

June 27, 2016

California Public Utilities Commission
RE: Mesa 500kV Substation Project
c/o Ecology and Environment, Inc.
505 Sansome Street, Suite 300
San Francisco, CA 94111
Mesa.CPUC@ene.com

Via Email

RE: Mesa 500-kV Substation Project (Mesa Loop-In Project)

I. Introduction

The California Independent System Operator Corporation (CAISO) appreciates the opportunity to comment on the Draft Environmental Impact Report (DEIR) prepared for the Mesa 500-kV Substation Project (Mesa Loop-In Project or Project) pursuant to the California Environmental Quality Act (CEQA). The Mesa Loop-In Project is a critical component of the CAISO's efforts to meet long-term local reliability needs in the Los Angeles Basin (LA Basin) area in the wake of the retirement of the San Onofre Nuclear Generating Station and scheduled retirements of generation units in compliance with the state's once-through-cooling (OTC) regulations. Alternatives 1 & 2 do not meet the reliability concerns identified by the CAISO or the project objectives outlined in the DEIR. As a result, these the Commission should reject these alternatives for failing to meet the basic project objectives. Alternative 3 meets all identified reliability concerns and the DEIR project objectives, but it may not be feasible to accomplish in the timeframe necessary to facilitate the retirement of existing OTC generation. If the Commission determines that Alternative 3 will delay the in-service date of the project until after the scheduled retirement of the existing LA Basin OTC generation, then the Commission should reject it as infeasible because it cannot be accomplished in a successful manner within a reasonable period of time, as required by CEQA regulations.

II. Mesa Loop-In Project Background

As configured by Southern California Edison Company (SCE) and the CAISO, the Mesa Loop-In Project maintains reliability in the LA Basin while allowing for significant integration and delivery of new renewable resources in the Tehachapi and Eastern LA Basin areas into the LA Basin load centers. As described in the CAISO's 2013-2014 transmission plan, the Mesa Loop-In Project expands SCE's existing Mesa 230/66/16 kV Substation to bring a new 500 kV electric source to the LA Basin metropolitan load center, delivering power from Tehachapi wind resources or resources located in PG&E service territory or the Northwest via the 500kV bulk transmission network system. The Mesa Loop-In Project includes three 500/230 kV and three 230/66 kV transformer banks providing significant capacity to deliver power from the 500 kV transmission system to load in the LA Basin area. The Vincent-Mira Loma 500 kV,

Laguna Bell-Rio Hondo 230 kV & Goodrich-Laguna Bell 230 kV lines will be looped into an expanded substation to provide new source lines and to distribute power toward coastal cities to the south.

As identified in the DEIR, the basic project objectives for the Mesa Loop-In Project are to:

1. Address anticipated violations of North American Electric Reliability Corporation (NERC) Standard TPL-001-04, Western Electricity Coordinating Council (WECC) Regional Business Practice TPL-001-WECC-RBP-2, and California Independent System Operator (CAISO) Planning Standards that would occur upon retirement by December 31, 2020, of generators that use Once-Through Cooling (OTC).
2. Avoid introduction of new violations of NERC, WECC, and CAISO standards.
3. Maintain electrical service by minimizing service interruptions during project implementation.¹

The CAISO agrees with these key project objectives as identified in the DEIR.

III. Discussion

The DEIR identifies three alternatives to the Mesa Loop-In Project that it finds are capable of meeting project objectives, as well as being feasible and environmentally superior to the Mesa Loop-In Project. Alternatives 1 and 2 present electrical variations to the proposed Project that would potentially reduce the physical footprint of the Mesa Substation and the associated environmental impacts.

A. Alternative 1 – Single 1600 MVA Transformer

Alternative 1 replaces the three 500/230 kV 1120 MVA transformers specified in the proposed Project with a single, larger 500/230 kV 1600 MVA transformer. The DEIR states that Alternative 1 will meet all project objectives if a remedial action scheme (RAS) is implemented to address thermal overload of the Chino–Mira Loma 220-kV No. 3 Transmission Line.² The DEIR states that this alternative would not create any new violations of reliability criteria, thus meeting Objective 2, and would meet Objective 3 because the alternative would minimize outages during project construction.

