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Submitted to: CAISO (regionaltransmission@caiso.com)

COMMENTS OF NEXTERA ENERGY TRANSMISSION WEST, LLC ON THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION'S 2016-2017 TRANSMISSION PLANNING PROCESS SEPTEMBER 21- 22, 2016 STAKEHOLDER MEETING

NextEra Energy Transmission West, LLC (NEET West) appreciates this opportunity to provide comments on the California Independent System Operator Corporation's (CAISO) 2016-2017 Transmission Planning Process (TPP) September 21-22, 2016 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 2016-2017 TPP:

NEET West Recommends CAISO Develop a Long-Term Reliability Transmission Solution for the Pacific Gas &Electric (PG&E) Oakland Area in 2016-2017 TPP

To improve reliability and mitigate thermal overloads within the Oakland area, NEET West plans to submit two new transmission solutions that consist of a new 230 kV transmission source connecting Sobrante 230 kV substation or Moraga 230 kV substation to a new Oakland C 230 kV substation.

In the 2015-2016 TPP CAISO indicated that they will continue to consider transmission, generation or non-transmission solutions as they revisit the assessment of Oakland area needs in the 2016-2017 TPP cycle. In the near-term, the Oakland area relies on Special Protection Systems (SPS) with a relatively small amount of load shedding as allowed per the CAISO Planning Standards; however CAISO will consider alternatives for the long-term horizon.

- NEET West would like to emphasize that the reliability needs of the East Bay area are greatly dependent on the existing local generation that faces potential near-term retirement due to age[1] of Oakland area combustion turbine (CT) generation. It should also be noted that previous versions of the CAISO Planning Standards included the Greater Bay Area Generation Outage criterion, which recognized a higher unavailability of these units due to their age and forced outage rates. We observed during the September 21-22, 2016 meeting, that Oakland CT retirement is not certain yet and this was one of the reasons for CAISO not currently approving any transmission and/or non-transmission solutions as part of the 2016-2017 TPP study cycle. NEET West requests that the CAISO seeks resolution to the retirement of this very important generation in East Bay area and that the appropriate

[1] Oakland Power Plant became operational in January, 1978. Source: Master CAISO Control Area Generating Capability List. Revised Database to reflect known CAISO Control Area generating resource information as of: October 9, 2015.

assumptions are updated and reflected in the existing studies during the current 2016-2017 TPP study cycle as well as that long term solutions are developed to address all the identified issues in the East Bay. Consequent to this:

- NEET West requests that the CAISO's 2016-2017 TPP cycle include a special assessment of the Oakland/East Bay area and to evaluate the NEET West project alternative against all other transmission and non-transmission alternatives being considered to determine the most cost effective solution. Due to its characteristics, long-term planning for the Oakland/East Bay Area should incorporate an approach similar to the San Francisco Peninsula Extreme Event Reliability Assessment previously performed in the CAISO's 2015-2016 TPP cycle. The Oakland East Bay assessment should explore all viable mitigation options that address the special circumstances for this area; some of these circumstances include:
    - A high-density urban area consisting of over 400 MW of load.
    - Retirement of Oakland area CT generation.
    - Elimination of the reliance on SPS or Remedial Action Schemes (RAS) per the CAISO's new High Density Urban Load Area planning standard, which no longer allows "non-consequential load dropping in high density urban load areas in lieu of expanding transmission or local resource capability" to mitigate NERC TPL standard contingencies and transmission system impacts (for facilities ≥115 kV). NEET West recognizes there are multiple existing SPSs in the East Bay (PG&E Greater Bay Area: Moraga-Oakland J 115 kV line OL RAS, Grant 115 kV OL SPS, Oakland 115 kV C-X Cable OL RAS, Oakland 115 kV D-L Cable OL RAS); these schemes are designed to drop load in order to comply with NERC TPL contingency events.
    - The environmental restrictions and economic impacts of the Oakland combustion turbines (that are Regulatory Must Run (RMR) units) and the Northern California Power Agency (NCPA) combustion turbines in Alameda have on the system and how these restrictions and economics may be impacted with the addition of the NEET West Oakland Project.
    - Exposure and restrictions of transmission system topology. Existing critical overhead transmission sources (Moraga-Claremont, Moraga-Station X, and Moraga Station J 115kV circuits) are confined to multiple-circuit corridors and traverse heavily-wooded areas, foothill ridges and canyons. These conditions limit accessibility, and expose these facilities to causes of common-corridor outages (such as fire). Likewise, downtown Oakland's aging network of 115 kV underground cables (gas-filled pipe-type cables constructed in the 1960s) offer limited access due to heavy urban development, and are also exposed to seismic considerations (proximity and orientation to the Hayward Fault). All these factors complicate the timely restoration and/or reinforcement of existing circuits, and likewise present routing challenges for new facilities. Planning studies should consider the implications of multiple-circuit/extreme outages, and the potential for sustained unavailability of one or more circuits.

