ORA DATA REQUEST
ORA-SDG&E-DR-044-EJ1
SDG&E 2016 GRC – A.14-11-003
SDG&E RESPONSE
DATE RECEIVED: JANUARY 20, 2015
DATE RESPONDED: JANUARY 10, 2015

Subject: Electric Reliability Performance Measures

Please provide the following:
Electric Reliability Performance Measures (PP.81-84)

1. Please provide a more detailed description of how SDG&E's alternative performance-based ratemaking (PBR) mechanism is implemented. Specifically, elaborate on the significance of targets, deadbands, increments, annual improvements, rewards, penalties and maximum amounts.

SDG&E Response 01:

In general terms, SDG&E's alternative PBR is similar to previous Electric PBR mechanisms that SDG&E participated in. Below, first will be a brief discussion on the components listed in the question. Following that discussion are specific details on how each component is determined and implemented.

The first step for the Electric PBR was determining the proper reliability indices. Four indices were identified that can measure a reliability program's success both from a system-wide perspective but also allowing a focus on the customers who have recently experienced the worst reliability. The indices are SAIFI, SAIDI, Worst Circuit SAIDI, and Worst Circuit SAIFI. Next, targets for those indices were set using the most recent 5 years of available data; for example, data from 2009 through 2013 was used to determine the 2015 targets. The desire for a deadband was negotiated between SDG&E and CCUE, with the sentiment that there is uncertainty from year to year, and deadbands reduce volatility in penalty and reward. The deadbands for SAIDI and SAIFI are identical to those in the SDG&E's previous Electric PBR. The deadbands for Worst Circuit SAIDI and Worst Circuit SAIFI are proportionately similar to SAIDI and SAIFI. The increments selected for SAIDI and SAIFI are identical to previous PBR mechanisms. The increments selected for Worst Circuit SAIDI and Worst Circuit SAIFI are proportionately similar to those selected for SAIDI and SAIFI. The Annual Improvement was negotiated to 1% for SAIDI and SAIFI. The rewards/penalties for SAIDI and SAIFI were negotiated at a higher level than previous PBRs; the thought being that the previous amounts of $250,000 per increment were set approximately 20 years ago, and were therefore adjusted roughly to account for inflation – though a formal study of inflation was not undertaken. The rewards/penalties for Worst Circuit SAIDI and Worst Circuit SAIFI were negotiated to smaller amounts than SAIDI and SAIFI, using the logic that those indices affect fewer customers, and also because since the indices are new the amounts should be muted until more knowledge is gathered for their results. The maximum amounts for each index were negotiated but similar to previous PBR mechanisms.

SDG&E Response 01:-Continued

The method of determining the index results needs to be clarified, as there are a few "exclusions" to the reliability indices, as well as clarification on which outages are included. SDG&E considers all primary, unplanned outages to be reportable, regardless of the voltage class of the proximate cause. For the purposes of the PBR, SDG&E utilizes three types of exclusions:

1. SDG&E uses the IEEE 1366 standard of TMED exclusions – which excludes all outages on days that exceed a certain pre-determined amount of SAIDI. This standard is part of CPUC reporting in general. The threshold for 2014 was 3.84 minutes.
2. SDG&E will exclude all outages that were initiated for the purposes of safety. This exclusion is considered after the TMED exclusion has been accounted for.
3. For Worst Circuit SAIDI and Worst Circuit SAIFI, all outages initiated by fire will be excluded. This exclusion is considered after the TMED exclusion has been accounted for.

Worst Circuit SAIDI and Worst Circuit SAIFI utilize an innovative approach that will be discussed here. Each of those two indices identify the ten worst performing distribution circuits; one set for ten worst performing circuits as measured by circuit SAIDI, and another set for ten worst circuits as measured by circuit SAIFI. Once those circuits are identified, those circuits' performance becomes the basis for measurement to compare to targets. To clarify, the same circuits that are determined to be the worst performing are later measured against the target to determine progress. Because of a desire to improve many circuits, SDG&E proposed that a new 10 circuits would be determined each year, for each of the Worst Circuit indices. To elaborate, in a multiple year PBR, a set of 10 circuits would be calculated each year. In year 1 of a PBR, suppose the group of circuits for Worst Circuit SAIDI are called Set A. After year 1, the Circuit SAIDI for Set A is then calculated and used for PBR purposes. In year 2, whichever circuits are part of the ten Worst Circuits could be called Set B, and at the end of that year, Set B circuits would be used for PBR purposes. This way there is the potential to focus resources on many underperforming circuits over the course of a prolonged PBR, especially with a Circuit SAIDI and Circuit SAIFI index both in play. Only circuits with at least 100 customer meters are included in the selection process.