To test the effectiveness of Alternative 1, the CAISO conducted power flow studies based on the most recent long-term local capacity requirement studies for the LA Basin.³ Based on these studies, the CAISO identified thermal overloads under both normal system conditions (NERC category P0) and N-1-1 conditions (NERC category P6). The CAISO-identified overloads are indicated in Table 1 below:

¹ DEIR, Section 3.2.1, p. 3-2.

² DEIR, Section 3.4.1.2, p. 3-9.

³ 2015-2016 CAISO Transmission Plan, p. 153-170.

Table 1
Summary of CAISO Power Flow Analysis of Alternative 1

Contingency Type	Specific Contingency	Affected Facilities	Percent Loading of Applicable Rating
P0	None, normal conditions	Mesa-Laguna Bell 230 kV line	161%
P0	None, normal conditions	Mesa 500/230kV transformer bank	<ul style="list-style-type: none"> • 111% (if transformer impedance is at 10%) or • 94% (if transformer impedance is 14.66%)⁴.
P6	Vincent-Mesa 230kV No.1, followed by No. 2 outage	Mesa 500/230kV transformer	104%
P6	Mira Loma-Serrano 500kV line, followed by Mira Loma 500/230kV Bank No. 2 outage	Mira Loma 500/230kV transformer No. 1	103%
P6	Mesa-Laguna Bell 230kV line, followed by Mesa-Lighthipe 230kV line outage	Mesa-Redondo 230kV line	138%
P6	Serrano-Villa Park 230kV No. 2, followed by Serrano-Lewis 230kV No. 1 line	Serrano-Villa Park No. 1 230kV loading is near its emergency rating	95% - this has only 5% of margin left on emergency rating; this is not as robust as Alternative 3 or the original alternative as those have 13% margin on their emergency ratings.

⁴ The ISO uses 14.66% for impedance value assumption for the proposed 500/230kV 1600 MVA transformer for the rest of the contingency analyses for Alternative 1.

As indicated in Table 1, two of the CAISO-identified thermal overloads occur during normal system conditions (PO). Because these overloads occur during normal system conditions, the CAISO cannot rely on a RAS to mitigate the overloads.⁵

Based on the CAISO's review of the DEIR's power flow analysis, it appears that the thermal overloads identified by the CAISO were not identified in the DEIR because the DEIR used an outdated study case. The CAISO's analysis incorporates the study cases used in the 2015-2016 transmission planning process, which include the modeling of renewable resources to meet the state's 33% renewable portfolio standard at their Net Qualifying Capacity (NQC) values for local reliability assessments. Many of these renewable resources are located north of the Mesa Loop-In Project and east of the LA Basin. The CAISO modeled the outputs of the renewables at the NQC values or based on peak impact value for corresponding technology (*i.e.*, solar and wind) as indicated in the Assigned Commissioner Ruling on assumptions and scenarios promulgated by the Commission for use in the ISO transmission planning process.⁶ The CAISO described the impact of higher renewable output on LA Basin local capacity requirements in the 2015-2016 transmission plan:

The increase in the Western LA Basin sub-area LCR need for the 2025 time frame is due to a higher dispatch of renewable resources. Renewable resource dispatch was based on the CPUC provided technology factors (for Net Qualifying Capacity), for renewable generation north and east of the LA Basin LCR area. This higher level of renewable generation dispatch (about 2,000 MW higher) reflects updated modeling for centralized photovoltaic solar farms located outside north and east of the LA Basin LCR area. In addition, the updated modeling also includes wind generation resources located north of the LA Basin LCR area. The increase in renewable generation dispatch level to reflect net qualifying capacity (NQC)-level outputs contributes to further thermal loading concerns for the 230kV lines south of newly upgraded Mesa Substation under contingency conditions. This reflects the benefit of the upgraded Mesa Substation to facilitate delivering more renewable generation into the LA Basin load centers when it's upgraded to 500 kV voltage level and having additional 230 kV lines in the Western LA Basin looped into it.⁷

Alternative 1 does not meet NERC transmission planning standards when taking into account expected increases in renewable resources' outputs outside the LA Basin. As a result, Alternative 1 does not meet the basic project objectives of addressing NERC reliability criteria violations and avoiding the creation of new NERC reliability violations. Accordingly, the Commission should reject it.

⁵ Under normal system conditions NERC TPL-001-4 disallows any interruption of firm transmission service or non-consequential load loss.

