The ISO received comments on the topics discussed at the November 16, 2017 stakeholder call from the following:

1. Bay Area Municipal Transmission (BAMx)
2. California Public Utilities Commission – Staff (CPUC-Staff)
3. GridLiance
4. NextEra Energy Transmission, LLC (NEET West)
5. Office of Ratepayer Advocates (ORA)
6. Transmission Agency Northern California (TANC)

Copies of the comments submitted are located on the 2017-2018 Transmission Planning Process page at:

http://www.caiso.com/planning/Pages/TransmissionPlanning/2017-2018TransmissionPlanningProcess.aspx

The following are the ISO's responses to the comments.

1. Bay Area Municipal Transmission (BAMx)
Submitted by: Robert Jenkins

No	Comment Submitted	CAISO Response
1a	**Review of Previously Approved Transmission Projects** In general, BAMx is very pleased with the diligence that the CAISO has demonstrated in its review of both previously approved projects and new projects proposed by the Participating Transmission Owners (PTOs) and favoring the more cost effective solutions to the identified violations. The twelve (12) under $50 million projects for which it has been identified that no mitigation is needed represents a reduction in capital expenditures of $405 million to $626 million as shown in Table 1. BAMx observes the unprecedented nature of the forecast for decreasing loads as indicated in the forecast of this year's TPP loads. And that based upon the passage of SB350 and AB 802, along with increasing distributed PV, we expect that decreasing trend to build momentum. BAMx supports the CAISO utilizing an analytic method that seeks to capture such impacts in its evaluation of future transmission needs. In particular, BAMx supports the CAISO's analytic method used to evaluate the Gates-Gregg 230 kV project whereby initial assumptions favorable to the transmission project were tested to assess project viability. BAMx supports the CAISO's consideration to cancel the Gates-Gregg 230 kV project in the ISO 2017-2018 TPP based upon lack of sufficient economic benefits. Such cancellations will also help in restricting the accumulation of Allowance for Funds Used During Construction (AFUDC) for unneeded projects.	The comment has been noted. Further, the ISO refers BAMx to the comments received by PG&E, clarifying PG&E's treatment of AFUDC for the Gates-Gregg 230 kV project while the project is on hold and the treatment to be applied if the project is canceled or completed.

<table>
<tr><th>No</th><th>Comment Submitted</th><th>CAISO Response</th></tr>
<tr><td></td><td>

Table 1: Projects Recommended for Cancellation

Table 1A: Projects Recommended for Cancellation Without Any Further CAISO Action

<table>
<tr><th rowspan="2">Project Name</th><th rowspan="2">Area</th><th colspan="3">Capital Cost Estimate (M$)*</th></tr>
<tr><th>Range</th><th>Low</th><th>High</th></tr>
<tr><td>Los Esteros-Montague 115 kV Substation Equipment Upgrade</td><td>Greater Bay Area</td><td>$0.5-$1</td><td>$1</td><td>$1</td></tr>
<tr><td>Evergreen-Mabury Conversion to 115 kV</td><td>Greater Bay Area</td><td>$30-$40</td><td>$30</td><td>$40</td></tr>
<tr><td>Glenn #1 60 kV Reconductoring</td><td>North Valley</td><td>$5-$10</td><td>$5</td><td>$10</td></tr>
<tr><td>Napa – Tulucay No. 1 60 kV Line Upgrades</td><td>North Coast / North Bay</td><td>$5-$10</td><td>$5</td><td>$10</td></tr>
<tr><td>Ashlan - Gregg and Ashlan - Herndon 230 kV Line Reconductor</td><td>Fresno</td><td>$20-$70</td><td>$20</td><td>$70</td></tr>
<tr><td>Caruthers - Kingsburg 70 kV Line Reconductor</td><td>Fresno</td><td>$10-$20</td><td>$10</td><td>$20</td></tr>
<tr><td>Kearney - Caruthers 70 kV Line Reconductor</td><td>Fresno</td><td>$10-$20</td><td>$10</td><td>$20</td></tr>
<tr><td>Reedley 115/70 kV Transformer No. 2 Replacement Project</td><td>Fresno</td><td>$10-$15</td><td>$10</td><td>$15</td></tr>
<tr><td>Mission-Penasquitos</td><td>San Diego</td><td>$25-$30</td><td>$25</td><td>$30</td></tr>
<tr><td></td><td></td><td>Sub-Total</td><td>$116</td><td>$216</td></tr>
</table>

Table 1B: Projects Recommended for Cancellation with Further Action Not Requiring CAISO Approval

<table>
<tr><th rowspan="2">Project Name</th><th rowspan="2">Area</th><th colspan="3">Capital Cost Estimate (M$)*</th></tr>
<tr><th>Range</th><th>Low</th><th>High</th></tr>
<tr><td>Stagg – Hammer 60 kV Line</td><td>Central Valley</td><td>$10-$20</td><td>$10</td><td>$20</td></tr>
<tr><td>Rio Oso – Atlantic 230 kV Line Project</td><td>Central Valley</td><td>$200-$300</td><td>$200</td><td>$300</td></tr>
<tr><td>Table Mountain-Sycamore</td><td>North Valley</td><td>$80-$90</td><td>$80</td><td>$90</td></tr>
<tr><td></td><td></td><td>Sub-Total</td><td>$290</td><td>$410</td></tr>
<tr><td></td><td></td><td>Total Recommended for Cancellation</td><td>$406</td><td>$626</td></tr>
</table>