SDG&E defines a "PBR cycle" as the time period during which a particular PBR is in place; typically aligned with the set of years associated to a GRC. The PBR Cycle that the 2015 Electric PBR is part of is a single year cycle, attached to the 2012 GRC. The 2016 GRC is part of a new PBR cycle, and the targets for SAIDI and SAIFI would be reconsidered at that time using the appropriate data as described below.

SDG&E Response 01:-Continued

Targets – For the first year of a PBR cycle, the most recently available five years of data is used. The average of those five years is then determined. That value is then rounded to the nearest increment; except in the case of Worst Circuit SAIDI, where even though the increment is 10 minutes, the target can be rounded to the nearest 5 minutes.

For SAIDI and SAIFI, subsequent years into a PBR cycle utilize the Annual Improvement factor. The target for subsequent years will be calculated by recalling the original 5 year average (prior to rounding) and decrementing by 1% for each year into the cycle. After applying the Annual Improvement factor, the value is then rounded using the same method as above.

There are two main differences between how targets are set for Worst Circuit SAIDI and Worst Circuit SAIFI compared to SAIDI and SAIFI. Firstly, as stated above, the Worst Circuits are identified annually, and consequently their target is calculated annually – not solely as a decrement from an Annual Improvement factor. The target is based on the 5 year history, but because the list of circuits change each year, a new target and new set of circuits is used annually. The other main difference is that after the five year average is determined, the values are decremented a certain amount due to historical improvements.

An important process when using targets based on historical data is to ensure consistency between previous data and the data that will be collected going forward. Because SDG&E changed its reliability reporting methods a few years back, it was necessary to make adjustments to historical data to place the target on equal footing for upcoming data. The adjustments are associated to moving to the IEEE standard at the time of implementing SDG&E's new Outage Management System. These adjustments were discussed with, and considered appropriate by, CCUE.

Deadbands – The deadband is an amount that surrounds the target where no penalty or reward takes place. Meaning, if an index has a result that lies within the deadband no penalty or reward will occur for that particular index. The outer edge of the deadband is the value where penalty/reward starts. An example will help clarify. From GRC testimony, page 83, the SAIDI target is 60 minutes, with a deadband of +/- 2, an increment of 1, and a penalty/reward of $375,000/increment. This means that any value between 58 and 62 is considered within the deadband, and no penalty or reward will occur for SAIDI. It also means that 58 or 62 is the beginning point for a reward and penalty, respectively. Suppose SDG&E's 2015 SAIDI result was 63.5 SAIDI minutes. Because the value of 63.5 minutes is worse than 62 minutes (the limit of the deadband) there will be a penalty. That penalty would be calculated as follows: 63.5 – 62 = 1.5 minutes. Multiplying that 1.5 SAIDI minutes by $375,000 yields a $562,500 penalty.

SDG&E Response 01:-Continued

Another example: If SDG&E has a 2015 SAIDI result of 55 SAIDI minutes, a reward of $1.125M would occur because 58 – 55 = 3 minutes, and 3 minutes * $375,000 = $1.125M.

Increments – An increment is a unit of measurement to determine the amounts of penalty or reward. For example, SAIDI has an increment of 1 minute. This value is used when calculating the amount of penalty or reward that is due, given the pre-determined values for reward/penalty per increment.

Annual Improvement – The Annual Improvement is applicable to SAIDI and SAIFI. Worst Circuit SAIDI and Worst Circuit SAIFI have no Annual Improvement because they have a new set of targets and circuits each year; it is not possible to apply an improvement in a subsequent year due to new circuits being measured. The Annual Improvement is only applicable in the second and subsequent years of a PBR cycle. The first year of the PBR cycle will use the 5 year averages to set the target. Subsequent years will apply the annual improvement factor to determine the targets. As stated above, the methodology will be as follows: The target for subsequent years will be calculated by recalling the original 5 year average (prior to rounding) and decrementing by 1% for each year into the cycle. After applying the Annual Improvement factor, the value is then rounded using the same method as above.