⁶ See Commission Rulemaking 13-12-010, Assigned Commissioner's Ruling on Updates to the Planning Assumptions and Scenarios for Use in the 2014 Long-Term Procurement Plan and the California Independent System Operator's 2015-2016 Transmission Planning Process issued October 28, 2015, Attachment 1, p. 18.

⁷ 2015-2016 CAISO Transmission Plan, p. 156-157.

B. Alternative 2 – Two 1120 MVA Transformers

Alternative 2 removes one of the three 500/230 kV 1120 MVA transformers specified in the Proposed Project for installation at the Mesa Substation. The DEIR claims that Alternative 2 will meet all project objectives if a RAS is implemented to address thermal overload of the Chino–Mira Loma 220-kV No. 3 Transmission Line. The DEIR states that this alternative would not create any new reliability criteria concerns, thus meeting Objective 2, and it would meet Objective 3 because it minimizes outages during project construction.

To test the effectiveness of Alternative 2, the CAISO conducted the same power flow analysis as that conducted for Alternative 1. Based on these studies, the CAISO identified thermal overloads under both normal system conditions (NERC category P0) and N-1-1 conditions (NERC category P6). The CAISO-identified overloads are indicated in Table 2 below:

Table 2
Summary of CAISO Power Flow Analysis of Alternative 1

Contingency Type	Specific Contingency	Affected Facilities	Percent Loading of Applicable Rating
P0	None, normal conditions	Mesa 500/230kV transformer No. 2 (connecting to Mesa South 220kV bus)	Mesa 500/230kV Bank No. 2 (107%) based on typical impedance value of 14.66%
P0	None, normal conditions	Mesa-Laguna Bell 230kV line	Mesa-Laguna Bell 230kV line (108%)
P6	Mesa-Laguna Bell 230kV line, followed by Mesa-Lighthipe 230kV line outage	Mesa-Redondo 230kV line	106%

As indicated in Table 2, two of the CAISO-identified thermal overloads occur during normal system conditions (P0). Because these overloads occur during normal system conditions, the CAISO cannot rely on a RAS to mitigate the overloads.⁸

⁸ See footnote 3, above.

As with Alternative 1 above, it appears that the DEIR's power flow analysis does not incorporate the updated modeling of renewable resources north of the Mesa Loop-In Project and east of the LA Basin with their outputs modeled at NQC values. The overloads occurring during normal system conditions result from the increase in renewable capacity in the CAISO's updated analysis. Alternative 2 does not meet NERC transmission planning standards when taking into account expected increases in renewable resources outside the LA Basin. As a result, The Commission should reject Alternative 2 because it fails to meet the basic project objectives: it does not address NERC reliability criteria concerns or avoid creating new NERC reliability violations. ,

C. Alternative 3 – Gas Insulated Substation

Alternative 3 is electrically similar to the proposed project, but proposes a gas-insulated substation (GIS) instead of an air-insulated substation at Mesa Substation, thereby reducing the overall footprint of the project. Alternative 3 meets all NERC, WECC and ISO transmission planning criteria by mitigating all known reliability concerns and avoiding the creation of any new reliability concerns. As a result, the CAISO agrees that Alternative 3 meets the basic project objectives outlined in the DEIR.

Although Alternative 3 meets the basic project objectives, the CAISO has concerns regarding whether GIS substation design, construction, and electrification can be completed prior to the retirement of LA Basin OTC generation in December 2020. The CAISO believes that SCE is in the best position to comment on potential scheduling impacts that Alternative 3 may cause. If Alternative 3 cannot be completed and placed in-service to facilitate timely retirement of the LA Basin OTC generation, the Commission should reject it as infeasible because it is not "capable of being accomplished in a successful manner within a reasonable period of time" as required by CEQA Guidelines.⁹

In addition to the potential delay in the in-service date, the CAISO is also concerned about the potential higher costs incurred to install and maintain GIS equipment. These costs are material, and should be carefully considered in weighing any potential benefits.

IV. **Conclusion**

The CAISO appreciates this opportunity to provide comments on the DEIR. The CAISO recommends that the Commission reject Alternatives 1 & 2 for failing to meet project objectives. The Commission should carefully review whether Alternative 3 can be accomplished in time to facilitate the retirement of existing LA Basin generators in compliance with OTC regulations.

Sincerely

/s/ Jordan Pinjuv

Jordan Pinjuv
Counsel

⁹ CEQA Guidelines § 15364.