BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of San Diego Gas & Electric Company (U902E) for a Certificate of Public Convenience and Necessity for the South Orange County Reliability Enhancement Project.	Application 12-05-020 (Filed May 18, 2012)

OPENING COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION ON THE PROPOSED DECISION AND ALTERNATE PROPOSED DECISION

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I. Introduction

Pursuant to the Rule 14.3 of the California Public Utilities Commission (Commission) Rules of Practice and Procedure, the California Independent System Operator Corporation (CAISO) files these comments on the Proposed Decision of Administrative Law Judge Farrar (Proposed Decision) and the Alternate Proposed Decision of President Michael Picker (Alternate Proposed Decision) issued on September 26, 2016. The CAISO supports the Alternate Proposed Decision's conclusion to grant San Diego Gas & Electric Company's (SDG&E) application for a certificate of public convenience and necessity (CPCN) for the South Orange County Reliability Enhancement Project (SOCRE Project).

The Alternate Proposed Decision correctly acknowledges that the identified alternatives to the SOCRE Project fail to meet reliability requirements, and the alternative selected in the Proposed Decision, significantly reduce transfer capacity on the southern California high voltage transmission system. The Proposed Decision's alternative disregards the fundamental physics of the southern California electric system, admittedly fails to address all reliability concerns, causes incremental overloading in the Southern California Edison Company (SCE) service territory, and reduces transfer capacity on the 230 kV transmission system infrastructure connected the San Diego and Los Angeles areas. For these reasons, the Commission should reject the Proposed Decision and approve the Alternate Proposed Decision, with certain clarifications discussed below.

These Opening Comments are organized as follows: Section II provides a brief overview of the SOCRE Project and the CAISO transmission planning process. Section III identifies the specific factual, legal, and technical errors in the Proposed Decision. This section focuses primarily on identifying factual errors regarding the purported electrical effectiveness of Alternative J in the Environmental Impact Report (EIR) and other variations thereof proposed in this proceeding. The Proposed Decision erroneously approves Alternative J instead of the SOCRE Project. The CAISO provides recommended redlines to the Proposed Decision in Attachment 1 to these comments. In Section IV, the CAISO provides comments on the Alternate Proposed Decision. The CAISO also identifies additional information from the evidentiary record that supports the findings and conclusions in the Alternate Proposed Decision that should be included in the final decision. Specific redlined clarifications to the Alternate Proposed Decision are included in Attachment 2.

II. Background

A. The SOCRE Project

The CAISO identified a reliability need in the South Orange County area in its 2010-2011 transmission planning process[1] primarily related to the exceedance of applicable ratings for transmission system elements during multiple Category C contingencies as defined in the North American Electric Reliability Corporation (NERC) mandatory transmission planning standards.[2] The CAISO analyzed a number of alternatives to address the South Orange County reliability issues, including proposals from SDG&E. The CAISO identified and refined the SOCRE Project through the planning process, and ultimately the CAISO's Board of Governors approved it. The SOCRE Project SDG&E presented for approval in this proceeding is materially unchanged from the project the CAISO Board of Governors approved in the 2010-2011 transmission plan.[3]

The SOCRE Project consists of the following:

- Replacing an existing approximately 8-mile, 138 kV transmission line (TL13835) with a new 230 kV double-circuit extension between SDG&E's Capistrano and Talega Substations. One side will form part of a new 230 kV circuit from San Onofre bypassing the Talega substation and connecting to the Capistrano

[1] Exhibit CAISO-500, p. 8.
[2] Id. at p. 9.
[3] Id.

substation, and the other side will extend from the Capistrano substation to tap the existing Talega-Escondido 230 kV line near Talega;

- Looping in two 138 kV transmission lines that currently bypass the existing substation into the Capistrano Substation;
- Building a new 230 kV partially enclosed gas insulated substation at the existing 138/12 kV Capistrano Substation site; and
- Rebuilding and expanding the existing Capistrano Substation 138 kV facility with a new partially enclosed gas insulated substation.[4]

B. Applicable NERC and CAISO Standards

The CAISO plans the transmission system to meet mandatory reliability standards developed by NERC and the Western Electricity Coordinating Council (WECC).[5] In addition, the CAISO has developed its own Planning Standards to "complement [the NERC and WECC reliability standards] where it is in the best interests of the security and reliability of the [CAISO] controlled grid."[6] NERC Standards apply to all elements of the bulk electric system (BES). Further, the CAISO Planning Standards specify that "[t]he [CA]ISO will apply NERC Transmission Planning (TPL) standards,…and the approved WECC Regional Criteria to facilities with voltages levels less than 100 kV or otherwise not covered under the NERC Bulk Electric System definition that have been turned over to the [CA]ISO operational control."[7] The South Orange County transmission system is under CAISO's operational control and, therefore, the CAISO plans to meet all NERC transmission planning standards and the CAISO Planning Standards.