NEET West Recommends CAISO Develop a Long-Term Reliability Transmission Solution for the SCE Big Creek Area in 2016-2017 TPP

To improve reliability, and mitigate thermal overloads and transient stability concerns in the Big Creek area, NEET West plans to submit a proposal to construct a new Pittman Hill 230 kV substation project that will tie the following transmission lines together:

- Helms – New E1 230 kV #1 & #2 Lines (PG&E)
- Big Creek 3 - Rector 230 kV Line #2 (SCE)
- Big Creek 4 - Springville 230 kV Line (SCE)
- Big Creek 1 - Rector 230 kV Line (SCE)

NEET West requests that TPP 2016-2017 evaluation include the following key factors regarding the SCE Big Creek Area:

- Evaluate all alternatives[2], including NEET West Pittman Hill project, for reliability and performance by testing system thermal loading, voltage performance and control, stability performance, short-circuit margins, extreme contingency performance, and interface impacts (internal/external).
- NEET West requests that the 2016-2017 TPP evaluation include a comparison of the NEET West project alternative against alternatives being considered to determine the most cost effective solution, including any alternatives whose proposed costs are to be split between the Transmission Access Charge (TAC) and operations and maintenance.
- Evaluate the Midway 500 kV Substation Extreme Event outage and capture additional reliability benefits that the NEET West Pittman Hill Project has over any other alternatives.
- Evaluate impact of various alternatives in relieving congestion on Path 26[3]. NEET West observed that impact of the project on Path 26 will need to be carefully examined as this path is sensitive congestion flowgate that is currently being evaluated as part of the economic assessment and that should be included in both a 33% RPS and a 50% RPS evaluation. The studies and evaluations we observed suggest that Path 26 ugprades will be required and therefore NEET West suggests consideration of a Pittman Hill substation which will provide relief on this very important path.
- Evaluate potential for less reliance on Helms Pumped-Storage RAS.
- Evaluate load dropping RAS at Rector under contingency conditions for all alternatives.
- Determine the necessary reliance on Big Creek Generation under contingency conditions.

[2] NEET West study evaluated various competing transmission projects alternatives as observed in the CAISO during the 2015-16 and the 2016-17 TPP, including new 230 kV Big Creek transmission line, Thyristor Controlled Series Capacitor (TCSC), and the re-conductoring/re-rate of the existing 230 kV transmission lines. We determined that NEET West project demonstrated equal or better performance in several areas, including thermal and stability impact, elimination of the existing special protection systems, improved utilization of the existing PG&E and SCE transmission, and significant relief on the Path 26 flow.

[3] NEET West project demonstrated significant relief on Path 26 flow and this positive impact will need to be taken into account when compared other project alternatives.

- Quantify benefits for potential increased operational flexibility of the Helms Pumped-Storage Plant.

NEET West Recommends CAISO Develop a Long-Term Reliability Transmission Solution for the West of Devers Area in 2016-2017 TPP

To improve reliability and mitigate thermal overloads of the existing 230 kV transmission network in the West of Devers area[4], NEET West plans to submit a proposal to construct a new 500 kV transmission system from Mira Loma 500 kV substation to Red Bluff 500 kV substation with 50% compensation.