Rewards, Penalties, Maximum Amounts – Each index has an amount per increment that is the same for rewards and penalties. As discussed in the "deadbands" section, there is only a reward or penalty if the resulting index is outside the deadband. Although the increments of each index have a certain amount of significant digits, the reward or penalty can be fractionalized to the reporting values level of significant digit. As mentioned in the example above, if SDG&E's 2015 SAIDI result is 63.5 minutes, the resulting penalty would be $562,500 which accounts for the decimal portion of the result. In short, penalties and rewards are not rounded to the nearest increment, but rather to the agreed upon amount of significant digits. The maximum amount of penalty or reward is a "not to exceed" value, which places a cap on the penalty or reward. For SAIDI and SAIFI, the range of penalty and reward is 8 increments. This is determined by the maximum penalty/reward of $3M divided by the "per increment" value of $375,000. For 2015, the SAIDI maximum values are at 50 and 70 minutes, respectively for reward and penalty. On the reward side, the value of 50 minutes as a maximum value is determined by starting with the target of 60 minutes, accounting for the 2 minutes of deadband, and proceeding 8 increments further; mathematically 60 - 2 - 8 = 50 minutes. On the penalty side the math is similar: 60 + 2 + 8 = 70 minutes. The maximum range for SAIFI is 0.41 outages and 0.61 outages, respectively for reward and penalty, based on similar math as SAIDI. Worst Circuit SAIDI has maximum points at 470 minutes and 700 minutes. Worst Circuit SAIFI has maximum points at 3.25 outages and 5.55 outages. Any index result that is better than the maximum reward point will achieve the maximum reward for that index.

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2. Please show specifically how SDG&E derived the values for its targets, deadbands, increments, annual improvements, rewards, penalties and maximum amounts for each of SDG&E's four Electric PBR metrics. Provide all documentation and calculations to support exact values used in SDG&E's testimony and describe the reasoning behind SDG&E's methodology. Address all values listed in the tables provided on pages 83-84.

SDG&E Response 02:

Below is a summary depicting all data points present on pages 83-84 of GRC testimony. Data points that require explanation are elaborated below each index. The values that were reached by negotiation are discussed in SDG&E's Response to Q1 above.

SAIDI

	Values	Methodology
2015 Target	60	Calculated
Dead Band	+/- 2	Negotiated
Increment	1 minute	Negotiated
Annual Improvement	1%	Negotiated
Reward Incr.	$375,000	Negotiated
Penalty Incr.	$375,000	Negotiated
Maximum	$3,000,000	Negotiated

2015 Target calculation:

1. Utilize previously available 5 year history, in this case, data from 2009-2013.
2. Adjust data (as explained in SDG&E's Response to Q1) to allow for consistency between data that is used for target and how data is currently gathered for results. For SAIDI, the adjustment applies to data prior 2012, and is performed by adding 5.62% to historical data.
3. Calculate 5 year average of adjusted data between 2009 and 2013.
4. Round values to nearest increment. Increment for SAIDI is 1 minute.

Data and calculation – showing steps 1 and 2 above:

Year	SAIDI	Adjusted SAIDI
2009	49.71	52.51
2010	63.36	66.92
2011	53.43	56.43
2012	64.36	64.36
2013	59.96	59.96

SDG&E Response 02:-Continued

Step 3: Calculate the five year average of "Adjusted SAIDI" yielding 60.04 minutes.

Step 4: Round 60.04 minutes to nearest increment - which is one minute - resulting in 60 minutes.

SAIFI

	Values	Methodology
2015 Target	0.51	Calculated
Dead Band	+/- 0.02	Negotiated
Increment	0.01 outages	Negotiated
Annual Improvement	1%	Negotiated
Reward Incr.	$375,000	Negotiated
Penalty Incr.	$375,000	Negotiated
Maximum	$3,000,000	Negotiated

2015 Target calculation:

1. Utilize previously available 5 year history, in this case, data from 2009-2013.
2. Adjust data (as explained in SDG&E's Response to Q1) to allow for consistency between data that is used for target and how data is currently gathered for results. For SAIFI, the adjustment applies to data prior to 2012, and is performed by adding 6.48% to historical data.
3. Calculate 5 year average of adjusted data between 2009 and 2013.
4. Round values to nearest increment – which is 0.01 outages.

Data and calculation – showing steps 1 and 2 above:

Year	SAIFI	Adjusted SAIFI
2009	0.466	0.497
2010	0.520	0.554
2011	0.471	0.501
2012	0.533	0.533
2013	0.472	0.472

Step 3: Averaging the values in "Adjusted SAIFI" yields 0.511

Step 4: Round to nearest increment - which is 0.01 outages - resulting in 0.51 outages.