C. Project Objectives

The CAISO identified at least four primary project objectives for the SOCRE Project. First, the project should address all reliability concerns identified based on NERC requirements and CAISO Planning Standards.[8] Second, the project should provide a second transmission source to the South Orange County transmission system.[9] Third, the project should not

[4] Id. at p. 7-8.
[5] Exhibit CAISO-500, p. 3.
[6] Exhibit ORA-227, p. 3.
[7] Id. at p. 4.
[8] Exhibit CAISO-500, p. 9.
[9] Exhibit CAISO-502, p. 12.

compromise the overall effectiveness or reliability of the bulk electric system in Southern California.[10] Lastly, the project should enable SDG&E to perform necessary equipment replacement without jeopardizing reliability.[11] The SOCRE Project meets each of these objectives in a manner that is superior to other alternatives presented during this proceeding.

III. The Proposed Decision

A. Summary

The Proposed Decision approves Alternative J to the SOCRE Project as a means of meeting the reliability issues identified by the CAISO. Alternative J is described as "the 230 kV Loop In to Trabuco Substation" though the specific configuration is not specified in the Proposed Decision.[12] As defined in the EIR, Alternative J electrically interconnects SDG&E's South Orange County 138 kV transmission system with SCE's 230 kV system at the SDG&E owned Trabuco Substation. Throughout the course of this proceeding, the CAISO has reviewed at least six different iterations of Alternative J. Each version suffers from critical, yet distinct, deficiencies. The Proposed Decision seems to conflate the different versions of Alternative J and the distinct deficiencies related to each. This confusion underscores the difficulty and flaws of conducting an *ad hoc* review of transmission solutions that are not supported by power flow analysis or subjected to rigorous multi-stakeholder review process, such as the CAISO's transmission planning process.

The record in this proceeding illustrates why a more holistic approach that considers impacts across the transmission network is the preferred basis on which the Commission should approve transmission infrastructure investment. The Proposed Decision seems to accept that Alternative J needs such a holistic transmission planning assessment, as the Proposed Decision notes that it "lack[s]s sufficient information to assess the …ultimate feasibility of such an endeavor" and directs SDG&E to undertake additional studies to identify necessary upgrades to transmission system to accommodate Alternative J.[13] However, the record in this proceeding is sufficient to determine that the Proposed Decision suffers from critical factual errors, which, once corrected, make clear that Alternative J is infeasible. The CAISO details these errors below.

[10] Exhibit CAISO-500, p. 11.
[11] Id. at p. 10.
[12] Proposed Decision, p. 2.
[13] Proposed Decision, p. 44.

B. Alternative J Does Not Address All Violations of Applicable Reliability Standards

The Proposed Decision relies on the final EIR to justify its selection of Alternative J, asserting that it "would ensure that each of the potential Category C (N-1-1) contingencies identified by the applicant and the CAISO would be avoided through the 10-year planning horizon."[14] This fundamental finding is inaccurate because it fails to consider the new violations of applicable reliability standards Alternative J causes. In other words, although Alternative J remediates certain overloads that led the CAISO to approve the SOCRE Project, Alternative J simultaneously creates new overloads that are unaccounted for in and not resolved by the Proposed Decision.

1. Alternative J as Proposed in the FEIR Results in Overloading of the Single 230/138 kV Transformer at Trabuco Substation.

As proposed in the final EIR, Alternative J has only one 230/138 kV transformer at the redesigned Trabuco Substation. The CAISO studied this alternative and found that it created significant overloads on the single 230/138 kV transformer.[15] The Proposed Decision erroneously states that "the single proposed transformer is not mentioned as a limiting factor in the testimony the CAISO cites, and the concerns raised by the CAISO pertain to effects on the SCE system under severe circumstances that allow load drop."[16] This statement is incorrect in several ways:

- First, the testimony cited by the CAISO expressly states that "the CAISO identified thermal overload issues on the single 230/138 kV transformer at the Trabuco substation proposed in Alternative J."[17] The testimony is further supported by a table presenting the results of the CAISO's power flow analysis, which shows that under Alternative J, the single 230/138 kV transformer is loaded at 114% of its applicable rating.[18]

[14] Proposed Decision, p. 49.
[15] Exhibit CAISO-505, p. 8.
[16] Proposed Decision, p. 40-41.
[17] Exhibit CAISO-505, p. 4, ln. 3-5.
[18] Exhibit CAISO-505, p. 8, Table 1.

