

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

In the Matter of the Application of Southern
California Edison Company (U338E) for a
Permit to Construct Electrical Substation
Facilities with Voltage over 50 kV: Mesa 500
kV Substation Project

Application 15-03-003
(Filed March 13, 2015)

**OPENING BRIEF OF THE CALIFORNIA INDEPENDENT
SYSTEM OPERATOR CORPORATION**

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I. Introduction

Pursuant to the November 14, 2016 Scoping Memo and Ruling of Assigned Commissioner (Scoping Memo), the California Independent System Operator Corporation (CAISO) files this opening brief regarding Southern California Edison Company's (SCE) Application for a Permit to Construct (PTC) the Mesa 500 kV Substation Project (Mesa Loop-In Project).

The CAISO approved the Mesa Loop-In Project in its 2013-2014 transmission planning process to maintain electric system reliability in southern California in the wake of the closure of the San Onofre Nuclear Generating Station (SONGS) and the planned closure of gas-fired generation in compliance with the State Water Resource Control Board's (SWRCB) once-through-cooling (OTC) policy. The Mesa Loop-In Project provides the system reliability necessary to meet these objectives while simultaneously increasing flexibility to support the efficient and reliable dispatch of the rapidly-changing, dynamic generation fleet. The record in this proceeding clearly demonstrates that the Mesa Loop-In Project is necessary to meet long-term reliability needs for the Los Angeles Basin and that SCE's PTC Application should be approved.

The Final Environmental Impact Report (FEIR) studied three alternatives that it found to be both feasible and environmentally superior to the Mesa Loop-In Project. Alternatives 1 and 2 modify the electrical configuration of the Mesa Loop-In Project, by changing the number and size of the 500/230 kV transformers at the Mesa Substation. The CAISO studied these two alternatives and found that each caused overloading concerns. The CAISO's study case reflects that renewable generation outside the Los Angeles Basin serves peak loads within Los Angeles. Based on the CAISO's analysis, Alternatives 1 and 2 are not technologically feasible alternatives to the Mesa Loop-In Project. The CAISO details specific concerns regarding electrical and technological feasibility in Section V of this brief.

Alternative 3 maintains the same electrical configuration that the CAISO approved, but it provides for a more costly gas-insulated substation (GIS) at the Mesa Substation. Although this alternative meets the electric system requirements identified by the CAISO, it will have significant and adverse impacts on project timing and cost. Regarding timing, the GIS alternative would likely delay the in-service date of the project past the summer of 2021, when it is needed to address the December 2020 retirements of OTC facilities in the Los Angeles Basin.

If the in-service date of the project is delayed past the summer peak period in 2021, the OTC policy compliance dates for Los Angeles Basin resources will likely need to be extended to preserve local reliability. These timing concerns are discussed in more detail in Section VIII of this Opening Brief.

II. Significant Environmental Impacts of the Proposed Project

III. Feasible Mitigation Measures That Will Eliminate or Lessen the Significant Environmental Impacts

IV. Environmentally Superior Alternative

V. Infeasibility of Mitigation Measures and/or Environmentally Superior Project Alternatives

A. Background

The Mesa Loop-In Project is a flexible solution designed to help address southern California electric reliability needs, retire existing OTC generation facilities in a timely manner, and effectively integrate new renewable resources to serve the Los Angeles Basin. The FEIR project alternatives fail to meet these project objectives and still comply with transmission planning standards promulgated by the North American Electric Reliability Corporation (NERC). The CAISO reviewed the FEIR alternatives by conducting a detailed power flow analysis, the full results of which are presented in Exhibit CAISO-01. The CAISO's analysis shows that Alternatives 1 and 2 fail to comply with the NERC and CAISO Planning Standards. As a result, these alternatives are electrically and technologically infeasible.

As explained in Exhibit CAISO-01, the CAISO's analysis incorporates 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. Many of these renewable resources are located north of the Mesa Loop-In Project and east of the Los Angeles 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) consistent with the Assigned Commissioner Ruling on assumptions and scenarios promulgated by the Commission for use in the CAISO transmission planning process.¹ The CAISO described

¹ 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.

the impact of higher renewable output on Los Angeles 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.

