

**PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA**  
**ENERGY DIVISION**  
**Agenda ID 15937**  
**RESOLUTION E-4883**  
**January 11, 2018**

**R E S O L U T I O N**

Resolution E-4883. Liberty Utilities (Liberty CalPeco Electric) LLC  
Verification of the Attainment of the 89 MW Load Trigger for  
Phase 2 of the Line 625/650 Upgrade Project Pursuant to  
D.15-03-020. Request for Approval under Advice Letter (AL) 64-E.

**PROPOSED OUTCOME:**

- This Resolution denies Liberty Utilities (Liberty CalPeco Electric) LLC (Liberty CalPeco) authorization to commence with construction of Phase 2 of the NLT System Upgrade Project, Phase 2. The protest by NTCAA is valid. Commission approval of Liberty CalPeco AL 64-E is denied.

**SAFETY CONSIDERATIONS:**

- Effective administration of Liberty CalPeco is part of the responsibility of Liberty Utilities to meet their obligations under Public Utilities Code Section 451 to provide services that promote the safety, health, comfort, and convenience of their patrons, employees and the public.

**ESTIMATED COST:**

- Liberty CalPeco has estimated the cost of Phase 2 construction at approximately \$9 million.

By Advice Letter 64-E, filed on October 14, 2016.

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**SUMMARY**

This Resolution denies Liberty CalPeco's AL 64-E, with an effective date of today. On October 14, 2016 Liberty CalPeco filed Advice Letter 64-E, requesting approval pursuant to D. D.15-03-02015-03-020 to construct Phase 2 of the Line 625/650 North Lake Tahoe Powerline Upgrade Project (NLT Upgrade Project). The Decision ordered that upon approaching the load trigger of 89 MW, Liberty CalPeco would conduct a "network study" to provide verification that peak load

had reached a “trigger point” of 89 MW, and to further verify that at the 89 MW demand level the NLT System would experience reliability issues that could be solved by construction of Phase 2 of the NLT Upgrade Project.

Pursuant to D.15-03-020, Liberty engaged the services of Ascension Power Engineering (Ascension) to perform the new network study. The Ascension network study determined that the NLT system experienced peak demand of 88.7 MW during 2015-2016 on December 31, 2015 at 17:55 hours. D. 15-03-020 authorized the CPUC’s Energy Division (Energy Division) to conduct an independent analysis to verify the Liberty findings. To effectively review the Ascension study, the Energy Division sought expertise from the California Energy Commission (CEC). On July 20, 2017, the CEC’s Siting Transmission and Environmental Protection Division provided the Energy Division with a Staff Assessment of the Ascension network study attached to AL 64-E which documented the attainment of the 89 MW load trigger. However, the CEC Staff Assessment determined that at the 89 MW load level, no significant system reliability issues were identified that required mitigation by construction of Phase 2.

## **BACKGROUND**

On March 26, 2015, CPUC D.15-03-020 granted Liberty CalPeco a permit to construct Phase 1 of the NLT Upgrade Project. Phase I approval allowed the immediate upgrade of the 60 kV 650 Line from Truckee to Kings Beach by installing new tubular steel power poles and new conductor rated to eventually operate at 120 kV. Liberty CalPeco commenced Phase I construction in spring of 2016, and completed construction in late fall of that year. A future Phase II approval would allow the upgrade of three substations and enable the 650 Line to operate at 120 kV.

D.15-03-020 conditioned approval for Phase 2 construction on completion of a new network study to accurately identify the peak load trigger points that signal reliability criteria violations and the need to commence with Phase 2. This conditioned approval approach was determined to be necessary because intervenors in A.10-08-024 identified critical errors in the original network study supporting Liberty CalPeco’s application for a Permit to Construct (PTC) the Line NLT Upgrade Project. While skeptical of the accuracy of the original network study, D.15-03-020 did elect to use the study’s 89 MW system peak load as the point in which a new network study would be initiated.

## **NOTICE**

Notice of AL 64-E was made by publication in the Commission's Daily Calendar. Liberty CalPeco states that a copy of the Advice Letter was mailed and distributed in accordance with Section 4 of General Order 96-B.

## **PROTESTS**

Advice Letter 64-E was timely protested by the North Tahoe Citizen Action Alliance (NTCAA) on November 3, 2016. NTCAA take issue with Liberty CalPeco's Ascension network study finding that the "analysis, calculations, and data in the advice letter contained material errors and omissions. NTCAA reiterates their belief that the 89 MW "trigger point" is erroneous and is based on the discredited ZGlobal Addendum Study and ZGlobal's 2011 Validation Study contained in Liberty CalPeco's application for a PTC. NTCAA stresses that the intent of D.15-03-020 was to require a new, complete and accurate network study to determine the proper trigger points. NTCAA points out that if reaching 89 MW peak load was the only technical prerequisite, there would have been no reason for the Commission to require a new network study. NTCAA cites numerous passages in D.15-03-020 that support this conclusion.

NTCAA alleges that Liberty CalPeco violated the Commission's D.15-03-020 order 2 by presenting the Ascension network study which does not document and justify all data and assumptions for the new network study including, but not limited to the following errors and omissions: exclusion of the Kings Beach backup diesel generator plant from the model; exclusion of the system's inerties to Incline Village and South Lake Tahoe; failure to include infrastructure upgrades that would have a material effect on N-1 conditions; load transfer to NV Energy and their ownership within the model; and load data assumptions.

Finally, NTCAA argues that D.15-03-020 expected that the new network study would identify accurate, defensible peak load triggers that could be used by the Commission to approve Phase 2 of the NLT Upgrade Project. NTCAA argues that Liberty CalPeco used the order of a new network study to simply justify the discredited 89 MW trigger and thus failed to provide the Commission the deliverable it ordered.

Liberty CalPeco Reply to NTCAA

On November 10, 2016 Liberty CalPeco responded to the protest of NTCAA. Liberty CalPeco claims that the bulk of the NTCAA Protest impermissibly raises issues outside the scope of AL 64-E and which are irrelevant to the three preconditions of the D.15-03-020.

Liberty CalPeco reports that Phase 1 construction is complete. With respect to Phase 2 and Phase 3 approval Liberty CalPeco identifies the three key requirements listed in D.15-03-020 as preconditions to commencing construction on these subsequent phases:

- 1) Verification that load growth on the North Tahoe System is approaching 89 MW;
- 2) Perform a new network study to verify load growth predicates and that load growth outside the system is not the basis for meeting trigger points;
- 3) Submit a Tier 2 Advice Letter.

According to Liberty CalPeco the most critical aspect of D.15-03-020 is the requirement that NLT System load reach the 89 MW 'trigger point' for Phase 1 approval and 100MW for Phase 2 approval. Liberty CalPeco points out that the FEIR assessed the environmental impact of all three phases and D.15-03-020 granted the authority to commence construction on Phase 2 and 3 upon demonstration that the peak load triggers are attained as the of the period the new facilities are operational.

Liberty CalPeco claims that NTCAA's insistence that the 89 and 100MW triggers should be reevaluated are wrong, pointing out that the MW values for these trigger points have been used consistently in the EIR analysis, and D.15-03-020 specifically incorporates the triggers into Ordering Paragraph 1(b) and 1(c). Accordingly, Liberty CalPeco asserts that the need to establish new triggering points is also wrong and the NTCAA protest should be rejected and AL 64-E timely approved.