- Second, this testimony does not reference concerns in the SCE system under severe circumstances. The testimony cited specifically refers to "Thermal Overloads in the SDGE SOC System."[19]
- The CAISO's study was performed under reasonable off-peak 2020 conditions, with 1800 MW of northbound flow.[20] These conditions are not substantially different than those that have been observed to date, which have exceeded 1400 MW of northbound flow.[21] The path is capable of delivering up to 2400 MW.[22]

2. Alternative J as Modified with a Second 230/138 kV Transformer at Trabuco Substation Creates Additional Overloads.

Because the FEIR version of Alternative J was clearly flawed without adding a second transformer at Trabuco Substation, the CAISO conducted analysis with the addition of a second 230/138 kV transformer. Although this analysis was limited in nature given the short timeframe between issuance of the recirculated draft EIR and the testimony due date, the CAISO found significant additional overloads even with a second transformer.[23] The transmission system elements that would need to be upgraded are noted in the CAISO's prepared testimony on Alternative J.[24] The specific overloads on these transmission system elements, even with the second Trabuco Transformer, are in the record of this proceeding.[25] Based on this analysis, the CAISO identified five overloaded transmission system elements in SDG&E's South Orange County system with the second Trabuco transformer in place.[26] The Proposed Decision ignores this analysis.

The Proposed Decision states that "there are also thermal overloads of nearly identical magnitude during the contingencies presented for the SOCRE Project and other alternatives. Thus, Alternative J cannot be said to cause the thermal overloads."[27] This is demonstrably false. As the CAISO's studies show and the CAISO has repeated stated, the SOCRE Project mitigates

[19] Exhibit CAISO-505, p. 8, Table 1 (See Table 1 heading).
[20] Exhibit CAISO-505, p. 8, Table 1.
[21] Tr. at 323.
[22] Id.
[23] Exhibit CAISO-505, p. 6; Exhibit Frontlines-436, p. 7 of 10.
[24] Exhibit CAISO-505, p. 6, ln. 8-23.
[25] Exhibit Frontlines-436, p. 7 of 10 (Table 1 shows 5 overloaded transmission system elements in SDG&E's South Orange County system. The final column represents element loading with the second Trabuco transformer in place.)
[26] Id.
[27] Proposed Decision, p. 41.

all overloads in the South Orange County system, and no party contests this fact.[28] The Proposed Decision seems to conflate the CAISO's analysis regarding how Alternative J would impact ***SDG&E's South Orange County system*** with the CAISO's supplemental analysis regarding Alternative J impacts on the ***SCE transmission system***. The CAISO addresses the SCE system impacts separately below, but it is imperative that the Commission correct the Proposed Decision to indicate that SOCRE Project mitigates all overloading issues on the SDG&E South Orange County system (*i.e.*, the purpose for which it was designed).

3. The Overloads on the SDG&E South Orange County System Cannot be Addressed by a Special Protection System.

The Proposed Decision correctly notes that the CAISO represented that overloads on the SDG&E South Orange County System could not be resolved by instituting a Special Protection System (SPS).[29] However, the Proposed Decision errs in stating that the CAISO did not provide a clear explanation of its reasoning. To the contrary, the CAISO clearly explained in prepared testimony, on cross-examination, and in briefs that an SPS would be infeasible because it would not comply with the CAISO's Planning Standards.

- In prepared testimony, CAISO witness Millar expressly stated that based on CAISO Planning Standards, an SPS should not be used to monitor more than four transmission system elements;[30]
- At hearing, in response to a question regarding whether the CAISO had considered an SPS to mitigate overloads associated with Alternative J, CAISO witness Sparks stated that the CAISO considered and rejected it because "that solution was not feasible to be implemented and still meet the [CA]ISO SPS guidelines or grid planning standards.";[31]
- The CAISO's Opening Brief explained that such an SPS would be "infeasible as it would trigger an exceedingly complex SPS that would not meet the CAISO Planning Standards.";[32]

[28] Exhibit CAISO-505, p. 8.
[29] Proposed Decision, p. 41.
[30] Exhibit CAISO-500, p. 10, ln. 27-29.
[31] Tr. at p. 336.
[32] CAISO Opening Brief, p. 19.