</td><td></td></tr>
<tr><td>1b</td><td>Development of 30-Minute Emergency Rating on Suncrest Banks #80 and #81
The outages causing overloads on the Suncrest Banks are P6 type outages that are low probability events. The 136 percent overload identified was for the Summer Peak 2019 case and seems to be trending downwards to 134.2</td><td>This comment has been noted.</td></tr>
</table>

No	Comment Submitted	CAISO Response
	percent in 2027 Summer Peak. CAISO support for the development of a short-term Emergency Rating for Suncrest banks is a cost-effective solution to such situations. Building upon this approach, BAMx members would like to see short-term ratings to be identified as possible alternatives in evaluating other transformer thermal overload issues identified during the Transmission Planning Process.	
1c	**Phasor Measurement Units Installation Initiative** The CAISO has presented information identifying the need for Phasor Measurement Units (PMUs) to be installed at all interties at the balancing authority area to provide more precision regarding the system's net actual interchange after a frequency disturbance event. BAMx understands CAISO's need to have a greater visibility into the frequency deviations in order to stay compliant with NERC BAL-003-1.1. The CAISO also provided a high-level estimate of 50 PMU's that will be installed as part of this initiative with a per-unit cost of $30,000 per installation. The cost of this initiative sums up to approximately $1.5 Million. This is a positive development and such information gathering devices are likely to provide valuable information. Are there plans for coordination or data sharing with the parties to which the CAISO is interconnected. If so, are there any plans for cost sharing on the implementation of the PMU devices?	The transmission owners share their PMU data with Peak RC and neighboring transmission owners, and neighboring transmission owners reciprocate by sharing their data. Given this arrangement, there are no plans for cost sharing.
1d	**New Projects Recommended for Approval** BAMx has no further comments at this time on the 2017-2018 TPP projects recommendations. However, we may choose to comment on them once we have more information on them as part of the Draft Transmission Plan.	The comment has been noted.
1e	**Economic Planning-Preliminary Results of Congestion and Economic Assessments** While detailed production cost simulations and economic analyses have not yet been performed, if the CAISO decides to perform an economic assessment for the CAISO tie-lines and new projects such as, the Bob SS (VEA)-Mead S 230 kV line, more information should be provided concerning the historic congestion on the paths such as Path 24, Path 52, Path 46 (or West of Colorado River) and Path 58. If the CAISO expects an increase in future congestion, rationales for such increases should be thoroughly explained. For instance, it would be	The comment has been noted.

No	Comment Submitted	CAISO Response
	important to have some idea about how much energy has been historically imported at Eldorado and how much it would increase going forward based upon the assumptions made in the CAISO's production cost database.	

2. California Public Utilities Commission - Staff (CPUC-Staff)
Submitted by: Karolina Maslanka

No	Comment Submitted	CAISO Response
2a	***1. CPUC Staff appreciates the CAISO's proposal to add Phasor Measurement Units (PMUs) to all ISO interties at the boundaries of its balancing authority area, as PMUs have the potential to offer many benefits. However, CPUC Staff requests that the CAISO provide specifics on how the installation cost was estimated, and the estimated benefits and cost savings of the proposed PMU installations.*** CPUC Staff appreciates the CAISO's new proposal to add Phasor Measurement Units (PMUs) to all CAISO interties at the boundaries of its balancing authority area as presented at the November 16, 2017 meeting. CPUC staff sees potential for significant value in this proposal, as PMUs can offer many benefits. Among other things, CPUC Staff understands that a significant benefit of PMUs is the capability to use the data gathered to inform dynamic system ratings which could increase reliability and reduce congestion. PMUs provide real-time data on actual grid conditions which can reveal additional transmission capacity available at bottleneck points, which are not obvious when looking instead at line operating limits.1 This information will become increasingly useful as renewable generation, intermittently generated and often constrained by operating limits, increases in California and neighboring states. As transmission costs continue to rise, CPUC Staff also recognizes that all system upgrades, like the PMU proposal, should be considered through the lens of costs and benefits to ratepayers. To this end, CPUC requests that the CAISO consider the following before implementing the PMU proposal. First, CPUC Staff asks that the CAISO provide specifics in its 2017-18 TPP Draft Plan on how the $30,000 cost per installation was arrived at. Although installation costs may have decreased, a DOE study conducted a few years ago showed that costs of PMU installations across the U.S. ranged from $40,000 - $180,000. That study reflects that PG&E's costs for PMUs were on the higher end, at least double the cost of other utilities. With an estimated 50 PMU installations, as was stated during the Q&A session following Neil Millar's presentation, it is prudent that CAISO further investigate installation costs. Additionally, CPUC Staff recommends that the CAISO identify methods for	The $30,000 rough estimate was provided by a subject matter expert at the ISO. We are pursuing planning level cost estimates from the transmission owners.