Liberty CalPeco asserts that the Ascension Network study justified and documented all data and assumptions, and presents the requisite power flow plots for the new network study. Liberty CalPeco rejects NTCAA's assertion that the Ascension network study predetermined the validity of the 89 MW Phase 2 trigger point. Liberty CalPeco reports that the sum total of the actual peak load demand recorded on December 31, 2015 was 88.7 MW and the Ascension network study assessed the 88.7 MW of peak load distributed among the

substations in the same manner experienced on December 31, 2015 and determined that the load limit exceeded the reliable limit of the North Tahoe System, validating that the Phase 2 improvements would be necessary.

The Ascension network study explains that Liberty CalPeco's ability to rely on the Kings Beach Diesels is significantly restricted by the King's Beach Diesels environmental permit. Liberty CalPeco's reports their use of this resource is limited to 360 machine hours in a calendar year, half of the permitted 720 machine-hours shared equally between Liberty CalPeco and NV Energy. Given the presences of six generating units, 360 machine hours restricts the continuous usage of the facility to only one 2-1/2 day period of plant operation each calendar year. Liberty CalPeco claims that by starting and loading sufficient diesel units to be prepared for and avoid an N-1 contingency problem, the allocation of the diesels would be rapidly exhausted.

Liberty CalPeco responded to NTCAA's challenge of Ascension's assessment of repair and restoration time for line outages by pointing out that the principals at Ascension have more than 15 years of experience managing electric utility operations. Ascension has managed electric utility operations across Nevada and eastern California, including the NLT System itself during the period of Sierra Pacific Power Company ownership. Ascension has managed numerous restoration efforts after fires and storms, and has the appropriate background and expertise to assess repair and restoration times for outages. Accordingly, Liberty CalPeco asserts that lengthy outages durations in mountains terrain are a fact. Ascension's determination to not rely on the Kings Beach diesels in the network study is reasonable given the expected length of outages and the limited hours of diesel generation available.

In response to NTCAA allegations that Ascension incorrectly modeled reactive power injection at Kings Beach, Liberty CalPeco points out that the two 3-MVAR sources depicted in the Ascension network study model represent the capacitor banks at the Brockway substation, which for model simplicity have been represented at the Kings Beach 60kV bus along with the Brockway load.

In response to NTCAA allegations that the Ascension network study should have included distribution ties to Incline Village and South Lake Tahoe, Liberty CalPeco assert that NTCAA misconstrues those distribution connections. Liberty CalPeco defends the Ascension network study modeling as customary and representative of prudent utility practice, and necessary to avoid study complications. Liberty CalPeco emphasizes that while NV Energy has confirmed

its willingness to provide electricity in an “emergency”, and on an “as available” basis, Liberty CalPeco can’t consider NV Energy a source for firm backup from Incline Village.

Liberty CalPeco reports that the distribution tie to South Lake Tahoe is extremely limited in its capacity as only one line connects Meyers with Tahoe City. Accordingly, the Ascension network study does not assume the system interties to Incline Village and South Lake Tahoe will be available to enable Liberty CalPeco to meet peak loads.

Liberty Responded to the NTCAA allegation that the Ascension network study failed to take into account the load transfer capability of the upgraded 7203 and 7300 lines by arguing that NTCAA is attempting to propose project alternatives that were rejected in the FEIR.

Liberty next responded to the NTCAA questions regarding load transfers to NV Energy and facility ownership. Liberty CalPeco points out that the Ascension power flow model used in the Network study transfers 4 MW of load back to NV Energy’s Incline Village substation and actually reduces load and relieves system constraints. Furthermore, Liberty CalPeco argues facility ownership has no bearing on the Ascension network study.

Liberty CalPeco responded to NTCAA allegations that Ascension did not document how it confirmed the winter line ratings and additional allegation that Ascension is in doubt regarding the rating of NVE’s 120-60kV transformer at North Truckee substation. Liberty CalPeco claims that the ratings came from the 2004 Electric Power Distribution Handbook, Table 2.13. Liberty CalPeco acknowledge that Ascension employs individuals formerly employed by Sierra Pacific Power, but asserts that Ascension is an independent firm providing a range of services to a number of customers and that previous employment has no bearing upon the independent nature of the study.

Liberty CalPeco claims that the Ascension network study has verified load growth is approaching 89 MW and that load growth outside of its own system is not the basis for the increase. Furthermore, Liberty CalPeco suggests that Energy Division should disregard the historical load chart presented by NTCAA arguing that D.15-03-020 focused on future load growth.

Liberty CalPeco claims to have appropriately measured Liberty and non-Liberty customer demand at the eight substation load measuring points identified in

D.15-03-020. Table 1 demonstrates that Liberty CalPeco's December 2015 peak load was 2.3 MW higher than the reference loads from the 2011 study, and shows that Liberty CalPeco's load in the 2015 peak hour was a higher percentage of the total load measured at the eight substations.

Lastly, Liberty CalPeco disputes the NTCAA claim that loads served radially from Truckee have no significant effect on power flows south of Truckee nor on voltages at Tahoe City and Northstar. Liberty CalPeco claims that Truckee loads have nearly one-to-one effect upon the loading on the North Truckee 120/60kV transformer, which becomes the limiting element in some of the critical contingency scenarios in the Ascension network study.

## **DISCUSSION**

D.15-03-020 found the ZGlobal network studies that Liberty CalPeco used to support its Application for PTC (A.10-08-024) seeking CPUC approval to upgrade the NLT System were flawed. As a result, the actual NLT System peak demand levels remained uncertain. As important, the actual NLT System peak load capacity remained unclear. D.15-03-020 addresses the uncertainty by ordering a new network study – essentially a complete revision of the flawed ZGlobal studies – to resolve the conflicting claims being made by NTCAA and Liberty CalPeco regarding the need and timing of the NLT System Upgrade Project, Phase 2.

However, there was general agreement between parties for the need to immediately construct Phase 1, (although NTCAA disputed the need for the Line 650 upgrade to continue beyond Northstar, or to include a “fold” of Line 650 at the Northstar Substation). Regardless, in D.15-03-020 the Commission approved the construction of Phase 1 of the NLT System Upgrade Project the rebuild of the 625 line from Truckee to the Kings Beach, including the Northstar fold.

In recognition of the unresolved dispute over the appropriate timing of Phase 2 and a later Phase 3 approval, D.15-03-020 ordered a new network study to accurately determine the correct Phase 2 and 3 trigger points, and if necessary, revising the 89 MW trigger for Phase 2 construction approval and the 100 MW trigger for Phase 3 construction approval: “We reiterate that a new network

study must form the basis for the trigger point assessments for Phases 2 and 3. The flaws in the existing planning documents leave those documents insufficiently reliable for such use.”<sup>1</sup>

D.15-03-020 references Appendix P4 to the Final EIR with bullet points confirming the need for accurate, and if necessary, revised trigger points:

- “Given the goal of correctly identifying the trigger points, such points must be based on system models that are accurate”.
- “It is not possible to correctly identify the trigger points for Phases 2 and 3 without the completion of a new network study.”
- “All data and assumptions for a new network study should be documented and justified along with the results and power flow plots, with the final deliverable being trigger points for Phases 2 and 3”.<sup>2</sup>

D.15-03-020 addressed comments on the Proposed Decision by NTCAA: “NTCAA’s comments on the EIR, its prepared testimony, and its briefs have urged a relook at the planning horizon for the second and third stages of the Proposed Project. The proposed decision agrees that the timing should be reexamined given acknowledged flaws in the planning documents. The proposed decision does not abandon the 89 MW and 100 MW demand growth triggers, however, nor does the record support that result.”<sup>3</sup>

In referencing the 89 MW and 100 MW trigger points that were established by planning documents in the Liberty CalPeco application for a PTC, the Commission relied on a prudent, record based, commencement point for the new network study that would ultimately determine if the 89 MW and 100 MW triggers were accurate indications of the North Tahoe System peak load capacity, and if not, what the correct triggers should be. While the Commission clearly intended the trigger points referenced in the Liberty CalPeco application to act as a starting point, it is understandable that Liberty CalPeco could interpret the 89 MW target referenced in D.15-03-020, and simple attainment of that demand threshold, as verified by an accurate network study, as the exclusive test for receiving Commission approval of Phase 2.