The Proposed Decision ignores all of these clear statements. Further, the CAISO Planning Standards are part of the record in this proceeding. The CAISO Planning Standards specifically state that an SPS "should not be monitoring more than 4 system elements or variables."[33] As noted above, the CAISO's analysis in this proceeding indicates that even the least flawed version of Alternative J, which adds a second Trabuco transformer, still results in five overloaded transmission system elements. As a result, the CAISO Planning Standards do not allow an SPS. The SPS options was not "presumed not to meet CAISO guidelines" as the Proposed Decision states,[34] but rather shown to be infeasible based on CAISO Planning Standards. Indeed, if Alternative J is actually approved and implemented, it would create a problem similar to the current one in which multiple transmission system element overloads led to the need for the SOCRE Project in the first instance.

4. Single Contingency Load Shedding Concerns Are Unique to the ORA's Alternative J Variants.

The Proposed Decision incorrectly summarizes the CAISO's opposition to Alternative J by stating the "CAISO opposes Alternative J on claims that it would modify the South Orange County system in a way that causes single contingency load shedding that does not exist today and so, would be an unacceptable degradation of customer service."[35] This statement mistakes the CAISO's specific concerns related to ORA's proposed Alternative J variations with Alternative J more generally. Both the CAISO testimony and Opening Brief sections cited by the Proposed Decision pertain to ORA's Alternative J variants[36] that were uniquely flawed because they separated the South Orange County 138 kV system into two parts. As a result, the ORA variants cause single contingency load shedding that does not occur today. Thus, the two ORA Alternative J variants are wholly unacceptable alternatives, but this concern expressed by

[33] Exhibit ORA-227, p. 10 (See ISO SPS6).
[34] Proposed Decision, p. 46, footnote 97. The CAISO notes that this footnote and the accompanying text imply that the CAISO "presumed" the SPS would not meet CAISO Planning Standards. The CAISO never "presumed" an outcome, but rather conducted actual study of electrical flows to determine that the proposed SPS would not meet clearly defined guidelines.
[35] Proposed Decision, p. 48 (Citing the CAISO Opening Brief, p. 17-18, citing Exhibit CAISO-504, p. 2-3).
[36] CAISO Opening Brief, p. 17 ([ORA's Trabuco] alternative would separate the South Orange County load into two parts by opening some of the 138 kilovolt (kV) circuit breakers … Similar to the Trabuco Alternative, the Pico Alternative would separate South Orange County load into two parts by opening some 138 kV circuit breakers… Both alternatives would result in substantial single contingency load dropping in the South Orange County area.")

the CAISO does not apply more generally to all Alternative J variations. The Proposed Decision then incorrectly assumes that substation improvements at Talega and Trabuco Substation could address this single contingency load shedding. That assumption is flawed because multiple 138 kV substations would be served from a single radial 138 kV line, subjecting the substations to single contingency load drop no matter how the substations were improved.[37] As discussed above, even assuming the 138 kV system is not separated, Alternative J results in transmission element overloads in the South Orange County system that cannot be addressed by an SPS.

5. All Variants of Alternative J Exacerbate Conditions on SCE's Transmission System.

The Proposed Decision conflates the overloads in the SDG&E Southern Orange County system caused by Alternative J with the increased loading in the SCE system caused by Alternative J. For example, the Proposed Decision states that "the only overload shown for Alternative J that is not also an overload with the SOCRE Project, is wholly mitigated by the Trabuco second transformer alternative."[38] The CAISO notes that the statement cited in the Proposed Decision does not indicate that all overloads would be solved by adding a second Trabuco transformer; rather, the specific overload of the single 230/138 kV transformer would be mitigated.[39] Indeed, later in the transcript the CAISO witness clarified that adding a second transformer mitigated the initial identified overload, "but unfortunately it did cause other problems."[40] These other problems are identified in Exhibit Frontlines-436, p. 7 of 10, which identifies five overloaded elements after adding a second Trabuco transformer. The Proposed Decision fails to account for this.

[37] Exhibit CAISO-504, p. 3, ln. 4-15.

