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Submitted to: CAISO ([regionaltransmission@caiso.com](mailto:regionaltransmission@caiso.com))

**COMMENTS OF NEXTERA ENERGY TRANSMISSION WEST, LLC  
ON THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION'S  
2018-19 TRANSMISSION PLANNING PROCESS SEPTEMBER 20-21, 2018  
STAKEHOLDER MEETING**

NextEra Energy Transmission West, LLC (NEET West) appreciates this opportunity to provide comments on the California Independent System Operator Corporation's (CAISO) 2018-19 Transmission Planning Process (TPP) September 20-21, 2018 stakeholder meeting. In summary, we respectfully request CAISO to consider the following factors as it undertakes its current transmission planning efforts to improve reliability in the 2018-19 TPP:

**CAISO should consider releasing for competitive solicitation in the current TPP various 500 kV Bulk Dynamic Reactive Voltage Systems (Gates, Round Mountain) required to address existing voltage issues on the 500 kV network in Northern California, and to address voltage stability concerns resulting from the Diablo Canyon Nuclear Power Retirement in 2025.**

CAISO's 2018-19 TPP reliability study demonstrated that post-Diablo Nuclear retirement, and due to unacceptable high voltage conditions observed in normal and post-contingent conditions, recommendation is provided to consider installing dynamic reactive support system at 500 kV Gates and 500 kV Round Mountain area<sup>1</sup> (up to 548 kV on Gates normal are observed, possible dynamic stability issues in the Gates area, High voltage on 500 kV wide system in Northern California in off-

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<sup>1</sup> In CAISO's recently published *2018-19 Reliability Assessment - Preliminary Study Results*, the CAISO documents voltage stability concerns at or close proximity to Round Mountain 500 kV under anticipated 2020, 2023, and 2028 summer peak and off-peak conditions (including the cases with high renewable integration) and with Diablo Canyon Power Plant (DCPP) out of service. The contingencies tabulated within the CAISO's preliminary results are all NERC Category P0-P7 conditions including: Malin – Round Mountain #1 or 2 500 kV and Diablo unit; Malin – Round Mountain #1 and 2 500 kV; Diablo – Midway #1 and #2 500 kV. Furthermore, for a 3-phase fault conditions at either one of the following locations: Round Mountain 500 kV, Malin 500 KV, Captain Jack 500 kV, Gates 500kV, Midway 500kV, Tracy 500 kV, Metcalf 500 kV, under-voltage conditions were observed that may trigger under-voltage load tripping due to stalling of induction motors. CAISO indicated installation of dynamic reactive support at Gates and Round Mountain 500 kV substation may also help for these issues.

peak cases, low voltages with 500 kV contingencies on Maxwell and Olinda 500 kV in peak cases, renewable units tripping due to low or high voltage, Low voltages due to stalling of induction motor load). CAISO indicated that the size, type and location of reactive support is being further assessed and verbally confirmed that final project solutions will be included in the current CAISO 2018-19 TPP cycle.

NEET West has observed the reliability concerns at Round Mountain within the last three TPP cycles: 2015-16<sup>2</sup>, 2016-17<sup>3</sup>, and 2017-18<sup>4</sup>; which makes the most recent 2018-19 TPP results the fourth (4<sup>th</sup>) year of evaluation. PG&E concurred with the CAISO regarding the high voltage condition as recently their 2018 Request Window Proposals presentation, which displayed real time voltage data for the past year at Round Mountain and Table Mountain 500 kV Substations exceed high end thresholds of 540 kV across the entire year.

While NEET respects that the PG&E Bulk system is highly complex, a four (4) year planning period which identifies existing real time high voltage issues should be resolved in a more proactive manner. Per NERC Standard TPL-001-4 Requirement R2.7:

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<sup>2</sup> The Round Mountain 500 kV Substation Shunt Reactor project was submitted in the 2015 Request Window as a transmission solution to high voltages on the 500 kV transmission system. PG&E proposed to install a 300 Mvar shunt reactor on the Round Mountain 500/230 kV substation. High voltages on its 500 kV bus were observed under off-peak normal conditions in the transmission planning reliability studies as well as in real-time operations. The proposed shunt reactor was estimated to cost between \$24 million and \$36 million and the forecast operational date is December 2019. The ISO will continue to assess the high voltage issues in the 2016-2017 transmission planning process to further assess the alternatives, the requirement for static versus dynamic support, and optimal locations for high voltage mitigation on the bulk system. Current operating action plans will be used to mitigate the high voltage interim until the detailed mitigation plan is developed. (Page 62)

