TURN DATA REQUEST
TURN-SDG&E-DR-05
SDG&E 2016 GRC – A.14-11-003
SDG&E RESPONSE
DATE RECEIVED: APRIL 2, 2015
DATE RESPONDED: APRIL 23, 2015

1. SDG&E-09 (Jenkins), pp. JDJ-4 and 5, lists various criteria for electric distribution project spending, including maximum equipment loading percentages. The "New Business" and "Capacity" categories describe correction of equipment loadings when load reaches 100% (for major new business load), 100% (due to area load growth) and above 90% ("where highly loaded equipment…will adversely impact operations and reliability").

   a. How are these percentages calculated? Please identify the peak load standard that is used for the numerator, and explain its derivation.
   b. Please provide a sample calculation clearly defining the inputs for the numerator and denominator of this percentage. Please explain what historical or estimated data set(s), including at a minimum the number of years, are used to calculate the percentages.
   c. Please explain, with supporting documents or analyses, the bases for choosing the 100% or 90% loading criteria.
   d. Please explain the spending decisions triggered by the 90% criterion.

SDG&E Response:

a. The percentage is calculated by the actual transformer or circuit loading divided by the transformer or circuit rating. The circuit is composed of field equipment outside the substation and the rating is based on the limiting element on the main feeder. The numerator is derived from the actual peak on the transformer or circuit.

b. For example, loading of a typical circuit with an underground cable as the limiting element is 500 A and the cable rating is 500 A. Therefore, 500A / 500A = 100%

c. The 100% is selected to allow for continuous operation at the maximum field equipment rating. For example see design rating standard attached titled "Cable Ampacities". The 90% is the preferred planning percentage because it allows for a safe margin for operating the system reliably and also allows for pro-active planning to meet capacity needs.

d. The 90% criterion allows SDG&E to plan the system correctly by being proactive, instead of reactive after an overload occurs on equipment; it is the preferred distribution planning percentage.

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2. Please provide the actual peak load calculations in Excel and relevant workpapers for each of the following distribution capital projects discussed in chapter 9 (Jenkins) for - 1) Mira Sorrento 138/12KV Substation, 2) Salt Creek Substation, 3) Telegraph Canyon – 138/12kV Bank & C1226, 4) C917, CC: New 12kV Circuit and 5) C1049, CSW: New 12kV Circuit. In addition, for each project please explain in detail how existing and forecasted distributed generation were taken into account when calculating future peak load.

SDG&E Response:

		2012 Actual Peak
Mira Sorrento 138/12kV Substation	North City West	50.5 MW
	Mesa Rim	92.8 MW
	Genesee	84.6 MW
	Torrey Pines	87 MW
Salt Creek Substation	Telegraph Canyon	83.8 MW
	Proctor Valley	50.1 MW
Telegraph Canyon - 138/12kV Bank & C1226	Telegraph Canyon	83.8 MW
	C1223	433.7 A
	C945	604.6 A
C917, CC: New 12kV Circuit	C910	551 A
	C912	490 A
C1049, CSW: New 12kV Circuit	C165	459.3 A
	Streamview	62 MW

At this time, the existing distribution generation (DG) is captured; however, it is added to the load. As an example, assume a circuit Z with a peak load of 300A and 20A of DG. In the forecast, the load of 300A and DG of 20A are summed to obtain the peak load of 320A.

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3. SDG&E-09 (Jenkins), p. JDJ-27, lists capacity/expansion projects and related expenditures.
   a. Which of these projects have some amount of distributed solar generation on circuits for which SDG&E forecasts capital expenditures in this GRC?
   b. Please provide the known installed capacity of solar DG for each circuit or substation included in the Table.

SDG&E Response:

Budget/Project Title	3a	3b*
209 Field Shunt Capacitors	NA	NA
228 Reactive Small Capital Projects	NA	NA
2252 Mira Sorrento 138/12KV Substation	Y	37.1A
2258 Salt Creek Substation & New Circuits	Y	11.2A
7245 Telegraph Canyon- 138/12kV Bank & C1226	Y	0.7A
7249 San Ysidro- New 12kv Circuit 1202	Y	30.9A
7253 C1161 BD - New 12kV Circuit	Y	10A
8253 Substation 12kV Capacitor Upgrades	NA	NA
8259 C917, CC: New 12kV Circuit	Y	68.5A
9271 C1259, MAR: New 12kV Circuit	Y	19.7A
9274 C1282 LC - New Circuit	Y	13A
9276 Poseidon - Cannon Substation Modification	Y	0.5MW
10266 C350, LI: Reconductor & Voltage Regulation	Y	19.1A
10270 C1049, CSW: New 12kV Circuit	Y	24A
10272 Middletown 4kV Substation RFS	Y	6A
11244 C928, POM: New 12kV Circuit	Y	24.7A
11257 Camp Pendleton 12kv Service	NA	NA
11259 C100, OT: 12kV Circuit Extension	Y	11.2A
13250 C108, B: 12kV Circuit Reconfiguration	N	0
13251 PO: Reconductor	Y	30.3A
13259 C1243, RMV: Reconductor	N	0A
13260 C1288, MSH: New 12kV Circuit	N	0A
13263 C982: OL-Voltage Regulation	Y	2.9A
13285 C1090, JM: New 12kV Circuit	Y	11.1A
13286 C1120, BQ: New 12kV Circuit	Y	36.3A
13288 GH New 12kV Circuit	Y	0.4A
97248 Distribution System Capacity Improvement	NA	NA

*All of the values from Net Energy Metering nameplate.

