

March 14, 2017

Submitted to: CAISO (regionaltransmission@caiso.com)

**COMMENTS OF NEXTERA ENERGY TRANSMISSION WEST, LLC
ON THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION'S
2017-2018 TRANSMISSION PLANNING PROCESS FEBRUARY 28, 2017
STAKEHOLDER MEETING**

NextEra Energy Transmission West, LLC (NEET West) appreciates this opportunity to provide comments on the California Independent System Operator Corporation's (CAISO) 2017-2018 Transmission Planning Process (TPP) to discuss the study plan assumptions as the basis to perform the transmission planning technical studies for this year. In addition, we appreciate the opportunity to provide comments on the two special studies that are a part of the 2016-2017 TPP: the out-of-state portfolio analysis of the 50% Renewable Portfolio Standard (RPS) Special Study and the Benefits Analysis of Large Energy Storage Special Study.

In summary, we respectfully request CAISO to consider the following factors as it undertakes its current transmission planning efforts in the 2017-2018 TPP:

NEET West Requests that the CAISO commence an in-depth Economic Planning and 50% RPS Public Policy Study for a new Mira Loma – Red Bluff 500 kV Transmission System

NEET West is proposing a new 500 kV transmission system from Red Bluff 500 kV substation to Mira Loma 500 kV substation with 50% compensation¹.

1. New 500 kV transmission line between Red Bluff substation and Mira Loma substation with 50% compensation. Line ratings: 3421 MVA Normal, 3880 MVA Emergency.

¹ Additional transmission reinforcement including reactive support (shunt reactors and capacitors) may be needed at the existing 500 kV substations to properly integrate the proposed project. Furthermore, a new Mira Loma – Red Bluff 500 kV transmission project will also require careful study of the existing SPSs and any modifications and readjustments to minimize the use of generation required for tripping under P1 and P6 contingency conditions.

2. Series Compensation: 50%, optimal location in the line to be determined with more detailed studies.

Ratings: 3291 MVA Summer Normal, 3949 MVA Summer Emergency.

NEET West studies indicate a new 500 kV transmission line between Red Bluff and Mira Loma can improve the reliability and thermal overloads of the existing 230 kV transmission network in the area of Devers, San Bernardino, El Casco, and Vista. In addition, a new line can also improve the normal overload on Alberhill – Valley 500 kV T/L as observed in the CAISO’s generation interconnection studies, where the addition of the QC8 Phase 2 and QC9 Phase 1² projects triggered several thermal and low voltage conditions. Given preliminary results of the CAISO’s 50% RPS “informational only” study which indicate high potential for generation curtailment in Riverside County, it is evident from our analysis that a high voltage electric transmission infrastructure will be a critical component in this area necessary to integrate higher levels of renewable generation. To this point, we respectfully request that CAISO undertake an in-depth study for the Mira Loma – Red Bluff 500 kV transmission line, specifically to perform:

1. Economic Planning Study
2. Public Policy study at a 50% RPS level and to carefully examine the system, local, and societal benefits of such facility.

Based on NEET West study, 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 by CAISO would be required to quantify the

²C9P1 – page 24 – Normal Overload on Alberhill-Valley 500 kV T/L. In order to mitigate base case overloads and provide for a base case that meets criteria with all facilities in-service, an alternative to Red Bluff – Mira Loma 500 kV transmission, or a new 500 kV transmission line from Eldorado Substation to Lugo Substation would be required in addition to CAISO’s congestion management.

economics of congestion management costs expended annually in order to maintain system reliability for this transmission line.

- Will minimize generation curtailment and also continued reliance on the existing Special Protection Systems (SPS), specifically Inland SPS and West of Devers SPS, and continued reliance on operating procedures for voltage and thermal control.
- Complements the integration of CAISO approved participating transmission owner's projects³ and the approved competitive transmission solicitation projects.
- Supports 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.
- Combat Reactive Power Deficiencies. With the continued load growth and addition of renewable generation in the Eastern area, voltage degradation to the system was observed. The inclusion of the proposed Mira Loma - Red Bluff 500 kV transmission system improved base case voltage issues identified at the previously mentioned substations, in addition to resolving the thermal overload problems. Furthermore, the study identifies the need for additional voltage support at Red Bluff, Colorado River, and Serrano substations. This analysis will need to be conducted separately to determine an accurate amount of reactive support needed at these existing substations.

³Path 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).

- Continues to support integration of renewable generation in CAISO. NEET West’s proposed Mira Loma-Red Bluff project will support the integration of renewable generation. The Cluster 8 Phase 1&2 and Cluster 9 Phase 1 Interconnection Study Report identified several thermal overloads 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.

