California ISO

California Independent System Operator Corporation

Letter sent via email

February 23, 2018

Mr. Rob Peterson
Energy Division, Infrastructure Permitting and CEQA
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102-3298

Dear Mr. Peterson:

Re: Estrella Substation Project and Paso Robles Area Reinforcement

This letter is in response your letter of October 31, 2017 regarding the Estrella substation project and Paso Robles area reinforcement needs and our subsequent meeting on February 1, 2018 where we agreed to provide responses to questions 1 and 2 in the attachment to your letter.

Regarding the current forecast in the Paso Robles area, Table 1 provides the loads at each of the substations in the Paso Robles area as modeled in the base cases for the 2017-2018 transmission planning process. The study years in the reliability assessment of the 2017-2018 transmission planning process were 2019, 2022 and 2027. At the time the reliability assessment was performed, the latest in-service date targeted for the Estrella Substation project was May 2019 and as such the project was modeled in the base cases used in the reliability assessment. The transfer of the distribution load in the area to the Estrella substation was forecast to be after 2022, so the transfers were reflected in only the 2027 base cases.

Table 1: Forecast loads modeled in the 2017-2018 TPP base cases

Substation		2019 Summer Peak	2022 Summer Peak	2027 Summer Peak[1]
Estrella	Gross load	0.0	0.0	28.0
	BTM-PV	0.0	0.0	0.0
	AAEE	0.0	0.0	0.0
	Net Load	**0.0**	**0.0**	**28.0**
Paso Robles	Gross Load	70.7	73.7	63.8
	BTM-PV	3.7	4.4	6.7
	AAEE	1.3	2.2	3.7
	Net Load	**65.6**	**67.1**	**53.5**
Templeton	Gross Load	74.7	77.9	64.5
	BTM-PV	6.0	6.8	9.7
	AAEE	1.1	1.7	2.8
	Net Load	**67.5**	**69.4**	**52.0**
Atascadero	Gross Load	25.4	26.5	28.9
	BTM-PVPV	1.4	1.7	2.6
	AAEE	0.2	0.3	0.5
	Net Load	**23.9**	**24.5**	**25.9**
San Miguel	Gross Load	12.6	13.0	6.4
	BTM-PV	1.3	1.5	1.9
	AAEE	0.2	0.3	0.5
	Net Load	**11.1**	**11.1**	**4.0**
Total Area Load	Gross Load	183.4	191.1	191.6
	BTM-PV	12.5	14.5	20.8
	AAEE	2.8	4.5	7.5
	Net Load	**168.1**	**172.1**	**163.3**

Figure 1 illustrates the existing system in the Templeton and Paso Robles area and Figure 2 illustrates the system in the Paso Robles area after the Estrella Substation project is in-service.

[1] The loads in the tables were modeled in the 2017-2018 TPP base cases. In reviewing the loads with PG&E, the loads in 2027 at Paso Robles, Templeton and San Miguel after the load transfer to Estrella were noted to be erroneously lower in the base cases than the peak forecast for the area where the total area gross load is forecast to be 225 MW. The loads will be updated in the 2018-2019 TPP base cases.

