative to 12 kV: 1.517

b. Equipment that cannot be operated or maintained under modern safety practices could be considered antiquated. Such is the case with several types of 4 kV equipment. For example, on the overhead 4 kV system, brown clay cutouts (OH FMO Std. 1199.501-17C) were used along with World War II-era galvanized steel wire with copper coating. These cutout switches fall apart upon actuating and cannot be operated energized due to the potential to cause phase to ground faults. On the underground 4kV system, submersible D&W oil filled cutout switches (UG FMO Std. 4199.109) must be switched while de-energized, however are maintained while energized. This forces linemen to use extreme caution when replacing fuses due to the risk of picking up load.

SDG&E Response 102 Continued:

c. The equipment described in item b) above cannot be replace as manufacturers no longer produce them. Their replacements are modern 12 kV-rated devices; however, because 4 kV operates at higher current than 12 kV to serve an equivalent load, higher current rated 12 kV devices must be used in these applications, even though the voltage rating is well above the operational requirement, thus causing increased expense.

d. All electric conductors naturally exhibit power and energy losses as a factor of the operating current. This is determined by the equation $P_{LOSS} = I^2R$, where P is power in watts, I is current in amps, and R is resistance in ohms. To deliver an equivalent amount of power, e.g. 100 kW, the 12 kV power loss is calculated as such:

Assume resistance is 1 ohm.

$P_{DELIVERED, 3Ph} = 1.73*IV$, where V is the operating voltage.

Rearranging, for 12 kV, $I = P_{DELIVERED} / V = 100{,}000 \text{ W} / (12{,}470 * 1.73) \text{ V} = 4.63 \text{ A}$

The power losses in this 12 kV system would be calculated, generally, as:
$P_{LOSS, 12 kV} = 4.63^2*1 = \underline{21.44 \text{ W}}$

For a 4 kV system, $I = P_{DELIVERED} / V = 100{,}000 \text{ W} / (4{,}160 * 1.73) \text{ V} = 13.90 \text{ A}$

The power losses in this 4 kV system would be calculated, generally, as:
$P_{LOSS, 4 kV} = 13.90^2*1 = \underline{193.10 \text{ W}}$

To compute the ratio of 4 kV losses to 12 kV losses, divide 193.10 W by 21.44 W to arrive at 9.00. This ratio can be adjusted upward slightly to account for commonly low voltage issues that also can occur on 4 kV systems due to lack of voltage regulation during highly loaded conditions.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

103. In Ex. SDGE-14-CWP, pp. 513 and 519, SDG&E provides historical and forecast expenditures for budget code 11249, Install SCADA on Line Capacitors - RAMP, a program to "convert the existing 1404 line capacitors to SCADA control.

a. Please provide the number of SCADA conversions done in each of the years 2012-2017, inclusive.

b. How many of the 1404 line capacitors remain to be converted as of the end of 2017?

c. Please provide the forecasted number of SCADA conversions to be done in each of the years 2018-2022, inclusive.

d. By what year does SDG&E expect to complete converting all 1404 line capacitors to SCADA control?

e. Please explain the negative expenditure shown for the year 2015.

f. Please provide the "detailed cost estimates" and "specific scope of work" referenced on SDGE-14-CWP, p. 514.

SDG&E Response 103:

a.

2012 – 0
2013 – 0
2014 – 11
2015 – 4
2016 – 6
2017 – 12

b. 1,144 remaining capacitors to be upgraded to SCADA.

c.

2018 – 20
2019 – 20
2020 – 40
2021 – 40
2022 – 40

d. 2048 at 40/year rate after 2019.

SDG&E Response 103 Continued:

e. Negative expenditures resulted from previous duplicate charging of equipment to jobs. An adjustment account was created to remove the duplicate charges, and the totals adjusted for prior years ended up being more than the actual expenditures of jobs installing SCADA Capacitors for that year 2015.

f. See below for the cost estimate associated with budget code 11249. The goal of this project is to convert existing distribution line capacitors to SCADA control to provide improved VAR control, and improved system efficiency and operability. SCADA controls will also alert utility personnel of capacitor failures and/or fuse operations. This will increase capacitor bank safety and reliability, minimize downtime, and expedite repair work. These projects are prioritized by replacement of failed capacitors and replacing capacitors on circuits with the highest need of voltage support. The primary scope is to replace existing capacitors with SCADA controlled capacitors. Possible pole change-out is required based on pole loading calculations. Antennae will be required on the pole for SCADA communications.

11249 – Install SCADA Online Capacitors

Description	Unit	Quantity	Cost ($1000) (material, direct charges, contract costs)
Labor	HR	43,720	$2,186
Non-Labor	EA	1	$8,744
Total			$10,930

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

104. Ex. SDGE-14-CWP, p. 522, shows historical and forecasted expenditures for budget code 11253, wireless fault indicators. Past SCE and PG&E GRCs have described fault indicators as highly cost-effective means of improving reliability.

a. For each of the years 2012-2017, please provide the annual number of wireless fault indicators added to the SDG&E distribution system.

b. As of year-end 2017, how many wireless fault indicators were installed on the SDG&E distribution system?

c. For each of the years 2018-2022, inclusive, how many wireless fault indicators does SDG&E expect to add to its OH distribution system?

d. Please provide SDG&E's best estimate of the SAIDI and SAIFI reductions in each of the years 2012-2022 due to wireless fault indicators on its distribution system (i.e., how much higher would SAIDI and SAIFI each have been without wireless fault indicators?

e. Please provide any analyses SDG&E has in its possession as to the benefit/cost ratio of the wireless fault indicators on its distribution system.

f. Please provide any analyses SDG&E has in its possession as to the benefit/cost ratio of the wireless fault indicators it proposes to add to its distribution system during this GRC cycle or any individual year(s) of this cycle.

g. Please provide the "detailed cost estimates" and "specific scope of work" for wireless fault indicators referenced on Ex. SDGE-14-CWP, p. 523.

h. Please explain the negative $677K expenditures shown on Ex. SDGE-14-CWP, pp. 522 and 525.

SDG&E Response 104:

a. Below are the annual number of wireless fault indicators added to the SDG&E distribution system.

2012 – 2,230
2013 – 560
2014 – 237
2015 – 0
2016 – 10
2017 – 910

SDG&E Response 104 Continued:

b. 910 units were installed and operational at the end of 2017. All units installed previously were damaged during an over-the-air Firmware upgrade early in 2016. SDG&E plans to replace these damaged units.

c.

2018 – 2,500
2019 – 1,000
2020 – 1,000
2021 – 1,000
2021 – 1,000

d. SAIDI and SAIFI saving estimates have not been calculated.

e. Wireless Fault Indicators will reduce outage durations by allowing operators to dispatch troubleshooters to the affected section of the circuit. The 'heartbeat' feature of the wireless fault indicators gives the operators and troubleshooters confidence that the units' indication can be trusted. With manual indicators, there is much less confidence of accuracy. Inaccurate indication has led operators to close-in isolating devices multiple times causing undue stress on the circuit and extending the outage duration.

f. The new devices that will be rolled out in 2018 and beyond will have the added capability of recording load within 2% accuracy. This will allow our distribution planning engineers to better plan for the capacity and reliability of our system, even where there is no SCADA communications. The new devices will also be power harvesting, which should increase the useful life of the fault indicators.

g. Specific scope of work varies for each installation (equipment and structure changes required including telecom and system protection work), and is entered into our Work Order Request (WOR) form that provides detailed cost estimates for the specific work to be done.

h. Negative expenditures resulted from moving inventory back into stock after they had previously been charged to jobs that could not be completed.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

105. Please explain the $29-36 million per year "Contractor Safety Program" capital expenditures shown on SDGE-14-CWP, p. 541. What is this program, how many capital dollars is SDG&E planning to spend on it in 2017-2019, and where are those dollars found in SDG&E's workpapers?

SDG&E Response 105:

The contractor safety program is the safety oversight administered by a team of safety personnel of capital projects. The program also consists of administering and creating safety work standards and methods. All costs associated with the Contractor Safety Program are embedded within each ED Capital Budget. There is no separate budget which funds the Contractor Safety Program, as each ED Capital Budget is funded to pay for a part of the execution of said program. The forecast of $29 - $36 million per year represents an estimate of how much is being spent in total across all ED Capital Budgets to fund the Contractor Safety Program.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

106. SDG&E has a proposed program to increase the number of feeder isolation and tie SCADA switches (Ex. SDGE-14, p. 90). After spending zero in 2017, the program would ramp up to a capex level of $7.0 million/year in 2018 and 2019 (Ex. SWP-14-CWP, p. 545).

a. Is this program analogous to the program proposed in the TY2018 SCE GRC to move SCE's distribution system towards a "3-3" configuration (3 sectionalizing switches and 3 tie switches per circuit).

b. Please provide the "detailed cost estimates" and "specific scope of work" for this program referenced on Ex. SDGE-14-CWP, p. 544.

c. Please describe the ultimate scope of this program, in terms of the number and percentage of SDG&E distribution circuits to be affected, the number of switches to be installed, the duration of the program, and the year by which it is intended to be completed.

SDG&E Response 106:

a. SDG&E objects to this question to the extent that it seeks information not within SDG&E's knowledge and possession. SDG&E does not operate SCE's system nor prepare SCE's general rate case forecasts. Subject to and without waiving this objection, SDG&E responds as follows: SDG&E's program is similar in nature to providing a "3-3" circuit configuration in that the benefits of each SCADA fault isolating device are derived from preventing customers upstream of the isolating device from being interrupted by damage downstream of the device, and vice-versa by providing SCADA ties for customers downstream of SCADA devices for support if there is damage upstream. The more SCADA devices that are installed, the more precisely system operators can isolate and restore load, which will lead to improved reliability. However, as opposed to targeting 3 sectionalizing switches and 3 tie switches per circuit, SDG&E is targeting SCADA installations that maximize reliability benefits by installing proportionally more SCADA devices on circuits with more customers, as well as more SCADA devices on circuits with higher incidents of outages.

b. The cost estimate for budget 11267 is shown below. The scope of this project is to expand the installation of line devices with SCADA functionality, either via the upgrade of non-SCADA enabled devices or by installation of new SCADA devices.

SDG&E Response 106 Continued:

Description	Unit (FT, HR, EA)	Quantity	Cost ($1000) (material, direct charges, contract costs)
Labor	HR	35	$1,758
Materials	Per Site	20	$9,402
Communications	Per Site	20	$1,396
Removal	Per Site	20	$1,396
Total			$13,952

c. SCADA devices are now installed routinely as part of SDG&E's core business and will continue to do so indefinitely as long as SCADA benefits are identified during project scoping. This project (Budget Code 11267) covers 20 SCADA Sites between 2017 and 2019.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

107. PG&E has proposed, and described in its TY2017 GRC testimony, "FLISR" installations as a way to improve reliability. FLISR can involve fuses, fault detectors, switches, and SCADA, all the subject of SDG&E proposals, and of questions earlier in this data request set. PG&E has provided data showing very high SAIDI/SAIFI improvements due to FLISR.

a. Are SDG&E's various reliability improvement programs collectively equivalent to PG&E's FLISR installations?

b. Are their components of PG&E's FLISR programs which are not being implemented by SDG&E?

c. Please provide any aggregate historical or forecast data SDG&E has as to

i. the impact of its various distribution reliability programs on its SAIDO and/or SAIFI

ii. benefit/cost ratios for its various distribution reliability programs

SDG&E Response 107:

a. SDG&E objects to this question to the extent that it seeks information that is not within SDG&E's knowledge or possession. SDG&E does not operate PG&E's system or prepare PG&E's general rate case forecasts. Subject to and without waiving this objection, SDG&E responds as follows:
SDG&E has implemented a centralized FLSIR system utilizing existing and compatible SCADA devices that would be considered comparable to PG&E's FLSIR installations. SDG&E's reliability improvement programs that target SCADA upgrades and SCADA expansion are being leveraged by SDG&E's FLISR program. New SCADA installations represent the field hardware that send data to SDG&E's centralized FLISR controller. This data is required for FLISR to calculate and identify the location of the failed circuit and generate a switching plan to reroute power to the unaffected customers. The more SCADA devices that are installed, the more granular FLISR can isolate and restore load, which will lead to improved SAIDI. Additionally, when upgraded, legacy SCADA devices will provide additional data points to the FLISR system expanding its scope and capabilities. Installations of individual fuses and fault detectors are not part of SDG&E's FLISR program, but are addressed through SDG&E's wider reliability enhancement program.

b. SDG&E is unaware of any components of PG&E's FLISR program that are not being implemented by SDG&E.

SDG&E Response 107 Continued:

c. i. Historical reliability information can be found at: http://www.cpuc.ca.gov/General.aspx?id=4529

SDG&E's programs fall primarily into several categories:

- Expansion of SCADA systems and FLISR implementation
  - These systems reduce or eliminate impacts of initial restorations to customers
- Proactive Aging Infrastructure Replacement Programs
  - Reduce instances of equipment failure leading to customer outage

In recent history, investments that reduce restoration times, designed to improve SDG&E's reliability program have been offset by the implementation of practices designed to reduce SDG&E's wildfire risk. These practices, such as turning off reclosing on circuits in the fire threat zones, and requiring patrol before re-energizing circuits to prevent downed wires from igniting dry brush. Evidence of the increased restoration times can be found in SDG&E's annual report in the above link by focusing on CAIDI (average customer restoration times) in the NE and EA districts.

The reports show a variation in numbers from year to year. These fluctuations are normal, environment specific and are caused by rainfall, storm/wind events, and load peaks experienced from year to year that both cause outages directly and can trigger early equipment failure.

SCADA implementation is used industry-wide in order to decrease time in fault identification and to improve restoration response to electric outages. The implementation of SCADA fault isolating devices further expands automated isolation points in the system, preventing customers upstream of the isolating device from being interrupted by damage downstream of the device. Additionally, relay target information sends the Distribution Operations department identifying information about the nature of the damage and location, enabling quicker identification and ultimately restoration. When SCADA tie switches are paired with isolating devices, faster remotely operated restoration may occur to customers downstream of the isolating device during times of upstream failure. In this second scenario, the action is further enhanced with the implementation of Fault Location, Isolation, and Service Restoration (FLISR) technology. The technology performs these actions faster than a Distribution Operator normally could, reducing the sustained outage impact to a mere momentary outage (less than 5 minutes). Manual operation of devices to identify, isolate, and restore faults would range from 45 min. to 1.5 hours depending on conditions, response times, and outage traffic on the system. Net benefits to each

SDG&E Response 107 Continued:

individual circuit identified are based on the customer counts, electrical layout, and topography of the circuit.

ii. SDG&E does not have program-level benefit/cost analysis of its various distribution reliability programs, but instead models individual projects for benefit/costs in some programs. For these programs, it seeks a benefit of 1.0 or above in internally approving its projects and prioritizes the projects based on highest benefit to cost ratio.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

108. SDG&E proposes a program to improve detection of downed conductors (Ex. SDGE-14, p. 92), which would obviously improve safety, and would also improve reliability by shortening response time and perhaps shrinking the number of affected customers. However, the budget is only $0.3 million per year, which is in turn only 4 percent more than the 2012-16 average (Ex. SDGE-14-CWP. p. 554).

a. Is this program any more than an R&D or demonstration program?

b. The program is described as consisting of "new equipment or upgrades at substations within high risk fire areas" (Ex. SCG-14-CWP, p. 554). How many substations does SDG&E have within "high risk fire areas"?

c. For each year from 2012-2017, inclusive, how many substations in high risk fire areas had "enhanced ground fault detection schemes" installed?

d. As of the end of 2017, how many substations in high risk fire areas still had not had enhanced ground fault detection schemes installed?

e. For each year from 2018-22, inclusive, how many substations each year does SDG&E plan to install enhanced ground fault protection schemes at?

f. By what year, if ever, does SDG&E plan to have enhanced ground fault detection schemes installed at all of its substations in high risk fire areas?

g. Please provide the "detailed cost estimates" and "specific scope of work" for this program referenced on Ex. SDGE-14-CWP, p. 555.

SDG&E Response 108:

a. Yes, this project provides proven benefits by implementing a variety of off-the-shelf relays and SCADA controllers with modern algorithms designed to detect high impedance ground faults. These differ by vendor and may include:

    1. Automatically tracking the natural variation in load unbalance (which is seen at the SCADA site or relay as negative sequence current). The algorithm then varies the fault detection threshold real-time to account for load, essentially allowing for the relay to detect a sudden change in current and detect a high impedance ground fault.