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<sup>1</sup> D. 15-03-020 page 43.

<sup>2</sup> D. 15-03-020 page 41

<sup>3</sup> D. 15-03-020 page 46

In D.15-03-020 Ordering Paragraph 1 (b), the Commission ordered:

“Construction of Phase 2 shall not commence without verification that load growth on the North Tahoe Transmission System is approaching 89 megawatts (MW), as further specified in Ordering Paragraph 3;”

Ordering Paragraph 2 states: “Liberty Utilities LLC, shall perform a new network study to verify the load growth predicates that warrant commencement of Phase 2 and of Phase 3; all data and assumptions for the new network study must be documented and justified along with results and power flow plots, with the final deliverable being the construction commencement timeline (i.e., the “trigger points”) for Phase 2 and for Phase 3. Liberty Utilities new network study analysis must identify and explain any “other considerations” that affect its identification of the trigger points and must verify that load outside its own system is not the basis for the trigger points.”

Interpreting the Ordering Paragraphs, it is clear that the intent of the new network study was not simply verification of the previously established “triggers” but a full reevaluation of the NLT System so that an accurate construction commencement timeline (“deliverable”) could be established. In other words, the cited “triggers” represented a starting point for reevaluation of the actual load capacity of the NLT System, and not an accepted load level capacity for the System. The phrase “identification of trigger points” implies that the established triggers were not intended to prompt construction commencement, but to only initiate a new network study that would identify an accurate timeline that the original flawed studies could not. Therefore the established 89 MW peak load “trigger” is not the threshold for construction to commence, it is merely the “trigger” for a new and accurate network study to develop as a “deliverable” a defensible construction commencement timeline. This new network study would then confirm not only that the system had reached the 89 MW load level, but more importantly, whether the 89 MW load level established in the discredited ZGlobal studies was even relevant to System reliability. Additionally, the Commission ordered that if those original triggers were not relevant, that the correct triggers be established.

To enable Energy Division review of the Liberty CalPeco new network study, D.15-03-020 ordered that the commencement request for Phases 2 and 3 be both filed as a Tier 2 Advice Letter, declining Liberty CalPeco's request for a Tier 1 filing and stating: "A Tier 2 AL is subject to our staff's compliance review and we conclude that is appropriate here".<sup>4</sup> The decision then allows Energy Division to "utilize the consultants already contracted under the terms of the Mitigation Monitoring Compliance Reporting Program (MMCRP) to assist with the review: "Energy Division should not recommend approval of either AL unless the information offered to verify, respectively, the 89 MW and 100 MW construction triggers is compliant with the requirements of this decision."<sup>5</sup>

To effectively review the ordered Tier 2 filing, the Commission initially attempted to contract technical assistance under the existing MMCRP contract as recommended in D.15-03-020. Unfortunately, timely modification of the existing contract to include an engineer qualified to independently review the Liberty CalPeco filing and perform the required power flow analysis proved difficult. To prevent further delay, the Commission turned to experts in our sister agency, the CEC, to assist with the review. The CEC Siting Transmission & Environmental Protection Division provided expert staff to assist Energy Division staff review.

On July 20, 2017 the CEC issued the CEC Staff Assessment of the Network study Included in Liberty Utilities (Liberty CalPeco Electric) LLC Advice Letter 64-E. (Staff Assessment). In short, the CEC review objective as stated in the Staff Assessment was to "review the new network study and convey the conclusions back to Energy Division. The purpose of this report is to convey those conclusions". Using all relevant documents at their disposal the CEC staff "completed essentially a four-part analysis: (1) review of North Lake Tahoe Transmission System loads; (2) review of the Ascension Power Engineering network study; (3) and evaluation of whether or not the diesel generators at Kings Beach could be used to mitigate high line loading identified in the network study; and (4) and evaluation of a transmission mitigation alternative to issues identified in the network study".<sup>6</sup> In short, the CEC staff Assessment aimed to determine whether the 89 MW trigger threshold had been reached, whether the Ascension network study accurately assessed the peak loads, whether including

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<sup>4</sup> D.15-03-020 page 41

<sup>5</sup> D.15-03-020 page 42

<sup>6</sup> CEC Staff Assessment, page 2

the diesel generation assets as recommended by NTCAA would mitigate loading issues, and an analysis of potential transmission improvements that could mitigate loading issues allowing the NLT System to operate reliably, even at the 89 MW load level. It should be noted that the North Truckee 120/60 kV transformer would reach 105.5% of loading in the event of the loss of line 132. However, this transformer is owned and operated by NV Energy, and is not in the control of Liberty CalPeco. As such, the Ascension study does not recommend a system improvement based on this N-1 situation.

#### Energy Commission Staff Conclusions

1. The NLT System load has reached the 89 MW “trigger point” as demonstrated by the coincident peak measured on 12/24/16. However, justification for the Upgrade Project appears to not be solely a function of the 89 MW “trigger”, but also of the proportional load distribution across the NLT System. Both a one-percent escalation of the 2015/2016 coincident peak loads as well as the 2016/2017 coincident peak loads results in cases exceeding 89 MW. However, the results do not demonstrate that both cases have criteria violations requiring mitigation by the Upgrade Project.
2. The network study performed by Ascension and submitted by Liberty CalPeco found network issues under contingency conditions that are apparently mitigated by the Upgrade Project, based on proportional load distribution that occurred during the 2015/2016 coincident winter peak.
3. Energy Commission staff evaluated whether operating the diesel generators at 2 MW, 4 MW and 6 MW could solve the contingency issues identified in the Ascension network study and found that 2 MW would reduce loading on the Truckee-Squaw Valley 60 kV line and would solve the low voltage issue at the Tahoe City Substation. In order to mitigate the overload on the Truckee transformer, 6 MW are needed.
4. Energy Commission staff evaluated and alternative, replacing the copper conductor on the Truckee--Squaw Valley 60 kV line (line 609). From a network perspective, this alternative does solve the primary system issue (high loading on the Truckee--Squaw Valley 60 kV line) that was used to justify Phase 2 of the Upgrade Project in the Ascension network study. We have not evaluated environmental impacts or costs of this option.

It is important to note that while the 2015/2016 data indicate that the Upgrade Project is necessary, the same analysis using the 2016/2017 data, the most recent data available, indicate that no criterial violations occur. Relying on the CEC Staff

Assessment as a key element of the Energy Division's review of Liberty CalPeco's AL 64-E, and the direction provided in D.15-03-020, the Commission believes that the showing in AL 64-E is insufficient for purposes of approving Phase 2 of the NLT System Upgrade at this time. And since this matter is the subject of a protest, approval is denied. Several factors lead the Commission to this conclusion.