Figure 1: Paso Robles area existing system

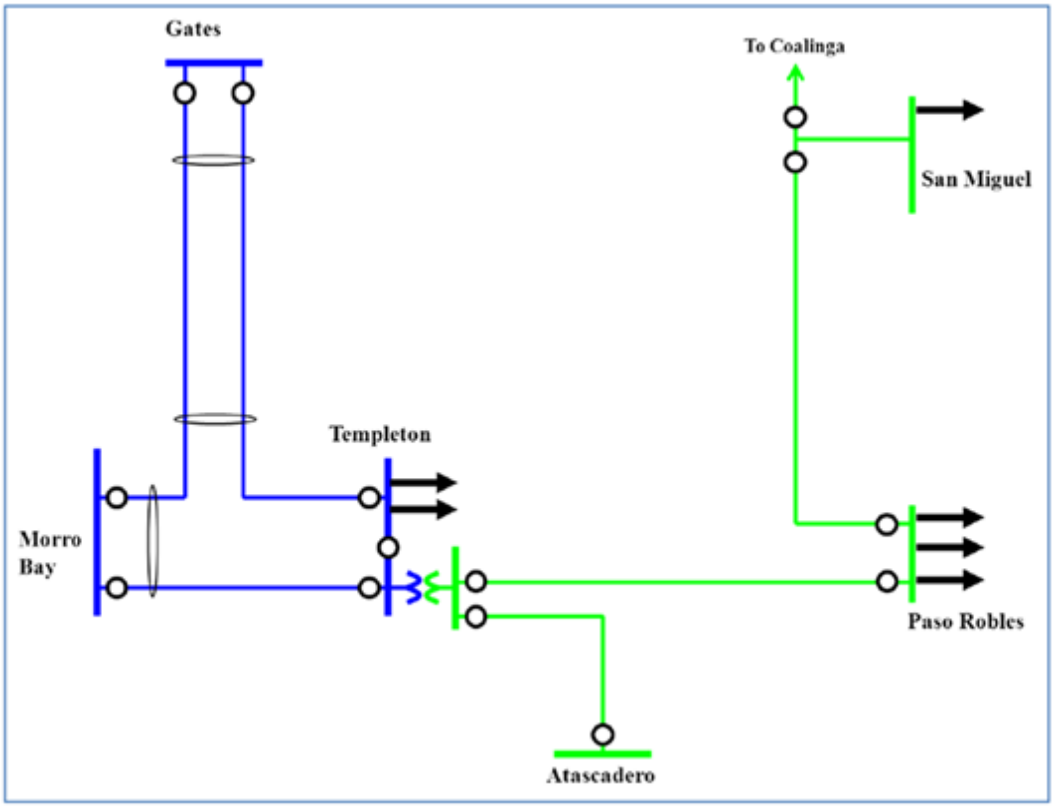
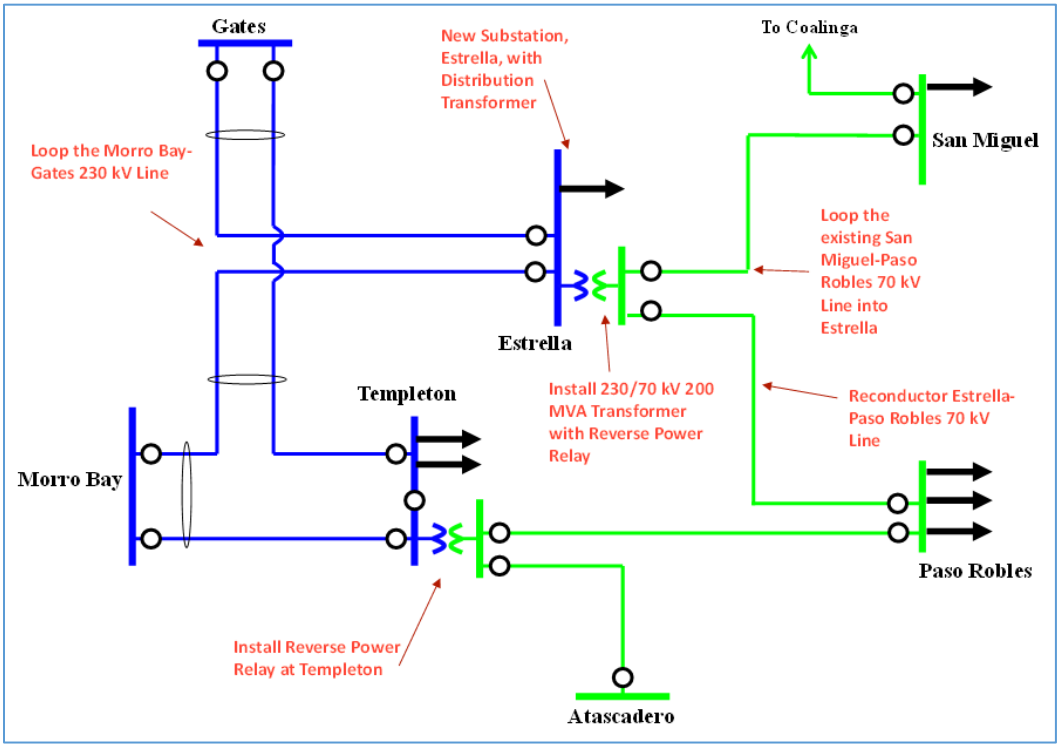