    2. Detecting a downed or otherwise damaged line by measuring current spikes that indicate intermittent arcing typical of a high impedance ground fault. These types of algorithms tally the current spikes and isolate the apparent fault based on the number of spikes seen over time.

SDG&E Response 108 Continued:

3. Utilizing frequency and/or harmonic signatures seen on the distribution feeder using vendor patented technology.)

b. SDG&E owns and operates 12 substations that reside within SDG&E's High Risk Fire Area (HRFA). However, this program provided redundant risk from downed conductors in layers. For the first layer, this program addresses SCADA controllers on distribution feeders that enter the HRFA and some that enter SDG&E's more expansive Fire Threat Zone (FTZ). Some of these feeders are protected by multiple pole mounted service restorers, not only do each of these enhance reliability, but each adds an additional redundancy for fire risk reduction. For the second layer of fire risk reduction, this program addresses substation relays that these feeders originate from. There are currently 29 substations under consideration for this project because the feeders that originate at the substation have a large portion in HRFA and FTZ.

c. The number of substation relays installed is zero and have yet to be upgraded with enhanced ground fault detection schemes. However, approximately 200 SCADA controllers that feed HRFA and/or FTZ were upgraded with enhanced ground fault detection schemes. These SCADA controllers are on feeders that originate from 29 substations.

d. As of the end of 2017, all 29 substations in consideration still do not have enhanced ground fault detection schemes enabled. However, 100% of SCADA controllers for pole mounted service restorers on the boundary of the HRFA have been installed. This provides a first layer of fire risk reduction for these areas.

e. Approximately 30 devices/sites are planned per year. This will be a combination of substation relay upgrades and additional line SCADA controllers as identified.

f. SDG&E anticipates completing the substation enhancements covered by this project by end of 2019.

g. The estimate for budget 12246 is shown below. The scope of this project is to provide enhanced ground fault detection schemes for distribution circuits to allow for improved detection of downed conductors and high impedance faults leading to faster automatic isolation, promoting enhanced safety and service reliability. This enhanced ground fault detection is provided by replacing all applicable legacy line device controllers with modern controllers with this protective functionality (e.g. replacing legacy Cooper Controllers with Cooper Form 6 controllers).

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

SDG&E Response 108 Continued:

Description	Unit (FT, HR, EA)	Quantity	Cost ($1000) (material, direct charges, contract costs)
Labor	HR	3,030	$240
Materials	Per Site	120	$531
Communications	Per Site	120	$96
Removal	Per Site	120	$96
Total			$963

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

109. On Ex. SDGE-14-CWP, p. 600, please explain why the Poway substation rebuild is described as "set for the fourth quarter of 2015" but no actual dollars are shown in either 2015 or 2016. When was the description written?

SDG&E Response 109:

SDG&E objects to this request to the extent that it assumes mistaken facts. Subject to and without waiving this objection, SDG&E states as follows: The costs presented in testimony and work papers represent just the distribution portion of the project. SDG&E incurred costs going back to 2015 for the transmission components of the project, which are not recoverable in the CPUC General Rate Case, and thus were not represented in testimony or the work papers.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

110. SDG&E says that budget code 16257, Vault Restoration, has an estimated cost estimate of exactly $1 million per year, "based on detailed cost estimates" for a "specific scope" (Ex. SDGE-14-CWP, pp. 626-627). Please provide those detailed estimates and explain how they came out to be such a round number for two years in a row.

SDG&E Response 110:

An estimate of the components and cost of SDG&E's Vault Restoration program are shown below:

Total Cost: Approximately $100,000 per structure:

- Initial assessment = $4k
- Structural in-depth assessment = $4k
- Structural design = $13k
- Construction = $75k
- Final site review = $4k

SDG&E expects to have a workload of 10 vaults per year for 2018 and 2019.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

111. SDG&E proposes to spend $2.5 million per year upgrading its worst performing circuits (Ex. SDGE-14, p. 103; Ex. SDGE-14-CWP, p. 634). Because this work can involve new or replacement switches, OH conductor, fault indicators, fuses, etc. (Ex. SDGE-14, p. 104; Ex. SDGE-14-CWP, p. 634), it can overlap with work described elsewhere. Please provide, to the extent possible, a description of how SDG&E has avoided double-counting the same work (e.g., fuse installation), and how much of each of the types of equipment described in Ex. SDGE-14-CWP. p. 634 it expects to install through this budget code.

SDG&E Response 111:

Prior to 2018, the separate components of work on Worst Circuits has historically been performed in SDG&E's District Construction & Operations Centers. While there may have been overlapping design work performed from SDG&E's Construction Services Department prior to 2018, actual upgrade or replacement of components only occurs once. Beginning in 2018, the planning and scoping phases of work related to Worst Circuits involves efforts from each Construction and Operations Centers and Constructions Services. These efforts are intended to identify areas of where work scope and mobilization can be consolidated.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

112. Ex. SDGE-14-CWP. p. 634, provides historical and forecast capital expenditures for budget code 16258, "OIR Worst Circuits." The "Project Justification" section on that page instructs the reader to "See SDG&E-14-CWP at section 16258 - OIR Worst Circuits," which is the same page.

a. Please explain this circular reference, and provide any additional project justification which may have been omitted.

b. Please provide the "detailed cost estimates" and "specific scope of work" for this program referenced on Ex. SDGE-14-CWP, p. 635.

SDG&E Response 112:

a. This note was placed during gathering of work papers and should have been removed prior to final submittal.

b. As the budget is zero cost based, all projects that are assigned to this budget are not yet identified. An example of a project cost estimate is accompanied as "CUE DR02 Q77-135 OIR Worst Circuits Example Estimate.doc."

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

113. SDG&E proposes to spend $2.8-$4.9 million per year in 2017-2019 to "improve service reliability...mitigate existing electric system deficiencies and improve system performance" under budget code 93240 (Ex. SDGE-14, pp. 106-107; Ex. SDGE-14-CWP, p. 653). This program consists of two components, one with expenditures rising to $3.1 million in 2019 for "distribution circuit reliability construction" to provide "comprehensive remedial solutions" which either consist of or include proactively replacing "bridged cutout switches" (Ex. SDGE-14-CWP, pp. 659-660) and the other, starting in 2019, to spend $1.8 million that year for the "Base Switch Program."

a. Please confirm that the dollar amounts in workplace details 93240.001 and 932400.002 on Ex. SDGE-14-CWP, pp. 659 and 661, have not been switched.

b. Please provide the total dollars planned for proactive replacement of bridged cutout switches in each of the years 2017-2022, showing separately dollars that are part of budget code 93240 and dollars that are part of other budget codes.

c. Please provide the number of proactive bridged cutout switch replacements planned for each of the years 2017-2022, showing separately replacements planned as part of budget code 93240 activities and replacements that are planned as part of other budget codes.

d. Please provide the "detailed cost estimates" and "specific scope of work" for this program referenced on Ex. SDGE-14-CWP, p. 654.

e. Please reconcile any differences between

i. The dollars shown for proactive bridged cutout switch replacement on Ex. SDGE-14-CWP, pp. 659-660

ii. The dollars shown in the response to subpart (b) of this question

iii. The capital cost for proactive bridged cutout switch replacements shown on Ex. SDGE-15-WP, p. 35 (1572 replacements over 7 years at $36K capital cost per switch)

iv. The dollars shown for proactive bridged cutout switch replacement in the response to subpart (d) of this question

f. Please reconcile any differences between the number of proactive bridged cutout switch replacements shown in:

i. The response to subpart (c) of this question

ii. The response to subpart (d) of this question

iii. Ex. SDGE-15-WP, p. 35 (1572 replacements over 7 years, or 224+ replacements per year).

SDG&E Response 113:

a. 93240.001 and 93240.002 are correct, but these programs have been moved to the 16252 budget code (RAMP - Electric Infrastructure Integrity), which covers proactive bridged cutout switch replacements. The 93240 budget code now solely focuses on General Reliability, SCADA Initiatives, and Community Fire Safety Program.

b.

Year	Bridged Cutout Count	Dollars (BC 16252)
2017	10	$400,000.00
2018	60	$2,400,000.00
2019	90	$3,600,000.00
2020	120	$4,800,000.00
2021	150	$6,000,000.00
2022	150	$6,000,000.00

c. The number of proactive bridged cutout switch replacements planned for each of the years 2017-2022 is shown below. A “switch” normally denotes three (3) single-phase switches at a single location.

Year	Bridged Cutout Count	Dollars (BC 16252)
2017	10	$400,000.00
2018	60	$2,400,000.00

2019	90	$3,600,000.00
2020	120	$4,800,000.00
2021	150	$6,000,000.00
2022	150	$6,000,000.00

d. See below for the cost estimate associated with budget 93240. The scope of work includes improvements to SDG&E's distribution system in order to improve general reliability performance by reducing the size and frequency of outages. The scope is to replace/add to/modernize SDG&E's distribution switch and protection infrastructure.

Description	Unit	Quantity	Cost ($1000) (material, direct charges, contract costs)
Labor	HR	67,780	$3,389
Non-Labor	EA	1	$7,350
Total			$10,739

e. The question part i requests to reconcile costs submitted for authorization the GRC revenue requirement with cost estimates from SDG&E's RAMP filing in November of 2016[3]. The costs proposed in the RAMP Electric Infrastructure Integrity chapter is a range of values. The costs requested through the GRC are a singular value after further refinement and in balance with other base activities (e.g. compliance, reliability, etc.) and therefore do not necessarily amount to the total risk assessment-derived annual spend. The original RAMP report values are included as appended workpapers for reference only. The capital costs associated with the estimated amount of bridge cutout switches is shown above in part b.

f. i. The approximate amount of bridge cutout switches to replace is shown in part c above.
ii. See question a above, as all bridge cutout switch replacements are in budget code 16252.
iii. See question b above for the approximate amount of bridge cutouts to be replaced.

[3] I.16-10-015/I.16-10-016 Risk Assessment and Mitigation Phase Report of San Diego Gas & Electric Company and Southern California Gas Company, November 30, 2016. Please also refer to Exhibit SCG-02/SDG&E-02, Chapters 1 (Diana Day) and 3 (Jamie York) for more details regarding the utilities' RAMP Report.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

114. SDG&E has about 300 substation transformers, the oldest over 80 years old (Ex. SDGE-14, p. 108; Ex. SDGE-14-CWP, pp. 664, 670; Ex. SDGE-15, p. 51 and Ex. SDGE-15-WP, p. 166 say there are 293 substation transformers). It asserts that replacing 9 of them (3%) will be sufficient "to replace the highest priority obsolete and problematic equipment"(Ex. SDGE-14, p. 108; Ex. SDGE-14-CWP, p. 664).

a. Please provide a current (as of end 2017) list of SDG&E's roughly 300 transformers, in Excel format, showing the name and year of installation for each.

b. For 2017, which of the transformers listed in response to subpart (a) of this question were replacements, as opposed to new transformers that did not replace an existing old transformer?

c. Please identify the substation transformers planned for replacement in each of the years 2018-2022.

d. If the responses to subparts (b and c) of this question do not list 9 substation transformers replaced or planned for replacement in the years 2017-19 combined, please reconcile the number shown in subparts (b) and (c) with the planned replacement of 9 substation transformers shown on Ex. SDGE-14-CWP, p. 664.

e. Please reconcile the forecasted expenditures of $24.4 million in 2017-2019 shown in the "Summary of Results" section with the $26 million shown in the "Project Justification" section on Ex. SDGE-14-CWP, p. 664.

f. Please provide the "forecasted amount of work" which results in the negative and positive adjustment on Ex. SDGE-14-CWP, p. 666.

g. What is SDG&E's estimate of the average unit cost for a substation transformer replacement?

SDG&E Response 114:

a. See accompanying file, “CUE DR02 Q77-135 Distribution Transformers.xlsx”.
b. See accompanying file, “CUE DR02 Q77-135 Distribution Transformers.xlsx”.
c. See accompanying file, “CUE DR02 Q77-135 Distribution Transformers.xlsx”.
d. See accompanying file, “CUE DR02 Q77-135 Distribution Transformers.xlsx”.
e. $24.4 million is the correct figure. The $26 million figure in the text narrative box ‘Project Justification’ should be replaced with “$24.4 million.”
f. The adjusted forecast represents a reduced spend as a part of the 2017 outlook. That amount of reduced cash flow was shifted to 2019, where SDG&E expects it to be spent.

SDG&E Response 114 Continued:

g. SDG&E's estimate of the average unit cost for a substation transformer replacement is approximately $1.75 million.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

115. SDG&E discusses substation circuit breaker replacements along with substation transformers, and proposes to replace 75 (5%) of its 1500 circuit breakers (Ex. SDGE-14, p. 108; Ex. SDGE-14-CWP, p. 664; note that Ex. SDGE-15, p. 51 and Ex. SDGE-15-WP, p. 166 say there are only 1300 substation circuit breakers).

a. Please provide a table in Excel format (current as of the end of 2017) showing the number of SDGE's 1300-1500 currently-in-service substation circuit breakers installed in each calendar year from the earliest year of installation through 2017.

b. How many of the circuit breakers shown with a 2017 installation date in response to subpart (a) of this question were replacements, as opposed to new circuit breakers that did not replace an existing old circuit breaker?

c. Please identify the number of substation circuit breakers planned for replacement in each of the years 2018-2022.

d. If the responses to subparts (b and c) of this question do not total to 75 substation circuit breakers replaced or planned for replacement in the years 2017-19 combined, please reconcile the number shown in subparts (b) and (c) with the planned replacement of 75 substation circuit breakers shown on Ex. SDGE-14-CWP, p. 664.

e. Of the forecasted expenditures of $24.4 million in 2017-2019 shown in the "Summary of Results" section on Ex. SDGE-14-CWP, p. 664, how many dollars each year are for circuit breaker replacements and how many are for transformer replacements?

f. What is SDG&E's estimate of the average unit cost for a substation circuit breaker?

SDG&E Response 115:

a. See accompanying file, “CUE DR02 Q77-135 Distribution Circuit Breakers.xlsx”.
b. See accompanying file, “CUE DR02 Q77-135 Distribution Circuit Breakers.xlsx”.
c. See accompanying file, “CUE DR02 Q77-135 Distribution Circuit Breakers.xlsx”.
d. See accompanying file, “CUE DR02 Q77-135 Distribution Circuit Breakers.xlsx”.
e. Approximately $21 million is for transformer replacement with the remaining being for breaker replacements and other associated substation replacements.
f. SDG&E's estimate of the average unit cost for a substation circuit breaker is approximately $100,000.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

116. Smart reclosers
SDG&E proposes to expand an existing program and spend $1.4 million per year on smart reclosers to "improve system reliability and provide faster power restoration" (Ex. SDGE-14-CWP, p. 682). Faster restoration means lower SAIDI. The proposed project will also, according to SDG&E, improve public safety.

a. Please provide any analysis and/or SDG&E estimates as to the SAIDI impacts of this program

b. Please provide any analysis and/or SDG&E estimates as to the safety impacts of this program

c. Please provide any analysis /or SDG&E estimates as to the B/C ratio of this program, taking into account its safety and/or reliability benefits

d. Please provide the "detailed cost estimates" and "specific scope of work" for this program referenced on Ex. SDGE-14-CWP, p. 683.

SDG&E Response 116:

a. SDG&E does not have an overall estimated SAIDI improvement estimate for this project. Instead, individual circuit improvements are considered for inclusion and prioritized based on operational needs with emphasis given to customer impact, relative system reliability improvement, and fire risk reduction.

b. SDG&E does not have a safety specific analysis for this project. However, safety benefits from additional SCADA data will include the implementation of improved protective relay settings to closer margins, enhancing safety while optimizing reliability by reducing trouble shooting time following a safety or fire-related event.

c. SDG&E does not have a cost-benefit specific analysis for this project.

d. The costs estimate for budget 12247 is shown below. The scope of work is to strategically upgrade manually operated overhead and underground switches with line switches with SCADA functionality in order to implement automated fault locating and system restoration for improved service reliability.

Description	Unit (FT, HR, EA)	Quantity	Cost ($1000) (material, direct charges, contract costs)
Labor	HR	5,960	$894
Materials	Per	21	$2,360

	Circuit		
Communications	Per Circuit	21	$407
Removal	Per Circuit	21	$407
Total			$4,068

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

117. Please confirm that the capital expenditure of $10.5 million in 2018 for a "new substation in the Downtown district" (Ex. SDGE-14-CWP, pp. 461-462) and the capital expenditure of $10.942 million in 2017 for "a new 69/12 kV substation near the downtown area" (Ex. SDGE-14-CWP, p. 691) are not the same project. If they are the same project, please explain whether the total cost of this project is $10.5 + $10.942 = 21.442 million, and why it is spread across two (or more?) separate budget codes.