First, it is apparent that NTCOA's assertion that the existing backup diesel generating capacity in Kings Beach could be an effective mitigation for system peak loading conditions, and should have been incorporated into the Ascension network study. This omission represents a critical failure to accurately model the NLT System. Because of this omission, the Commission finds that the protest of NTCOA is valid, at least in part.

Second, it is unclear whether the load shifting that occurred during the winter peak period 2016/2017 is a permanent change in load configuration on the North Tahoe System, and only analysis of peak load data collected during the 2017/2018 winter period will determine the future coincident system peak.

Third, it is possible that upgrading conductor on the Truckee Squaw Valley 60 kV line 609 could solve the primary system issue that was used to justify the need for Phase 2 approval at this time.

For these reasons the Commission believes that approval of Phase 2 by AL 64-E would be premature. At this time, the Commission believes that Liberty CalPeco should evaluate the potential use of the backup generation in Kings Beach and specifically, the ability to dispatch incremental levels of generation as suggested in the CEC Staff Assessment, to achieve the necessary reliability during peak load conditions. Liberty CalPeco should also evaluate the CEC Staff Assessment finding that upgraded conductor (1/0 copper to 397.5 AA) between Truckee and Squaw Valley could mitigate primary system issues. Finally, the Commission understands the value of additional peak load data collection during the 2017/2018 winter as a means of accurately determining coincidental peak period load shifting.

Regarding upgrading the Line 609 copper conductor, the Commission believes that our General Order 131-D would allow Liberty CalPeco to file an immediate Tier 1 Notice of Construction enabling Liberty CalPeco to pursue the upgrade of that segment of Line 609 prior to the winter of 2017/2018, and if deemed by

Liberty CalPeco to be an effective means of providing additional, immediate NLT System reliability.

The Commission finds that an advice letter filing containing an analysis of the above three issues is essential to informing a Phase 2, and the later Phase 3 approval.

## **COMMENTS**

Public Utilities Code section 311(g)(1) provides that this resolution must be served on all parties and subject to at least 30 days public review and comment prior to a vote of the Commission. Section 311(g)(2) provides that this 30-day period may be reduced or waived upon the stipulation of all parties in the proceeding. In this instance we are extending the 30 day comment period to 60 days.

The 60-day comment period for the draft of this resolution was neither waived nor reduced. Accordingly, this draft resolution was mailed to parties for comments, and will be placed on the Commission's agenda no earlier than 60 days from today.

## **FINDINGS**

1. The Commission approved D.15-03-020 on March 27, 2015. D. 15-03-025 approved the construction of the Line NLT Upgraded Project in three phases, and approved Phase 1 for immediate construction. D.15-03-020 ordered the approval for Phases 2 and 3 will be dependent upon a new and accurate network study demonstrating that the peak load target threshold of 89 MW had been reached, and further, that at the 89 MW peak load level, construction of Phase 2 was necessary to mitigate system criteria violations.
2. D.15-03-020 ordered Liberty CalPeco to file a Tier 2 Advice Letter with Energy Division when the system peak load reached 89 MW with a new network study attached demonstrating that the peak load threshold had been reached, that the load growth is not from outside the system, and to accurately document that system violations would occur at the 89 MW demand level, and that the violations could be mitigated by Phase 2 construction.

3. D.15-03-020 ordered Energy Division to evaluate the new Liberty CalPeco network study to ensure that accurate, documentable, and justified “trigger points” for Phases 2 and 3 were established. D.15-03-020 recommended that technical assistance from an existing Energy Division contract be used, if necessary. Ultimately, Energy Division was provided technical assistance by the CEC’s Siting Transmission & Environmental Protection Division.
4. On October 14, 2016 Liberty CalPeco filed AL 64-E which contained a new network study by Ascension documenting that the 89 MW threshold had been met and requesting approval from the Commission for Phase 2 construction.
5. On November 3, 2016 NTCAA protested AL 64-E alleging amongst other things, that the Ascension network study manipulated fundamental assumptions. And specifically, modeled the NLT System in an emergency state with the Kings Beach diesel generators producing zero real power (MW) and either severely reduced or no reactive power (MVAR).
6. On November 10, 2016 Liberty CalPeco responded to the NTCAA protest of AL 64-E arguing that AL 64-E met the three primary preconditions that D.15-03-020 required for commencement of construction of Phase 2.
7. On January 5, 2017 Energy Division staff issued a data request to Liberty CalPeco seeking amongst other things, North Tahoe System 2016 winter peak load data.
8. On July 20, 2017 Energy Division received the California Energy Commission Staff Assessment of the Network study Included in Liberty Utilities (Liberty CalPeco Electric) LLC Advice Letter 64-E.
9. The CEC Staff Assessment provided staff conclusions including the finding that the Liberty CalPeco North Tahoe System has reached the designated 89 MW peak load trigger identified in D.15-03-020. At the 89 MW CEC staff concluded that the 2015/2016 load data resulted in network issues that could be mitigated by the Phase 2 Upgrade Project. However, 2016/2017 load data, due to proportional load distribution across the NLT System, did not result in criterial violations that required mitigation by the Phase 2 Upgrade Project.
10. CEC staff evaluated operating the Kings Beach diesel backup generators at incremental levels of 2 MW, 4 MW, and 6 MW and concluded that generation at the 2 MW level could solve contingency issues identified in the Ascension Network study.

11. CEC staff found that upgrading copper conductor segment on the Truckee-Squaw Valley 60 kV Line 609 solves the primary system issue of high loading on the Truckee-Squaw Valley 60 kV Line 609 that was used to justify Phase 2 of the NLT Upgrade Project in the Ascension network study.
12. The CEC did not evaluate the environmental impacts of upgrading the copper conductor segment of the Line 609.
13. Liberty CalPeco omitted an important NLT System component, the Kings Beach diesel backup generation from the network study. The Protest of NTCAA is valid.

**THEREFORE IT IS ORDERED THAT:**

1. The request of Liberty CalPeco for approval to construct Phase 2 of the NLT System Upgrade Project is denied.
2. The protest of NTCAA is upheld.
3. Liberty CalPeco should file an Advice Letter with the Commission's Energy Division seeking approval for the NLT System Phase 2 upgrade when Liberty CalPeco has completed a new network study, which considers the CEC Staff Assessment findings, and complies fully with D.15-03-020 by documenting the construction commencement timeline for construction commencement for Phase 2. Alternatively, Liberty CalPeco may file a Petition to Modify D.15-03-020.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held January 11, 2018; the following Commissioners voting favorably thereon:

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TIMOTHY J. SULLIVAN  
Executive Director

State of California

California Natural Resources Agency

**M e m o r a n d u m**

**To:** Mary Jo Borak  
2017

**Date:** July 20,

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**Telephone:**

**From: Deputy Director: SHAWN PITTARD**  
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**Subject: Energy Commission Staff Assessment of the Network Study**  
**Included in Liberty Utilities (CalPeco Electric) LLC Advice Letter 64-E**

Attached is the Energy Commission staff assessment of the Network Study included in Liberty Utilities (CalPeco Electric) LLC Advice Letter 64-E performed at the request of CPUC staff.