In closing, NEET West requests that the 2017-2018 TPP evaluation by CAISO include both: economic and public policy study 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 other alternatives considered to determine the most cost effective solution.

Furthermore, NEET West appreciates the opportunity to provide comments on the **Benefits Analysis of Large Energy Storage** special study during the 2016-17 TPP cycle. In this regard, NEET West recognize that while energy storage is usually classified as a generation resource, the operational characteristic of advanced storage technologies and their use as transmission assets are worth exploring, as they could potentially provide substantial benefits to improving transmission grid reliability and congestion⁴. Electric storage resources have the ability both to charge and discharge electricity and can provide a variety of the transmission grid services to multiple entities (i.e., RTOs, transmission and distribution utilities). Equally important, they can provide multiple services almost instantaneously. As such, electric storage resources may fit into more of the traditional asset functions of generators, transmission, and distribution⁵. It is important to create a

⁴ On November 9, 2016, FERC Commission staff led a technical conference to discuss the utilization of electric storage resources as transmission assets compensated through transmission rates, for grid support services that are compensated in other ways, and for multiple services. In Western Grid, the Commission accepted Western Grid's proposal to provide cost-based rate recovery for electric storage resources through transmission rates based on the proposed uses (voltage support and thermal overload protection for relevant transmission facilities) and on other conditions Western Grid proposed, including a commitment to forego any sales into CAISO's organized wholesale electric markets.

⁵ FERC Commission, 18 CFR Part 35, [Docket No. PL17-2-000] Utilization of Electric Storage Resources for Multiple Services When Receiving Cost-Based Rate Recovery

transmission planning process where energy storage will be enabled to provide multiple services (including both cost-based and market-based services) as this will ensure full capability of the resource, thereby maximizing their efficiency and value for the system and to the customers. To properly characterize benefits of the battery energy storage device to the transmission grid, one or more of the following factors should be undertaken and that might address transmission criteria violation:

1. **Criteria Violation:** The threshold condition(s) on transmission component that trigger need for upgrade or congestion, (e.g. under voltage).
2. **Type of Contingency:** Event categories that trigger the problem or criteria violation. Examples: line trip, stuck breaker, generator outage.
3. **Response speed:** The minimum time in which the solution device needs to react by providing power, VARS, etc.
4. **Response duration:** The minimum and/or maximum time for which the solution device needs to stay activated to alleviate reliability violations.

In closing, NEET West recommends that CAISO provide additional planning guidance regarding how electric storage will be studied comprehensively in order to provide full resource capability and consequently to receive the cost of providing appropriate services through both cost-based and market-based rates concurrently. We would also like to see the methodology that CAISO will apply and to test an energy storage resource and how that resource will be compared on a cost & benefit analysis to other alternatives that could provide the same type of service.

Furthermore, NEET West understands that only segments of a comprehensive analysis is currently performed to support 50% RPS study and that more work and analyses need to be undertaken to properly integrate all renewable intermittent resources. We must recognize that the current electric transmission grid is designed around the concept of large conventional and controllable generators and that the intermittent renewables change the conventional methods for the daily operation of the electric grid substantially. We recognize CAISO's effort in undertaking several important special

planning studies; however, this represents only a fraction of comprehensive examinations that need to integrate other important elements of reliability performance such as: governor response, system inertia, short circuit requirements, voltage and reactive requirements, significant generation curtailments and redispatch of generation in real time that would require manual and/or automatic operational procedures, adjustments to the SPS etc. All of these studies will need to be assessed in parallel and operational inputs will need to be integrated into the transmission planning process, to properly balance challenges and outcomes. Finally, communication on the inputs assumptions and the results of the studies will need to be communicated to all stakeholders.

As NEET West commented in our previous submission, the transmission constraints issues that were observed across various special studies require continued reliance on operating procedures, inclusive of the SPS, curtailment and re-dispatch of generation to relieve transmission constraints and congestion. NEET West strongly advises that these mitigation tools are carefully reviewed and tested when comprehensive analyses are performed to factor real time operational challenges associated with operation of the grid and integration into the Energy Management and SCADA systems. There needs to be careful analysis undertaken to properly weight benefits and costs of: SPS, significant curtailments of conventional and renewable generation, and re-dispatch of resources versus conventional transmissions system solutions that might offer significant advantages to maximize not only the reliability of the grid but also provide the reliable deliverability of resources and robust operation of the transmission grid. This consideration will become even more important to support 50% RPS integration.

NEET West commends CAISO staff for all of the time and effort that it put into 2016-2017 and 2017-2018 TPPs. NEET West appreciates the opportunity to participate in the transmission planning process and to provide these comments.

Sincerely,



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