No	Comment Submitted	CAISO Response
	reducing installation costs, taking into consideration the various cost reduction strategies outlined in the DOE report. Second, CPUC Staff request that the TPP draft include a summary of information regarding cost savings achieved by the already installed PMUs within the CAISO service territory, which are not insignificant in number. To this end, Table 3-4 in the NASPI paper titled, *The Value Proposition for Synchrophasor Technology* lays out the benefits, benefit metrics, and calculation methods that may prove useful for quantifying PMU benefits moving forward. A quantification of benefits can help rank PMU benefits such as mitigation of major equipment failures, expedited service restoration, or congestion reduction. A better understanding of the cost savings by PMU function can inform metering strategy and storage prioritization of the high volume of data. CPUC Staff thanks the CAISO for the preliminary work conducted to prepare this proposal and looks forward to additional details as the proposal is further developed.	As described in the ISO presentation, the need for the proposed PMUs is to ensure compliance with NERC Standard BAL-003.
2b	***2. CPUC Staff asks the CAISO to provide one-line diagrams for all projects reviewed in the TPP process.*** CPUC Staff agrees with a recommendation proposed by a member of the public at the November 16, 2017 stakeholder meeting to provide one line diagrams for all proposed projects. In the preliminary assessment slides, one-line diagrams were provided for SDG&E projects. However, only geographic maps were provided for PG&E projects. CPUC Staff requests that in the future the CAISO provide one-line diagrams for all projects, because one-line diagrams include electrical components such as transformers, capacitors, and other limiting equipment necessary for assessing the need for projects. Consistent use of one line diagrams will allow stakeholders to better understand how proposed alternatives can address the identified need for the project.	The comment has been noted and the ISO has included diagrams in the transmission plan.
2c	***3. CPUC Staff appreciates the CAISO's review of the need for previously approved projects that have not been completed, and requests (1) clarification on alternatives considered for each project during the current***	The comment has been noted.

No	Comment Submitted	CAISO Response
	review (2) explicit identification of the originally assessed need for each project, and (3) additional support information. CPUC Staff thanks the CAISO for reviewing previously approved projects that have not yet been completed to determine if they are still needed. CPUC Staff requests clarification regarding the "less than $50 million projects concluded at this time to proceed with the current scope" listed in the table on slide 10 of the PG&E specific presentation made by Mr. Shrestha. That table appears to show that for many of the projects proposed to proceed, an alternative was not considered because "no reasonable lower cost alternative was available." CPUC Staff requests the CAISO clarify if this means that no alternatives were evaluated, or that alternatives were in fact considered but were all estimated to result in a higher cost than the proposed projects and therefore were not listed. If the former, CPUC Staff requests that the CAISO explain why no alternative "was available" and whether an alternative could be made "available," and if so, how. If the latter, CPUC Staff requests that the CAISO provide information on all alternatives considered and their relative costs. CPUC Staff requests additional information for the "less than $50 Million projects recommended for cancellation without any further action" presented in the table on slide 11 of the same PG&E-specific presentation. Currently, a majority of these projects appear to have "No need specified" as the reason for cancellation. CPUC Staff believes that an additional column, describing the originally identified need for each project, would be of great value. At a minimum, the CAISO should cross reference the specific page(s) of the TPP that provides the originally assessed need that led to approval of the project. This information will provide transparency that will, among other things, facilitate tracking of projects over time, which may reveal a pattern in the types of previously approved projects that result in later cancellations. For similar reasons related to transparency, CPUC Staff also requests that the CAISO provide the historical power flow data files used for the needs assessment of projects approved during the earlier TPPs. This additional information would be invaluable for stakeholders interested in understanding the transmission grid conditions at the time of these TPP project approvals.	The review identified that the upgrades were appropriate to mitigate the need and when other alternatives were reasonable they were considered as a potential alternative. The comment has been noted and the ISO has included in the 2017-2018 Transmission Plan the planning cycle that the project was originally approved.

No	Comment Submitted	CAISO Response
2d	***4. CPUC Staff looks forward to the CAISO's assessment of all newly proposed projects as well as cancellations and scope modifications of previously approved reliability projects estimated to cost over $50 million, and requests that the CAISO include the justification for any project being reassessed.*** The "Next Steps" presentation included in the November 16, 2017 Stakeholder Meeting slide deck states that all new projects as well as cancellations and scope modifications of reliability projects over $50 million requiring ISO Board of Governors approval will be included in draft plan to be issued for stakeholder comments by January 31, 2018. This information is particularly valuable to the CPUC CEQA unit for contracting and assignment planning. As requested in number 3, CPUC Staff requests that information regarding the originally assessed need for each project also be included.	Please see response to 2c above.
2e	***5. CPUC Staff requests that the CAISO include in the 2017- 2018 Draft Transmission Plan an explanation of the specific factors in 2027 that are expected to significantly reduce California Oregon Intertie (COI) congestion.*** The high level analyses of the California Oregon Intertie congestion found on slide 9 of the "Preliminary Results of Congestion and Economic Assessment" slide deck presented at the November 16, 2017 Stakeholder Meeting represented a forecast for very low congestion costs and short congestion durations in 2027, considering historical congestion levels. CPUC Staff requests that an explanation of the specific factors in 2027 that are expected to significantly reduce congestion are included in the 2017- 2018 Draft Transmission Plan released on January 31, 2018.	The majority of the current congestion is observed in the day ahead market. The reduction in congestion in future years is in part due to the increase in renewable generation during the day-time periods with the typically historically higher peak periods.