[38] Proposed Decision, p. 41, citing the transcript at p. 349, ln. 4-7, which states: "And so the transformer was what we assumed would be the mitigation -- the proper mitigation if, again, this alternative were pursued." The CAISO notes that this statement does not indicate that all overloads would be solved by the addition of a second Trabuco transformer. Indeed, later in the transcript at p. 350, ln. 7-10, the witness clarified that the addition of a second transformer mitigated the initial identified overload, "but unfortunately it did cause other problems." These other problems are identified in Exhibit Frontlines-436, p. 7 of 10, which finds five overloaded elements after the addition of a second Trabuco transformer.

[39] The citation refers to the transcript at page 349, ln. 4-7. There the CAISO witness states: "And so the transformer was what we assumed would be the mitigation -- the proper mitigation if, again, this alternative were pursued." Reading the transcript in full, it is clear that the second transformer is referred to as the "proper mitigation" in response to ORA counsel's specific question on transcript page 348, ln. 5-8, which is related to "the identified overload event in Table 1 of 505." (*i.e.*, the overloading of the single Trabuco transformer).

[40] Tr. at p. 350, ln. 7-10.

The Proposed Decision references "thermal overloads of nearly identical magnitude during the contingencies presented for the SOCRE Project and other alternatives."[41] Although the Proposed Decision fails to provide a relevant citation, it appears that this section references the CAISO's studies of the ***SCE system*** under Alternative J versus the impacts of the SOCRE Project.[42] The CAISO's studies of impacts on the SCE system are included in pages 9-11 of Exhibit CAISO-505. These studies show that in every case, Alternative J exacerbates loading issues on the SCE transmission system. The Proposed Decision correctly notes that in many cases the differential caused by Alternative J does not directly cause a thermal overload. However, the costs of exacerbating loading in the SCE system are real and significant, especially because the CAISO has already identified a need for new generation or storage resources in that area.

The CAISO presented unrebutted evidence that increased loading in SCE's system would cause a need for an additional 100 MW of generation or storage resource to mitigate the impact from Alternative J.[43] The Proposed Decision writes off this impact as a "small fraction" of the new resources already required.[44] There is no basis for asserting that 100 MW of additional generation is a *de minimis* impact, especially given the cost of the SOCRE Project. Conservatively assuming such additional resources could be sited at proper locations and at a competitive price, the total cost would approach $200 million,[45] about half the price of the total SOCRE Project. These costs would be added to the costs to upgrade the South Orange County 138 kV system, already estimated at $402-492 million by SDG&E, thereby making it significantly more expensive than the SOCRE project.

The CAISO also notes that the impacts on the SCE system have not been fully studied; the impacts already identified by the CAISO merely represent the minimum impacts that might be expected. Any Alternative J variant approved by the Commission would need to go through the CAISO's full transmission planning process to consider the system-wide consequences of such a configuration.

[41] Proposed Decision, p. 41.
[42] Subsequent sentences compare the impacts of the SOCRE Project versus Alternative J on the SCE system.
[43] Tr. at p. 392, ln. 22-28.
[44] Proposed Decision, p. 41.
[45] Assumes a price of two dollars per watt for new resources.

C. The Proposed Decision Does Not Properly Consider the CAISO's Role as Planning Coordinator and the Commission's Role in Reviewing Transmission Solutions for Public Convenience and Necessity.

1. The CAISO Must Comply with NERC Reliability Standards and the CAISO Planning Standards

As the NERC registered Planning Coordinator, the CAISO is obligated to meet NERC reliability standards. Pursuant to Section 215 of the Federal Power Act, NERC is the "Electric Reliability Organization" tasked with establishing and enforcing reliability standards for the bulk-power system.[46] All users, owners and operators of the bulk-power system must comply with the reliability standards that take effect pursuant to NERC's enabling legislation.[47] With respect to transmission planning standards, the CAISO tariff explicitly acknowledges that the planning process is designed to identify transmission solutions necessary to comply with NERC reliability standards and the CAISO Planning Standards.[48] CAISO compliance with these standards is mandatory and cannot be excused by the Commission.