Liberty California Pacific Company, LLC (Liberty CalPeco) is a privately owned utility that provides electric services to the California portion of the Lake Tahoe/Truckee region. In 2015 the CPUC approved Phase 1 of a three phase transmission upgrade project and required submittal of an advice letter showing that specific conditions had been met before proceeding with Phase 2 and Phase 3. These conditions included evidence that Liberty CalPeco's electric loads had reached certain trigger points and network studies showing that, when electric loads reached the trigger points, there would be reliability issues that Phase 2 and Phase 3 would resolve. Advice Letter 64-E is Liberty CalPeco's submittal requesting approval to proceed with Phase 2. CPUC staff requested Energy Commission staff assistance in reviewing Advice Letter 64-E and specifically the network study included in the letter.

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**ENERGY COMMISSION STAFF ASSESSMENT OF THE NETWORK STUDY  
INCLUDED IN LIBERTY UTILITIES (CALPECO ELECTRIC) LLC ADVICE  
LETTER 64-E**

**Introduction**

On May 23, 2017 Liberty Utilities requested that the California Public Utilities Commission (CPUC) seek the assistance of the California Energy Commission (Energy Commission) staff for the evaluation of the network study included with the Liberty Utilities California Pacific Electric Company (CalPeco) LLC (Liberty CalPeco) Advice Letter 64-E filed October 1, 2016. Liberty CalPeco submitted Advice Letter 64-E in order to proceed with Phase 2 of the 625 and 650 Line Upgrade Project (Upgrade Project). The CPUC approved the Upgrade Project on March 27, 2015, but separated the approval into three phases. Liberty CalPeco was permitted to proceed with Phase 1 in 2015, but in order to proceed with Phase 2 and Phase 3, Liberty CalPeco was required to submit Advice Letters with the CPUC's Energy Division. The approving order required that the advice letter for Phase 2 show that Liberty CalPeco's peak load was approaching an 89 megawatt (MW) "trigger point" and include a new network study that verified the need for the project at the projected peak load. Liberty CalPeco's Advice Letter 64-E provides an analysis of peak loads and a new network study as required by the CPUC order. In order to complete the processing of Liberty CalPeco Advice Letter 64-E, the CPUC Energy Division requested the Energy Commission review the new network study and convey the conclusions back to CPUC Energy Division. The purpose of this report is to convey those conclusions.

To perform the assessment, Energy Commission staff reviewed the Liberty CalPeco Advice Letter 64-E and other relevant documents, which include:

1. Appendix P4 ("Response to February 14 North Tahoe Citizen Action Alliance (NTCAA)<sup>7</sup> Comments and Supporting Documents") to the Final EIS/EIS/EIR<sup>8</sup> (September 2014)
2. CPUC Decision 15-03-020 (March 26, 2015)

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<sup>7</sup> North Tahoe Citizens Action Alliance (NCTAA)

<sup>8</sup>. Environmental Impact Statement (EIS), Environmental Impact Report (EIR)

3. Liberty CalPeco Advice Letter 64-E (October 14, 2016)
4. NTCAA Protest Letter (November 3, 2016)
5. Liberty CalPeco Reply to the NTCAA Protest Letter (November 10, 2016)
6. Liberty CalPeco Data Response to the CPUC Energy Division Data Request 1 (November 10, 2016)
7. Liberty CalPeco Response to the CPUC Energy Division Data Request 2 (January 5, 2017)
8. Liberty CalPeco Advice Letter 75-E (March 3, 2017)
9. NTCAA Protest Letter (March 22, 2017)
10. Liberty CalPeco Letter to CPUC President Picker (May 23, 2017)
11. NCTAA Letter to CPUC President Picker (June 5, 2017)
12. Power Flow data from Liberty Utilities (June 7, 2017)
13. Western Electricity Coordinating Council (WECC) 16HW3a1 PSLF<sup>9</sup> base case

Energy Commission staff completed essentially a four-part analysis: (1) review of North Lake Tahoe Transmission System loads; (2) review of the Ascension Power Engineering network study; (3) an evaluation of whether or not the diesel generators at Kings Beach could be used to mitigate high line loading identified in the network study; and (4) an evaluation of a transmission mitigation alternative to issues identified in the network study.

Energy Commission staff's conclusions are presented at the end of this report following the four-part analysis.

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<sup>9</sup> Positive Sequence Load Flow (PSLF). This is the name of the transmission simulation software developed by General Electric (GE) and is often referred to as PSLF or GE PSLF. "16HW3a1" is a naming convention used by the WECC for the data sets developed for use in the PSLF model, and this is a 2016, heavy winter load case.

### **North Lake Tahoe (NLT) Transmission System Loads**

In addition to the peak load information found in the relevant documents listed above, Energy Commission staff also searched for load data submissions Liberty CalPeco may have submitted to the Energy Commission. However, Energy Commission staff found that because Liberty CalPeco has a peak load less than 200 MW, the utility is not required to file peak load data with the Energy Commission. As a result, Energy Commission staff relied solely on the peak load information found in the relevant documents listed above.

The documents listed above indicate that, based on actual metered loads from the 2015/2016 and 2016/2017 winter seasons, the NLT Transmission System had actual coincident peak loads of 88.7 MW and 90.4 MW, respectively, as measured at eight substation load measuring points. This comprises Liberty CalPeco load at the Squaw Valley, Tahoe City, Brockway, Northstar, Glenshire and Truckee substations, and non-Liberty CalPeco load at the Martis Valley (Tahoe Donner Public Utility District load only) and Truckee (both Tahoe Donner Public Utility District load and NV Energy load) Substations. These are actually coincident peak loads based on substation meter reads, not forecasts. Thus, in the winter season prior to submittal of Advice Letter 64-E, the NLT Transmission System had experienced a coincident peak load of 88.7 MW and soon thereafter experienced a coincident peak load of 90.4 MW (the latter as reported in Liberty CalPeco Response to Energy Division Data Request 2 dated January 5, 2017). Based on these submittals, it is reasonable to conclude that the 89 MW “trigger point” described in CPUC Decision 15-03-020 has been reached.

The Energy Commission staff then examined whether the 89 MW threshold actually triggers reliability criteria violations that can be mitigated by the Upgrade Project. Energy Commission staff also considered this load information in light of the stipulation in CPUC Decision 15-03-020 that Liberty CalPeco must verify that load growth outside of its own system is not the basis for the “trigger points.” Both Advice Letter 64-E and the Liberty CalPeco response to Energy Division Request 2 indicate that any load growth between the 2011 study numbers and the 88.7 MW and 90.4 MW actual peak loads is attributable to Liberty CalPeco loads. Furthermore, the non-Liberty CalPeco loads actually dropped during this same time period.

Energy Commission staff observed that the coincident peaks for the 2015/2016 and 2016/2017 winters had significant differences in the proportional amount of the peak loads across the substations comprising the NLT Transmission System. For example, during the coincident peak hour cited for the 2015/2016 winter, the loads at the Squaw Valley and Tahoe City substations were 13.3 MW and 25.2 MW, respectively; while the loads at these same two substations during the

coincident peak hour cited for the 2016/2017 winter were 20.2 MW and 17.9 MW. In other words, the load at the Tahoe City substation was high relative to the Squaw Valley Substation in one year, but in the subsequent year this load relationship was reversed. While Energy Commission staff does not attempt to explain this difference, the record does indicate that the peak load at any individual substation does not necessarily coincide with the time of the coincident system peak. It is also important to point out that this difference in the distribution of coincident peak loads between the two years causes different power flow results on each line between the two years.