<sup>3</sup> The studies identified high voltages in the 500 kV system in Central California starting from 2026 when Diablo Canyon Nuclear Power Plant retires. The ISO is considering installing additional reactive devices, preferably dynamic – so that they could both absorb reactive power under normal system conditions and supply reactive power with contingencies as needed. The ISO is working with PG&E on the reactive modeling and will be conducting a detailed assessment to determine reactive needs on the bulk system in the 2017-2018 Transmission Planning Process. (Page 87)

<sup>4</sup> The studies identified high voltages in the 500 kV system in Central California starting when Diablo Canyon Nuclear Power Plant retires, which is currently planned for 2025 and reflected in the 2027 cases. It is recommended to consider installing additional reactive devices, preferably dynamic, so that they could both absorb reactive power under normal system conditions and supply reactive power with contingencies as needed. A more detailed study will specify exact locations, sizes and types of this reactive support. (Page 87)

The ISO reviewed this proposal and concluded that the proposal is valid, but additional studies are required to determine the exact locations and the size of the devices. The ISO will be continuing to assess the bulk system reactive needs after the retirement of the Diablo generation in the 2018-2019 transmission planning process. (Page 89)

- “For planning events shown in Table 1, when the analysis indicates an inability of the System to meet the performance requirements in Table 1, the Planning Assessment shall include Corrective Action Plan(s) addressing how the performance requirements will be met.”

The decommissioning of the Diablo Canyon Power Plant (“DCPP”) will further perplex optimal voltage control on the Northern California Bulk 500 kV transmission system. Finally, by taking into consideration the long lead time required for constructing the transmission projects, NEET West recommends that CAISO finalizes the dynamic reactive proposals at both locations in 2018-19 TPP cycle and to consider opening both candidate projects (at Gates and Round Mountain) for competitive solicitation.

**CAISO should consider developing a transmission solution in the current TPP for the Suncrest - Sycamore 230 kV thermal overloads (also Suncrest and Miguel transformers) observed in 2017-18 TPP and to release the identified project for competitive solicitation**

The San Diego Main 2020, 2023 and 2028 Summer Peak, and 2023 Spring Off-Peak baseline scenarios detail overloads to the Suncrest-Sycamore 230 kV lines, the Suncrest 500/230 kV transformer banks, and the Miguel 500/230 kV transformer banks due to P6 contingencies. On page 214 of the Day 1 presentations, the CAISO results list potential mitigation solutions that include implementing 30-minute ratings and implementing operator actions. The proposed solutions rely on applicable 30 minute emergency ratings to allow time for operator action following the 2<sup>nd</sup> contingency.

NEET West conducted detailed studies to test the proposed CAISO mitigation solutions and determine if the listed operator actions could mitigate the overloaded facilities. NEET West tested the following operator actions:

- Adjust 30-min available demand response
- Dispatch available and future energy storage resources
- Adjust the IV PFC to shift power off the California transmission through the CFE system and back into California across the Tijuana-Otay Mesa 230 kV line.

While performing the studies, it was determined that there is a limit to the amount of flow that can be rerouted through the CFE system. It was observed that using the IV PFC will offload the Sycamore-

Suncrest lines under contingency conditions; however, it also increases flows on Tijuana-Otay Mesa 230 kV line. Therefore, the available IV PFC operator adjustment is finite, and studies must ensure that the assumed adjustment does not generate other overloads elsewhere on the system. NEET West studies determined the following regarding the suggested operator actions:

- The tested operator actions are not enough to mitigate the overloads evaluated on the SDG&E system for loss of the ECO-Miguel 500 kV line combined with a single Sycamore-Suncrest 230 kV line (RAS #1), which the CAISO preliminary reliability results show with a 128% and 135% overload in the 2028 SP and 2023 SOP cases respectively. Operator actions included tripping demand response, utilizing energy storage, and adjusting the IV PFC.
- The best case of operator actions evaluated shows a 102.7% and 115.3% overload to the remaining **Suncrest-Sycamore 230 kV line** following the loss of the ECO-Miguel 500 kV line combined with loss of a single Suncrest-Sycamore 230 kV line for 2028 summer peak and 2023 Spring Off Peak cases respectively.

The operator action of shifting power through the CFE system has its limitations because it causes an overload to the **Tijuana-Otay Mesa 230 kV line** for loss of the ECO-Miguel 500 kV Line combined with loss of a single Suncrest-Sycamore 230 kV Line.

