



Brittney Lee, Esq.
Regulatory Case Administrator
San Diego Gas and Electric Company
8330 Century Park Court
San Diego, CA 92123-1530

October 14, 2016

Sent Via Electronic Mail Only

Andrew Barnsdale
Project Manager
Energy Division, Infrastructure Permitting and CEQA Unit
505 Van Ness Avenue
San Francisco, CA 94102-3298

Re: SDG&E's Response No.1 to Energy Division's Deficiency Letter No. 1 on Artesian 230 kV Substation Expansion Project (A.16-08-010)

Dear Mr. Barnsdale:

Enclosed please find San Diego Gas & Electric Company's (SDG&E's) formal response to Energy Division's Deficiency Letter No. 1, issued on September 16, 2016. The enclosed response contains SDG&E's full response.

If you have any questions or require additional information, please feel free to contact me by phone: (858) 637-7995 or e-mail: Blee2@semprautilities.com.

Sincerely,

\s\Brittney Lee

Brittney Lee, Esq.
Regulatory Case Administrator

Enclosures

cc:

Allen Trial – SDG&E
Elizabeth Cason – SDG&E
Neal Bartek – SDG&E
Central Files – SDG&E

Julie Watson – ESA
Mary Jo Borak – CPUC Energy Division (CEQA Unit)
Marcel Poirier – CPUC Legal Division

SDG&E Artesian 230 kV Substation Expansion Project (A.16-08-010)
Energy Division Deficiency Report 1 Dated September 16, 2016
SDG&E Response #1 (10/14/16)

Deficiency Report for the SDG&E Artesian 230 Kilovolt Substation Expansion Project Application (A. 16-08-010)

REPORT OVERVIEW

Review of the PEA for San Diego Gas & Electric Company's Artesian 230 kV Substation Expansion Project was based on the CPUC Proponent's Environmental Assessment (PEA) Checklist for Transmission and Substation Projects, October 7, 2008. Based on these criteria, the following additional information is needed in order to deem the application and PEA complete.

SDG&E Artesian 230 kV Substation Expansion Project (Application 16-08-010) - Deficiency No. 1