### **Review of the Ascension Power Engineering Network Study**

Advice Letter 64-E included a network study completed by Ascension Power Engineering (“Ascension”). Ascension reported that the model it developed for the study was derived from the 2016-2017 heavy winter WECC base case. Energy Commission staff received the model from Liberty CalPeco through a request submitted to Energy Division staff. Separately, Energy Commission staff downloaded the relevant cases from WECC. This enabled Energy Commission staff to verify how the Liberty CalPeco model was derived. Energy Commission staff found that the Ascension study did not make significant changes to the WECC base case outside of changes in the peak load for the Liberty CalPeco system.

Energy Commission staff reviewed Ascension’s network study results of the NLT Transmission System with Phase 1 installed and metered loads from the 2015/2016 coincident peak (88.7 MW). Ascension found three system issues under contingency (N-1) conditions. Energy Commission staff verified these results using the power flow base case provided by Liberty CalPeco, and conducted other power flow simulations using this same base case and the GE PSLF program.

One issue identified by Ascension – a transformer overload at the North Truckee substation due to the loss of line 132 (North Truckee-Martis 120 kV line) – was not sufficient for Ascension to recommend the Upgrade Project.<sup>10</sup>

A second issue identified by Ascension was low voltage (0.888 per unit) at the Tahoe City substation due to the loss of the Squaw Valley – Tahoe City 60 kV

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<sup>10</sup> Ascension states that the transformer is not owned by Liberty CalPeco, but is owned and operated by NV Energy. Ascension further states that Liberty CalPeco is not in control of nor do they have the ability to specify operational limits of the transformer. This leads Ascension to not recommend a system improvement based on this N-1 situation.

line. This represents a criteria violation (i.e., voltage must be at least 0.90 per unit but not greater than 1.05 per-unit). In its report (page 16, third paragraph, first sentence), Ascension seems to cite this as a justification for the Upgrade Project (“Therefore, even at the 2015 peak of 88.7 MW, Phase 2 is needed.”). Energy Commission staff agrees that this criteria violation requires mitigation and that, for this power flow case, the Upgrade Project will mitigate the violation.

The third issue identified by Ascension is the loading on the Truckee – Squaw Valley 60 kV line, which is loaded to 98.9-percent of its winter rating due to the loss of the North Truckee – Martis 120 kV line. Although Energy Commission staff notes that this does not constitute a criteria violation, Ascension cites this result as a justification for the Upgrade Project by arguing that when the 2015/2016 winter coincident peak of 88.7 MW is escalated by an annual growth rate of one-percent, the 89 MW trigger would be exceeded in the 2016/2017 winter. In other words, Ascension is suggesting that the loading on the Truckee – Squaw Valley 60 kV line is expected to increase sufficiently in the 2016/2017 winter to justify the Upgrade Project. It is unclear whether Ascension actually ran this case. It is also worth noting that this conclusion is based on the proportional distribution of loads from the 2015/2016 winter coincident peak and Energy Commission staff found a different result when the proportional distribution of coincident peak loads from the 2016/2017 winter is used (see later discussion).

In general, the Liberty CalPeco NLT Transmission System appears robust. **Table 1** shows the loadings on the major facilities under the worst N-1 condition for each particular facility. Outside of the Truckee-Squaw Valley 60 kV line that is heavily loaded under an N-1 outage, none of the other facilities is heavily loaded, even under the worst contingency for that facility. For example, the Truckee - Northstar 60 kV line is the highest loaded line under N-1 conditions and it is only loaded to 68-percent of its rated winter capacity. Because the rest of the NLT Transmission System was not close to overloading, further analysis focused on impacts to the three issues: loading on the Truckee transformer, loading on the Truckee – Squaw Valley 60 kV line and the voltage at the Tahoe City substation.

**Table 1**  
**Maximum Loading on NLT Transmission Facilities Under N-1 Conditions**

| #  | Transmission Facility                    | Maximum Loading Under N-1 Condition (Plot A in MW) | % Loading | Line Outage (contingency)                |
|----|------------------------------------------|----------------------------------------------------|-----------|------------------------------------------|
| 1  | North Truckee 120/60kV transformer       | 78                                                 | 105.5%    | North Truckee-Martis 120kV line (#132)   |
| 2  | Squaw Valley 120/60kV transformer        | 48.5                                               | 64.9%     | North Truckee 120/60kV transformer       |
| 3  | North Truckee-Martis 120kV line (#132)   | 70.4                                               | 31.3%     | North Truckee 120/60kV transformer       |
| 4  | Martis-Squaw Valley 120kV line (#132)    | 62.8                                               | 43.2%     | North Truckee-Martis 120kV line (#132)   |
| 5  | North Truckee-Truckee 60kV line (#621)   | 77.7                                               | 67.2%     | North Truckee-Martis 120kV line (#132)   |
| 6  | Truckee-Squaw Valley 60kV line (#609)    | 39.5                                               | 98.9%     | North Truckee-Martis 120kV line (#132)   |
| 7  | Squaw Valley-Tahoe City 60kV line (#629) | 48.3                                               | 66.8%     | Northstar-Kings Beach 60kV line (#650)   |
| 8  | Kings Beach-Tahoe City 60kV line (#625)  | 26.1                                               | 37.9%     | Squaw Valley-Tahoe City 60kV line (#629) |
| 9  | Northstar-Kings Beach 60kV line (#650)   | 39.2                                               | 55.3%     | Squaw Valley-Tahoe City 60kV line (#629) |
| 10 | Truckee-Northstar 60kV line (#650)       | 49.7                                               | 68%       | Squaw Valley-Tahoe City 60kV line (#629) |

### **Load Sensitivity Analysis**

Energy Commission staff escalated the 2015/2016 winter coincident peak loads by one-percent (only Liberty CalPeco loads were escalated) as documented below in **Table 2** and used these loads to create a new power flow case.<sup>11</sup>

<sup>11</sup> Only real power loads were escalated and not reactive power loads.

**Table 2**  
***Liberty CalPeco 2015/2016 Coincident Peak Loads Escalated by 1%***

| Entity          | Load Description                                | 2015/2016 | Escalated by 1% |
|-----------------|-------------------------------------------------|-----------|-----------------|
| Liberty CalPeco | Squaw Valley                                    | 13.3 MW   | 13.4 MW         |
|                 | Tahoe City                                      | 25.2 MW   | 25.5 MW         |
|                 | Brockway                                        | 12.3 MW   | 12.4 MW         |
|                 | Northstar                                       | 9.2 MW    | 9.3 MW          |
|                 | Glenshire                                       | 2.5 MW    | 2.5 MW          |
|                 | Truckee (Liberty CalPeco loads only)            | 6.7 MW    | 6.8 MW          |
|                 | <b>Subtotal Liberty</b>                         | 69.2 MW   | 69.9 MW         |
| TDPUD           | Martis Valley (TDPUD)                           | 7.6 MW    | 7.6 MW*         |
|                 | Truckee (TDPUD load only)                       | 10.5 MW   | 10.5 MW*        |
| NV Energy       | Truckee (NV Energy)                             | 1.4 MW    | 1.4 MW*         |
|                 | <b>Subtotal Others</b>                          | 19.5 MW   | 19.5 MW*        |
|                 | <b>Total North Lake Tahoe Transmission Load</b> | 88.7 MW   | 89.4 MW         |

\* No change

Using this case, Energy Commission staff found that, while the loading on the Truckee – Squaw Valley 60 kV line increased to 99.8-percent of the winter rating following the loss of the North Truckee – Martis 120 kV line, it did not overload.<sup>12</sup> It is interesting to note that although the 89 MW “trigger” would be exceeded, the loading on this line does not cause a criteria violation requiring mitigation by the Upgrade Project. This result is contrary to that predicted by Ascension. However, the other two issues still remain. These results are summarized in **Table 3**.