3. GridLiance
Submitted by: Noman L. Williams

No	Comment Submitted	CAISO Response
3a	**CAISO 2017 – 2018 Draft Transmission Plan Reliability projects** GWT submitted its Valley – Innovation 230 kV project into the CAISO TPP window on September 15, 2017. As GWT described in its project submission, the project is needed to increase grid reliability by adding significant transmission capacity and by resolving the outstanding number of contingencies needing mitigation. It will also strengthen the existing 230 kV loop to facilitate the export of renewable power from Nevada into California. The proposed project extends GWT's 230 kV loop by 40 miles west from its current westerly most position. The conceptual cost estimate of this project is $40 million. This project should be approved in the 2017-2018 TPP. The project includes • Installing a second 230 kV circuit on an existing vacant tower position from Innovation to Johnnie Tap, • Upgrading the existing Johnnie Tap to Valley Substation line to double circuit 230/138 kV, • Expanding Valley substation to install new 230/138 kV transformer, and • Adding necessary terminal equipment at Valley and Innovation. The project is forecasted to increase reliability by adding significant transmission capacity, strengthening the existing 230 kV loop in VEA's service territory and reducing the number of contingencies requiring mitigation. First, the rebuilt line will add about 800 MVA of transmission capacity in the GWT system. Second, the 230 kV loop is a vital grid design needed to facilitate delivery of renewable generation out of Nevada into California. The proposed project extends GWT's 230 kV loop by 40 miles west from its current westerly most position. Third, the project dramatically reduces the number of contingencies requiring mitigation – 100% reduction for P1 contingencies, 89% reduction for P4-P7 contingencies, and 90% percent reduction for P6 contingencies.	The ISO is continuing to review this project and recommendations have been provided in the draft transmission plan. The ISO Planning Standards describe the risks and benefits of utilizing Special Protection Systems or RAS, and they also provide guidelines for ensuring that reliability is maintained. The issues the submitted project would mitigate were identified in one sensitivity case only. The RAS alternative is sufficient to mitigate all of the identified issues and the RAS design is consistent with the ISO Planning Standards.

No	Comment Submitted	CAISO Response
	The project is a better option than increasing the number of Remedial Action Schemes (RAS) to protect against grid contingencies. GridLiance's preferred alternative is to construct a new transmission line to decrease dependency on RAS. New transmission capacity will strengthen the electrical grid and increase overall grid reliability. GridLiance has observed that eastern interconnection regions do not depend upon RAS for long-term transmission solutions; rather these regions mitigate long-term issues by constructing new current carrying facilities such as transmission lines. GridLiance offers the proposed project as a means of balancing the reliance on RAS with the need for new transmission capacity.	
3b	**CAISO 2017 – 2018 Draft Transmission Plan Study Indicates Continued Significant Path Congestion** CAISO's analyses thus far have shown that the Bob Switch (Bob SS) to Mead path will present significant congestion in the upcoming years. This congestion will likely have detrimental effects on CAISO ratepayers by constraining supplies and potentially by adding to renewable curtailment which itself may trigger overbuild of renewable resources to meet targets. Upgrades to the path seem both technically feasible and economically viable. The CAISO Preliminary Results of Congestion and Economic Assessments as posted and presented at TPP Stakeholder Meeting #3 for the 2017 – 2018 Transmission Plan study identifies nearly $11 million of expected congestion annually, affecting approximately 550 hours, in its 2027 study year on the Bob Switch (Bob SS) to Mead line. Though the cost of congestion is less than the previous year's study, the affected hours are approximately the same, and the congestion on the Bob SS to Mead path continues to top the list of congested paths. Additionally, congestion on the order indicated in these preliminary results, with approximately one in every 16 hours being constrained, and at an average cost of almost $20,000 per constrained hour, continues to demonstrate that this path is an ideal candidate for an economic upgrade.	The comment has been noted. Also it is noted that the simulation results of congestion may change as the ISO's PCM database development is still a work-in-progress. The final results of 2017~2018 planning cycle have been included in the draft transmission plan and will be presented in the stakeholder meeting #4.
3c	**Upgrade of the Bob Switch (Bob SS) to Mead Path is Feasible** The 15-mile Bob Switch (Bob SS) to Mead 230 kV path can be upgraded from its current approximate 400 MVA rating to 800 MVA, 2000 A or greater, by	Bob SS to Mead upgrade has been submitted as an economic study request. It has been evaluated based on the ISO's planning process set out in the ISO's tariff and based on ISO's TEAM methodology.

No	Comment Submitted	CAISO Response
	rebuilding the existing line. Utilizing existing ROW, the upgrade could be built within 18 months to two years of approval. Considering these preliminary results and recommitting to our $20 to $25 million cost estimate, the total cost of the project is fully covered by reduction in the cost of congestion to the CAISO participants over the course of less than 2 ½ years.	
3d	**Comments on Methodology** Though the TEAM approach has been recently modified to better reflect the historically relied upon ratepayer perspective, we continue to stress the cost of non-delivery of renewable energy and the cost of economic dispatch to accommodate renewables are legitimate adverse impacts borne by CAISO ratepayers.	The cost of economic dispatch as the result of production cost simulation is considered in the production benefit calculation, as described in the TEAM documentation. Public policy benefits and renewable integration benefits are categorized in the TEAM document.