Def. No.	DEFICIENCY	SDG&E RESPONSE																																																																																																																
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1	<p><u>With respect to load growth and load forecast:</u></p> <p>The pre-filing PEA included a 10 year forecast starting with 2013, but the PEA does not include data from 2014, 2015 and 2016. Please include this information to provide a complete load forecast and support the objectives and purpose of the Proposed Project.</p>	<p>The requested load forecast information for years 2014, 2015, and 2016 is provided below.</p> <p>2014 Non-Coincident Published Forecast</p> <table><tr><th>Substation</th><th>2014</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>2024</th></tr><tr><td>Artesian</td><td>36.9</td><td>37.2</td><td>37.6</td><td>37.9</td><td>38.3</td><td>38.6</td><td>41.0</td></tr><tr><td>Bernardo</td><td>110.4</td><td>113.7</td><td>115.0</td><td>116.3</td><td>117.5</td><td>118.8</td><td>126.0</td></tr><tr><td>Poway</td><td>50.8</td><td>51.3</td><td>51.8</td><td>52.2</td><td>52.7</td><td>53.2</td><td>55.6</td></tr><tr><td>Pomerado</td><td>63.6</td><td>66.4</td><td>67.0</td><td>67.6</td><td>68.2</td><td>68.8</td><td>71.8</td></tr><tr><td>Rancho Carmel</td><td>66.7</td><td>66.2</td><td>66.6</td><td>67.0</td><td>67.3</td><td>67.7</td><td>69.7</td></tr><tr><td>Total</td><td>328.4</td><td>334.8</td><td>338.0</td><td>341.0</td><td>344.0</td><td>347.1</td><td>362.9</td></tr></table> <p>2015 Non-Coincident Published Forecast</p> <table><tr><th>Substation</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>2020</th><th>2025</th></tr><tr><td>Artesian</td><td>40.4</td><td>41.4</td><td>42.4</td><td>43.4</td><td>44.4</td><td>44.9</td><td>47.4</td></tr><tr><td>Bernardo</td><td>103.3</td><td>106.2</td><td>107.4</td><td>108.6</td><td>109.8</td><td>111.0</td><td>117.0</td></tr><tr><td>Poway</td><td>53.4</td><td>52.9</td><td>53.4</td><td>53.9</td><td>54.3</td><td>54.8</td><td>57.0</td></tr><tr><td>Pomerado</td><td>58.8</td><td>67.8</td><td>68.4</td><td>69.0</td><td>69.5</td><td>70.1</td><td>72.8</td></tr><tr><td>Rancho Carmel</td><td>58.4</td><td>59.1</td><td>59.7</td><td>60.4</td><td>61.0</td><td>61.7</td><td>64.9</td></tr><tr><td>Total</td><td>314.3</td><td>327.4</td><td>331.3</td><td>335.3</td><td>339.0</td><td>342.5</td><td>359.4</td></tr></table>	Substation	2014	2015	2016	2017	2018	2019	2024	Artesian	36.9	37.2	37.6	37.9	38.3	38.6	41.0	Bernardo	110.4	113.7	115.0	116.3	117.5	118.8	126.0	Poway	50.8	51.3	51.8	52.2	52.7	53.2	55.6	Pomerado	63.6	66.4	67.0	67.6	68.2	68.8	71.8	Rancho Carmel	66.7	66.2	66.6	67.0	67.3	67.7	69.7	Total	328.4	334.8	338.0	341.0	344.0	347.1	362.9	Substation	2015	2016	2017	2018	2019	2020	2025	Artesian	40.4	41.4	42.4	43.4	44.4	44.9	47.4	Bernardo	103.3	106.2	107.4	108.6	109.8	111.0	117.0	Poway	53.4	52.9	53.4	53.9	54.3	54.8	57.0	Pomerado	58.8	67.8	68.4	69.0	69.5	70.1	72.8	Rancho Carmel	58.4	59.1	59.7	60.4	61.0	61.7	64.9	Total	314.3	327.4	331.3	335.3	339.0	342.5	359.4
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2	<p><u>With respect to load growth and load forecast:</u></p> <p>The PEA states that the CAISO analysis indicated N-1 overloads of two transmission lines but provides no indication of the magnitude of overload, nor does it appear that there is an explanation as to what the physical constraints may be that result in the overload or which component of the lines are overloading. Please provide this information. Please also include a complete listing of line normal and emergency ratings as well as normal and N-1 line flows.</p>	<p>SDG&E notes that the overloads occur on existing 69kV <i>power</i> lines¹. The CAISO approved the Proposed Project in the 2013/2014 CAISO TPP. Based on the CAISO and SDG&E results, both parties identified the Proposed Project as the preferred alternative.</p> <p>In SDG&E's analysis, under summer peak² conditions, NERC thermal violations were detected on both TL6915 (Sycamore to Pomerado circuit # 1) and TL6924 (Sycamore to Pomerado circuit # 2) after the loss of either one of these two parallel lines. The overload on the remaining line, TL6915 or TL6924, was approximately 42 percent and 18 percent of the continuous and emergency rating, respectively. That is to say, the loss of one of the two Sycamore to Pomerado power lines will cause the remaining line to operate at 142 percent of capacity under continuous (normal) operating conditions and 118 percent of capacity under emergency conditions. Both power lines currently have a continuous rating of 145 MVA and an emergency rating of 174 MVA. With all lines in service, each power line carries approximately 112 MVA. During the N-1 condition, the</p>																																																													

¹ CPUC General Order 131-D distinguishes between distribution lines ("designed to operate under 50 kV"), power lines ("designed to operate between 50 and 200kV"), and transmission lines ("designed to operate at or above 200 kilovolts").

² Based on the current 2016/17 Grid Assessment Study Year

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		<p>loading on the remaining line is approximately 206 MVA.</p> <p>TL6915 and TL6924 are both comprised of overhead and underground segments. These two parallel lines originate from the Sycamore Canyon Substation, sharing an underground duct package for approximately 500 feet until it transitions overhead at a double-circuit (joint) cable pole. From the cable pole, the lines predominantly share overhead structures for approximately 1.74 miles, heading northerly towards Pomerado Substation. The overhead lines then terminate outside of Pomerado Substation at a double-circuit cable pole, transitioning back to an underground position and proceeding approximately 500 feet, in separate trench packages, to the substation rack.</p>
3	<p><u>With respect to the 69kV congestion at Sycamore Canyon Substation as a Project Objective:</u></p> <p>Please include more information and forecast data regarding reliability violations at Sycamore Canyon Substation in order to further support the objective of the Proposed Project relieving 69kV congestion at the Substation.</p>	<p>The Poway Area Load Pocket is expected to grow by as much as 12 percent³ over the next 10 years. The way the system is currently configured, the primary source for this area is Sycamore Canyon Substation. The Proposed Project will relieve the 69kV congestion at Sycamore Canyon substation. Currently ‘congestion’ is not a NERC violation; however, it is listed as a project objective as an added benefit to the Poway Area Load Pocket.</p>

³ Depending on what forecast is being considered the load growth over a 10 year period may change. The anticipated load growth using the most recent published forecast is 12 percent.