Figure 2: Paso Robles area after the Estrella project is in-service



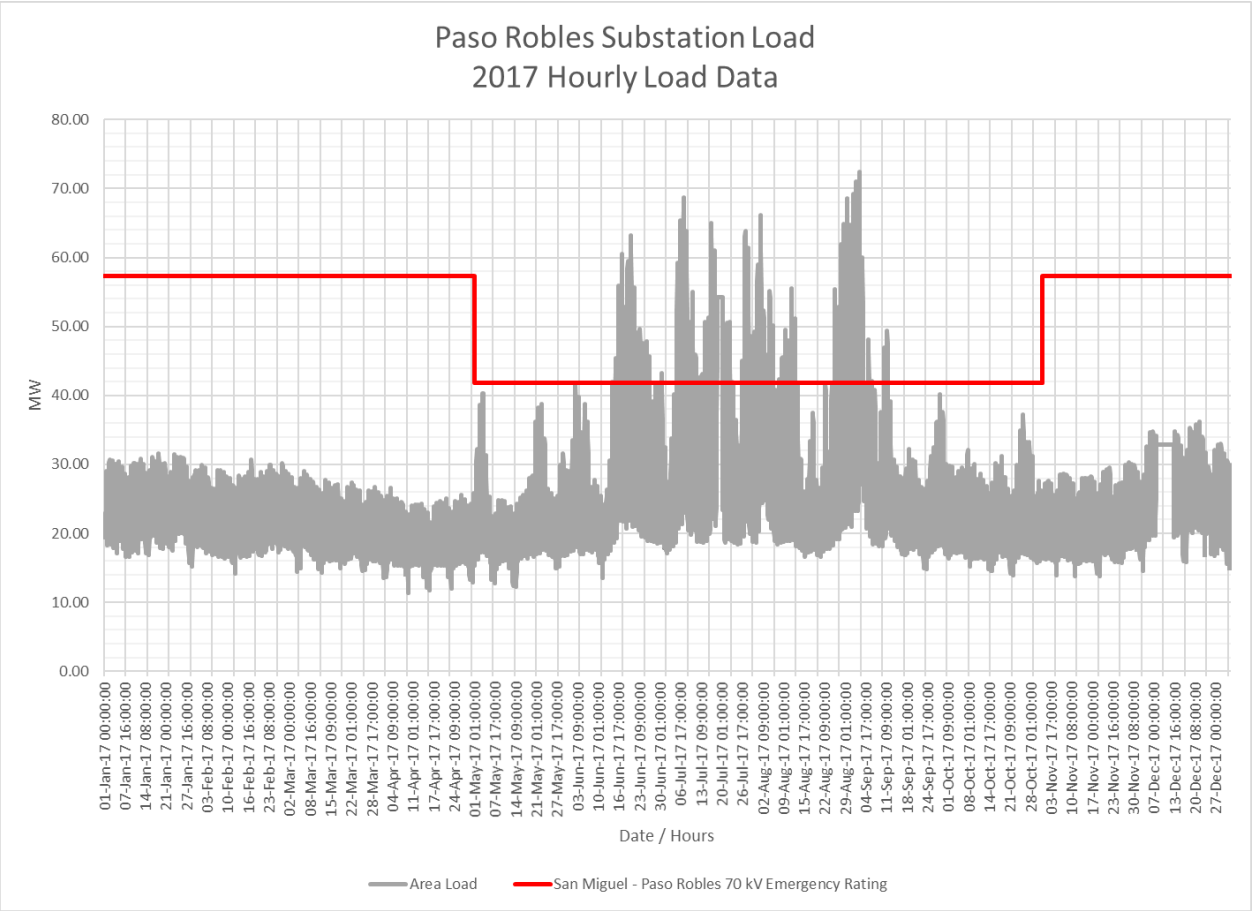
As indicated above, the Estrella Substation project was modeled in the base case used for the 2017-2018 transmission planning process. The ISO has studied the need for the project in the near-term planning horizon using the 2019 and 2022 summer peak base cases used in the 2017-2018 transmission planning process with the Estrella project removed from the model. Based upon the loading in the area the results would be very similar in 2027. Table 2 lists the overloads that were observed for the identified contingencies. For the P1 (N-1) contingency, the reliability constraint is overloading of the Coalinga-San Miguel 60 kV and San Miguel-Paso Robles 60 kV lines as well as voltage collapse in the area.