4. NextEra Energy Transmission, LLC (NEET West)
Submitted by: Edina Bajrektarević

No	Comment Submitted	CAISO Response
4a	**NEET West recommends CAISO to release the Rio Oso Area 230 kV (+200/-260 MVar) Voltage Support Static Var Compensator (SVC) for competitive solicitation in 2017-2018 TPP** In the 2016-17 and 2017-18 Transmission Plan studies, the CAISO has identified a reliability driven need for a +200/-260 MVar dynamic reactive power support at Rio Oso substation in PG&E's service territory. The dynamic reactive power support is required to address high voltages during normal system conditions (P0) in Rio Oso and Gold Hill area (115 kV, 60 kV) and to address low voltages during low hydro and system outage conditions. Similar to Suncrest SVC, NEET West recommends that CAISO release this project for competitive solicitation during 2017-18 TPP cycle. To be more specific, and consistent with the CAISO functional specification for Suncrest 230 kV 300 MVar Dynamic Reactive Power Support1, the approved project sponsor will build, own, operate, and maintain all transmission facilities including the new reactive power support 230 kV SVC up to and including the 230 kV terminal line structure that will connect to the existing PG&E's Rio Oso substation. In addition, this competitive solicitation process will ensure to the California rate payers that the most qualified and cost competitive bid is selected to build, own, operate, and maintain the project.	This project was approved in the 2011-2012 transmission planning process and its assignment was based on the tariff in effect at that time. This project was found to be needed with a minor scope change. PG&E is currently working on implementation of this project.
4b	**NEET West recommends CAISO performs a careful evaluation of NEET West's proposed Lockeford – Industrial 230 kV line reliability project in 2017-2018 TPP** The Lockeford-Lodi Area 230 kV Development Project approved by the CAISO Board in the 2012-13 Transmission Plan was put on hold earlier this year for reassessment. At the September 21-22, 2017 Stakeholder Meeting for the 2017-18 TPP, this project was discussed with a preliminary conclusion that further analysis is required. Subsequently, the City of Lodi requested that the most recent CAISO's study for the Lockeford – Lodi Area incorporate the revised 10- year peak load forecast that reflects recent economic development in the area spurred by the growing wine industry in the region. To improve the reliability and to mitigate thermal overloads within the Lodi and Lockeford area, NEET West proposed a new reliability transmission that	The ISO's analysis and discussion is provided in the draft transmission plan.

No	Comment Submitted	CAISO Response
	consists of a new Lockeford – Industrial 230 kV Line and a new Industrial 230 kV bus with a new 230/60 kV Industrial Transformer. The preliminary project cost estimate for this project is $30 million, which is very cost competitive when compared to other considered alternatives. NEET West requests that the CAISO's 2017-2018 TPP cycle include a special assessment of the Lodi/Lockeford area and to evaluate the NEET West project alternative against all alternatives considered to determine the most cost effective solution.	
4c	**NEET West recommends CAISO performs a careful evaluation of NEET West's proposed Lopez – Divide 230 kV line reliability project in 2017-2018 TPP** The CAISO's 2017-2018 Reliability Assessment – Preliminary Study Results for Central Coast Los Padres (CCLP) identified a number of contingencies that generated potential overloads. The Mesa/Santa Maria Remedial Action Scheme (RAS) and Divide RAS were put in place as an interim solution to voltage collapse issues in the CCLP area until PG&E's proposed Midway-Andrew Transmission Project (approved in 2012), or a different alternative currently under reliability re-valuation by CAISO, comes in-service. Many of the contingencies that cause the potential for overloads in the preliminary reliability results will initialize the operation of the RAS. Elimination of these overloads is critical as non-consequential load loss for P1-P7 contingencies does not coincide with CAISO's Planning for High Density Urban Load Area Standard. To improve reliability and mitigate thermal overloads within Mesa and Santa Maria area for critical contingencies including Morro Bay, Mesa, Diablo transmission segments, NEET West proposed a new reliability transmission solution that consists of a new Lopez 500/230 kV substation, a new Divide 230/115 kV substation, and a new 230 kV Lopez – Divide transmission line. NEET West's proposed Lopez-Divide 500/230 kV Project would resolve the same potential overloads to the CCLP system identified in this year's Preliminary Reliability Assessment that are resolved by the PG&E's proposed Midway-Andrews Project. However, NEET West's proposed solution resolves the identified thermal and voltage issues at a much lower project cost. The preliminary project cost estimate for this project is $100 million, which is very cost competitive when compared to other more expensive alternatives including PG&E's Midway – Andrew project. NEET West's Lopez-Divide Project also	The ISO has identified the need to reinforce the transmission system in the Mesa substation area. The ISO is continuing to assess the Midway-Andrew project and alternatives and is recommending the project remain on hold to further assess the bulk system impacts of converting one of the 500 kV lines to 230 kV. The ISO's analysis and discussion is provided in the draft transmission plan.