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4	<p><u>With respect to the Proposed Project:</u></p> <p>The CAISO 2014-2015 Transmission Plan identified a need for a second Pomerado-Poway 69kV line with a service date of June 2016. The status for the proposed second Pomerado-Poway 69kV line should be disclosed and discussed, as well as the interaction and effects it would have with the Proposed Project. If this line is constructed and operational, please indicate so in the system configuration figures in the PEA.</p>	<p>The 2nd Pomerado to Poway 69kV line is still in its early stages of development. This project is expected to have a regulatory filing as a PTC. The earliest anticipated in-service date is 2020. NERC P1 violations were identified on TL6913 (Pomerado to Poway) pre-Artesian and P3 (G-1/N-1) post-Artesian during the 2014/2015 planning cycle. Adding a second 69kV line from Pomerado to Poway will not only mitigate the P1 and P3 violations, but improve reliability generally to the Poway Area Load Pocket which is expected to grow by as much as 12 percent (according to the latest load forecast) over the next 10 years. If the 2nd Poway to Pomerado power line is constructed and energized prior to energization of the Artesian 230kV Substation Expansion Project, NERC category P1 thermal violations occur on TL648 (Poway to Rancho Carmel) as a result of the reduced impedance on the 69 kV path. An additional reliability measure might take place to protect the 69 kV lines until the Proposed Project is in service.</p>
<i>Alternatives</i>		
5	<p><u>With respect to Alternative 1 (3rd Sycamore Canyon to Pomerado 69kV Power Line):</u></p> <p>Please provide additional information as to the duration of the solution provided by this alternative.</p>	<p>The annual CAISO and SDG&E planning cycles both examine a 10th year scenario for all CAISO approved projects. Based on the current planning cycle analysis, we do not anticipate a need to perform any additional system upgrades if the 3rd Sycamore Canyon to Pomerado 69 kV Power Line Alternative is chosen as the preferred alternative.</p>
6	<p><u>With respect to Alternative 1 (3rd Sycamore Canyon to Pomerado 69kV Power Line):</u></p> <p>This alternative requires installation of a System Protection Scheme at Sycamore Canyon to trip third Sycamore Canyon -Pomerado 69kV line under certain contingencies. Please describe these contingencies in detail.</p>	<p>The maximum rating on a 69kV line with overhead and underground components is approximately 174MVA. Adding a third Sycamore to Pomerado 69kV line will require a minimum rating of 230MVA. Under certain contingencies, e.g. P7 (common structures) from Sycamore to Pomerado, the third line will require a minimum of 230MVA to carry the load. If SDG&E cannot design a 69kV power line with a rating of 230MVA, then a special protection system (SPS) will be required to trip a device and lower flow within its rating. This SPS would thus reduce the flow over the Sycamore to Pomerado 69kV path, but would therefore limit the flow of power into the Poway Load Pocket Area, potentially resulting in load shedding (power outage).</p>

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7	<p><u>With respect to Alternative 2 (Proposed Project with GIS Substation):</u></p> <p>This alternative appears to be electrically the same as the Proposed Project: Please include data to support the need for an additional 230-69kV transformer by 2022.</p>	<p>The reliability analysis does not indicate the need for an additional 230/69 kV transformer by 2022. Note, however, that the Poway Load Pocket Area has been forecasted to grow as much as 12 percent over the next ten years according to the latest load forecast. The GIS alternative, which is electrically identical to the Proposed Project, will allow for the addition of a second transformer, if needed in the future. The GIS design will also, because of its more compact footprint, allow for the ultimate layout of the 230kV yard to include the addition of a third 230kV bay (two additional elements) without significant construction and/or site expansion. This will allow future addition of a second transformer (if required) and also allow for other future 230 kV positions in the substation without major changes to the substation. This meets SDG&E substation design practices to plan for an ultimate design that will allow for future load demands to be met.</p>
8	<p><u>With respect to the Alternative 3 (Chicarita 69kV Conversion):</u></p> <p>This alternative appears to result in additional load on the Sycamore Canyon 230/69kV transformers. Please clarify this.</p>	<p>Alternative 3 does add additional load to the Sycamore 230/69 kV transformers. However, because of the impedance reduction on the Sycamore Canyon to Chicarita path, this alternative mitigates the NERC violation on TL6915 and TL6924.</p>
9	<p><u>With respect to the Alternative 3 (Chicarita 69kV Conversion):</u></p> <p>Please provide additional information as to the duration of the solution provided by this alternative.</p>	<p>The annual CAISO and SDG&E planning cycles both examine a 10th year scenario for all CAISO approved projects. Based on the current planning cycle analysis, we do not anticipate a need to perform any additional system upgrades if the Chicarita 69kV Conversion is chosen as the preferred alternative.</p>