2021 and 2025 Local Capacity Technical Studies

Submitted by	Company	Date Submitted
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PG&E appreciates this opportunity to comment on the 2021 and 2025 Local Capacity Technical Study Draft Results, published on March 12th and presented to stakeholders on March 16th, 2020. PG&E recognizes the substantial efforts and commends the CAISO Staff for its hard work in performing this study. Below are comments that address a concern with the identified need in the Greater Bay Area study results.

Comments on the Overall Greater Bay Area Study Results:

In the draft LCR results for the overall Greater Bay Area, the CAISO has identified that in both 2021 and 2025, an outage of both Metcalf 500/230 kV #11 & #12 Transformer Banks (T-1-1) results in an overload of the remaining Metcalf 500/230 kV #13 Transformer Bank. This double transformer bank outage and identified overload has resulted in an increased generation requirement in the overall Greater Bay Area, which the CAISO has calculated to be 6,353 MW and 6,110 MW respectively, as compared to last year's study results of 4,550 MW and 4,395 MW, respectively. This is an increase of roughly 1,800 MW from one study year to the next. PG&E believes that this increase is primarily due to the change in LCR criteria in which CAISO now considers a T-1-1 (loss of a transformer followed by the loss of second transformer) in its calculation of the LCR. This double transformer outage was not considered in the previous LCR criteria.

PG&E further believes that this transformer outage criteria should not be applied at Metcalf 500 kV Substation given the layered and robust strategy for addressing the loss of high voltage transformers at the substation.

First, all of Metcalf 500/230 kV transformers have on-site spares that are ready to be used in the event the situation arises. Switching in either one of these on-site spare units is estimated to take anywhere from 12-24 hours depending on the situation and conditions.
In the event one of the 500 kV single-phase transformers is permanently out of service and not repairable, PG&E would switch in the afore mentioned on-site spare and then use an off-site Capitalized Emergency Material (CEM) 500 kV single phase spare to permanently replace any failed Metcalf 500 kV unit, including any of the units at Metcalf. Depending on the

environment and urgency, the CEM Spare should be able to be on-site and energized in about 3 months.

Lastly, if for some reason the on-site spare were to be permanently out of service and the CEM spare is not available (an extremely unlikely scenario) then a different spare from other stations or from other positions from within the same station could be used. Relocating a Spare within the same station may take around 2 months to complete. Relocating a Spare from another station may take up to 3 months.

As described above, PG&E counts on a very robust and layered strategy for addressing the loss of high voltage transformers at Metcalf 500 kV Substation, such that the station would not operate with two 500/230 kV transformer banks out of service for an extended period of time. In fact, PG&E expects that after the initial transformer failure, the spare and therefore the transformer would be brought back into service between 12 - 24 hours of the event. A second failure could be mitigated within 2 -3 months, but during that time there would be two energized transformers at Metcalf.

Furthermore, NERC's TPL-001-4 reliability standard contemplates that "When an entity's spare equipment strategy could result in the unavailability of major Transmission equipment that has a lead time of *one year or more (such as a transformer)*, the impact of this possible unavailability on System performance shall be studied." In Metcalf's case as described the spare equipment strategy ensures both failed banks would be back in-service well within the one-year period specified in the NERC standard.

In 2007 FERC in Order 693 also considered this same issue and discussed the relationship between transformer outages and a spare equipment strategy:

"…the consideration of planned outages is inextricably linked with spare equipment strategy. Thus, if an entity's spare equipment strategy for the permanent loss of a transformer is to use a "hot spare" or to relocate a transformer from another location in a timely manner, the outage of the transformer need not be assessed under peak system conditions. However, if the spare equipment strategy entails acquisition of a replacement transformer that has a one-year or longer lead time, then the outage of the transformer must be assessed under the most stressed system conditions likely to be experienced."

Lastly, PG&E is also investigating the possibility of obtaining higher ratings on these three 500/230 kV banks to further support the capacity needs in the Greater Bay Area. However, PG&E does not yet have the results of the bank capabilities analysis and other equipment limitations.

In summary, given PG&E's robust and layered 500/230 kV transformer bank spare strategy, where a failure of a transformer could be mitigated quickly returning Metcalf to having three 500/230 kV transformers in mere hours and loss of a second would be mitigated in a matter of

weeks while keeping two 500/230 kV transformers energized, and in meeting NERC and FERC's guidance on spare equipment, PG&E recommends CAISO not apply the Metcalf 500/230 kV #11 & #12 Transformer Banks (T-1-1) outage in the determination of the overall Greater Bay Area LCR.