No	Comment Submitted	CAISO Response
	eliminates the significant reliance on the Mesa/Santa Maria RAS and Divide RAS. NEET West requests that the CAISO's 2017-2018 TPP cycle include a special assessment of the Mesa/St Maria area and to evaluate the NEET West project alternative against all alternatives considered to determine the most cost effective solution. NEET West urges CAISO to approve the project for this area in this 2017-18 TPP cycle as this area has been identified by CAISO for reliability improvement since 2012. The previously approved reliability project for this area, Midway – Andrew 230 kV, (as approved in 2012-2013 TPP cycle) is on hold primarily due to significant cost escalation and CAISO is now testing other alternatives to select the most optimal reliability plan.	
4d	**Consideration of Preferred Resources Solutions** NEET West is encouraged to see that preferred resources solutions were highlighted as potential alternative solution(s) to address local reliability transmission issues in the latest reliability assessment. To support this process, NextEra Energy Resources, LLC (NEER) submitted several preferred resource solutions – Battery Energy Solution Systems (BESS) that will provide cost effective and reliability mitigations for Lodi area (Lodi 40 MW BESS), Oakland area (Oakland 40 MW BESS), and Alto/Las Galinas area (Alto 45 MW, Las Galinas 22 MW BESS). Finally, NEET West would like to continue stress importance of CAISO working with stakeholders to develop a methodology for evaluating energy storage resources (non-wires solutions), including how energy storage solutions will be compared in a cost/benefit analysis to other transmission alternatives that could provide the same type of service.	The comment has been noted.

5. Office of Ratepayer Advocates (ORA)
Submitted by: Kanya Dorland

No	Comment Submitted	CAISO Response
5a	**1. The CAISO should include additional information to support the projects presented at the November 16, 2017 CAISO TPP stakeholder meeting.** A. Cost estimates for all alternatives considered should be provided. The CAISO should include cost estimates for all alternatives considered. During the 2017-2018 TPP stakeholder meeting on November 16, 2017, San Diego Gas & Electric Company (SDG&E) and Pacific Gas and Electric Company (PG&E) presented information on their proposed reliability projects with estimated costs of less than $50 million. Alternative solutions also were considered including non-wire solutions such as battery storage. The CAISO provided the costs of project alternatives with its presentations for the SDG&E area. However, the CAISO did not provide cost estimates for the project alternatives considered with its presentation for the PG&E area, stating only that the costs of the recommended project solutions in the PG&E area were comparatively lower than the battery storage alternatives considered. ORA requests that the CAISO include the costs for all alternatives under consideration as part of the project presentations for stakeholders' evaluation. Going forward, the cost and benefit evaluation of battery storage solutions should also demonstrate that the multiple values and/or services that this technology can provide have been considered, and if they warrant further consideration as an effective solution. B. Single Line-diagrams for all proposed electrical improvements should be provided. The CAISO should require all project presentations of proposed electrical improvements to include single line diagrams when presenting the project proposals. This would allow stakeholders to understand the basic information of and need for the proposed projects.	The ISO's analysis and discussion with cost estimates and single line diagrams are provided in the draft transmission plan. The ISO expects to address this issue in future planning cycles when the methodologies for this consideration have been developed through a stakeholder process. Please refer to the ISO's 2018 Final Policy Initiatives Roadmap available on the ISO website. Please refer to the above response.
5b	2. **The CAISO should monitor previously approved projects and inform stakeholders if the projects are no longer cost effective or if there are more cost effective solutions that were not previously considered.** PG&E's presentation on previously approved projects of less than $50 million also included a list of previously approved transmission projects in PG&E's	

No	Comment Submitted	CAISO Response
	service territory that will proceed with their current scope, a revised scope, or be cancelled.**3** ORA requests that PG&E provide information on the CAISO's transmission planning standards or the current benefit cost ratio (BCR), if applicable, for the projects listed in the PG&E's presentation that are slated to move forward with their current scope or a revised scope. Currently, there is no method for monitoring the BCR of proposed projects from their initial evaluation phase in the TPP to the start of construction. ORA recommends that the CAISO monitor the BCR of proposed projects during all phases of project development by providing the current project costs and BCR calculations in each TPP cycle and prior to the start of construction. For example, during the CAISO's 2017-2018 TPP September 21, 2017 stakeholder meeting, the CAISO stated that it intends to further analyze the Midway-Andrew transmission project, including re-purposing the Diablo-Midway 500 kV #3 line to a 230 kV line. During this presentation, the CAISO did not provide the current project cost estimates or BCRs for the proposed project or the alternatives.	The ISO will address concerns on a case by case basis.
	ORA generally supports further analyses of the Midway-Andrew project and the CAISO's consideration of existing transmission lines to solve reliability issues in the project area to the extent those issues still exist after the retirement of the Diablo Canyon Power Plant. There are a number of 500 kilovolt (kV) lines and 230 kV lines in the Diablo Canyon-Midway-Andrew project area that may be under-utilized or may have lower demand after the retirement of the Diablo Canyon Power Plant. ORA recommends additional analysis and presentations on the results of the analysis on this project including the current cost estimates and BCR calculations for the project as proposed and the proposed alternatives. ORA is making this request because the cost estimate for this project has varied widely in the past 18 months. The original PG&E cost estimate for the Midway-Andrew project from the 2012-2013 TPP was $120 to $150 million. The cost estimate in a 2016 FERC filing and in 2017 PG&E AB 970 reports ranges from $215 million to $414 million and up to $700 million. This broad range makes it difficult to assess the value of removing the existing Special Protection	The ISO has identified the need to reinforce the transmission system in the Mesa substation area. The ISO is continuing to assess the Midway-Andrew project and alternatives and is recommending the project remain on hold to further assess the bulk system impacts of converting one of the 500 kV lines to 230 kV. The ISO's analysis and discussion is provided in the draft transmission plan.