SDG&E Response 117:

The capital expenditure of $10.5 million in 2018 for “a new substation in the Downtown district” and the capital expenditure of $10.94 million in 2017 for “a new 69/kV substation near downtown area” are not the same project.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

118. FiRM (Fire Risk Mitigation) is a very large program, on which SDG&E proposes to spend $57.8 million per year in 2017-2019), to replace conductor, splices, and poles that are "known to be a risk in the fire-prone areas" (Ex. SDGE-14, p. 111; Ex. SDGE-4-CWP, p. 701). SDG&E says this spending will be "almost exclusively" to replace small copper conductor with larger conductor sizes and to replace wood poles with steel poles (Ex. SDGE-14, p. 111:20-21). There are apparently about 30,000 wood poles in fire zones at present (Ex. SDGE-14, p. 123:22-23).

a. Please provide the "detailed cost estimates" and "specific scope of work" for this program referenced on Ex. SDGE-14-CWP, p. 703.

b. Please provide the actual spending for FiRM in 2017.

c. For each of the years 2012-2017, please provide the number of wood distribution poles that the FiRM program

i. Replaced with new wood poles

ii. Replaced with steel poles

iii. Removed without replacement

d. For each of the years 2012-2017, please provide the miles of #4 and #6 copper conductor that were replaced by more robust conductor through the FiRM program

e. Within the geographical area covered by the FiRM program, please provide, as of the end of 2017:

i. The number of wood distribution poles (and a reconciliation of this number to the 30,000 poles (200,000 minus 170,000) referenced in Ex, SDGE-14, p.123:22-23).

ii. The number of steel distribution poles

iii. The miles of #4 and #6 copper conductor in service

iv. The number of miles of other sizes of distribution conductor in service

f. Please provide the "historical wire-down data" cited on Ex. SDGE-14-CWP, p. 702

SDG&E Question 118 Continued:

g. Please provide the missing text at the end of Ex. SDGE-14-CWP, p. 702, which is truncated mid-word.

h. For the period 2018-22, please provide SDG&E's estimate (by year, if it changes from one year to the next) of the average unit cost under the FiRM program to:

i. Replace a wood pole with a steel pole

ii. Replace a mile of #4 or #6 copper conductor with "more robust conductor"

i. For the period 2018-22, inclusive, please provide the annual planned activities under FiRM, disaggregated into:

i. Number of wood-to-steel pole conversions, and the associated dollars of capital expenditure

ii. Miles of small copper conductor replaced with more robust conductor, and the associated dollars of capital expenditure

iii. Other FiRM activities, and their associated dollars of capital expenditure

j. By what year does SDG&E plan to complete the FiRM project?

k. What percentage of the wood distribution poles identified in response to subpart (e.1) of this question does SDG&E intend to eventually replace with steel poles?

l. What percentage of the small copper conductor identified in response to subpart (e.3) of this question does SDG&E intend to eventually replace with more robust conductor?

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

SDG&E Response 118:
This response contains Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023 and is provided under separate cover.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

119. SF6-insulated distribution switches were installed on the SDG&E system from the 1980s through the 2000s, are a major greenhouse gas, and are subject to regulation by both EPA and the CARB (Ex. SDGE-14, p. 113; Ex. SDGE-14-CWP, p. 711). SDG&E proposes to spend $3.5 million in 2017, increasing to $14.1 million per year in 2018-19, to remove SF6 switches on its system (Ex. SDGE-14, p. 112; Ex. SDGE-14-CWP, p. 711). SDG&E appears to say, in a non-SF6 part of its workpapers, that it has 1000 such switches and will remove them over 5 years, ending in 2020 (Ex. SDGE-14-CWP, p. 201).

a. Please confirm that SDG&E's testimony and workpapers for SF6 work say nothing about the number of SF6 switches, the number to be replaced annually, or how long it will take to replace them all (Ex. SDGE-14, pp. 112-113; Ex. SDGE-14-CWP, pp. 710-718).

b. Please confirm that SDG&E proposes to quadruple its SF6 distribution switch removal budget from 2017 to 2018 (Ex. SDGE-14-CWP, p. 711).

c. How many SF6 distribution switches remained on SDG&E's system as of the end of 2017?

d. How many SF6 distribution switches does SDG&E intend to remove in each of the years 2018-22, inclusive?

e. When does SDG&E expect to complete removing all SF6 distribution switches from its system?

f. What is SDG&E's estimate of the unit cost to remove an SF6 switch from its distribution system during this GRC cycle?

SDG&E Response 119:

a. The testimony and work papers generally describe the SF6 replacement program and associated justifications, SDG&E’s intention is to replace approximately 100 switches each year over ten years.

b. See testimony and associated workpapers for yearly forecasts.

c. Approximately 1000 switches remained on SDG&E’s system as of the end of 2017.

d. SDG&E intends on removing or replacing approximately 100 switches per year.

e. SDG&E anticipates removing or replacing all SF6 distribution switches by 2028.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

SDG&E Response 119 Continued:

f. SDG&E estimates that the approximate removal costs are as follows:
   - Manual = $110,000 per switch
   - SCADA = $150,000 per switch

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

120. Ex. SDGE-14-CWP, p. 720 appears to say that the Rancho Santa Fe substation fire hardening project will remove and not replace the 4 kV equipment there, thus eliminating Rancho Santa Fe as a 4kV substation.

a. Is this a correct reading?

b. If so, is this one of the 4 kV substation elimination projects discussed elsewhere by SDG&E (e.g., Ex. SDGE-14, pp. 84-85 and Ex. SDGE-4-CWP, p. 489), or is this in addition to those projects?

SDG&E Response 120:

a. Yes, this is correct.

b. Rancho Santa Fe Substation Fire Hardening Project is a separate and unique project relative to the 4kV modernization efforts that are being requested elsewhere. However, if there were no separate request during this GRC cycle, or if this budget is not funded/approved during this GRC cycle, then SDG&E would include the substation within a future 4 kV modernization request, as all 4 kV infrastructure is within the 4kV modernization queue set to be eliminated sometime in the future.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

121. The Google fiber project involves $5 million in each of 2018 and 2019 for poles that will need to be replaced to accommodate the extra weight caused by equipment being added by a "large-scale communications infrastructure provider," or CIP (Ex. SDGE-14, p. 115; Ex. SDGE-14-CWP, p. 729). That "provider" is apparently Google (Ex. SDGE-14-CWP, pp. 728, 729, 730, 731, 732, 733, 735).

a. Please provide the annual number of wood distribution pole replacements resulting from this project.

b. Please describe any reimbursements that will be received from Google or other CIPs for pole replacements under budget code, and identify where such reimbursements are shown in SDG&E's workpapers?

c. Are the dollars shown for budget code 15257 (Ex. SDGE-14-CWP, p. 729) net of reimbursements from Google or other CIPs?

SDG&E Response 121:

a. To date SDG&E has not replaced any poles resulting from this project because it has not started. It is anticipated that starting in 2018 there will be large-scale Communication Infrastructure Provider (CIP) projects starting as a result of the increased demand for high-speed streaming and wireless services. In addition to the high-demands for faster service, more and more entities are attaching to poles. This is minimizing the space available on poles. When these projects start, it is anticipated that approximately 250 poles will be identified to require a changeout by SDG&E per year.

b. Responsibility of costs is determined according to the circumstances of the replacement, subject to Commission guidelines set in other proceedings. SDG&E will not be reimbursed for pole replacements for which SDG&E is responsible. If a pole is to be replaced and the CIP is responsible then the CIP will solely pay for the pole replacement. If SDG&E is responsible for the pole replacement then SDG&E will solely pay for the replacement.

c. As previously stated in “b”, SDG&E will not be reimbursed for pole replacements. The dollars shown are costs for pole replacements that SDG&E will be responsible for.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

122. SDG&E proposes to spend $1.3 million per year (down from $1.7 million in 2016) to "replace aging circuit breakers and/or obsolete electromechanical relays" in fire areas (Ex. SDGE-14-CWP, p. 737).

a. Please quantify "aging."

b. Please provide any data or analysis SDG&E has (e.g., Weibull curves) showing the expected failure rate for circuit breakers as a function of their age.

c. Please provide the "detailed cost estimates" and "specific scope of work" for this program referenced on Ex. SDGE-14-CWP, p. 739.

d. For each of the years 2017-22 inclusive, please provide the number of circuit breakers actually replaced (2017) or planned to be replaced (2018-22) by this program.

e. Within the geographical area ("Fire Threat Zone") covered by this project, how many 12 kV circuit breakers does SDG&E have, as of the end of 2017?

SDG&E Response 122:

a. The term “aging” is used to describe the relative operational age of assets. An asset’s age alone does not describe its likelihood of failure, but may correlate with other such factors that do. Aging for circuit breakers can be defined qualitatively as a circuit breaker that is no longer built to modern safety, environmental, and/or operational practices. Oil insulated circuit breakers, for example, are no longer preferred over modern alternative insulating mediums such as vacuum and SF_6 gas. Circuit breakers and their associated components (e.g. bushings) may also be subjected to premature or accelerated “aging” due to environmental contamination (i.e. corrosion) or other weathering (e.g. sun exposure, wind, dust, etc.). Quantitatively, circuit breakers are “aged” at the end of their operational life, as determined by condition-based assessments or their plant book life.

   Aging for electromechanical relays is defined similar to circuit breakers, with some distinctions. Electromechanical relays are normally housed in enclosures and are therefore not as subjected to weathering and environmental contamination, as compared to circuit breakers. The operational age of relays may be determined by engineering and other condition assessments that consider factors such as the device’s sensitivity, accuracy, and overall ability to suit the functional needs of the protected asset. Regarding the latter, for example, SDG&E actively pursues fire hardening efforts, which include advanced protective relaying schemes requiring the use of microprocessor-based relays in order to perform logic-based operations and other automation.

SDG&E Response 122 Continued:

b. Weibull curve data are not available for circuit breakers.

c. Detailed cost estimates are as follows

Description	Unit	Quantity	Cost ($1000) (material, company labor, direct charges, contract costs)
Relays & Controls	EA	6	$900
Switchgear	EA	12	$240
Substation Circuit Breaker - Open Rack	EA	4	$197
Total			1,337

For specific scope of work please refer to SDGE-14, p. 116.

d. Planned and recently replaced circuit breaker information are as follows

Year	12 kV Breakers Targeted for Replacement by Substation	Relays Targeted for Replacement by Substation
2017	Creelman – replace (4) oil circuit breaker with vacuum circuit breakers Warners – replace (4) oil circuit breakers with vacuum circuit breakers Descanso – replace (4) oil circuit breakers with vacuum circuit breakers	Creelman – replace (4) electromechanical relays with microprocessor relays Descanso – replace (3) electromechanical relays with microprocessor relays Warners – replace (3) electromechanical relays with microprocessor relays
2018	Descanso – continued from 2017 Warners – continued from 2017 Barrett – replace (3) oil circuit breakers with vacuum circuit breakers Cameron – replace (3) oil circuit breakers with vacuum circuit breakers	Descanso – continued from 2017 Warners – continued from 2017 Barrett – replace (3) electromechanical relays with microprocessor relays Cameron – replace (2) electromechanical relays with microprocessor relays Santa Ysabel – replace (2)

		microprocessor relays with microprocessor relays
2019	Creelman – replace (3) oil circuit breaker with vacuum circuit breakers Glencliff – replace (2) oil circuit breaker with vacuum circuit breakers	Creelman – replace (3) electromechanical relays with microprocessor relays Glencliff (2) – replace (2) electromechanical relays with microprocessor relays

e. As of the end of 2017, there are approximately 242 12 kV circuit breakers serving circuits in the FTZ geographic area.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

123. The Electric Integrity Infrastructure (EII) program is the non-fire-zone equivalent of FiRM (Ex. SDGE-14, p. 118), with a budget almost as large ($52.4 million vs. $57.8 million for FiRM) by 2019 (Ex. SDGE-14, p. 117; Ex. SDGE-14-CWP, p. 747). One of its components is replacing OH conductor (Ex. SDGE-14, p. 118; Ex. SDGE-14-CWP, pp. 747, 753-754). The majority of the program ($32.7 million in 2019) is for OH conductor replacement (Ex. SDGE-14-CWP, pp. 749, 753).

i. For the area covered by the EII program, please indicate how many miles of overhead conductor were in service as of the end of 2017, by conductor size.

ii. For the overhead small wire and connector replacements (budgeted on Ex. SCG-14-CWP, p. 753), please provide the annual miles of small wire replacements planned for each year from 2018-2022, inclusive (by wire size to be replaced, if data is available)

iii. Please provide the expected average unit cost per mile of small wire replacements.

iv. Please provide the "detailed cost estimates" and "specific scope of work" for this program referenced on Ex. SDGE-14-CWP, p. 748.

SDG&E Response 123:

i. Approximate Miles of Overhead Conductor[4]

Conductor Size	Circuit Miles
#2	524.5
#4	873.1
#6	817.5
1/0	144.7
1033.5	8.4
2/0	6.8
3/0	51.7
336.4	117.8
394.5	38.7
4/0	180.3
636	349
Other	15.8

ii. This information is not available.

[4] The table includes all overhead distribution circuit miles in non-FTZ areas of SDG&E's territory.

SDG&E Response 123 Continued:

iii. The estimated average unit cost per mile for small wire replacements is $1,400,000. This cost is loaded with 30% contingency and assumes the need for pole replacements. Please see RAMP EII chapter for further description of scope of work.

iv. The following WiSE Program Scope of Work and Cost Estimates (x$1,000,000) include 30% contingency with no additional loaders:

Location		**2018**		**2019**		**2020**		**2021**		**2022**	
Substation	Circuit	FCP	Replace	FCP	Replace	FCP	Replace	FCP	Replace	FCP	Replace
Felicita	474	$0.24	$2.07				$1.45				
Spring Valley	731	$0.15		$0.24	$2.55		$0.63				
Spring Valley	733					$0.24	$3.03				
Encinitas	288			$0.15		$0.24	$2.27				
Spring Valley	732							$0.24	$3.05		
Encinitas	286							$0.24	$3.31		
Clairemont	276			$0.15				$0.24	$3.53		
Del Mar	66					$0.15				$0.24	$5.56
Station F	140					$0.15		$0.24	$0.60		
Encinitas	289							$0.24	$2.96		
Clairemont	279									$0.24	$2.79
Del Mar	61									$0.24	$1.12
Granite	415							$0.15		$0.24	$3.04
Granite	387							$0.15		$0.24	$2.19
Chollas West	163									$0.24	$3.82
Projected Costs			$2.07		$2.55		$7.38		$13.45		$18.52
		$0.39	$0.62	$0.54	$1.91	$0.78	$7.38	$1.50	$13.45	$1.44	$18.52
Total Projected		**$1.01**		**$2.45**		**$8.16**		**$14.95**		**$19.96**	
Reconductor Completion		30%		75%		100%		100%		100%	

Note: Cells highlighted in blue show deferred reconductoring to allow projected design ramp up and development of new construction standards.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

124. The Electric Integrity Infrastructure (EII) program is the non-fire-zone equivalent of FiRM (Ex. SDGE-14, p. 118), with a budget almost as large ($52.4 million vs. $57.8 million for FiRM) by 2019 (Ex. SDGE-14, p. 117; Ex. SDGE-14-CWP, p. 747). One of its components is "strategic undergrounding of distribution lines" (Ex. SDGE-14-CWP, pp. 747, 759-760).

a. How many mile of OH conductor does SDG&E plan to underground through this component of the EII program, in each of the years 2018-22, inclusive.

b. Please provide the "detailed cost estimates" and "specific scope of work" for this program referenced on Ex. SDGE-14-CWP, p. 748.

SDG&E Response 124:

a. This information is not available. The actual strategic undergrounding will be assessed as needed once other wire-down risk mitigation strategies (e.g. reconductor, advanced protection) are found to be infeasible.

b. Cost estimates for the Strategic Undergrounding budget were derived from the costs of the Wire Correction Program as the targeted infrastructure would result in Strategic Undergrounding spend. SDG&E plans to develop the Strategic Undergrounding program's specific scope through 2017-2018, aiming to reach full scale in 2020 or thereafter, as determined during the design phase of the individual circuits scoped in the Wire Correction Program. 2017 is designated as a scoping year and is thus $0. 2018 was designated as a startup year, reflecting 10% of the Wire Correction program costs or $2,326. 2019 reflects an estimated 30% of the Wire Correction program costs or $6,977. Please refer to SDGE-14-CWP page 759 for the costs of the Strategic Undergrounding and SDGE-14-CWP page 760 for the costs of the Wire Correction program.