Table 2: Reliability results in 2019 and 2022 without the Estrella Substation project

Monitored Facility	Contingency Name	Category	2019 Summer Peak (without Estrella Substation Project)	2022 Summer Peak (without Estrella Substation Project)
Coalinga - San Miguel 70 kV line	PASO ROBLES-TEMPLETON 70kV	P1	Nconv (DC 189.2%)	Nconv (DC 192.0%)
San Miguel - Paso Robles 70 kV line		P1	Nconv (DC 159.0%)	Nconv (DC 161.6%)
Coalinga - San Miguel 70 kV line	Templeton 230/70 kV Transformer	P1	Nconv (DC 189.2%)	Nconv (DC 192.0%)
San Miguel - Paso Robles 70 kV line		P1	Nconv (DC 159.0%)	Nconv (DC 161.6%)
Coalinga - San Miguel 70 kV line	Templeton Bus or Breaker	P2	Nconv (DC 189.2%)	Nconv (DC 192.0%)
San Miguel - Paso Robles 70 kV line		P2	Nconv (DC 159.0%)	Nconv (DC 161.6%)
Coalinga - San Miguel 70 kV line	_TEMPLETON-GATES 230kV and MORRO BAY-TEMPLETON 230kV	P6	254.08	228.03
Templeton - Atascadero 70 kV line		P6	158.32	139.42
San Miguel - Paso Robles 70 kV line		P6	216.18	165.74
Atascadero - Cayucos 70 kV line		P6	155.16	133.59
Atascadero - San Luis Obispo 70 kV line		P6	191.22	172.13
San Luis Obispo - Cayucos 70 kV line		P6	164.77	129.52
San Luis Obispo 115/60 kV Transformer #3		P6	108.28	98.01

The reliability studies are consistent with the current loading and reliability constraints in the area. Figure 3 illustrates the current load at the Paso Robles 60 kV substations and the rating of the San Miguel-Paso Robles 60 kV line (summer and winter).

Figure 3: 2017 load in Paso Robles area



As can be seen in Figure 3, an outage of the Templeton-Paso Robles 60 kV will result in overloading of the San Miguel-Paso Robles 60 kV lines in addition to voltage stability in the area. The loading on the Coalinga-San Miguel 60 kV line is the same as the San Miguel-Paso Robles 60 kV line and would also be overloaded. The interim operational action plan to address the reliability constraints in the area, until the Estrella Substation project is in-service, is to rely on an under voltage load shedding (UVLS) scheme that will trip load in the area that addresses the overload and voltage stability conditions under the P1 contingency condition.

The Estrella Substation project was originally approved in the 2012-2013 transmission planning process to address the transmission reliability constraints identified above in addition to the need PG&E identified for a new load interconnection point for the distribution system in the area. The ISO has reviewed an alternative that would add an additional 230/70 kV transformer at Templeton substation, reconstruction of the Templeton substation by PG&E, upgrades to the Paso Robles substation and a new Templeton-Paso Robles 70 kV line. The alternative would address the transmission reliability constraints but at a higher estimated cost than the Estrella Substation Project and does not address the need identified by PG&E for a new load interconnection point for the distribution system in the area.

In our meeting on February 1, the ISO agreed to have further discussion with PG&E with respect to the distribution system needs and if a high level assessment of potential for storage to meet the distribution need could be provided. PG&E has indicated that based on the latest forecast,

the Paso Robles distribution planning area is forecast to be overloaded by 7.3 MW or 3.4 % during peak in 2024. The distribution feeders that are forecast to be loaded at or above 100% of normal ratings in 2024 are: Atascadero 1103, Paso Robles 1107, Paso Robles 1108, San Miguel 1104, and Templeton 2113. Templeton Bank #2 is forecast to be overloaded in 2024 by 2.4%.

In conducting a high level assessment of storage as an alternative to meet the distribution need, PG&E indicated to the ISO that building the Estrella Substation, including ties to other area circuits and banks, will:

- Allow normal switching reconfiguration to occur;
- Eliminate forecasted overloads of facilities; and,
- Provide additional operational flexibility by allowing extra load to be shifted over to these facilities during events that require the system to be abnormally reconfigured, such as during an outage.

PG&E also indicated it has performed a preliminary assessment of battery storage in this area, but found it did not provide the same level of reliability and operational flexibility to the system. In the case of storage, otherwise available bank capacity and the construction of a new feeder would be required to provide the capacity to charge the battery, thereby reducing the existing system capability available during the battery charging period. In addition, a single storage installation, despite being located in the anticipated growth area, would be very limited in its ability to address all of the overload issues that could arise throughout this heavily-loaded distribution planning area. The new substation, in addition to being located near the anticipated growth area, would be better able to project additional capacity throughout the distribution planning area because of the circuit ties and transfer capabilities that the three new 21 kV feeders would provide.

If you have any questions, please contact me.

Sincerely,

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Manager, Regional Transmission – North

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