**Table 3**  
***Comparing Facility Loading Between 2015/2016 Loads and with 1% Escalation***

| Transmission Element              | 2015/2016 Loading                  | w/ 1% Escalation       | Contingency                          |
|-----------------------------------|------------------------------------|------------------------|--------------------------------------|
| North Truckee Transformer         | 79.1 MVA <sup>13</sup><br>(105.5%) | 79.7 MVA<br>(106.3%)   | North Truckee - Martis 120 kV line   |
| Truckee – Squaw Valley 60 kV line | 39.5 (98.9%)                       | 39.8 MW (99.8%)        | North Truckee - Martis 120 kV line   |
| Tahoe City Substation voltage     | 53.29 (0.888 per-unit)             | 53.19 (0.887 per-unit) | Tahoe City – Squaw Valley 60 kV line |

<sup>12</sup> Energy Commission staff modified the line rating of the North Truckee – Martis 120 kV line to match the line rating in Appendix C of the Ascension network study.

<sup>13</sup> Mega-Volt Amepere (MVA)

Energy Commission staff then created a sensitivity case to ascertain whether the differing proportional loads across the NLT transmission system from the 2016/2017 coincident peak would lead to a different result. To do this, Energy Commission staff modified Ascension's power flow base case with the 88.7 MW peak by replacing the substation loads with those listed in the last column of Table DR2-2 from the Liberty CalPeco response to Energy Division data request 2, January 5, 2017.<sup>14</sup> A comparison between the actual 2015/2016 and 2016/2017 coincident peak loads are provided in **Table 4**. Although there is only a 1 MW difference in NLT Transmission System loads between the case with the one-percent escalation of 2015/2016 loads (89.4 MW) and the case with actual 2016/2017 loads (90.4 MW), Energy Commission staff nevertheless believed it worthwhile to examine any difference in the results due to the differing proportional loads.

**Table 4**  
**Comparison of Actual 2015/2016 and 2016/2017 Coincident Peak Loads**

| Entity          | Load Description                                | 2015/2016 | 2016/2017 |
|-----------------|-------------------------------------------------|-----------|-----------|
| Liberty CalPeco | Squaw Valley                                    | 13.3 MW   | 20.2 MW   |
|                 | Tahoe City                                      | 25.2 MW   | 17.9 MW   |
|                 | Brockway                                        | 12.3 MW   | 10.5 MW   |
|                 | Northstar                                       | 9.2 MW    | 15.0 MW   |
|                 | Glenshire                                       | 2.5 MW    | 2.5 MW    |
|                 | Truckee (Liberty CalPeco loads only)            | 6.7 MW    | 7.0 MW    |
|                 | <b>Subtotal Liberty CalPeco</b>                 | 69.2 MW   | 73.0 MW   |
| TDPUD           | Martis Valley (TDPUD)                           | 7.6 MW    | 6.6 MW    |
|                 | Truckee (TDPUD load only)                       | 10.5 MW   | 9.3 MW    |
| NV Energy       | Truckee (NV Energy)                             | 1.4 MW    | 1.5 MW    |
|                 | <b>Subtotal Others</b>                          | 19.5 MW   | 17.4 MW   |
|                 | <b>Total North Lake Tahoe Transmission Load</b> | 88.7 MW   | 90.4 MW   |

Using this case, Energy Commission staff re-ran the same N-1 contingencies that created the issues noted by Ascension with the 2015/2016 loads.

Energy Commission staff found that the difference in the proportional distribution of loads between the two cases renders different results even though the difference in total load is minor. Increasing the loads in the Liberty CalPeco system to the 90.4 MW 2016/2017 peak actually reduced the loading for the three issues noted by Ascension. This appears to be caused by a shift in the substation loads, especially at the Squaw Valley and Tahoe City substations

<sup>14</sup> Only real power loads were escalated and not reactive power loads.

(Squaw Valley loads increased by 6.9 MW and Tahoe City loads decreased by 7.3 MW). While the coincident system peak only increased by 1.7 MW, from 88.7 MW to 90.4 MW, there were much larger changes in the loads at specific substations. In other words, justification for the Upgrade Project appears to not be solely a function of the 89 MW “trigger,” but also of the proportional load distribution across the NLT Transmission System.

**Table 5** compares the loading relative to the three issues noted by Ascension (Truckee Transformer, Truckee-Squaw Valley 60 kV, line and the voltage at the Tahoe City substation).

**Table 5**  
***Comparing Facility Loading with 2015/2016 Loads and 2016/2017 Loads***

| <b>Transmission Element</b>       | <b>2015/2016 Loading</b> | <b>2016/2017 Loading</b> | <b>Contingency</b>                   |
|-----------------------------------|--------------------------|--------------------------|--------------------------------------|
| North Truckee Transformer         | 79.1 MVA (105.5%)        | 75.6 MVA (100.8%)        | North Truckee - Martis 120 kV line   |
| Truckee – Squaw Valley 60 kV line | 39.5 (98.9%)             | 38.5 MW (96.2%)          | North Truckee - Martis 120 kV line   |
| Tahoe City Substation voltage     | 53.29 (0.888 per-unit)   | 56.05 (0.934 per-unit)   | Tahoe City – Squaw Valley 60 kV line |

It is important to note that there may be a fundamental shift in loads from the Tahoe City Substation to the Squaw Valley substation. The highest load seen at the Tahoe City Substation (non-coincident peak) in 2016/2017 was 21.1 MW, while in 2015/2016 Tahoe City had a peak load of at least 25.2 MW. The 2016 number is based on the January 5, 2017 Liberty Utilities Data Response 2, thus did not include all of the 2016/2017 winter season. However, the NLT system typically peaks during the Christmas and New Year holidays, which was included. This difference could be the result of a random annual load fluctuation or some other shift in loads from the Tahoe City Substation to the Squaw Valley Substation. If there has been a permanent shift in the way loads are served, the system issues identified in Ascension study are significantly improved.

### **Diesel Generation at Kings Beach**

Ascension concluded that the six 2 MW diesel generators (12 MW total) at Kings Beach are not considered mitigation for N-1 contingencies in the network study. Ascension's logic for drawing this conclusion is primarily tied to the view that, due to permit restrictions, Liberty CalPeco can only rely on the Kings Beach generation operating at maximum capacity for 60 hours per calendar year and that winter season outage duration in the NLT Transmission System will likely exceed 60 hours. Liberty CalPeco's response to Energy Division Data Request 2 listed a number of outages between 1996 and 2005 that lasted longer than 60 hours.

Since each of the turbines has a 60-hour limit it is possible to run fewer than 12 MW for more hours. Thus, Energy Commission staff wondered whether the diesel generators at Kings Beach could in fact be used to lower the loading on the Truckee – Squaw Valley 60 kV line and the North Truckee – Truckee Transformer during an outage of the North Truckee – Martis Valley 120 kV line or whether or not the generators could be used to mitigate the low-voltage issue at the Tahoe City substation when the Tahoe City – Squaw Valley 60 kV line is out.