The proposed scope includes proactively undergrounding overhead distribution in areas with high propensities for failure caused by weather, third parties, or aged infrastructure. Program will focus on areas not already covered by fire mitigation efforts or other programs.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

125. The Electric Integrity Infrastructure (EII) program is the non-fire-zone equivalent of FiRM (Ex. SDGE-14, p. 118), with a budget almost as large ($52.4 million vs. $57.8 million for FiRM) by 2019 (Ex. SDGE-14, p. 117; Ex. SDGE-14-CWP, p. 747). Two of its components are described by SDG&E as "switch inspection and high risk replacement" (Ex. SDGE-14-CWP, pp. 755-56 and 761-762).

a. Please confirm that the difference between the two separate "switch inspection and high-risk replacement" components of the EII program is that one is for OH switches and the other is for UG switches.

b. Please describe the relationship between the two switch replacement components of the EII program and the OH and UG switch replacements for which capital costs are shown for both FMO and non-FMO switches in Ex. SCG-15-WP, p. 35.

c. For each of the switch replacement components of the EII program, please provide:

i. the "detailed cost estimates" and "specific scope of work" for this program referenced on Ex. SDGE-14-CWP, p. 748.

ii. the number of switches to be replaced in each of the years 2018-2022, inclusive.

iii. the unit cost for switch replacements (annually, for each year from 2018-2022, if it changes between years).

SDG&E Response 125:

a. Although both components of the EII program contain OH and UG switches, neither component of the EII program is exclusively for OH or UG switches.

b. Switch Inspections target all non-Field Maintenance Only (FMO) OH and UG switches in the SDG&E service territory that are not being proactively replaced. FMO devices are those that are maintained in the field but are to be replaced with a different (not in-kind) unit upon failure or proactive replacement. SDG&E plans to inspect, pursuant to internal standard practices, all switches that are to remain in operation. At the time of study, the following illustrates the number of non-FMO switches:

SDG&E Response 125 Continued:

Switch Classifications	Estimated scope to be inspected	Total number of switches (apply % scope to this)
Non-FMO Overhead Switch	100%	2,130
Non-FMO Underground Switch	100%	1,583

High Risk Replacements target a portion of FMO and non-FMO (e.g. bridged cutout switches). The % of switches targeted for replacement vary by switch classification. Initial estimates indicated the following:

Switch Classifications	Estimated scope to be proactively replaced	Total number of switches (apply % scope to this)
Bridged cutout switches	75%	1,572
FMO Overhead Switches	75%	2,958
FMO Underground Switches	50%	1,689

As a union between the inspection and proactive replacement programs, some switches originally slated for inspection-only are expected to require proactive replacement as a result:

Switch Classifications	Estimated scope to be replaced following inspection	Total number of switches (apply % scope to this)
Non-FMO OH Switch	20%	2,130
Non-FMO UG Switch	20%	1,583

c.

i) Please see attached workpaper, "CUE DR02 Q77-135 GRC Work Paper – Switch Inspection 01102018.xlsx"

ii)

Annual Switches Inspected /Replaced	Bridged Cutout Switches	FMO OH SW (Replace)	FMO UG SW (Replace)	Non-FMO OH SW (Inspect)	Non-FMO UG SW (Inspect)	Replace after Inspection - OH	Replace after inspection - UG
2018	60	111	42	107	79	21	16
2019	90	166	63	160	119	32	24
2020	120	222	84	213	158	43	32
2021	150	245	93	235	175	47	35
2022	150	245	93	235	175	47	35

SDG&E Response 125 Continued:

iii)

Switch Classifications	Unit Cost
Bridged cutout switches (Replace/Upgrade)	$40,000
FMO Overhead Switches (Replace)	$15,400
FMO Underground Switches (Replace)	$46,505
Non-FMO Overhead Switch (Inspect)	$1,854
Non-FMO Underground Switch (Inspect)	$2,100
Non-FMO OH Switch (Replace)	$17,254
Non-FMO UG Switch (Replace)	$48,605

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

126. The Electric Integrity Infrastructure (EII) program is the non-fire-zone equivalent of FiRM (Ex. SDGE-14, p. 118), with a budget almost as large ($52.4 million vs. $57.8 million for FiRM) by 2019 (Ex. SDGE-14, p. 117; Ex. SDGE-14-CWP, p. 747). One of its components is described by SDG&E as "proactive ... replacement of 600-amp tee connectors" (Ex. SDGE-14-CWP, p. 763), specifically UG tee connectors (Ex. SDGE-14-CWP, p. 764). Separately, SDG&E appears to have another program, the "Tee Modernization Program," which is also intended to replace UG tee connectors (Ex. SCG-14-CWP, p. 795). SDG&E says aging tee connectors are a safety hazard due to violent failures, and a reliability risk because they can cause sustained outages when they fail (Ex. SDGE-14, p. 122; Ex. SDGE-14-CWP, p. 795). SDG&E says tee connector failures are "one of the largest contributors to customer outages in the last few years" (Ex. SDGE-14, p. 122; Ex. SDGE-14-CWP, p. 795).

a. Please confirm that the Tee Modernization Program and the tee connector replacements under the EII program are separate programs, and are not double counting of the same work.

b. Please provide the "detailed cost estimates" and "specific scope of work" for tee connector replacements referenced on Ex. SDGE-14-CWP, pp. 748 and 796.

c. What is the average life expectancy for a tee connector?

d. Please provide any data SDG&E has (e.g., Weibull curves) as to the expected failure rate as a function of age for tee connectors.

e. Please provide an age distribution as of the end of 2017, showing the number of tee connectors in service at the end of 2017 by year of installation:

i. For SDG&E as a whole

ii. On " circuits with multiple historic tee failures and with high fault current" (Ex. SDGE-14, p. 122)

SDG&E Question 126 Continued:

f. For each of the programs under which SDG&E proposes to replace tee connectors (EEI, Tee Modernization Program, and any others), for each year from 2018-2022,inclusive, please provide:

i. The number of proactive replacements planned for that year and program

ii. The number of reactive replacements after failure expected for that year and program

iii. The percentage of those replacements that are expected to be on "circuits with multiple historic tee failures and with high fault current" (Ex. SDGE-14, p. 122)

g. How many tee connectors did SDG&E have as of the end of 2017?

h. How many tee connectors did SDG&E have as of the end of 2017 that were on "circuits with multiple historic tee failures and with high fault current" (Ex. SDGE-14, p. 122)?

i. Please provide the data documenting that "tee connector failures have become one of the largest contributors to customer outages in the last few years" (Ex. SDGE-14-CWP, p. 795; Ex. SDGE-14, p. 122)

j. Please provide the data documenting that aging tee connectors are a safety hazard due to violent failures, and a reliability risk because they can cause sustained outages when they fail (Ex. SDGE-14, p. 122; Ex. SDGE-14-CWP, p. 795).

k. Please provide the average unit cost for tee connector replacements (annually, for each year from 2018-2022, if it changes between years; separately for proactive and reactive replacements, if they have different unit costs).

l. When does SDG&E intend to complete:

i. The Tee Modernization Program?

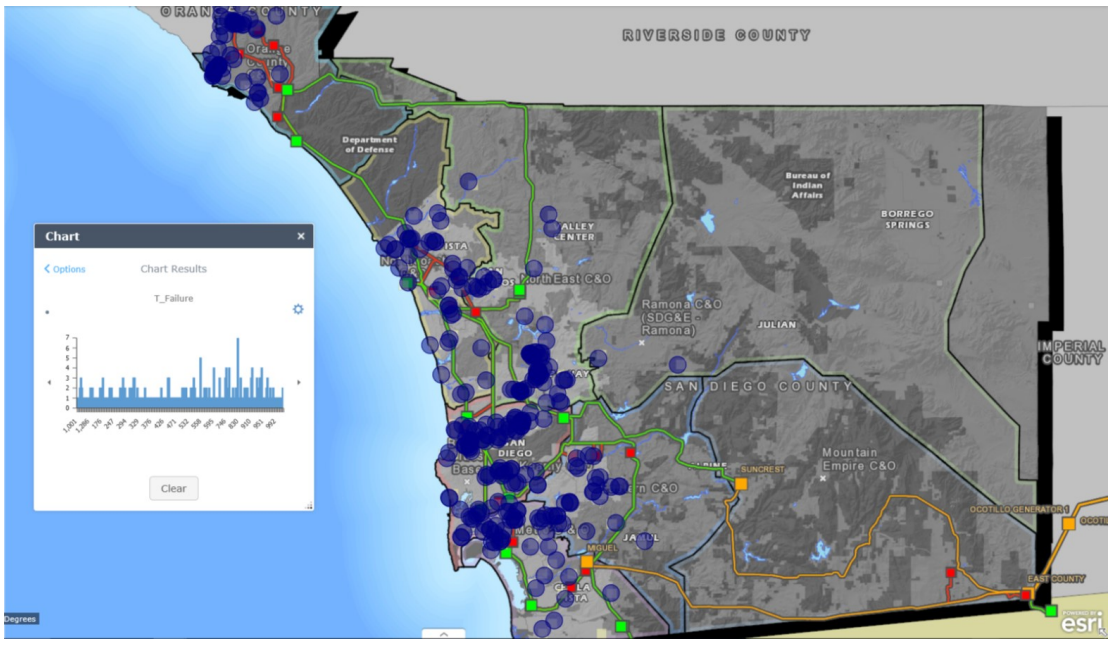
ii. Proactive tee connector replacements under the EII program?

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

SDG&E Response 126:

a. The Tee Modernization Program (TMP) and tee connector replacements are the same program in the context of this GRC filing. However, while TMP focuses on replacing "in-and-out" configuration 600-amp tees (multiples of six(6)-600-amp tees per manhole substructure) with upgraded Cooper Cleer N-Junction devices for added reliability and operational flexibility, there are also ongoing but separate efforts to replace 600-amp tees in-kind where the Cleer devices are not applicable. The former is a capital upgrade program whereas the latter is an O&M activity.

b. 13 circuits consisting of 59 manholes were completed under TMP in 2017, resulting in approximately $2.1M spent (fully loaded). The unit cost is shown per circuit and manhole and consist of $161,538 per circuit and $35,593 per manhole, both loaded. Projecting this forward through 2022, the project is expected to maintain or even expand its current pace. The heat map generated below informed the majority of 2017 workflow for TMP, generally focused on areas of high concentrations of 600-amp tee failures. SDG&E continues to develop a risk-informed prioritization process in order to determine actual scope starting in 2018. Final details and actual scope of work for 2018 TMP prioritization are not yet available. Please see response h) for further information regarding prospectively targeted locations.



SDG&E Response 126 Continued:

c. SDG&E objects to this request on the grounds that it is vague and ambiguous as to the term "average life expectancy." Subject to and without waiving this objection, SDG&E responds as follows: Tee connectors, which are appurtenances to cables, are capitalized to FERC Account E367 – Underground Conductors & Devices. Per Exhibit SDG&E-34-R (Revised Direct Testimony of Matthew Vanderbilt) at MCV-23, the proposed average service life for assets in FERC Account E367 is 49 years. Please refer to Exhibit SDG&E-34-R at page MCV-23 for more information.

d. This data is unavailable.

e. This data is unavailable.

f. (i) Estimated data:

Year	Proactive Tee Replacements Planned (6 tees per manhole) under TMP
2018	360
2019	720
2020	720
2021	720
2022	720

(ii) Future reliability of existing legacy tee connectors cannot be determined accurately, however the volume of existing legacy tee connectors is substantially larger than the targeted pace of proactive improvements, therefore the outstanding or residual reliability risks are significant. Widespread improvements can be expected to improve slowly over a period of several years. When practical and applicable, failed tees are replaced with Cleer devices.

Year	Reactive Tee Replacements (6 tees per manhole)
2018	540
2019	540
2020	534
2021	534
2022	528

SDG&E Response 126 Continued:

(iii) The percentage of replacements that are expected to be on circuits with multiple historic tee failures and with high fault current is not currently determined. In general, SDG&E will continue to focus on areas with multiple historic tee failures, however other factors may be used to determine project priorities such as feasibility of permitting, planned outage management, and construction. Maximum available fault current is under evaluation as a factor to consider for TMP planning and has not yet been incorporated into any risk modeling.

g. The following table describes the end of year 2017 count of 600-amp tees per GIS records:

EOY 2017 600-Amp Tees	Number of Tee Connection Points[5]	Number of Structures
Manholes/Vaults	15,766	3,214
Handholes	30,025	11,888
Other Structures	6,803	2,278

h. Please refer to response f) part iii).

i. The following table shows the SAIDI impact of tee failures over the last several years, trending upward and 2nd only to cable failures overall. Tee failures are the #1 contributor to SAIFI and also trending upward.

Year	# Outages	SAIDI	%	SAIFI	%	Sys SAIDI	Sys SAIFI	CAIDI
2017 (F)	94	10.61	17	0.1022	18	63.03	0.5670	103.8019
2016	90	13.23	18	0.1078	17	72.75	0.6200	122.7204
2015	66	9.54	16	0.0819	16	57.92	0.5260	116.4548
2014	32	6.56	10	0.0585	10	64.60	0.6030	112.2133
2013	36	8.04	13	0.0592	13	59.96	0.4720	135.9707
2012	55	9.28	14	0.0714	13	64.36	0.5330	129.9774

j. The statement regarding safety hazard derives from remarks by first responders. Historic data collection efforts have focused on the state of equipment and customer impacts. SDG&E utilizes a Damage Assessment Form (DAF) that captures some data regarding safety hazards. Excerpts of these records specific to 600-amp tee failures are as follows:

[5] In the GIS model, a connection point serves as an "in" or an "out" of the tee rack, thus representing 1, 2, or 3 tees (single phase or three phase). In most cases, one connection point consists of three (3) tees, however one structure can have multiple circuits, therefore a manhole structure could commonly contain as many as 24 tees. Note the above table does not contain 200-amp tee counts as they are not in scope for TMP at this time.

SDG&E Response 126 Continued:

DT COMPLETED FIELD	FIELD TECH REMARK TEXT	SO REMARKS 1
12/14/2012	Burnt up tee body	Sparks and smoke coming out of metal cov
4/3/2014	Elbow caught on fire damaging elbows and rack, called for crew.	SDPD reports no lights

The following excerpts of 600-amp tee failure events depict the extensive outage impact, often entire circuits, and required restoration efforts due to various factors including water pumping in flooded manholes, wait time for pumper trucks to arrive on scene, and time required to make repairs to tee assemblies.