This study case represents the most up-to-date model of generation resources at the time testimony was prepared in this proceeding.

B. The Commission Should Give Significant Weight to the CAISO's Analysis in Determining the Feasibility of Project Alternatives

The FEIR inappropriately used SCE's 2014 reliability study case, which does not accurately reflect renewable resources scheduled to be online when the Mesa Loop-In Project is in service. In contrast, the CAISO's study case more accurately models currently built and planned renewable projects that will serve Los Angeles Basin area load. The Office of Ratepayer Advocates (ORA) asserts that the Commission should rely on the study case used in the FEIR to determine whether the proposed alternatives to the Mesa Loop-In Project are feasible.² This assertion lacks both a factual and legal basis.

From a factual perspective, the Commission should use the CAISO's updated study case because it more accurately reflects the system conditions that will be in effect when the Mesa Loop-In Project is in service. The 2014 study case used in the FEIR analysis does not include renewable projects that are currently in operation or the projects that are planned to be in service by 2021 based on the Commission's current 33% renewable portfolio standard portfolio.³

² Exhibit ORA-01, p. 6.

³ Exhibit CAISO-01, p. 5.

Because the FEIR study case fails to accurately model renewable resources, the FEIR technical analysis did not uncover the reliability issues identified in the CAISO's more accurate modeling.⁴ Unlike the FEIR analysis, the CAISO's study case reflects reasonably stressed generation dispatch to meet expected gross loads.⁵ Analysis of this case indicated thermal overloads under normal operating conditions with all transmission elements in service (also known as P0 in NERC TPL-004-1).⁶ This analysis shows that Alternatives 1 and 2 will not reliably meet expected system conditions in 2021.

In addition, this analysis shows that Alternatives 1 and 2 are not sufficiently flexible to meet reliability needs as the grid moves toward higher penetrations of renewable resources. As more renewables are integrated, the grid must be capable of serving load at times of high gross load with varying levels of renewable resources. For example, the system must maintain reliability during the gross peak periods, which often occur during the afternoon when renewable generation output levels are relatively high. During these periods, the systems is relying on significant contributions from renewable resources to balance load. But the system must also be flexible enough to serve loads later in the evening, when load levels are still relatively high, but the output from renewable resources such as solar have dropped. Alternatives 1 and 2 fail to meet the dynamic needs of the emerging electric system.

Legally, the Commission is well within its authority to consider the CAISO's study case in its feasibility review. Consistent with the California Environmental Quality Act (CEQA) guidelines, the CAISO's power flow studies are part of the record and provide substantial, uncontroverted evidence regarding the technical infeasibility of Alternatives 1 and 2.⁷ In prior decisions, the Commission has acknowledged the relevance of similar information on the feasibility of project alternatives.⁸ In addition, the FEIR itself acknowledges that the Commission will take the CAISO's study case and results into account in making its final decision on the feasibility of project alternatives.⁹ Put simply, there is no logical or legal basis for ORA's assertion that the Commission should disregard the CAISO's analysis.

⁴ Exhibit CAISO-01.

⁵ Tr. at 16:21-26.

⁶ Exhibit CAISO-01, p. 9, fn. 8.

⁷ CEQA Guidelines § 15091(b).

⁸ D.16-08-017, p. 32-33.

⁹ FEIR, p. 291 ("The CPUC's decision-makers will consider CAISO's comments regarding the One Transformer Substation Alternative when making their final decision on the proposed Project and the feasibility of alternatives.")

C. FEIR Alternative 1 Is Electrically and Technologically Infeasible

FEIR 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. To test the effectiveness of Alternative 1, the CAISO conducted power flow studies based on the most recently documented long-term local capacity requirement studies for the LA Basin.¹⁰ These studies identified thermal overloads under both normal system conditions (NERC category P0) and N-1-1 conditions (NERC category P6).¹¹ Two of the CAISO-identified thermal overloads occur during normal system conditions (P0), which cannot be addressed by a remedial action scheme (RAS) under the NERC transmission planning standards.¹²

The CAISO conducted additional analysis with an alternative configuration as suggested in the FEIR comments.¹³ This alternative configuration connects the single 1600 MVA transformer to the “right-hand side” bus (aka Mesa south 230 kV bus), as indicated in the FEIR comments. Even with this alternative configuration the CAISO continued to observe overloaded system elements, including during P0 conditions.