No	Comment Submitted	CAISO Response
	System from the project area and proceeding with the Midway-Andrew project as proposed.	
5c	**3. ORA recommends the City of Santa Clara fund the Northern Receiving Station (NRS)- Scott 115 kV Line Upgrades.** During the November 16, 2017 CAISO TPP stakeholder meeting, the CAISO presented a modification to the NRS-Scott #1 115 kV Line Reconductor project scope. This modification expands the scope to include reconductoring NRS-Scott #1 115 kV line as well as #2 115 kV Line. This modification is in response to a request from the City of Santa Clara. The City of Santa Clara is served by Silicon Valley Power, which is not a participating transmission owner in the CAISO's balancing authority area. For this reason, ORA recommends the costs of this project be allocated to Silicon Valley Power consistent with FERC Order No. 1000, which sets forth the principle that project costs be allocated commensurate with benefits received.	The project is required to maintain reliability for contingencies and overloads on the on the ISO controlled grid.
5d	**4. ORA recommends canceling the Gates-Gregg 230 kV Line Project** During the CAISO 2017-2018 TPP presentation on November 16, 2017, the CAISO stated that the Gates-Gregg 230 kV line project "appears" to be no longer needed. For this reason, ORA recommends cancelling the project as soon as possible to avoid incurring unnecessary costs. As ORA stated in our March 14, 2017 comments on the TPP study plan, the CAISO should avoid incurring costs for projects that will ultimately be cancelled or significantly revised. The cost of this project also has increased significantly since approved in the 2012- 2013 TPP from $145 million to $200 million in 2017. With this cost increase, the BCR threshold for this project may no longer be met. ORA recommends that future presentations on this project and other projects under evaluation should include the BCR calculations to confirm the value of such projects as updated information becomes available.	The ISO is recommending the project remain on hold to further assess the uncertainties in the assumptions in assessing the benefits of the project. Further, the ISO refers ORA to the comments received by PG&E, clarifying PG&E's treatment of AFUDC for the Gates-Gregg 230 kV project while the project is on hold and the treatment to be applied if the project is canceled or completed.
5e	**5. The CAISO should provide additional insights into economic planning study projects.** The CAISO's presentation on Preliminary Results of Congestion and Economic Assessments during the November 16, 2017 2017-2018 CAISO TPP stakeholder meeting provided information on congestion duration and costs on major transmission lines under the CAISO control. It also recommended	The ISO's analysis and discussion is provided in the draft transmission plan.

No	Comment Submitted	CAISO Response
	economic planning studies for eight different project areas. The CAISO's presentation on these requested studies listed the potential benefits as provided by the project developers, but did not discuss the underlining reasons for the proposed study projects. The CAISO should explain the factors driving the need for the proposed projects, if any, including but not limited to those identified by the project submitter, such as congestion, but also peak renewable growth, ramping demands, and any other factors so that stakeholders may better understand the drivers and inherent need for the proposed study projects.	

6. Transmission Agency of Northern California (TANC)
Submitted by: Ann Czerwonka

No	Comment Submitted	CAISO Response
5a	The Transmission Agency of Northern California (TANC) appreciates this opportunity to provide comments on the California Independent System Operator's (CAISO) 2017-2018 Transmission Plan November 16, 2017 Stakeholder Meeting to discuss projects under $50 million for approval, cancellation of projects after a review of need, and the congestion results of the economic studies. TANC's primary concern is for the protection of and the maximization of the transfer capability on the California-Oregon Intertie (COI) or Path 66. For the past several years, TANC has made comments, posed questions, and proposed modelling enhancements to the manner in which the CAISO's TPP performs its economic modelling related to the COI. This remains a major and significant concern to TANC. We believe that maximizing transfer capability between the Pacific Northwest and California should be a priority, and our concern is that the current and historic CAISO approach, in the TPP, not only fails to promote maximizing this critical path but actually further curtails regional exchanges, rather than address underlying issues on PG&E's northern California grid. For example, in this TPP the CAISO has recommended cancelling or reducing the scope of two projects that TANC is concerned will have a deleterious effect on the COI transfer capabilities. Finally, we note that the South of Palermo project (a project that would facilitate maximizing the COI transfer capabilities), was approved 6 years ago and is still many years away from planned operation. The CAISO transmission plan continuously fails to provide solutions to maximize the capabilities of the key transmission path into California from the Pacific Northwest and, as a result, California ends up relying on more carbon intensive resources and more expensive energy.	The comment has been noted.
5b	**COI Modeling** During the 2016-2017 Transmission Planning Cycle, the CAISO improved its modelling of the COI operation by including some historic planned outages as provided by the members of the Owner's Coordinating Operating Agreement (OCOA) of which TANC belongs. While an improvement, TANC noted that these improvements still insufficiently modelled the actual operational capabilities of the COI as evidenced by historic capacity levels and congestion (Table 1). In the stakeholder meeting it was confirmed that this planning cycle used the same outage data from 2016-2017 and unsurprisingly came up with	The comment does not identify the source of the congestion data described in the comment. Based on the comments regarding the same issue that have been submitted in previous planning cycles, the congestion data in this comment are likely representing day-ahead COI congestion. While the ISO agrees that the day ahead congestion represents real costs, these are issues best explored at the market level rather than