Occurrence	Substat	Circuit	DamagedDevice	FromFacility	CustomerImp	CustomerMinut	SystemSAIDI
8/9/2016	GE	268	TEE (DEAD BREAK)	M2579470279	3516	1341685	0.934442066
6/15/2014	PB	545	TEE (DEAD BREAK)	H2260369243	5887	1269312	0.896340314
10/2/2016	PB	545	TEE (DEAD BREAK)	H2265269219	5896	945404	0.658444617
4/18/2015	ME	821	TEE (DEAD BREAK)	H110311	2416	920119	0.644962965
4/6/2016	CC	913	TEE (DEAD BREAK)	M2898273754	2444	825824	0.57516085
12/26/2014	MG	257	TEE (DEAD BREAK)	M1720774383	3968	805852	0.569062322
3/12/2013	KY	715	TEE (DEAD BREAK)	M2346073208	1654	723700	0.514376163
9/9/2015	EN	287	TEE (DEAD BREAK)	M3212069329	5071	701720	0.491874868
9/6/2016	SR	430	TEE (DEAD BREAK)	M2158474938	2260	645609	0.449646681
3/5/2016	SR	430	TEE (DEAD BREAK)	M2125174615	2173	634063	0.44160525
7/9/2015	KE	137	TEE (DEAD BREAK)	M103012	3166	605970	0.424758328
9/6/2013	OS	580	TEE (DEAD BREAK)	M3750466086	1906	543799	0.38650994
12/8/2014	GE	269	TEE (DEAD BREAK)	M2584470426	4350	514765	0.36350765
1/6/2016	CC	913	TEE (DEAD BREAK)	M2905573908	2449	509763	0.355034148
7/18/2015	MR	228	TEE (DEAD BREAK)	H2687672691	2447	477362	0.334609774
6/13/2015	CP	313	TEE (DEAD BREAK)	M4889156364	2325	469179	0.328873851
11/27/2013	OT	107	TEE (DEAD BREAK)	M2202071691	3048	457551	0.325208412
4/15/2016	MR	229	TEE (DEAD BREAK)	H2686972172	1826	457684	0.318762737
5/21/2015	SS	728	TEE (DEAD BREAK)	M120778	2709	430530	0.301782601
1/1/2016	SA	904	TEE (DEAD BREAK)	M3824067220	4161	421597	0.293629258

k. Please see item b

l. Program completion is not yet foreseen due to the high volume of assets.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

127. PRiME (Pole Risk Mitigation and Engineering) spending will start at $0.3 million in 2017, then increase to $4.6 million in 2018 and $40.4 million in 2019 (Ex. SDGE-14, p. 123; Ex. SDGE-14-CWP, p. 803. PRiME is aimed at the approximately 170,000 SDG&E wood poles that are not in fire-prone areas (Ex. SDGE-14, pp. 123, 125; Ex. SDGE-14-CWP, p. 803). SDG&E says PRiME will result in a "much safer and more reliable overhead electric system" (Ex. SDGE-14, p. 126). With regard to the PRiME program:

a. Please provide an age distribution for the wood distribution poles within the scope of the PRiME program, showing (as of yearend 2017) the number of poles installed in each year up to and including 2017, and including a reconciliation of any deviation between the total number of poles listed for all years and the 170,000 poles SDG&E says it will inspect through the PRiME program post-2017 (Ex. SDGE-14, p. 125:25).

b. Please reconcile the different PRiME capital costs shown in Ex. SDGE-14-CWP (p. 803 and Ex. SCG-15-WP (sum of "Capital" lines on pp. 36 and 201).

c. Please indicate whether capital costs shown for PRiME represent just inspection costs (cf. Ex. SDGE-14-CWP, p. 807, where the entire proposed spending is described as "Pole loading inspection," and Ex. SDGE-15, p. 3:8-9, referring solely to evaluation), include both inspection and pole replacement capital costs for those poles that fail inspection (see the O&M workpapers at Ex. SDGE-15-WP, p. 36, which show a PRiME pole replacement capital cost of $2.8 million in 2018 and $33.8 million in 2019, based on replacing 130 poles in 2018 and 1582 poles in 2019), or are solely for replacement costs, with inspection costs treated as an O&M cost.

d. Please reconcile the different numbers SDG&E provides for annual inspections under the PRiME program (compare Ex. SDGE-14, p. 125:22-25 and Ex. SDGE-5, p. 3:8-9 with Ex. SDGE-14-CWP, p. 804 and with Ex. SDGE-15-WP, p. 201).

e. Please reconcile the different dates SDG&E provides for when the PRiME program will be completed (compare Ex. SDGE-14, p. 125:24-25 (9 years ending in 2026) with Ex. SDGE-14-CWP, p. 804 (inspections completed in 2027; last year for replacements not given) and Ex. SDGE-15-WP, p. 200 ("PRiME is a ten year program")).

f. Please reconcile the different numbers SDG&E gives for the total number of inspections to be performed (compare Ex. SDGE-14, p. 125:25 (170,000), Ex. SDGE-15, p. 25:14-22 (annual numbers sum to 170,250), and Ex. SDGE-14-CWP, p. 804 (annual numbers sum to 168,400).

SDG&E Question 127 Continued:

g. Please provide the "detailed cost estimates" and "specific scope of work" for PRiME referenced on Ex. SDGE-14-CWP, p. 805.

h. For each year from 2018 through project completion, through the PRiME program, how many poles are expected to be

i. Inspected

ii. Identified as needing replacement

iii. Replaced

iv. In the year-end backlog of poles identified as needing replacement but not yet replaced.

i. SDG&E says PRiME will result in a "much safer and more reliable overhead electric system" (Ex. SDGE-14, p. 126). Please provide:

i. The analysis showing it will improve safety

ii. The analysis showing it will improve reliability

iii. A quantification of the expected annual safety improvements

iv. A quantification of the expected annual SAIFI and SAIDI improvements

v. Any B/C analysis SDG&E has comparing the expected safety and/or reliability benefits to the PRiME program costs.

SDG&E Response 127:

a. During the life of the PRiME program, other programs such as FiRM, CNF, CMP, and New Business will also be progressively replacing poles under other conditions or criteria, therefore it would not be possible to specifically identify each pole, nor the age of each pole, that will be analyzed by the PRiME program. The number of poles that will be managed by other programs over the life of the PRiME program was estimated, which reduced the total number of poles that will be managed by the PRiME. The estimates of other programs reduced the number of poles to be analyzed by PRiME from an approximation of 204,000 distribution wood poles to approximately 170,000 poles. The 170,000 poles will be further identified and

prioritized as part of a pilot program in 2018 and annually thereafter as PRiME and other programs progress.

The approximate number of SDG&E wood distribution poles by approximate pole age:

Pole Age (years)	Total
0 - 19	38,000
20 - 29	20,000
30 - 39	25,000
40 +	121,000
Approx. Total	204,000

b. Total capital costs are shown on Ex. SDGE-14-CWP, p.803 and are further defined in "g" below.

c. Costs as referenced in Ex. SDGE-14-CWP, p.803 and as further defined in "g" are pure capital costs for each activity mentioned. O&M costs are identified in the O&M testimony and work papers.

d. Total Approximate Poles Analyzed:
   - 2017 = 0
   - 2018 = 1600
   - 2019 = 22,600

e. The PRiME program is currently estimated to complete analysis activities in approximately 2027.

f. The total approximate number of poles to be analyzed by the PRiME program is 170,000.

g. 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.
   - Refer to item "h" response: Number of poles to be replaced and/or rearranged was determined as a result of data collected from SDG&E's CMP program.
   - 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.

Costs below include both analysis and replacement/rearrangement of poles:

- 2017 Approximations
  - Project Management = $0.27M
- 2018 Approximations
  - Analysis = $1.78M
  - Construction = $2.80M
- 2019 Approximations
  - Analysis = $5.83M
  - Construction = $34.60M

h. Approximate pole count forecasts for PRiME (2018-2021):

Category	2018	2019	2020	2021
Analyzed	1,600	22,600	22,600	22,600
Replaced	112	1,582	1,582	1,582
Rearrange	48	678	678	678

i. (i)) PRiME is a risk mitigation and reliability program initiated from pole loading concerns. SDG&E does not yet have a formal analysis regarding safety improvement of the PRiME program. The estimated potential safety and risk reduction benefits, also known as Risk Spend Efficiency (RSE), in its RAMP report pursuant to D.14-12-025 and D.16-08-018. The risk reduction benefits for PRiME were estimated as part of the larger overhead mitigation grouping in the RAMP report. As stated in Exhibit SDG&E-14-R, Revised Testimony of Alan Colton, on page AFC-125, in 2018 SDG&E plans to perform a quantitative pilot based on 1,600 poles. The "[r]esults from the pilot phase will be used to prioritize future year projects based on risk and to further define cost" (Exhibit SDG&E-14-R at AFC-125 lines 23-24).

(ii) SDG&E does not yet have an analysis of the reliability improvements that may be obtained from PRiME, this may be obtained as a result of the pilot program.

(iii) SDG&E does not yet have an analysis of the safety improvements that may be obtained from PRiME, this may be obtained as a result of the pilot program.

(iv) SDG&E does not yet have an analysis of the SAIDI and SAIFI reliability improvements that may be obtained from PRiME, this may be obtained as a result of the pilot program.

(v) SDG&E does not yet have any C/B analysis of the safety and/or reliability benefits that may be obtained from PRiME, this may be obtained as a result of the pilot program.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

128. In evaluating the B/C ratio for programs that improve safety and/or reliability, please provide:

a. the dollar value(s) per minute of SAIDI that SDG&E believes are appropriate to use, and the analytical basis for those value(s).

b. the dollar value(s) per minute of SAIFI that SDG&E believes are appropriate to use, and the analytical basis for those value(s).

c. The unit(s) in which SDG&E believes it is appropriate to measure safety and changes in safety results.

d. The dollar value per unit for the unit(s) of safety that SDG&E believes are appropriate to use.

SDG&E Response 128:

a. The CPUC has authorized a value of SAIDI minute for PBR benefit/penalty at $375,000 for each SAIDI minute. The Commission has also authorized a benefit/penalty amount of $125,000 for each 10 worst circuit SAIDI minutes. SDG&E utilizes these benchmarks in its analyses.
b. The CPUC has authorized a value of SAIFI for PBR benefit/penalty at $375,000 for each 0.01 SAIFI increment. The Commission has also set a benefit/penalty amount of $125,000 for each 0.1 Worst Circuit SAIFI increment. SDG&E utilizes these benchmarks in its analyses.
c. SDG&E currently uses a 7x7 matrix as a framework to evaluate risk[6]. The 7x7 matrix includes criteria to assess levels of impact, including the impacts to safety, and levels of frequency. Each level (1-7) is defined so that the level can be distinguished from one another. The future use of the 7x7 matrix is currently being discussed before the Commission in Phase 2 of the Safety Model Assessment Proceeding (S-MAP), Application (A.) 15-05-002 consolidated. As such, the units to measure the attribute of safety are subject to change based on a final decision in A.15-05-002.
d. SDG&E does not have a position at this time of an appropriate dollar value per safety unit.

[6] *See* I.16-10-015/I.16-10-016 Risk Assessment and Mitigation Phase Report of San Diego Gas & Electric Company and Southern California Gas Company, November 30, 2016. Please also refer to Exhibit SCG-02/SDG&E-02, Chapter 1 (Diana Day) for more details regarding the utilities' RAMP Report and risk evaluation.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

129. One of the PRiME program workpapers references costs associated with annual inspections of "facilities within the HRFA" and repairs of "potential sources of ignition before fire season" (Ex. SDGE-14-CWP, p. 808.

a. Please confirm that "HRFA" is an acronym for "high risk fire area."

b. Please confirm that PRiME is aimed at poles outside of the HRFA, while the FiRM and CNF programs address poles within the HRFA.

c. Please explain how, if at all, the costs shown on Ex. SDGE-14-CWP, p. 808, are included within the requested PRiME capex funding on Ex. SDGE-14-CWP, p. 803.

SDG&E Response 129:

a. Yes
b. PRiME will address poles throughout SDG&E's service territory, evaluating pole-loading. The FiRM and CNF programs address poles within the HRFA and the FTZ. Neither the FiRM program nor the CNF program are focused on pole loading.
c. This question requests to reconcile costs submitted for authorization the GRC revenue requirement with cost estimates from SDG&E's RAMP filing in November of 2016. The costs proposed in the RAMP filing are a range of values. The costs requested through the GRC are a singular value after further refinement. The original RAMP report values are included as appended workpapers for reference only. Total capex costs are shown on Ex. SDGE-14-CWP-R, p.803. Additional information can be found in SDG&E's RAMP Report and in the direct testimony of Jamie York (SDG&E-02, Chapter 3), regarding RAMP-to-GRC integration.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

130. Please explain why one of the workpapers supporting SDG&E's request for "advanced Energy Storage" describes the work scope as "Convert the existing 1404 existing (sic) line capacitors to SCADA control" (Ex. SDGE-14-CWP, p. 826).

SDG&E Response 130:

This was a misstatement inadvertently included on the original workpaper, it should be omitted altogether. The statement should read, “This budget will provide funding to mitigate intermittency and operational problems from renewable energy sources by installing energy storage on distribution circuits that have a high concentration of photovoltaic systems.”

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

131. Please provide the "detailed cost estimates" and "specific scope of work" for the program referenced on Ex. SDGE-14-CWP, p. 838.

SDG&E Response 131:

The work identified within Ex. SDGE-14-CWP on p. 838 consists of installing a CAISO regulated meter and interconnection equipment and the commissioning of the Vanadium-Redux Flow battery. A detailed cost estimate of the specific work is outlined in the table below.

Description	Unit	Quantity	Cost ($1000) (material, direct charges, contract costs)
Labor	HR	4,545	$250.0
CAISO Meter Installation	EA	1	$150.0
Electrical Interconnection	EA	1	$100.0
Commissioning	EA	1	$39.0
Total			$539

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

132. SDG&E plans to add 12 Mw of solar capacity and 150 Mwh of battery storage at a capital cost of under $5.5 million (Ex. SDGE-14-CWP, p. 863).

a. What will the peak capacity and the number of sustained hours of operation be for the planned storage?

b. Please provide the "detailed cost estimates" and "specific scope of work" for this program referenced on Ex. SDGE-14-CWP, p. 864.

SDG&E Response 132:

a. This project will install up to 12MW of solar and up to150MWh of energy storage, to increase the total storage capacity within Borrego Springs' existing micro grid to 154.5MWh. The peak load at Borrego Springs is roughly 13MW, and this project will allow the micro grid to provide power to the community of Borrego Springs through the night time hours, when the sun is not shining. Borrego 3.0 would significantly reduce dependency on diesel generation, create a near 100% renewable micro grid environment and increase grid resiliency for the entire community.

b. The work identified within Ex. SDGE-14-CWP on p. 864 consists of acquiring land, purchasing an energy storage unit, and the required equipment to communicate as well as deploy the energy storage within SDG&E's DERM system. A detailed cost estimate of the specific work is outlined in the table below.

2017

Description	Unit	Quantity	Cost ($1000) (material, direct charges, contract costs)
Labor	HR	1,254	$69.0
Land	EA	1	$140.0
Total			$209

2018

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

Description	Unit	Quantity	Cost ($1000) (material, direct charges, contract costs)
Labor	HR	20,000	$1,100.0
Energy Storage Unit	EA	1	$1,940.0
Land/Easements	EA	1	$810.0
Equipment Procurement	EA	1	$500.0
Telecom Equipment	EA	1	$250.0
DERMS Development	EA	1	$630.0
Total			$5,230

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

133. Ex. SDGE-14-CWP, p. 908 contains historical and forecasted capital expenditures for the CNF project.

a. Please provide the annual number of wood distribution poles that this project:

i. Will replace

ii. Will remove, due to undergrounding.

b. Please provide the "detailed cost estimates" and "specific scope of work" for this program referenced on Ex. SDGE-14-CWP, p. 909.

c. Please reconcile the very different costs for this project on Ex. SDGE-14-CWP, pp. 908 and 915.

d. Please explain how SDG&E allocates costs for this project between FERC and CPUC-jurisdictional costs, and provide the underlying computations to do so for the subprojects shown on Ex. SDGE-14-CWP, pp. 926, 928, and 934.

SDG&E Response 133:

a. (i) Will replace
Please see the table below listing the approximate number of distribution poles SDG&E installed or plans to install per year as part of the CNF Project. Note: the actual number of poles replaced can be affected by a number of factors, including but not limited to; fire/weather restrictions, environmental delays/restrictions, outage constraints and regulatory delays in issuing Notices To Proceed for a particular line or line segment.

(ii) Will remove due to undergrounding
Please see the table below listing the approximate number of distribution poles SDG&E removed or plans to remove per year as part of the CNF Project. Note: the actual number of poles removed can be affected by a number of factors, including but not limited to; fire/weather restrictions, environmental delays/restrictions, outage constraints and regulatory delays in issuing Notices To Proceed for a particular line or line segment.