A new Mira Loma – Red Bluff 500 kV Transmission System would provide a long term solution that:

- Will eliminate and/or minimize the congestion management cost. Presently, congestion management is used to mitigate thermal issues on the existing West of Devers 230 kV and 500 kV transmission network. Depending on the amount of congestion that occurs on this path, the costs could be significant. Construction of a new Mira Loma – Red Bluff 500 kV transmission system would reduce the amount of congestion management necessary (including generation curtailments) to alleviate the thermal issue and consequently economic savings could be realized. Further analysis would be required to quantify the economics of congestion management costs expended annually in order to maintain system reliability for this transmission line.
- Minimize generation curtailment, and also continued reliance on the existing SPS, specifically Inland SPS and West of Devers SPS, and continued reliance on operating procedures for voltage and thermal control.
- Complement integration of CAISO approved participating transmission owner's projects[5] and the approved competitive transmission solicitation projects.

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[4] As part of the CAISO 2016-2017 TPP, the preliminary reliability results identify the existing transmission line can be subject to thermal overloads under several category P1 and P6 contingency conditions (up to 18% as reported by CAISO in 2021 SP Heavy Renewable & Min Gas Gen). Furthermore, the project will improve the voltage profile on 500 kV system network from Alberhill, Valley, Devers, Colorado River, Rancho Vista, Red Bluff, Serrano, and also on 230 kV transmission network from Devers, El Casco, Etiwanda, Mirage, Mira Loma, Rancho Vista, San Bernardino, Serrano, Vista, Widlife, and 115 kV network at Devers and Alberhill.

[5] Path 42 Upgrade Project (2015)
Devers – Mirage 230 kV Lines Upgrade (2015)
Tehachapi Renewable Transmission projects (2016)
Lugo – Eldorado 500 kV line reroute (2017)
Suncrest 300 MVar SVC (2017)
Sycamore – Penasquitos 230 kV line (2017)
El Dorado – Lugo Series Caps Upgrade (2019)
Lugo – Mojave Series Caps Upgrade (2019)
West of Devers Upgrade Project (2020), and
Delaney-Colorado River 500 kV line Project (2020).

- Support Eastern LA Basin Local Capacity Requirement (LCR) Sub-Area process. The LCR need for the Eastern LA Basin sub-area is based on the need to mitigate post-transient voltage instability that is caused by the loss of the Alberhill – Serrano 500 kV line, followed by an N-2 of Red Bluff-Devers #1 and #2 500 kV lines. The LCR need to mitigate this post-transient voltage instability concern is determined to be approximately 2,230 MW (source: CAISO TPP 2015-2016), which is to be met by available resources in the Eastern LA Basin sub-area.
- Reactive Power Deficiency. With the continued load growth and addition of renewable generation in the Eastern area, there is voltage degradation to the system that was observed. With the inclusion of the new proposed Mira Loma - Red Bluff 500 kV transmission system, as required to mitigate thermal overload problems, the base case voltage issues identified at the previously mentioned substations were improved. Furthermore, the study identifies the need for additional voltage support at both Red Bluff and Colorado River, and Serrano substation. This analysis will need to be conducted separately to determine an accurate amount of reactive support needed at these existing substations.
- Continue to support integration of the renewable generation in CAISO. NEET West's proposed project will support the integration of renewable generation. The most recent Cluster 8 Phase 1 Interconnection Study Report, SCE Eastern Bulk Area Report (January, 2016), identified numerous thermal overloads and low voltages conditions with all facilities in-service. This constraint is commonly referenced as the "West of Devers Area Deliverability Constraint". This constraint is of primary importance to California renewable integration because it affects the deliverability of generators in several energy zones, including Riverside East, Tehachapi, Imperial, San Diego South and other non-CREZ.

NEET West requests that the 2016-2017 TPP evaluation include the reliability evaluation of the NEET West Mira Loma – Red Bluff 500 kV transmission project, to take into account all benefits of the project and to perform a comparison of the NEET West project alternative against alternatives considered to determine the most cost effective solution.

NEET West Recommends CAISO Develop a Long-Term Reliability Transmission Solution for the PG&E Fresno Herndon Area in 2016-2017 TPP

To improve reliability and mitigate thermal overloads within the Herndon area[6], NEET West plans to submit a proposal to construct a new 230 kV transmission system that consists of a new 230/115 kV transformer at Bullard Substation and a new 230 kV transmission line from Ashlan Ave to Bullard Substations. The NEET West 230 kV transmission line between Ashlan Ave to Bullard removes the identified transient stability issues for a Bus 2 fault at Herndon 115 kV.