Based on the CAISO’s analyses, Alternative 1 does not meet the basic project objectives of addressing identified NERC reliability criteria violations and not causing new NERC reliability violations. Accordingly, the Commission should reject it.

D. FEIR Alternative 2 is Electrically and Technologically Infeasible

FEIR 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 FEIR 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. To test the effectiveness of Alternative 2, the CAISO conducted the same power flow analysis it 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). Two of the CAISO-identified thermal overloads occur during normal system conditions (P0) and, as such, the CAISO cannot rely on a RAS to mitigate the overloads.

¹⁰ 2015-2016 CAISO Transmission Plan, p. 153-170.

¹¹ Exhibit CAISO-01, p. 8-9. The CAISO-identified overloads are indicated in Table 1 for the transformer connection to the “left-hand side” bus (aka north Mesa 230 kV bus.)

¹² Under normal system conditions, NERC TPL-001-4 disallows any interruption of firm transmission service or non-consequential load loss.

¹³ FEIR Response to CAISO Comments, p. 291.

The CAISO conducted additional analysis using an alternative configuration as suggested in the FEIR comments. This alternative configuration connects the two 1120 MVA transformers to the “right-hand side” bus (aka Mesa 230 kV south), as indicated in the FEIR comments. With this alternative configuration, the CAISO identified several overloaded system elements, including during P1, P3 and P6 conditions. Thus, the Commission should reject Alternative 2 as technologically infeasible.

E. Alternative 3 is Temporally and Potentially Economically Infeasible

Alternative 3 is electrically similar to the proposed project, but it proposes a GIS instead of an air-insulated substation at Mesa Substation. Alternative 3 meets NERC, WECC and CAISO transmission planning criteria by mitigating all known reliability concerns and not creating any new reliability concerns.

However, the GIS substation design, construction, and electrification cannot be completed prior to the retirement of Los Angeles Basin OTC generation in December 2020. According to SCE’s testimony, Alternative 3 would result in an approximate 14 month delay in the overall project schedule, meaning that it may potentially result in two additional summer peak periods without the project in-service.¹⁴ Based on this information, Alternative 3 cannot be completed and placed in-service to facilitate timely retirement of the Los Angeles Basin OTC generation and 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.¹⁵

In addition to delaying the in-service date, installing and maintaining a GIS will result in materially higher costs. SCE indicated that Alternative 3 would result in incremental costs of \$64-\$74 million compared to the Mesa Loop-In Project.¹⁶ The CAISO does not take a position on the economic feasibility of Alternative 3, but considers the increase in costs as an additional reason to reject Alternative 3.

¹⁴ Exhibit SCE-01, p. 18.

¹⁵ CEQA Guidelines § 15364.

¹⁶ Exhibit SCE-01, p. 26-28.

VI. Overriding Considerations

VII. CEQA Compliance

VIII. Necessity of Additional Measures to Maintain Electrical Reliability if Project Delayed Past 2020

Currently, significant gas-fired generation in the Los Angeles Basin is scheduled to retire at the end of 2020 in compliance with SWRCB's OTC policy.¹⁷ If the Mesa Loop-In Project is delayed past 2020, the OTC policy compliance dates for gas-fired generation in the Los Angeles Basin will likely need to be extended to preserve electric reliability. However, there is no guarantee that the SWRCB will agree to extend the OTC policy compliance dates. The SWRCB is advised by the Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS) to maintain reliability electric service, but the SWRCB itself must approve an adjustment greater than 90 days in the OTC compliance schedule after a full evaluation and hearing process.¹⁸

In order to timely retire the existing gas-fired generation subject to the OTC policy, the Mesa Loop-In Project must be completed and energized prior to the summer 2021 peak period.

IX. EMF Compliance

X. Safety Issues

¹⁷ Exhibit SCE-01, p. 7.

¹⁸ Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, Section 2(B)(2)(b).

XI. Conclusion

For the foregoing reasons, the CAISO urges the Commission to approve the Mesa Loop-In Project and reject the CEQA project alternatives due to their infeasibility.

Respectfully submitted,

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