Work Type	2017	2018	2019	2020	Total
Distribution Steel Pole Installation	54	361	289	287	991
Distribution Wood Pole Removal (UG)	0	70	184	30	284

b. Approximate forecasted costs from 2017-2019 for CNF include:

Cleveland National Forest MSUP	**2017 ($K)**	**2018 ($K)**	**2019 ($K)**

Labor	1,210	781	782
Non-Labor	24,945	38,428	39,253
Total Direct Costs	**26,155**	**39,209**	**40,035**

Labor	**1,210.05**	**780.80**	**781.92**
Mgmt & Non-Union Labor	556.64	780.80	781.92
Union Labor	653.41	-	-

Non-Labor	**24,945.08**	**38,428.49**	**39,253.40**
EPC	16,918.40	32,156.56	33,781.39
Services	6,958.83	5,996.16	5,319.97
Other	658.65	47.40	44.44
Easements/ROW & Fee-Owned Property	83.82	95.04	-
Leased/Rented Property	40.95	66.36	66.36
Internal Settlements	74.86	41.97	41.24
Vehicle Utilization	115.11	-	-
Materials	94.22	-	-
Employee Costs	0.24	25.00	-

c. Project Costs

Segment	Cost Cat	2017	2018	2019	Total	GRC Reference[7]
625B/629E	Total	1,229	-	-	1,229	*pg 914*
625D	Total	843	2,095	-	2,938	*pg 916*
629A	Total	1,938	7,529	-	9,467	*pg 918*
682	Total	3,053	3,386	-	6,439	*pg 920*
6931	Total	1,885	-	-	1,885	*pg 922*
78	Total	1,740	-	-	1,740	*pg 924*
79B	Total	1,639	2,382	12,041	16,062	*pg 926*
C222	Total	741	256	8,474	9,471	*pg 928*
157	Total	3,824	4,295	-	8,119	*pg 930*
442	Total	6,131	8,470	-	14,601	*pg 932*
449/625C/629D	Total	1,254	9,607	18,540	29,401	*pg 934*
PMO	Total	1,878	1,189	980	4,047	*pg 936*
Total CNF	Labor	1,210	781	782	2,773	*Ties to pg 908*
Total CNF	Non-Labor	24,945	38,428	39,253	102,626	*Ties to pg 908*
Total CNF	NSE	-	-	-	-	*Ties to pg 908*
Total CNF	**Total**	**26,155**	**39,209**	**40,035**	**105,399**	***Ties to pg 908***

[7] SDGE 14 - Electric Distribution Capital CWP Alan Colton

SDG&E Response 133 Continued:

d. SDG&E allocates CPUC-jurisdictional costs for this project as the components, hardware and work associated with just the distribution portions of the project while the FERC costs are associated with the transmission related components, 69kV and above. Certain costs shown in witness testimonies, such as Electric Distribution Capital, contain costs that will later be segmented and/or allocated between gas and electric operations, this includes costs recoverable under other proceedings, such as Electric Transmission, which are recovered under FERC rate proceedings. This allocation is performed in the RO model and is described in the revised testimony of Mr. James Vanderhye, Exhibit SDG&E-32-R, Shared Services & Shared Assets Billing, Segmentation & Capital Reassignments. The costs allocated to electric transmission are omitted from the GRC revenue requirement.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

134. With regard to generators interconnecting under its WDAT or Rule 21:

a. Does SDG&E believe as a matter of policy that such generators should reimburse SDG&E for the interconnection costs SDG&E incurs, so that those costs are not borne by ratepayers as a whole?

b. Please indicate where in SDG&E's testimony and workpapers it shows:

i. Costs incurred with processing and implementing generation interconnection requests

ii. Reimbursements received from interconnecting generators

SDG&E Response 134:

a. Yes, in conformance with authorized CPUC criteria.
b.
   i. Budget code 13264 provides costs to engineer, design, and construct interconnection facilities.
   ii. Reimbursements received from interconnecting generators are included in miscellaneous revenue. Please refer to SDG&E-40 Direct Testimony of Eric Dalton – Miscellaneous Revenue and SDG&E – Miscellaneous Revenues WP.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

135. SDG&E reports that jacketed UG cables are "approaching their manufacturer recommended service life" (Ex. SDGE-14, p. 75) and SDG&E predicts "a steady uptrend of jacketed cable failures over the next five years" (Ex. SDG&E-14, p. 75).

a. Please provide a table showing the following date, for each year from 2012-2017 (actuals) and 2018-2022 (forecasts):

i. Miles of jacketed UG cable replaced proactively

ii. Miles of jacketed UG cable replaced reactively after failure

iii. SAIDI due to jacketed UG cable failures

iv. SAIFI due to jacketed UG cable failures

b. As of yearend 2017:

i. How many miles of jacketed UG cable remain on SDG&E's system? If the answer is not approximately 8664 miles (10,558 miles of UG cable (Ex. SDGE-15, p. 1), minus the 1894 miles are unjacketed (85 circuit miles of unjacketed feeder cable and 1809 miles of unjacketed lateral cable (Ex. SDGE-14, p. 81; Ex. SDGE-14-CWP, p. 453)), please explain why not.

ii. What is the average age of the jacketed UG cable on SDG&E's system?

iii. How old are the oldest jacketed UG cables on SDG&E's system?

iv. Please provide an age distribution for SDG&E's jacketed UG cable, showing (as of the end of 2017), the number of miles installed in each year up through 2017.

SDG&E Question 135 Continued:

c. For each of the years 2018-2022, inclusive, with regard to jacketed cable:

i. How many miles of replacements does SDG&E plan to do?

ii. What is the forecasted unit cost per mile for jacketed cable replacements?

iii. What is SDG&E's forecasted capital expenditure for jacketed cable replacements?

iv. Where in SDG&E's workpapers are the forecasted capital expenditures for jacketed cable replacements found? If they are under more than one budget code, please indicate the dollars for each budget code separately.

v. Please provide the jacketed UG cable failure rate data or analysis (historical and/or forecast) that leads SDGE to expect "a steady uptrend of jacketed cable failures over the next five years" (Ex. SDG&E-14, p. 75).

d. What is the" manufacturer recommended service life" (Ex. SDGE-14, p. 75) for jacketed UG cable?

e. What is SDG&E's expected service life for its jacketed UG cable?

f. Please provide any data or analysis SDG&E has in its possession (e.g., Weibull curves) regarding the expected failure rate as a function of age for jacketed UG cable.

g. For the years 2012-2017, inclusive, please provide:

i. The average miles of jacketed UG cable in service

ii. The miles of jacketed UG cable experiencing a failure during the year

iii. The jacketed UG cable failure rate

h. Please provide the data that leads SDG&E to conclude that it is seeing "a rise in failures of jacketed cable" that will accelerate over the next five years (Ex. SDGE-14, p. 75:17-20).

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 27, 2018

SDG&E Response 135:

a.

i. Miles of jacketed UG cable replaced proactively

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Circuit Miles	0	0	0	0	0	1.6	0	0	0	0	0

ii. Miles of jacketed UG cable replaced reactively after failure

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Circuit Miles	1.63	1.24	1.73	1.93	2.79	N/A	4.5	6	8	11	15

iii. See response to Q90.a.v-viii.

iv. See response to Q90.a.v-viii.

b.

i. As of mid-year 2017 (last time the study was performed), SDG&E had approximately 9,129 miles of jacketed UG cable on its system with a total UG cable mileage of 10,804 miles. This study did not differentiate between feeder and lateral cable amounts.

ii. This information is not available.

iii. 1977

iv. This information is not available.

c.

i. Based on failure rates, SDG&E will only prioritize jacketed cable if failure rates continue to escalate. Otherwise, SDG&E will continue to invest proactive cable replacement on unjacketed cable which has a much higher failure rate.

ii. This forecast is for proactive cable replacement and is based on jobs where unjacketed cable was replaced. These are direct costs.

Year	2018	2019	2020	2021	2022
Feeder unit cost/mile	$413,000	$423,000	$433,000	$444,000	$455,000
Lateral unit cost/mile	$96,000	$98,000	$101,000	$103,000	$106,000

SDG&E Response 135 Continued:

iii. Proactive jacketed cable replacements are expected to be near zero until the risk posed exceeds the risk of remaining lateral unjacketed cable. Testimony outlining the risk of jacketed cable failure is outlined to expose and impress the fact that current cable replacement rates are insufficient to provide long-term cable failure rate escalation, which will have a negative impact on long-term system reliability.

iv. Costs for jacketed cable replacements would be in the 230 budget, although. as mentioned above, jacketed cable replacement is assumed to be at similar costs to replacement of unjacketed cable failure, but little money is expected to be spent in this category until risks outweigh the risk of replacement of remaining lateral unjacketed cable.

v.

Year	2006	2007	2008	2009	2010	2011	1012	2013	2014	2015	2016	2017
# of failures	8	12	13	22	21	12	19	13	27	31	34	N/A

d. The “manufacturer recommended service life" for jacketed UG cable depends on the vintage of the cable. For jacketed cable purchased in the late 1970’s/early 1980’s to the mid 1990’s the service life was 30-35 years. The cable purchased today has a service life of 40 years.

e. SDG&E objects to this request on the grounds that it is vague and ambiguous as to the term “expected service life.” Subject to and without waiving this objection, SDG&E responds as follows: Distribution cables are capitalized to FERC Account E367 – Underground Conductors & Devices. Per Exhibit SDG&E-34-R (Revised Direct Testimony of Matthew Vanderbilt) at MCV-23, the proposed average service life for assets in FERC Account E367 is 49 years. Please refer to Exhibit SDG&E-34-R at page MCV-23 for more information.

f. This information is not available.

g.

i. This information is not available.

i. The miles of jacketed UG cable experiencing a failure is shown below:

year

Year	2012	2013	2014	2015	2016	2017
Circuit miles	1.63	1.24	1.73	1.93	2.79	N/A

SDG&E Response 135 Continued:

iii. This information is not available.

h.

Year	2006	2007	2008	2009	2010	2011	1012	2013	2014	2015	2016	2017
# of failures	8	12	13	22	21	12	19	13	27	31	34	N/A

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: JANUARY 12, 2018

136. SCG reports anticipated costs in this GRC cycle for replacing 1.92% per year of its AMI modules and 3000 MTU batteries annually (Ex. SCG-4, p. 43).

a. Does SDG&E's testimony include costs for AMI module replacements and MTU battery replacements? If so, where?

b. How many AMI modules are deployed on the SDG&E system?

c. What is SDG&E's expected life for its AMI modules?

d. What percentage of its AMI modules does SDG&E expect to replace annually?

SDG&E Response 136:

a. Field labor costs for AMI module (gas modules) replacements for gas meters can be found in the testimony of Gwen Marelli, Exhibit SDG&E-17, under the CS-F Operations forecast. Batteries in the AMI modules deployed in the SDG&E service territory cannot be changed. In the event a dead or significantly degraded battery is discovered, the AMI module is retired.
b. There were 870,940 active AMI modules in SDG&E's service territory as of December 31, 2016.
c. SDG&E's expected life of its AMI modules is 15 years.
d. SDG&E expects to replace approximately 0.7% of its AMI modules annually.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

137. SDG&E testifies that "infractions identified during ... inspections ... must be cleared within 12 months of the initial inspection." Please identify

a. any such infractions identified in 2016 or before that were not cleared as of the end of 2017.

SDG&E Response 137 a.:
For compliance purposes, there are zero infractions identified in 2016 or before that were not cleared as of the end of 2017.

Per G.O. 95 Rule 18, Section A, Subsection (2)b, correction times may be extended under reasonable circumstances, such as: third party refusal, customer issue, no access, permits required, and system emergencies (e.g. fires, severe weather conditions). There are 248 infractions on distribution facilities (poles, pad mounted equipment, subsurface equipment) that fall within this extension category.

b. The number of such infractions that remained uncleared after more than 12 months, as of the end of each of the years from 2012-20116, inclusive.

SDG&E Response 137 b.:

For compliance purposes, there have been zero uncleared infractions from 2012-2016.

Per G.O. 95 Rule 18, Section A, Subsection (2)b, correction times may be extended under reasonable circumstances, such as: third party refusal, customer issue, no access, permits required, and system emergencies (e.g. fires, severe weather conditions). The table below shows infractions on distribution facilities (poles, pad mounted equipment, subsurface equipment) that fall within this extension category.

TOTAL Infractions Extended Under G.O. 95	Time period
1,428	infractions identified in 2011 or before, but not cleared by 12/31/12
1,641	infractions identified in 2012 or before, but not cleared by 12/31/13
1,666	infractions identified in 2013 or before, but not cleared by 12/31/14
946	infractions identified in 2014 or before, but not cleared by 12/31/15
459	infractions identified in 2015 or before, but not cleared by 12/31/16

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

c. Please explain why SDG&E has 34,000 poles "requiring follow up maintenance work" (Ex. SCG-15, p. 64) and whether any of that work represents an infraction that " must be cleared within 12 months of the initial inspection."

SDG&E Response 137c.:

The "34,000 poles" references our Vegetation Management activities, where pole brushing is performed on 34,000 poles. This work does not represent an infraction that must be cleared within 12 months. Rather, this is a mandated activity under PRC 4292. This work is performed on an annual and cyclical basis as San Diego County has a fire season that is 365 days per year. The activity under Public Resource Code 4292 must be compliant 365 days per year. SDG&E is compliant with this requirement.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

138. Ex. SDGE-15-WP, p. 35, contains capital cost estimates for five different kinds of switch replacements. One of them, bridged cutout switch replacements, was addressed in prior data requests. With regards to the other four:

a. SDG&E projects proactive replacement of 2958 OH FMO switches over a 7-year period, at a unit cost of $13,756 each, which corresponds to $5.813 million per year. For each of the years 2017-22, inclusive, how many capital expenditure dollars is SDG&E requesting for replacement of OH FMO switches, and where can that request be found in SDG&E's testimony and workpapers (please supply exact page cite(s)).

b. SDG&E projects post-inspection replacement of 426 OH non-FMO switches over a 7-year period, at a unit cost of $13,756 each, which corresponds to $0.837 million per year. For each of the years 2017-22, inclusive, how many capital expenditure dollars is SDG&E requesting for replacement of OH non-FMO switches, and where can that request be found in SDG&E's testimony and workpapers (please supply exact page cite(s)).

c. SDG&E projects proactive replacement of 1689 UG FMO switches over a 7-year period, at a unit cost of $42,113 each, which corresponds to $10.161 million per year. For each of the years 2017-22, inclusive, how many capital expenditure dollars is SDG&E requesting for replacement of UG FMO switches, and where can that request be found in SDG&E's testimony and workpapers (please supply exact page cite(s)).

d. SDG&E projects post-inspection replacement of 317 UG non-FMO switches over a 7-year period, at a unit cost of $42,113 each, which corresponds to $1.907 million per year. For each of the years 2017-22, inclusive, how many capital expenditure dollars is SDG&E requesting for replacement of UG non-FMO switches, and where can that request be found in SDG&E's testimony and workpapers (please supply exact page cite(s))

SDG&E Response 138:

a. SDG&E's TY 2019 application and supporting testimony follows the Rate Case Plan, which requires SDG&E to identify forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. SDG&E objects to this request to the extent it incorrectly assumes otherwise. Subject to and without waiving this objection, SDG&E responds as follows:

SDG&E Response 138 Continued:

The numbers stated in the question are correct, and SDG&E is requesting $5.813 million per year in capital expenditure dollars for OH FMO switch replacements. These costs are included in the capital budget code 16252, RAMP – Incremental – Electric Integrity. These costs are shown in the testimony Ex. SDGE-14 p. AFC-C-3 and in the workpapers Ex. SDGE-14-CWP p. 755-756.

b. SDG&E's TY 2019 application and supporting testimony follows the Rate Case Plan, which requires SDG&E to identify forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. SDG&E objects to this request to the extent it incorrectly assumes otherwise. Subject to and without waiving this objection, SDG&E responds as follows:

The numbers stated in the question are correct, and SDG&E is requesting $0.837 million per year in capital expenditure dollars for OH non-FMO switch replacements. These costs are included in the capital budget code 16252, RAMP – Incremental – Electric Integrity. These costs are shown in the testimony Ex. SDGE-14 p. AFC-C-3 and in the workpapers Ex. SDGE-14-CWP p. 755-756.

c. SDG&E's TY 2019 application and supporting testimony follows the Rate Case Plan, which requires SDG&E to identify forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. SDG&E objects to this request to the extent it incorrectly assumes otherwise. Subject to and without waiving this objection, SDG&E responds as follows:

The numbers stated in the question are correct, and SDG&E is requesting $10.161 million per year in capital expenditure dollars for UG FMO switch replacements. These costs are included in the capital budget code 16252, RAMP – Incremental – Electric Integrity. These costs are shown in the testimony Ex. SDGE-14 p. AFC-C-3 and in the workpapers Ex. SDGE-14-CWP p. 761-762.

SDG&E Response 138 Continued:

d. SDG&E's TY 2019 application and supporting testimony follows the Rate Case Plan, which requires SDG&E to identify forecasted costs for a Test Year of 2019. SDG&E has not forecasted specific funding for years beyond 2019, which is addressed by the attrition mechanism. SDG&E objects to this request to the extent it incorrectly assumes otherwise. Subject to and without waiving this objection, SDG&E responds as follows:

The numbers stated in the question are correct, and SDG&E is requesting $1.907 million per year in capital expenditure dollars for UG non-FMO switch replacements. These costs are included in the capital budget code 16252, RAMP – Incremental – Electric Integrity. These costs are shown in the testimony Ex. SDGE-14 p. AFC-C-3 and in the workpapers Ex. SDGE-14-CWP p. 761-762.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

139. SDG&E plans to hire 20 new linemen by 2019 (Ex. SDGE-15, p. 45:24-25), and states that "Addi[t]ional lineman lineman (sic) will improve outage response times and reliability" (Ex. SDGE-15-WP, pp. 102, 145).

a. Please provide any quantitative estimates SDG&E has as to the reduction in SAIDI or the change to any other reliability measure due to adding 20 linemen.