- There is no adjustment to the IV PFC that can balance flows to a level capable of avoiding overloads on both the Suncrest-Sycamore 230 kV line and Tijuana-Otay Mesa 230 kV line in the 2023 off peak cases for loss of the ECO-Miguel 500 kV line combined with a single Sycamore-Suncrest 230 kV line (RAS #1).
- Based on the above, NEET West suggests that CAISO performs more analysis and to develop a comprehensive long term transmission project for this area. NEET West has evaluated adding a 3<sup>rd</sup> 230 kV Suncrest – Sycamore 230 kV transmission line or alternatively adding energy storage (~200 MW) at Sycamore. Finally, the identified project solutions (transmission

and/or energy storage at 230 kV level) should be considered as candidates for competitive transmission solicitations.

**CAISO should consider canceling Midway – Andrew project and develop a Least Cost Long-Term Reliability Transmission Solution in the current TPP for the Central Coast Los Padres (“CCLP”) and release it for competitive solicitation**

The reliability constraints (thermal and voltage) in the CCLP area will continue to persist, as reported by CAISO in Day 1 presentations page 125 which indicated that P6 contingencies remain to cause reliability violations until the project is placed into service. The Midway – Andrew project approved in 2012-13 TPP was placed on hold by the CAISO for future evaluation in the 2018-19 TPP. The original project cost was \$120-150 million escalated to \$215 million (Day 1 presentations, page 125). PG&E has pushed the forecasted in-service date from June 2025 to December 2025 and by delaying the start of the most optimal transmission project another year, the Los Padres area will remain vulnerable to the reliability constraints mentioned in the Draft Plan.

CAISO is currently evaluating mitigation options that include increasing emergency ratings coupled with lower voltage capacitor banks or SVC’s as well as SPS to shed load. NEET West is concerned as the extensive and perpetual reliability issues in the Los Padres area stem from only having two 230 kV sources into the area (Mesa and Morro Bay). It’s unlikely that these concerns can be mitigated without the implementation of a new source into the area and NEET West discourages the use of SPS to shed load when a viable transmission alternative exists.

Furthermore, it is clear from the 2017-18 and 2018-19 TPP that the Midway-Andrew 230 kV project is no longer needed as initially proposed. The system needs and configuration have significantly changed since the initial approval of the Midway-Andrew Project, due to the announced retirement of the Diablo Canyon Power Plant which will leave underutilized transmission in the area that can be reallocated to resolve this reliability concern. The mitigation needed in this area will no longer include main components of the original Midway-Andrew Project which included a 65-100 mile new line between Midway and Andrew. These scope changes will have a significant impact to the estimated budget for the project. Furthermore, it is difficult to argue that changes to project scope of this magnitude can be grandfathered in under an old tariff that did not approve the new scope, nor include the best interests of ratepayers by not allowing an opportunity for competitive solicitation.

NEET West recommends that CAISO performs a comprehensive evaluation in the current cycle to identify and to approve a new transmission project that will comprehensively mitigate the reliability issues in this local area.

**CAISO should consider releasing for competitive solicitation in the current TPP a new 230 kV transmission project necessary to address the reliability violations on the Amargosa 230/138 kV transformer in the Valley Electric Association (“VEA”) system**

The CAISO’s 2018-19 Reliability Assessment – Preliminary Study Results for VEA area identified a number of P1, P4 and P7 contingencies that generated potential overloads to the Amargosa 230/138 kV transformer for which a potential mitigation solution may be needed.

NEET West encourages the CAISO to study the VEA closely because it was found that the previously approved Charleston-Vista 138 kV line does not resolve the overloads to the Amargosa 230/138 kV transformer. Specifically, a N-1-1 outage of the new Charleston-Vista 138 kV line combined with loss of Gamebird-Pahrump 138 kV line will result in overloads to the Amargosa 230/138 kV transformer. Furthermore, GridLiance’s Request Window presentation suggested that the previously approved Charleston-Vista 138 kV line needed to be 230 kV (page 6-7, GridLiance Request Window Proposals, CAISO 20018-19 Sep 20-21 Meeting). NEET West recommends that CAISO evaluates a new Charleston – Vista 230 kV line as well as a new Gamebird – Charleston 230 kV transmission line solution to determine which project is the most effective in removing the overload to the Amargosa 230/138 kV transformer bank (i.e., recommend testing N-1-1 conditions: loss of Charleston – Vista 230 kV combined with Gamebird – Pahrump 230 kV line). Consequently, the identified project solution should be considered as candidate for competitive transmission solicitation.

## **Conclusion**

NEET West commends CAISO’s staff for all of their time and effort put into reliability assessment in the 2018-2019 TPP. NEET West submits these comments with the goal of enhancing the processes utilized in the evaluation and selection of the most efficient and effective reliability transmission projects in the TPP. We look forward to working with CAISO and other stakeholders in helping improve the reliability of the transmission system of the state of California.

Sincerely,



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