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SDG&E Response 02:-Continued

Worst Circuit SAIDI

	Values	Methodology
2015 Target	585	Calculated
Dead Band	+/- 35	Negotiated
Increment	10 minutes	Negotiated
Reward Incr.	$125,000	Negotiated
Penalty Incr.	$125,000	Negotiated
Maximum	$1,000,000	Negotiated

2015 Target calculation:

1. Utilize previously available 5 year history, in this case, data from 2009-2013.
2. Inspect outage durations at the distribution circuit level. Sum the durations from the 2009-2013 time-frame, and create a "Circuit SAIDI" value for each circuit. Circuit SAIDI is simply the average duration of outages for the customers on that circuit.
3. Determine the 10 worst circuits when ranking Circuit SAIDI.
4. Using a customer weighted approach, determine the average Circuit SAIDI for the group of those 10 worst circuits. This is done by adding the customer minutes from the worst circuits, then dividing that value by the sum of the customers on the ten worst circuits.
5. Divide the value in step 4 by five, to calculate an annual average for the group of 10 worst circuits.
6. Decrement the value by 15% to account for "natural" improvement. SDG&E reviewed the ten most recent groupings of five years, to determine if there were improvements that occurred before the index was in place. The improvements could have been from at least two sources: 1) SDG&E performing some form of improvement on those circuits, 2) natural reversion to the mean. In either case, decrementing the average by 15% causes SDG&E to perform improvements above and beyond what was previously occurring.
7. Round the decremented value to the nearest 5 minutes.

Data and calculation:

Upon inspection of circuit data, it was determined the ten worst circuits in terms of SAIDI are the following, shown with their respective total of Circuit SAIDI over the 5-year span, and customer count:

SDG&E Response 02:-Continued

Circuit	Circuit SAIDI	Circuit Customer Count
172	5478238	985
170	2658298	613
171	3843190	1184
1215	421641	132
444	1267895	405
440	837598	277
CTL1	566201	196
212	1750115	621
79	2169408	835
221	2595240	1027
Total	**21587824**	**6276**

Step 4: the average circuit SAIDI over the 5 years for those customers is 21,587,824 customer minutes divided by 6,276 customers, which equals 3439.79 minutes.

Step 5: divide 3439.79 by five to calculate the annual average circuit SAIDI, which results in 687.96 minutes.

Step 6: decrement 687.96 by 15%, which results in 584.76 minutes.

Step 7: round to nearest five minutes; resulting in 585 minutes.

Worst Circuit SAIFI

	Values	**Methodology**
2015 Target	4.40	Calculated
Dead Band	+/- 0.35	Negotiated
Increment	0.10 outages	Negotiated
Reward Incr.	$125,000	Negotiated
Penalty Incr.	$125,000	Negotiated
Maximum	$1,000,000	Negotiated

SDG&E Response 02:-Continued

2015 Target calculation:

1. Utilize previously available 5 year history, in this case, data from 2009-2013.
2. Inspect outage occurrences at the distribution circuit level. Create a "Circuit SAIFI" value for each circuit by determining the number of customer outages divided by customers on the circuit. Circuit SAIFI is simply the average number of outages that each customer has experienced on each circuit.
3. Determine the 10 worst circuits when ranking Circuit SAIFI.
4. Using a customer weighted approach, determine the average Circuit SAIFI for the group of those 10 worst circuits. This is done by summing the outages from the worst circuits, then dividing that value by the sum of the customers on those circuits.
5. Divide the value in step 4 by five, to calculate an annual average for the group of 10 worst circuits.
6. Decrement the value by 3% to account for "natural" improvement. SDG&E reviewed the ten most recent groupings of 5 years, to determine if there were improvements that occurred before the index was in place. The improvements could have been from at least two sources: 1) SDG&E performing some form of improvement on these circuits, 2) natural reversion to the mean. In either case, decrementing the average by 3% causes SDG&E to perform improvements above and beyond what was previously occurring.
7. Round the decremented value to the nearest 0.10 outages.

Data and calculation:

Upon inspection of circuit data, it was determined the ten worst circuits in terms of SAIDI are the following, shown with their respective total of Circuit SAIDI over the 5 year span, and customer count:

Circuit	Customer Outages	Circuit Customer Count
445	30742	928
444	13328	405
1215	3760	132
440	6723	277
221	21251	1027
79	15559	835
SL1	4033	225
OK1	2640	149
448	16656	941
212	10868	621
Total	**125560**	**5541**

SDG&E Response 02:-Continued

Step 4: the average circuit SAIFI over the 5 years for those customers is 125,560 customer outages divided by 5,541 customers, which equals 22.66 outages.

Step 5: divide 22.66 outages by five to calculate the annual average circuit SAIFI, which results in 4.532 outages.

Step 6: decrement 4.532 by 3%, which results in 4.396 outages.

Step 7: round to nearest 0.10 outages, resulting in 4.40 outages.