SDG&E Response 139a: SDG&E does not have the requested quantitative estimates.

b. For each of the years 2012-17, please indicate the number of workers, by classification (e.g., lineman, troubleshooter, apprentice, etc.) employed by SDG&E at the end of that year who were available for "outage response." Please also indicate how many, if any, of these workers are not in the Electric Regional Operations (ERO) group that "restores[] service after outages (Ex. SDGE-15, p. 38:13).

SDG&E Response 139b: Following is the breakdown for workers available for "outage response." All are within Electric Regional Operations. In addition to the individuals below, traffic control and certain gas personnel could also be involved in an outage response if warranted by the situation or conditions.

	2012	**2013**	**2014**	**2015**	**2016**	**2017**
Apprentice Lineman	32	38	32	36	33	31
Apprentice Lineman - EROC			2	3	1	2
Fault Finding Specialist	5	5	6	4	5	5
Line Assistant	20	15		14	10	10
Line Assistant - EROC				1	2	1
Lineman	190	169	151	158	151	157
Lineman - EROC			8	4	6	5
Troubleshooter	42	43	40	41	41	40
Total	**289**	**270**	**239**	**261**	**249**	**251**

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

c. For each of the years 2018-22, on a forecast basis, indicate the number of workers, by classification, that SDG&E expects to have available for "outage response."

SDG&E Response 139c: Overall, SDG&E anticipates keeping headcount consistent with current levels. SDG&E hiring is expected to keep up with attrition. The exceptions to this include an additional 20 linemen and an additional 15 apprentice linemen included in the TY 2019 request**.**

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

140. SDG&E plans to hire 20 new linemen and 15 new apprentices by 2019 (Ex. SDGE-15, p. 45:24-25). The associated workpapers show costs for all 20 linemen (Ex. SDGE-15-WP, p. 145, showing 2018 costs of $1800K for 20 linemen at $90K each; $1800K/$90K = 20), but the incremental costs for the apprentices are only $990K ($2790K total minus $1800K for linemen equals $990K for apprentices). Does this cost represent all 15 planned new apprentices?

SDG&E Response 140:

Yes, the apprentices were forecasted at $66k of O&M per year. In addition to the costs attributed to apprentices within the Electric Regional Operations workpaper, the costs for the apprentice class are captured within the Skills & Compliance Workpaper (SDGE-15-WP p. 152). Total labor associated with the class is $278k.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

141. SDG&E's electric distribution O&M workpapers include some costs which are clearly gas-related (Ex. SDGE-15-WP, p. 146, "Dig Alert, call 811" and "Furnace/Carbon Monoxide Safety" lines. Are these costs included in error? Are they also counted in the gas testimony?

SDG&E Response 141:

The costs for the electric safety campaign found in SDG&E-15 are not related to gas. This safety campaign includes "Dig Alert, call 811" as it related to underground electric safety. The line "Furnace/Carbon Monoxide Safety" was included in error and should be removed from this section. Costs for damage prevention and public awareness regarding gas service are included in the testimony of Omar Rivera, Exhibit SDG&E-05.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

142. SDG&E proposes to increase its O&M budget for DER activities by $0.395 million (30%) (Ex. SDGE-15, p. 90). It identifies four specific increases that total $0.255 million (Ex. SDGE-15, p. 91), but provides no description or explanation for the other $0.14 million of proposed increase. Please provide an explanation.

SDG&E Response 142:

The additional $0.14 million is attributed to two items. The first is the addition of two new engineering positions. These positions are described in the testimony (Ex. SDGE-15, p. 91 24-30) and total $0.12 million in 2019 as shown in the workpapers (Ex. SDGE-15-WP, p. 311.) The second is the addition of a sixth energy storage unit in 2019 which increased the maintenance cost by an additional $0.02 million. This is calculated correctly in the workpapers (Ex. SDGE-15-WP, p. 311) but not stated correctly in the testimony, which cites only the labor costs associated with battery maintenance in 2018.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

143. Please reconcile the differing number of distribution substation reported by SDG&E (134 on Ex. SDGE-15, p. 51 and 140 on Ex. SDGE-15-WP, p. 166).

SDG&E Response 143:

The correct number is 134 distribution substations, based on the current distribution substation count at the time of the GRC filing.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

144. SDG&E says that O&M costs for 4 kV substation elimination are "estimated to be 5% of the capital cost" (Ex. SDGE-15-WP, p. 168). But the 2019 O&M budget is only $152K (Ex. SDGE-15-WP, p. 168), while the capex budget is $11.4 million in 2019 (Ex. SDGE-14, p. 84; Ex. SDGE-14-CWP, p. 489). 5% of $11.4 million is $570K, not $152K. Please reconcile the apparent inconsistency.

SDG&E Response 144:

The capex budget for 4kV Modernization – Substation is included in capital budget code 6260.002 Ex. SDGE-14 p. AFC-C-3 and Ex. SDGE-14-CWP pp. 497-498. The capex budget in 2019 is given as $2.279 million and 5% of that cost is $0.114 million.
The capex budget for 4kV Modernization – Distribution is included in capital budget code 6260.001 Ex. SDGE-14 p. AFC-C-3 and Ex. SDGE-14-CWP pp. 495-496. The capex budget in 2019 is given as $9.114 million and 5% of that cost is $0.456 million.
The O&M portion of the 4kV Modernization – Distribution costs are included in the Construction Services workgroup Ex. SDGE-15-WP pp. 14-20.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

145. Please explain why it is reasonable to expect Fueling Our Future (FOF) savings to exceed 10% of the otherwise-expected labor costs for each instance in which SDG&E has projected FOF savings of that magnitude (e.g., Ex. SDGE-15, pp. 41, 52, 58), particularly when the reductions involve deferring maintenance (Ex. SDGE-15, p. 52:17-19).

SDG&E Response 145:

The labor savings are expected due to a number of different programs that either improve processes, leverage technology, or increase controls. Examples of the types of programs established are provided in SDG&E pages WHS – 41, 52, and 58.

With regard to deferred maintenance, one example of this is to leverage condition-based maintenance data to reduce manual substation oil sampling. Under the old technology, as part of SDG&E's maintenance procedures, manual oil samples were taken every year in every substation distribution transformer to have them tested for dissolved gas analysis and oil quality. It was important to get at least one sample each year, as dissolved gas analysis is a trend based analysis and not based on absolute values, where oil quality is based on not to exceed values. SDG&E recently installed dissolved gas monitors on all distribution transformers, this will send automated email alerts at different set values, and are available for trend analysis through software. Samples are now taken daily, automatically (as opposed to once a year, manually). While it was determined the manual sample is still needed for oil quality metrics (which the DGA monitor does not perform), it was determined the annual frequency was driven by the need for dissolved gas trend analysis. Engineering determined the manual samples could be taken every other year with little risk to the health of the transformer asset, cutting the maintenance costs in half, a savings of $72k dollars annually.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

146. Troubleshooters are "SDG&E's first responders" during emergencies and unplanned outages, yet SDGE proposes to cut their budget from 2016 to 2019 (Ex. SDGE-15, p. 63). The 2019 budget is also smaller than actual spending on 2012 and 2013 (Ex. SDGE-15-WP, p. 205). The unit cost per FTE is shown as increasing 7 percent from 2014 to 2016, but then remaining flat from 2017 to 2019 (Ex. SDGE-15-WP, p. 205).

a. For each year from 2012-2017 (actuals) and 2018-2022 (planned), provide the number of troubleshooters employed by SDG&E.

b. Please confirm that the unit cost per FTE for the troubleshooting organization is shown as increasing 7 percent from 2014 to 2016, but then remaining flat from 2017 to 2019 (Ex. SDGE-15-WP, p. 205).

c. Please provide the dollars spent in each of the years 2012-2017 (actuals) and proposed to be spent in 2018-2022 (planned) just for troubleshooters (excluding the engineers, technical assistants, etc. also included in the costs shown in Ex. SDGE-15-WP, p. 205).

SDG&E Response 146:

a. Below are the historical headcount levels for troubleshooters. For years 2018 – 2022, SDG&E plans to remain at current levels.

	2012	2013	2014	2015	2016	2017
Troubleshooter	42	43	40	41	41	40

b. The statement is correct.
c. 2012: 6.568M, 2013: $6.190, 2014: $5.745M, 2015: $5.723M, 2016: $6.341M. Costs are presented in actual dollars.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 15, 2018

147. SDG&E says that it has 6527 miles of overhead conductor (Ex. SDGE-15, p.1).

a. Please provide an age distribution table, in Excel format for those 6527 miles of OH conductor, showing (as of yearend 2017) the number of miles installed in each year from the earliest installation year through 2017.
b. Please provide the total number of miles of OH conductor SDG&E expects to replace through all programs, both reactively and proactively, in each year from 2018-2022, inclusive.

c. What is the average expected life for SDG&E's overhead conductor?

d. Please reconcile any differences between the expected life given in response to the preceding subpart (c) of this question, and the expected service life SDG&E is proposing for depreciation purposes for FERC Account 365 (59 years and one month, per Ex. SDGE-34, p. 22; Ex. SDGE-34-WP, p. 188).

SDG&E Response 147:

a. SDG&E data as tracked beginning in 1990 is provided in "OHConductorAgeMiles.xlsx."
b. SDG&E expects to replace roughly 155 miles of OH conductor in 2018 and 135 miles of OH conductor in 2019, for a total of 290 miles through all programs.
c. SDG&E objects to this request on the grounds that it is vague and ambiguous as to the term "average expected life." Subject to and without waiving this objection, SDG&E responds as follows: Overhead conductors are capitalized to Federal Energy Regulatory Commission (FERC) Account 365 – Overhead Conductors & Devices. Per Exhibit SDG&E-34-R (Revised Direct Testimony of Matthew Vanderbilt) at MCV-22, the proposed average service life for assets in FERC Account 365 is 59 1/12 years. Please refer to Exhibit SDG&E-34-R at page MCV-22 for more information. Actual conductor life can vary based conductor material (copper, aluminum, with or without steel core support), the load the conductor experiences (how much heat,) the load cycle (how much thermal expansion and contraction), and the environment (corrosion, wind etc.).
d. Please refer to the response to Question 147(c) above.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

148. SDGE says it has about 4500 distribution relays (Ex. SDGE-15, p. 53). It is replacing electromechanical relays with microprocessor based relays (Ex. SDGE-15, p. 54).

a. Please indicate how many of SDG&E's 4500 distribution relays are electromechanical relays, and provide an age distribution table for the electromechanical relays, showing (as of year end 2017) the number of electromechanical relays installed in each year from the earliest installation year through 2017.

b. For each year from 2018 through 2022, inclusive, please indicate the number of electromechanical relays SDG&E expects to replace each year, and the capital expenditure to do so.

c. On what page in SDG&E's workpapers can the capital expenditure provided in response to the preceding subpart (b) of this question be found?

d. By what year does SDG&E expect to complete replacing its electromechanical relays?

e. What is the expected life of an electromechanical relay on the SDG&E distribution system?

SDG&E Response 148:

a. There are approximately 2,360 electromechanical distribution relays (12kV or 4kV) on the system. SDG&E is unable to provide an age distribution for electromechanical relays in service on the distribution system, install dates are not recorded in our database for these devices. Paper relay sheets were typed into Cascade (our Substation Management System) in 2007. New installations of electromechanical relays had ceased by that time. A spot check suggests SDG&E stopped installing new electromechanical relays on the distribution system by 2001. Given the long lifespan of such devices, the vast majority of electromechanical relays are much older than 2001. A spot check also shows some electromechanical relays dating back to the early 1970's, many dating to the 1980's. SDG&E is aware of cases where electromechanical relays have lasted on the system as long as 50 years.

b. SDG&E does not have a formal electromechanical relay replacement program; relays are replaced as part of larger capital jobs such as substation rebuilds, control shelter upgrades and circuit breaker replacements.

SDG&E Response 148 Continued:

c. See response to b.

d. See response to b.

e. The electromechanical relays can last 50 or more years, as long as they are routinely maintained and calibrated. The principal driver of replacement of electromechanical relays is not failure rates, but the increased control, outage-cause diagnostic abilities and functionality provided by newer microprocessor-based relays.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

149. According to SDG&E, elimination of a 4 kV substation by replacing it with 12 kV assets will have an O&M cost equal to 5 percent of the capital cost (Ex. SDGE-15-WP, p. 168). However, the O&M costs shown on Ex. SDGE-15-WP, p. 168 for 2018 and 2019 are much less than 5% of the 2018 and 2019 capital expenditures for 4 kV elimination shown in Ex. SDGE-14, p. 84:23-24. Please reconcile this discrepancy.

SDG&E Response 149:

The capex budget for 4kV Modernization – Substation is included in capital budget code 6260.002 Ex. SDGE-14 p. AFC-C-3 and Ex. SDGE-14-CWP pp. 497-498. The capex budget in 2019 is given as $2.279 million and 5% of that cost is $0.114 million.
The capex budget for 4kV Modernization – Distribution is included in capital budget code 6260.001 Ex. SDGE-14 p. AFC-C-3 and Ex. SDGE-14-CWP pp. 495-496. The capex budget in 2019 is given as $9.114 million and 5% of that cost is $0.456 million.
The O&M portion of the 4kV Modernization – Distribution costs are included in the Construction Services workgroup Ex. SDGE-15-WP pp. 14-20.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

150. SDG&E used the 2014-2016 average to project future O&M costs for its Distribution and Engineering group, while the historical data shows flat costs in 2012-2015, then a jump in 2016 (Ex. SDGE-15-WP, p. 187).

a. Does SDG&E consider the 2016 O&M costs for this group to be an anomaly, or a new normal?

b. Please provide the 2017 O&M costs for this group.

SDG&E Response 150:

a. SDG&E does not consider 2016 the new normal. The primary cost driver for the 2016 increase was increased maintenance expenses for emergency backup generators utilized as part of SDG&E's Fire Prevention Plan, and will remain in future years. But other activities performed by this group can vary, so an average was used to smooth out high and low years.

b. 2017 O&M costs are not yet available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

151. Please reconcile the different PRiME O&M costs shown by SDG&E for both 2018 and 2019 non-labor ($460K and $2142K on Ex. SDGE-15-WP, p. 200, versus $537K and $2019K on Ex. SDGE-15-WP, p. 201) and 2018 labor ($60K on Ex. SDGE-15-WP, p. 200, versus $32K on Ex. SDGE-15-WP, p. 201).

SDG&E Response 151:

The forecasting for PRiME was being refined even while workpapers were being prepared, the supplemental workpaper at page 201 was the latest to be completed and the values shown on it were not updated back to the Distribution and Engineering activity summary sheet at page 200. The methodology shown on Ex. SDGE-15-WP, p. 201 shows the most accurate representation of the costs.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

152. SDG&E requests fewer dollars for tree trimming in each of the years 2017-2019, inclusive, than it actually spent in 2012, 2013, 2014, or 2016, ", "in spite of a host of potential upward cost pressures" (Ex. SDGE-15-WP, p. 220).

a. Please explain why SDG&E expects less tree trimming expense in the future than in the last five years.

b. Please provide the actual tree trimming O&M expense for 2017.

SDG&E Response 152:

a. SDG&E continues to look for ways to reduce cost by means of "right tree, right place", removing incompatible trees and replacing them with trees that would not require future maintenance by the utility. Additionally, SDG&E has been utilizing tree growth regulators (TGR) where possible to help slow the rates of growth on certain species of trees, in some cases reducing tree pruning expenses for two to three years. However, trees treated with TGR will eventually cause an upward pressure in future years to re-prune and re-treat. The number of hazard (dead, dying, defective) trees worked by SDG&E in 2017 dropped compared with years 2015 and 2016. This reduction is partly due to the relative reduction in tree mortality caused by the Gold Spotted Oak Borer. Lastly, SDG&E has been very successful in removing Palms over the last 5 plus years; however, incompatible trees continue to be planted under or near overhead utilities. SDG&E requested a two-way balancing account to account for such unforeseen variables and sufficiently fund a robust program to ensure public safety, regulatory compliance, reduce potential for outages, increase public education, and prevent the source for wildfires.
b. 2017 figures are not yet available.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

153. SDG&E says that its distribution system is "predominantly 12 kV, with some large areas of 4 kV" (Ex. SDGE-15, p. 2:7-9).

a. Please provide the number and percentage of customers served at 4 kV, and at 12 kV

b. Please provide the number and percentage of distribution substations that operate at 4 kV, and at 12 kV (with the understanding that the total may exceed 100% due to substations that operate at both 4 kV and 12 kV)

c. Please provide the number and percentage of SDG&E's distribution circuits that operate at 4 kV, and at 12 kV.