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4. SDG&E-09 (Jenkins), p. JDJ-15, lines 24-26, states that distributed generation "is assumed to provide zero output at peak for distribution capacity evaluations."

   a. Is distributed solar generation accounted for in any way when determining distribution capital expenditure forecasts for this GRC? If so, please explain in detail how it is accounted for in determining the forecasts.
   b. Does SDG&E model load impacts of distributed solar generation using load-flow modeling or another technique? If so, please identify and explain the modeling technique and provide the results of that modeling.
   c. How does SDG&E consider distributed resources as an alternative to traditional distribution equipment upgrades?
   d. Please explain in detail why SDG&E makes the assumption described in its testimony. Please also provide any studies or analyses SDG&E has conducted to determine that distributed solar provides "zero output at peak," or that an assumption of zero is appropriate for distribution planning purposes.

SDG&E Response:

a. No. As stated in the response to Question 2, the distribution solar generation is captured, but it is not relied upon and is added back to determine the peak.
b. No.
c. SDG&E has in the past evaluated and solicited distributed resources through an RFP as an alternative to traditional equipment upgrades, and found DG not to be cost effective, therefore it is not considered in equipment planning at this time.
d. The worst case scenario from a distribution planning perspective is if no DG were present, therefore the existing methodology of installing projects is utilized. DG currently does not provide physical assurance, nor guarantees performance or availability during peak conditions. If DG is relied upon to insure an overload does not occur, but is unavailable when needed, the circuit or substation will have a real-time capacity deficiency which may lead to prolonged outages during peak conditions. No studies have been prepared to support the assumption**.**

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5. SDG&E-09 (Jenkins), p. JDJ-15, lines 24-26, states that distributed generation "is assumed to provide zero output at peak for distribution capacity evaluations." If no study or data analysis has been performed to support that assumption, please perform an analysis that estimates, based on actual load-flow data at the circuit level in SDG&E's system, what percentage of distributed solar nameplate capacity contributes to reducing peak load on a circuit. TURN does not intend that all circuits be analyzed, rather a representative sample. This may include residential/commercial/industrial circuits and circuits with multiple types of load profiles. Results should be typical of the entire system and differentiated to provide percentage values for each type of circuit. For instance, no one type of circuit should be unnecessarily over-emphasized such that it could influence any "average" result that is calculated.

SDG&E Response:

SDG&E is not required to create new studies, reports or analyses beyond what already exists or is contained in testimony and workpapers. SDG&E does provide two documents that were previously prepared for other proceedings that contain information responsive to this data request:

1. TURN-05 Q5 Renewables Summit Presentation.pdf
   This document illustrates at slides 6 and 7 the PV output ratios compared to total load for aggregate circuits in the SDG&E system. This document was prepared for presentation at the 2013 Solar Forum Renewable Summit held in San Diego.

The information and any attachments referenced below should be protected as confidential and protected materials pursuant to PU Code Section 583 & General Order 66-C as well as the Protective Order and Non-Disclosure Agreement issued for this proceeding.

RESPONSE REMOVED DUE TO CONFIDENTIALITY

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6. Assuming existing distributed solar generation reduces peak load by 25% of nameplate capacity, please estimate the impact on distribution capital expenditures for the following projects listed on p. JDJ-27: 1) Mira Sorrento 138/12KV Substation, 2) Salt Creek Substation, 3) Telegraph Canyon – 138/12kV Bank & C1226, 4) C917, CC: New 12kV Circuit and 5) C1049, CSW: New 12kV Circuit

SDG&E Response:

The applicant is not required to create new studies, reports or analyses beyond what already exists or is contained in testimony and workpapers. SDG&E has not seen a study supporting the 25% assumption, and has not studied the effect on its forecasts based on speculative assumptions.

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7. In its 2015 test year rate case, SCE conducted an analysis that found that distributed solar generation contributes 2%-17% of nameplate capacity to peak load between noon and 5 p.m. See attached excerpt from Exhibit SCE-03, v. 3 at pp.12-13.
    a. Was SDG&E previously aware of this analysis or similar analyses?
    b. Has SDG&E conducted any similar analysis on its system? If not, why not?

SDG&E Response:

a. No
b. At this time SDGE has not determined solar nameplate capacity contribution between noon and 5, since the current distribution planning process assumes a worst case zero output at peak.

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8. SDG&E-09 (Jenkins), p. JDJ-27, Table 3, summarizes distribution expenditures on a project level basis. Related to 1) Mira Sorrento 138/12KV Substation, 2) Salt Creek Substation, 3) Telegraph Canyon – 138/12kV Bank & C1226, 4) C917, CC: New 12kV Circuit and 5) C1049, CSW: New 12kV Circuit, please provide the following information:

   a. 10 year (2004-2013) historical peak load data for the project on an annual basis. Please also provide the peak load capacity of equipment requested for distribution capital expenditure for the 5 projects listed above. Next, please calculate the percentage of peak load reached on an annual basis for equipment requested for distribution capital expenditure.
   b. Forecasted load on equipment underlying SDG&E's GRC forecast of distribution capital expenditure and indication of what year equipment would be overloaded (over 90% or 100%) of capacity.
   c. Amount of distributed solar generation impacting the circuit or substation for each project (in Megawatt (MW) and Megawatt hours (MWh) capacity for each historical year (2004-2013)).
   d. The forecasted amount over the next 10 years of distributed solar generation in MW and MWh expected to affect load on equipment underlying SDG&E's GRC forecast of distribution capital expenditure. If forecasts over the next 10 years are not available or would be unduly burdensome to produce, please provide forecasts extending as far into the future as are available or would not be unduly burdensome to produce.

SDG&E Response:

   a. Response is located on the attached excel spreadsheet under tab A.
   b. Response is located on the attached excel spreadsheet under tab B.
   c. Response is located on the attached excel spreadsheet under tab C.
   d. SDG&E is currently working on developing a distributed solar generation forecast; however, at this time only CEC-related information is available.