Energy Commission staff evaluated the impact of running the Kings Beach diesel generators in 2 MW, 4 MW and 6 MW increments using the 2015/2016 peak load case. Energy Commission staff network studies found that running 6 MW of diesel generation at Kings Beach could mitigate all three issues identified in the Ascension network study. Running as few as 2 MW of diesel generation at Kings Beach reduces loading on the Truckee – Squaw Valley line and solves the low voltage issue at the Tahoe City Substation. At least 6 MW of diesel generation at Kings Beach is required to prevent the overload of the Truckee transformer. Liberty CalPeco would be able to use as many as 6 MW for up to 120 hours. These results are summarized in **Table 6**.

**Table 6**  
***Loading NLT Transmission Facilities Under N-1 Conditions***  
***With the Diesel Generators at Kings Beach using 2015/2016 loads***

| <b>Transmission Element</b>       | <b>Base Case</b>          | <b>2 MW at Kings Beach</b> | <b>4 MW at Kings Beach</b> | <b>6 MW at Kings Beach</b> | <b>Contingency</b>                         |
|-----------------------------------|---------------------------|----------------------------|----------------------------|----------------------------|--------------------------------------------|
| North Truckee Transformer         | 79.1 MVA<br>(105.5%)      | 77.1 MVA<br>(102.8%)       | 75.7 MVA<br>(100.9%)       | 73.9 MVA<br>(98.5%)        | North Truckee -<br>Martis 120 kV<br>line   |
| Truckee – Squaw Valley 60 kV line | 39.5 MVA<br>(98.9%)       | 38.6 MVA<br>(96.2%)        | 37.9 MVA<br>(94.2%)        | 37.2 MVA<br>(92.3%)        | North Truckee -<br>Martis 120 kV<br>line   |
| Tahoe City Substation voltage     | 53.29<br>(0.888 per-unit) | 54.29<br>(0.905 per-unit)  | 54.68<br>(0.911 per-unit)  | 55.05<br>(0.918 per-unit)  | Tahoe City –<br>Squaw Valley 60<br>kV line |

### **Truckee - Squaw Valley 60 kV Line Reconductoring Alternative**

The Truckee – Squaw Valley 60 kV line is comprised of two segments. One segment is 8.3 miles long and is built with 1/0 copper conductor, which is the lowest rated conductor on the Liberty CalPeco NLT Transmission System (40 MVA winter rating). The second segment is 1.24 miles long and uses 397.5 AA (all-aluminum) conductors (75 MVA winter rating). The 397.5 AA conductor is used for all the 60 kV lines in the NLT Transmission System modeled in the Ascension network study except for the 8.3 mile segment of the Truckee-Squaw Valley 60 kV line.

Energy Commission staff evaluated the impact of replacing the 1/0 copper segment of line 609 with 397.5 AA conductor relative to the three issues identified in the Ascension network study. Specifically, Energy Commission staff analyzed whether the conductor replacement would sufficiently reduce loadings on the North Truckee transformer or the Truckee – Squaw Valley 60 kV line or whether it improved the low-voltage issue at the Tahoe City Substation. Energy Commission staff selected the 2015/2016 peak load case because the loading on

the Truckee – Squaw Valley 60 kV line was actually loaded higher in this case than it was in the 2016/2017 peak load case.

Energy Commission staff found that replacing the 8.3 mile 1/0 copper segment of line 609 with 397.5 AA conductor does result in improvements relative to the three issues identified in the Ascension network study, but does not mitigate all criteria violations. Specifically, the loading on Truckee – Squaw Valley 60 kV drops from 98.9-percent to 58.2-percent; the Truckee transformer loading drops from 105.5-percent (79.1 MVA) to 103-percent (77.2 MVA), but is still a criteria violation; and, the voltage at the Tahoe City substation increases from 0.88 per-unit to 0.89 per-unit, but is still a criteria violation as it does not meet required minimum operating level of 0.90 per-unit. These results are summarized in **Table 7**.

**Table 7**  
***Comparing Facility Loading with Truckee – Squaw Valley Reconductor***

| <b>Transmission Element</b>       | <b>2015/2016 Loading</b> | <b>With Reconductor</b> | <b>Contingency</b>                   |
|-----------------------------------|--------------------------|-------------------------|--------------------------------------|
| North Truckee Transformer         | 79.1 MVA (105.5%)        | 77.2 MVA (103.0%)       | North Truckee - Martis 120 kV line   |
| Truckee – Squaw Valley 60 kV line | 39.5 (98.9%)             | 43.7 MW (58.2%)         | North Truckee - Martis 120 kV line   |
| Tahoe City Substation voltage     | 53.29 (0.888 per-unit)   | 53.41 (0.890 per-unit)  | Tahoe City – Squaw Valley 60 kV line |

Energy Commission staff notes that the Final Environmental Impact Report considered, but did not evaluate, replacing the conductor on line 609 because it did not solve the reliability issues the 625 and 650 Line Upgrade Project was designed to address.<sup>15</sup> However, we note that this decision was apparently based on the original network study by ZGlobal. The Energy Commission staff network study indicates that replacing the 8.3 miles of 1/0 copper conductor on line 609 solves the primary reliability issue that Ascension cited in the justification for Phase 2 of the Upgrade Project. Energy Commission staff has not evaluated the environmental or costs of replacing the conductor for this line.

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<sup>15</sup> Energy Commission staff also notes that Paul Scheurman in his *Report of Findings Re: Need for Upgrade of North Lake Tahoe Electric Transmission System* dated 3/24/2014 states, "However, given the environmental constraints and sensitivities associated with the 609 line outlined in the September 2012 *North Lake Tahoe Electric Transmission System Upgrade Scoping Document* prepared by Tri Sage Consulting, as well as the remoteness of the line it appears impractical to reconductor this line."

### **Energy Commission Staff Conclusions**

1. The NLT Transmission System load has reached the 89 MW “trigger point” as demonstrated by the coincident peak measured on 12/24/16 (per Table DR2-2 from the Liberty CalPeco response to Energy Division data request 2, January 5, 2017). However, justification for the Upgrade Project appears to not be solely a function of the 89 MW “trigger,” but also of the proportional load distribution across the NLT Transmission System. Both a one-percent escalation of 2015/2016 coincident peak loads as well the 2016/2017 coincident peak loads results in cases exceeding 89 MW. However, the results do not demonstrate that both cases have criteria violations requiring mitigation by the Upgrade Project.
2. The network study performed by Ascension and submitted by Liberty CalPeco found network issues under contingency conditions that are apparently mitigated by the Upgrade Project, based on the proportional load distribution that occurred during the 2015/2016 coincident winter peak.
3. Energy Commission staff evaluated whether operating the diesel generators at 2 MW, 4 MW and 6 MW could solve the contingency issues identified in the Ascension network study and found that 2 MW would reduce loading on the Truckee – Squaw Valley 60 kV line and would solve the low voltage issue at the Tahoe City Substation. In order to mitigate the overload on the Truckee transformer, 6 MW are needed.
4. Energy Commission staff evaluated an alternative, replacing the copper conductor on the Truckee – Squaw Valley 60 kV line (line 609). From a network perspective, this alternative does solve the primary system issue (high loading on the Truckee – Squaw Valley 60 kV line) that was used to justify Phase 2 of the Upgrade Project in the Ascension network study. We have not evaluated the environmental impacts or costs of this option.