SDG&E Response 153:

a. 1% of customers are not related to Primary Meter or Transformer Device in GIS

Nominal Voltage	Customer Count	Percent
4	112,293	7%
12	1,340,782	92%

b.

Nominal Voltage	Substation Count	Percent
4	27	20%
12	134	100%

c.

Nominal Voltage	Circuits Count	Percent
4	222	21%
12	813	79%

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

154. SDG&E's O&M testify references workpapers for the split between capital and O&M for switch inspections and replacement (Ex. SDGE-15, p. 23:1-2 and p. 23:8-9, p. 43:12-13 and p. 43:19-21). Please provide the page(s) in Ex. SDGE-15-WP where the referenced splits can be found.

SDG&E Response 154:

The split between capital and O&M cost for the Distribution Switch Maintenance and Upgrade Projects can be found in Ex. SDGE-15-WP, p. 35. The spreadsheet on page 35 shows the number of switches proposed for each program, the capital cost per switch, and the O&M cost per switch.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

155. SDG&E states that the "Distribution and Engineering group is responsible for all equipment pertaining to the distribution network" and performs "risk analysis" (Ex. SDGE-15, p. 56:20-24). For each category of distribution equipment, please provide the most recent analysis done by the Distribution and Engineering group as to

a. the life expectancy for that category of equipment,

b. the average of that type of equipment,

c. the failure rate of that type of equipment,

d. the failure rate of that type of equipment as a function of its age (e.g., Weibull curves),

e. the mean time to failure (MTTF) for that type of equipment, or

f. measures that SDG&E can take, has taken, or plans to take to extend the life of that type of equipment.

SDG&E Response 155:

Risk analysis is performed on a targeted basis for particular pieces of equipment, not necessarily on complete classes of equipment.

SDG&E does not have comprehensive data records for the age of all distribution equipment installed on the system, nor does SDG&E track failure rates for all types of equipment, generally relying on manufacturing specifications unless noticed equipment failure trends warrant further analysis. Similarly, for those types that are tracked, management evaluation of trends is used to initiate more in-depth analysis. To date, the greatest failure cause and impact is attributed to unjacketed cable failures, which has led to the creation and maintenance of a program to mitigate that issue.

Other general equipment risk is assessed as the impact of outages compared to cost of replacement and/or improvement of the equipment in question.

a. **the life expectancy for that category of equipment,**

Using the cable failure and analysis program as an example, the life expectancy of underground cable varies based on the age of the cable type, manufacturer and, most importantly, environmental conditions experienced at the specific installation locations. General specifications examples are:

SDG&E Response 155 Continued:

- The first unjacketed polyethylene cable (HMWPE – high molecular weight) that SDG&E purchased in the 1960's had an expected life of 20-25 years (manufacturer MTTF).
- The unjacketed crosslinked polyethylene (XLPE) cable that was purchased in the late 1960's through the early 1980's had an expected life of 30 years (manufacturer MTTF).
- The jacketed cable purchased from the early 1980's to the mid 1990's had an expected life of 30-35 years (manufacturer MTTF).
- The jacketed cable purchased today has a life expectancy of 40 years (manufacturer MTTF).

b. **the average of that type of equipment,**

This question is vague but if we use the above cable example, you can see the average life expectancy can change dramatically based on the year and cable type that was specified, the cable manufacturer and environmental conditions. Installation tooling and techniques also contribute to cable lifespans or reduction thereof.

c. **the failure rate of that type of equipment**

An example would be the analysis done for unjacketed cable failure rates for the 2015 year that determined:

- HMWPE – all vintages - 0.109 failures/conductor mile
- XLPE – all vintages - 0.38 failures/conductor mile

d. the failure rate of that type of equipment as a function of its age (e.g., Weibull curves),

See the example of the unjacketed cable program mentioned above, conducted by SDG&E. Manufacturers do not provide this data.

e. the mean time to failure (MTTF) for that type of equipment, or

Manufacturers provide general cable life expectancy as illustrated above, those ranges can vary. Generally, for jacketed cable manufactured today, the life expectancy is listed at 40 years.

f. measures that SDG&E can take, has taken, or plans to take to extend the life of that type of equipment. See following examples:

- Underground cable:
  - A life-extension option that is available is 'cable rejuvenation', and SDG&E has determined this is not economically justified based on available data.

SDG&E Response 155 Continued:

    - Another measure is to leverage fault indicator technology to limit or eliminate cable fault locating tests.
    - Specifying current limiting fuses that protect cable systems and associated equipment from excessive fault current.
- Pad-mount transformers and other pad-mounted equipment:
    - Mandated specification for all-stainless-steel design on cabinets.
    - Mandated cutover to only FR3 (vegetable based oil) for all transformers purchased after January 1st, 2016.
- Pad-mounted SCADA Distribution switches:
    - Completed manufacturer updates so that future controllers can be updated with the latest power electronics without replacing the entire switch.
    - Instituting RTU replacement programs to update the power electronics without replacing the entire switch if otherwise in good condition.
- Overhead equipment/hardware:
    - Many of these devices purchased historically were manufactured with bi-metal components that corroded quickly in coastal and agricultural environments. SDGE has partnered with manufacturers to eliminate these deficiencies, thus extending product life.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E PARTIAL RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

156. Please supply the data in Ex. SDGE-34-WP, pp. 876-877 in an Excel-readable form. Tabular data rather than graphical data is acceptable.

SDG&E Response 156:

Please refer to the attached document: "CUE-002-Q156_SDG&E-34-WP-875 MVanderbilt_Depreciation_Curves.xlsx"

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 6, 2018

157. Does SDG&E's proposal to add a Saturday work shift (Ex. SDG&E-15, p. 41:19-20) require agreement from its represented workers? If so, has such agreement been:

a. Sought?

b. Received?

SDG&E Response 157:

The ability to add a Saturday shift exists in the current negotiated contract language.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E PARTIAL RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 14, 2018

158. SDG&E shows the same depreciation expense for 2019, $560 million/year, under either proposed rates or current rates (Ex. SDGE-42, p. A-2). How is this possible, since SDG&E's proposed rates have different depreciation rates than its current rates, differences whose effects on depreciation expense SDG&E has quantified (Ex. SDGE-34-WP, pp. 3-8)?

SDG&E Response 158:

Table KN-1 at page KN-A-2 of SDG&E's Summary of Earnings testimony (Exhibit SDG&E-42-R) calculates SDG&E's rate of return using present (current) rates and 2019 forecasted expenses. Thus, except for Base Margin (line 1 in Table KN-1), which represents 2018 authorized rates, all expenses are 2019 forecasted expenses and the same shown in the 2019 proposed rates column.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE PARTIAL
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: JANUARY 30, 2018

159. SDG&E's proposed working cash component of rate base is based on the TY 2016 GRC Decision for the years 2016-2018, and then a different methodology for 2019 (Ex. SDGE-33, p. 2, Table SDGE-RCG-1, line 5 and footnote. Please

a. Describe each of the changes from the past GRC methodology that SDG&E is proposing in this GRC

b. For each change in methodology SDG&E is proposing for this GRC cycle, please quantify the effect of that change on the 2019 Working Cash amount.

c. What would the 2019 Working Cash amount be if calculated using the TY 2016 GRC Decision methodology?

SDG&E Response 159:

a. SDG&E has not made or proposed any changes in methodology from the 2016 GRC. Consistent with the 2016 GRC, SDG&E derived its 2019 GRC working cash request from a combination of 2016 recorded data (with attrition) and forecast data.

   As noted in the question, the working cash component of 2017 and 2018 rate base, as shown on Ex. SDG&E-33, Table SDGE-RCG-1 line 5, is the amount authorized in the TY 2016 GRC Decision, increased by the attrition rate. Conversely, the working cash component for 2019 is based on the working cash component requested for the 2019 GRC. This does not reflect a change in methodology, but rather a change in applicable source (i.e. TY 2016 vs. TY 2019).

b. SDG&E has not made or proposed any changes in methodology from the 2016 GRC.

c. SDG&E has not made or proposed any changes in methodology from the 2016 GRC.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E PARTIAL RESPONSE 2
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 16, 2018

160. SDG&E proposes a 59 year and 1 month average service life for Account E365, Overhead Conductors and Devices, an increase from the current 55 year life, and proposes use of an R1 Iowa curve instead of the current R0.5 Iowa curve (Ex. SDGE-34, p. 22:18-20; Ex. SDGE-34-WP, p. 188).

a. Please admit that the R1-59.083 curve SDG&E proposes is not even the best R1 curve, and that the best R1 curve ranked 161st out of all the curves SDG&E tested for Account E365 (Ex. SDGE-34-WP, p. 188).

b. What was the ranking of the R1-59.083 curve among all the curves SDG&E tested for Account E365?

c. Please explain why SDG&E is proposing to change Account E365 from an R0.5 curve to an R1 curve when its own analysis shows the R0.5 curve type ranked higher than the R1 curve type (Ex. SDGE-34-WP, p. 188?

d. Among R1 curves, please explain why SDG&E is proposing to use a 59 year and 1 month (59.083 year) life for Account 365, when its own analysis showed a 67 and 7/12 year life was a better fit among the 33 R1 curves tested (Ex. SDGE-34-WP, p. 188)?

e. The best fitting curve type for Account E365 in SDG&E's analysis was an O2 curve with an 86 year and 2 month service life (Ex. SDGE-34-WP, p. 188). If the Commission were to adopt that curve type instead of SDG&E's proposal, how much would it decrease SDG&E's forecasted depreciation expense for 2019 for Account E365?

SDG&E Response 160:

a. SDG&E objects to this request on the grounds that it is compound, as well as vague and ambiguous as to the term "best." Subject to and without waiving these objections, SDG&E responds as follows. SDG&E's depreciation study was performed as described in Exhibit SDG&E-34-R (Revised Direct Testimony of Matthew Vanderbilt) at Section III. As stated in Exhibit SDG&E-34-R at page MCV-10, "mathematical curve fitting represents the beginning of the evaluation phase. It is at this point that informed judgment is used to assess the historical data trends and other information to identify the most appropriate curve for estimation of future experience." Based on SDG&E's actuarial analysis, review of mortality summary data, and professional judgment, a R1-59 1/12 is proposed for the assets that are capitalized to Federal Energy Regulatory Commission (FERC) Account 365 – Overhead Conductors and Devices.

SDG&E Response 160 Continued:

b. Please refer to the response to Question 160(a) above. R1-59 1/12 ranked highest among all R1 curves.

c. SDG&E objects to this request on the grounds that it is vague and ambiguous as to the term "ranked." SDG&E further objects to this request as assuming facts that have not been established. Subject to and without waiving these objections, SDG&E responds as follows. Please refer to the response to Question 160(a) above.

d. Please refer to the response to Question 160(a) above.

e. SDG&E objects to this request on the grounds that it is vague and ambiguous as to the phrase "that curve type." SDG&E further objects to this question as it is unduly burdensome, calls for speculation, and assumes facts that have not been established. Subject to and without waiving these objections, SDG&E responds as follows. Please refer to the response to Question 160(a) above.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E PARTIAL RESPONSE 2
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 16, 2018

161. SDG&E proposes a 40 year average service life for Account E373.20, Street Lighting and Signal Systems, an increase from the current 36 year life, and proposes use of the 19th-ranked O1 Iowa curve instead of the current L0 Iowa curve (Ex. SDGE-34, p. 25:26-28; Ex. SDGE-34-WP, p. 212). The best fitting curve type for Account E373.20 in SDG&E's analysis was an H0.50 curve with an 42 year and 8 month service life (Ex. SDGE-34-WP, p. 212). If the Commission were to adopt that curve type instead of SDG&E's proposal, how much would it decrease SDG&E's forecasted depreciation expense for 2019 for Account E373.20?

SDG&E Response 161:

SDG&E objects to this request on the grounds that it is vague and ambiguous as to the phrase "that curve type." SDG&E further objects to this question as it is unduly burdensome, calls for speculation, and assumes facts that have not been established. Subject to and without waiving these objections, SDG&E responds as follows. SDG&E's depreciation study was performed as described in Exhibit SDG&E-34-R (Revised Direct Testimony of Matthew Vanderbilt) at Section III. As stated in Exhibit SDG&E-34-R at page MCV-10, "mathematical curve fitting represents the beginning of the evaluation phase. It is at this point that informed judgment is used to assess the historical data trends and other information to identify the most appropriate curve for estimation of future experience." SDG&E utilizes PowerPlan as a starting point to identify the mathematically best-fit average service life by survivor curve. PowerPlan does not rank H-type curves. Although SDG&E does not use H-type curves, they are shown in Exhibit SDG&E-34-WP-R, p. 188 for illustrative purposes only. Based on SDG&E's actuarial analysis, review of mortality summary data, and professional judgment, a O-40 is proposed for the assets that are capitalized to Federal Energy Regulatory Commission (FERC) Account 373.20 – Street Lighting and Signal Systems.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 2, 2018

162. SDG&E proposes to base the capital portion of its post-test-year ratemaking on, inter alia, the 5-year average of capital additions for the years 2015-2019. Please confirm (or provide corrected numbers) that:

a. Expressed in 2019 dollars, SDG&E expects the average annual capital additions for 2015-2019 to be $742.076 million per year (Ex. SDGE-43-WP, p. 6, line 13).

b. SDG&E expects its 2019 capital additions, also expressed in 2019 dollars, to be $1051.643 million (Ex. SDGE-43-WP, p. 6, line 12).

c. SDG&E is proposing to base its post-test-year ratemaking on, inter alia, an assumed 29.4% drop in capital additions (in constant 2019 dollars) from 2019 to 2020.

SDG&E Response 162:

In questions 162.a and 162.b, CUE specifically references the capital additions for Electric Distribution. Therefore, in our response we will only refer to Electric Distribution capital additions.

a. In December 2017, SDG&E submitted revised testimony and workpapers for the 2019 GRC filing. Please refer to exhibits SDG&E-43-R and SDG&E-43-R-WP for the revised direct testimony and workpapers of witness Kenneth J. Deremer. Expressed in 2019 dollars, the revised average annual capital additions for 2015-2019 for Electric Distribution is $742.202 million per year (Please see Ex. SDGE-43-R-WP, p.KJD-WP-6-R, line 13).
b. As stated above, please refer to exhibits SDG&E-43-R and SDG&E-43-R-WP for the revised direct testimony and workpapers of witness Kenneth J. Deremer. Expressed in 2019 dollars, the revised forecast for 2019 capital additions for Electric Distribution is $1,051.956 million (Please see Ex. SDGE-43-R-WP, p.KJD-WP-6-R, line 12).
c. For the purposes of the post-test year mechanism, SDG&E is proposing to base its capital additions for the attrition years on a five-year (2015-2019) recorded and forecasted average of capital additions. As stated on page KJD-7 of Kenneth Deremer's testimony (Ex. SDG&E-43-R), the five-year average methodology will "normalize year-to-year variability in utility spending and eliminates the administrative burden of conducting line-by-line reviews of forecasted capital expenditures." Actual capital additions in the post-test-year period will be based on various ongoing capital projects. The 29.4% drop that is referenced in question 162.c is the result of the 5-year averaging mechanism.

CUE DATA REQUEST
CUE-SDG&E-DR-02
SDG&E 2019 GRC – A.17-10-007
SDG&E RESPONSE
DATE RECEIVED: JANUARY 5, 2018
DATE RESPONDED: FEBRUARY 2, 2018

163. Please provide all errors identified by SDG&E in its testimony or workpapers, whether due to its own reviews or in response to data requests by any party.

SDG&E Response 163:

SDG&E objects to this request on the grounds that the burden of this request outweighs the likelihood that the information sought will lead to the discovery of admissible evidence, and to the extent it would require SDG&E to search through documents previously produced in this proceeding. Subject to and without waiving this objection, SDG&E states as follows:

SDG&E corrected and identified known errors in its December 20, 2017 revised testimony and workpapers service, as of the date of service, and provided a log of revisions on the last page of each revised testimony chapter. Issues that were identified prior to service of the revised testimony, but which were not discovered in time to correct in the testimony and workpapers, were noted in footnotes throughout the testimony. Any errors discovered since the December 20, 2017, revised testimony and workpapers service are identified as discovered in data request responses, and will be corrected in the appropriate rebuttal or hearing testimony phases, at the earliest opportunity.