<table>
<tr><th>No</th><th>Comment Submitted</th><th>CAISO Response</th></tr>
<tr><td></td><td>similar results of just $760,000 in congestion costs over just 32 hours. From 2012-2016, actual congestion at Malin has cost an average of over $59 million per year and on average occurred 2,605 hours per year. In 2017 congestion on the COI through October cost $57.6 million and had occurred for 2,241 hours.
TABLE 1
<table><tr><th>Year</th><th>Congestion Costs ($million)</th><th>Number of congested hours</th><th>Average COI Capacity when less than 4,800 MW</th><th>Number of hours COI Capacity less than 4,800 MW</th></tr><tr><td>2012</td><td>$84.66</td><td>3,682</td><td>3,377</td><td>7,619</td></tr><tr><td>2013</td><td>$33.59</td><td>1,827</td><td>3,640</td><td>6,813</td></tr><tr><td>2014</td><td>$90.54</td><td>2,424</td><td>3,614</td><td>6,013</td></tr><tr><td>2015</td><td>$37.68</td><td>2,303</td><td>4,176</td><td>5,365</td></tr><tr><td>2016</td><td>$51.14</td><td>2,791</td><td>3,987</td><td>5,677</td></tr><tr><td>Average 2011-2016</td><td>$59.50</td><td>2,605</td><td>3,757</td><td>6,297</td></tr><tr><td>2017 through Q3</td><td>$57.60</td><td>2,241</td><td>3,488</td><td>5,590</td></tr></table>
The CAISO has been unable to forecast realistic congestion numbers for the COI, and it appears that this is because the CAISO continues to model the COI at 4,800 for all but a limited number of hours per year even though the information in Table 1 shows that, on average, the COI transfer capacity was limited over 2,600 hours per year. This leads to congestion forecasts that are vastly underestimating the likely congestion costs on the COI. By underestimating the cost of congestion on the COI the CAISO is hindering its ability to find economic solutions that could potentially save millions of dollars and improve the number of hours that the COI can be better utilized. TANC continues to be willing to work with the CAISO in improving its modeling so that transmission congestion on COI is more accurately forecast, and to find solutions which would increase the numbers of hours per year that the transfer capability of the COI could be maximized.

TANC highly recommends that the CAISO consider performing a ‘backcast’ analysis of COI flows to examine how close the CAISO’s models for limitations on imports on Path 66 have been to reality. We would recommend that the CAISO may wish to review the 2012- 2013 and 2013-2014 TPP that forecast a total of zero (0) hours of congestion on Path 66 and 2017 and three (3) hours of congestion in 2018.</td><td>assuming that infrastructure solutions are appropriate and attempting to fully incorporate these factors into transmission planning analysis. Therefore, the transmission planning analysis will continue to focus more on physical congestion – generally experienced in real time – and will continue to track progress on improved market efficiencies in addressing the day ahead congestions and other issues identified by TANC.</td></tr>
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No	Comment Submitted	CAISO Response
5c	**PG&E System** TANC continues to be concerned over actions and inactions taken by the CAISO and PG&E to the underlying PG&E system that significantly prevent the COI from being utilized more effectively by lowering the operational capacity on the path. Specifically, in this planning cycle the CAISO is cancelling or changing the scope of two (2) PG&E projects, the Rio Oso- Atlantic 230-kV line project and the Rio Oso 230-kV voltage support project, which would assist to improve available capacity on the COI. Additionally, a very key project for supporting the capacity on the COTP, the South of Palermo project, has had its in-service date pushed off for years by PG&E. These projects do not just supply needed reliability benefits in the local area(s), but also help maintain and improve the import capabilities of the COI. *Rio Oso Atlantic 230-kV Line Project and Rio Oso 230-kV Voltage Support* The CAISO has determined that the Rio Oso-Atlantic 230-kV Line Project should be cancelled as it is no longer needed, to be replaced by upgrading the protection schemes and developing appropriate operating measures. This Project was also approved with the *South of Palermo* 11-kV Reinforcement Project to help meet several Central Valley reliability concerns. TANC understands that changed system conditions since then may have helped mitigate several reliability issues. However, it is unclear if the CAISO has considered the affect cancelling this project may have on the ability to maximize the COI and the downstream lines to deliver energy. TANC is concerned that the CAISO will use COI capacity limits to resolve issues that would have been resolved with this project. Additionally, the Rio-Oso 230-kV Voltage Support Project has had a scope change that removes the need for a capacitor bank at the Atlantic Substation. TANC has similar concerns as noted above about this Project. *South of Palermo 115-kV Reconductoring Project* The South of Palermo Project is an approved Project by the CAISO which would, among other reliability benefits proposed by PG&E, assist in improving the transfer capacity of the COI. The project was first approved in the 2010-2011 Board Approved Transmission Plan with an in-service date of May 1, 2014. It was proposed by PG&E and approved by the CAISO as a reliability	The Rio Oso Atlantic 230 kV line project was not modeled in the base cases for the 2017-2018 transmission planning process and as such the assessment was included in the bulk system analysis. The Rio Oso 230 kV Voltage Support project was found to continue to be needed, with a scope change as reflected in the Draft Transmission Plan.

No	Comment Submitted	CAISO Response
	project at a cost of $80-$100 million. However, its planned in-service date has continued to slip such that in the 2015-2016 Transmission Plan the in-service date had been moved out to April 2022, without comment. It is noted that, in the 2016-2017 Transmission Plan the in-service date has been moved up to February 2022.	