NEET West requests that the 2016-2017 TPP evaluation include the reliability evaluation of the NEET West Herndon project and a comparison of the NEET West project alternative against alternatives being considered to determine the most cost effective solution.

[6] Under multiple NERC category (P2 and P2-2) contingencies, preliminary reliability results indicate:
- Transient Stability Performance Issue for a Bus 2 fault at Herndon 115 kV bus.
- Thermal overloads on the Pinedale to Bullard 115 kV lines.

NEET West Recommends CAISO Develop a Long-Term Reliability Transmission Solution for the Mesa Area in 2016-2017 TPP

To improve reliability and mitigate thermal overloads within the Mesa area[7], NEET West plans to submit the project that consists of:

- A new Andrew-Santa Ynez 230 kV Line
- A new 230/115 kV Santa Ynez Transformer

The NEET West Andrew-Santa Ynez project resolves the identified thermal overloads for a Divide-Mesa 115 kV line and Divide-Purisma 115 kV Line outage combination. It also raises the post voltage profile above 0.9 pu in a Census defined Urban Load Area. The low voltage areas identified include Santa Ynez, Buellton, Lompoc, and Solvang which are all identified on the 2010 Census identified Urban Areas (UA's) of 50,000 of more. The project provides several other important benefits including improving reliability to the Vandenberg Air Force Base[8], meets additional reliability needs not addressed by the Andrew-Midway 230 kV Project, Morro Bay Transformer Bank Project, or the Midway-Temblor 115 kV re-conductor project, introduces a redundant source into the area. Sections of the Sisquoc-Santa Ynez 115 kV line are located within High-Very High Fire Hazard Severity Zones, as defined by CAL Fire. Adding a second source into Santa Ynez from an alternative right of way would improve the reliability to the area.

NEET West requests that the 2016-2017 TPP evaluation include the reliability evaluation of the NEET West Mesa project and a comparison of the NEET West project alternative against alternatives considered to determine the most cost effective solution.

[7] Under multiple NERC category (P2-3 & P2-4) contingencies, CAISO 2016-2017 TPP preliminary reliability results indicate:

- Thermal overloads up to 112% on the 18 mile Sisquoc-Santa Ynez 115 kV line in base cases.
- Voltage magnitude below 0.90 PU for single contingencies in base cases.
- Thermal overloads up to 118% on the 18 mile Sisquoc-Santa Ynez 115 kV line in sensitivity base cases.
- Voltage collapse under single contingencies in sensitivity base cases.

[8] Vandenberg AFB is served by the Divide substation, so a Divide area post contingency load dropping SPS is not a feasible alternative.

NEET West Recommends CAISO Evaluates New Pala 230 kV Substation and if Found Needed Should Be Competitively Bid in 2016-2017 TPP

To improve the reliability and thermal overloads within the Pendleton, San Luis Rey, and Ocean Runch area[9], NEET West respectfully requests the ISO to evaluate the project that consists of:

- New Pala 230 kV Loop-In Substation. Per participating Transmission Owner's presentation, this project includes:
  - Loop-in TL23030 into Pala
  - Add 230/69 kV transformer & equipment
  - Cost: $20M -$30M

NEET West requests that CAISO confirm the identified overloads and if validated the project should be competitively bid.

Conclusion

NEET West commends CAISO's staff for all of the time and effort that it put into the 2016-2017 TPP. NEET West submits these comments with the goal of enhancing the processes utilized in the evaluation of reliability projects in the transmission planning process. NEET West appreciates the opportunity to participate in the transmission planning process and to provide these comments.

Sincerely,

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[9] Under multiple NERC category contingencies, CAISO 2016-2017 TPP preliminary reliability results indicate N-1-1 of TL6912 & TL6932 causes overload of TL694B & TL694A as high as 120%. Post Ocean Ranch (ISD 2019) – NERC Cat P1 and P6 violations. LCR Need is also identified for Pala sub area.