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3. Please provide historical data for SDG&E's Electric Performance Measures.

    a. Provide all Electric PBR indices metrics used in the same format as the tables provided in SDG&E's testimony (pp.83-84) for years 2009-2013.

    b. Please provide the annual amount of money received by SDG&E for each metric as well as the total amount of money received by SDG&E for all Electric Reliability Performance Measures, for years 2009-2013.

SDG&E Response 03:

a. SDG&E did not have any Electric PBR indices in place for years 2009-2013.

b. Because SDG&E did not have an Electric PBR in place during 2009-2013 no amount of money was received or paid out.

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4. Decision 13-05-010 states: "In the next GRC filing, SDG&E must include a discussion and a summary of the reliability measures, with a comparison to the data from the prior GRC cycles. Also, a summary of the cause of the outages shall be included in the next GRC filing, along with a discussion of the trends that were observed" (p.208). Did SDG&E include this information in its testimony (specifically, "a comparison to the data from the prior GRC cycles" and "a discussion of the trends that were observed")? If yes, please provide the location in SDG&E's testimony and workpapers. If no, please provide this information.

SDG&E Response 04:

The reliability measures discussion was inadvertently removed from Mr. Woldemariam's testimony between the serving of the NOI and filing of the Application, owing chiefly to revisions made as a result of the filing of a Joint Petition for Modification (PFM) also stemming from that same decision. Please see attached file "ORA-SDG&E-DR-044-EJ1-Q4", which is the Joint Petition of [SDG&E] and [CCUE] for Modification of Electric Reliability Standards in Ordering Paragraph 9 of D.13-05-010 (A.10-12-005 and A.10-12-006 (cons.)), filed June 6, 2014, which contains the summary of reliability measures, data comparison and trend discussion required by page 208 of Decision 13-05-010. The Joint PFM had been marked for inclusion as "Appendix B" to the testimony of Mr. Woldemariam (SDG&E-10) at the time SDG&E served its Notice of Intent (in July 2014). The Commission granted the Joint PFM on September 14, 2014 (in D.14-09-005), and Appendix B and the discussion of reliability measures, data comparison, and trend discussion was removed from Mr. Woldemariam's testimony.

Below is a summary of the outage trend discussion for the data in the Master Data Request questions 7.a) and 7.b) (provided at the time of the Application filing), which will be included in Errata of Jonathan Woldemariam's testimony:

> Below is a table of outage information over the past 5 years. These outages are accounted using the same criteria set forth in SDG&E's annual reliability reporting to the CPUC – that is, sustained, unplanned, primary outages that affect customers, and excluding IEEE 1366 TMED. Although SDG&E analyzes this data on a regular basis it can be difficult to detect when changing annual numbers are a trend (i.e. implying a change in the underlying cause) versus non-uniform conditions (e.g. harsher weather from one year to the next). Precipitation, extreme heat, and high winds all affect electrical systems to some degree. The fact that these weather phenomena do not appear consistently from year to year is a leading reason why outage counts can fluctuate from year to year. However, SDG&E is confident there is a trend in the rate of underground Cable Failure, specifically for older unjacketed cable.

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SDG&E Response 04:

However, due to pro-active efforts, the actual outage counts has held relatively steady; this is due to the reduced amount of unjacketed cable offsetting the rising "per cable" failure rate. Without those pro-active programs, a rise in cable failures would occur. Additionally, due to fire mitigation purposes, many outages that formerly would have resulted in momentary outages (i.e. temporary faults cleared by reclosing actions) are now becoming sustained outages. SDG&E turns reclosing off during fire weather situations for a large section of its service territory. The length of time with automatic reclosing off varies from year to year based on weather conditions. The year 2014 in particular had prolonged elevated fire conditions, and therefore automatic reclosing was turned off for prolonged periods. Having reclosing off – ceteris paribus - increases the number of sustained outages, and therefore causes reliability indices such as SAIDI and SAIFI to rise.

Electric Distribution Outages by Cause, 2005-2013

Year	Crew Contact	Customer Contact	Equipment	Foreign Object	Miscellaneous	Tree Contact	Undetermined	Weather	Load Curtailment	Maintenance	Total
2005	78	232	1018	138	80	34	311	443	23	1	2358
2006	44	243	1046	145	138	26	295	295		1	2233
2007	56	225	1099	150	140	26	288	176		4	2164
2008	42	272	1074	182	88	30	295	193		4	2180
2009	40	200	979	153	76	19	187	174		1	1829
2010	43	179	970	190	90	21	225	266		7	1991
2011	36	211	1113	183	112	11	248	137		8	2059
2012	24	205	1125	215	79	7	269	223		6	2153
2013	18	227	1071	139	86	12	226	135		5	1919