2. CAISO Transmission Planning and Commission CPCN Review Should Be Complementary Processes.

The Proposed Decision states that the Commission is "not required to defer to the rules or standards [the CAISO] adopts for transmission planning."[49] Although this statement is partially true, it fails to recognize the disconnect between the Commission's authority to accept, reject, or modify transmission solutions and the CAISO's obligation to meet mandatory transmission planning standards. In this proceeding, the CAISO has noted that Alternative J is an electrically distinct solution and a significant departure from the SOCRE Project approved in the CAISO transmission plan. Because Alternative J is a completely different electrical project than the SOCRE Project, if the Commission approves Alternative J, the CAISO would need to comprehensively review it in the CAISO's transmission planning process to assess its full impact on system reliability. As discussed in this proceeding, at this time the CAISO does not believe any variation of Alternative J meets system reliability needs, and, in some cases, it exacerbates existing needs. If the CAISO finds that a Commission-approved variation of Alternative J does

[46] 16 U.S.C. 824o(b)(1).
[47] Id.
[48] CAISO Tariff, Section 24.2(a).
[49] Proposed Decision, p. 29.

not meet system reliability needs, the CAISO will be obligated to identify additional solutions that will meet those needs in accordance with NERC and CAISO Planning Standards. Though the Commission is not directly subject to NERC or CAISO Planning Standards, the CAISO remains subject to them and must seek to comply with them regardless of the project ultimately approved by the Commission. Indeed, State law requires the CAISO to "ensure efficient use and reliable operation of the transmission grid consistent with achievement of planning … criteria no less stringent than those established by the Western electricity Coordinating Council and the North American Electric Coordinating Council."[50] These State law requirements should not be undermined.

The CAISO notes that the Proposed Decision cites a 2001 Commission decision to support its statement that the Commission is not required to defer to transmission rules or planning standards.[51] There have been significant changes in the transmission planning paradigm since that decision. In 2001, the mandatory reliability standards did not yet exist, and NERC did not have enforcement authority as the Electric Reliability Organization. At that time, the CAISO did not have a robust FERC-approved transmission planning process, but rather only reviewed and concurred with participating transmission owner plans. The 2001 decision specifically noted that transmission planning process in place at the time of review of "new and untested" and that it was the first transmission line CPCN granted since the passage of AB 1890, which formed the CAISO.

Today, however, the CAISO undertakes an annual transmission planning process that has been approved by FERC in which the CAISO independently assesses system needs to meet mandatory reliability standards, state policy needs, and economic conditions. The mandatory transmission planning reliability standards have been in place for years, and NERC can levy significant fines on the CAISO for non-compliance. The CAISO, the Commission, and the Energy Commission have worked together to develop common assumptions to coordinate more effectively the CAISO transmission plan and Commission procurement proceedings. In summary, the transmission planning landscape has changed significantly since 2001, and interaction between the CAISO's transmission planning process and the Commission's CPCN review process should recognize this fact and the CAISO's unique role and obligation to

[50] Pub. Util. Code Section 343.
[51] Proposed Decision, p. 29.

maintain system reliability. These processes should work together to ensure that approved transmission solutions meet mandatory reliability standards in the most environmentally sound manner and at lowest possible cost.

D. Miscellaneous Corrections to the Proposed Decision

1. The Proposed Decision's Discussion of Load and Load Growth is Misleading.

The Proposed Decision discusses actual observed loads and load in great detail.[52] The CAISO believes this discussion is misleading and unnecessary because no matter what forecast is used, similar reliability issues are found. The CAISO used the most recent forecast developed by Energy Commission, which is lower that SDG&E's forecast, but still found numerous overloads without the SOCRE Project within the ten-year planning range. The difference in forecasts is minor and not determinative of the results.

Additionally, the discussion in the Proposed Decision improperly uses observed load to undercut base case forecasts. Based on the process alignment developed by the Commission, the CAISO and the Energy Commission (CEC), the CAISO uses 1-in-10 year peak load forecasts prepared by the CEC as the basis for its transmission planning activities. These forecasts represent potential loading conditions during a 1-in-10 year peak weather event and are used to ensure that the transmission system is capable of meeting such events. The fact that previous years did not reach the forecast level is not relevant, given that one would not expect a 1-in-10 peak year weather event in each year.

The CAISO notes that the Alternate Proposed Decision also contains many of these same errors. Specific modifications to Findings of Fact are included in Attachment 2.

2. The Proposed Decision's Discussion of Category D Events Addressed by Alternative J is not Relevant.

The Proposed Decision claims that Alternative J will provide "a level of reliability unmatched by the SOCRE Project," apparently on the basis that Alternative J can address some Category D events that are not addressed by the SOCRE Project. However, the CAISO is not required to plan the transmission system to mitigate all identified Category D contingencies and Alternative J fails to meet all Category C contingencies, which the CAISO is required to

[52] Proposed Decision, p. 20-22.

mitigate. The fact that Alternative J may address some Category D contingencies is not relevant to whether it meets reliability needs, because it fails to meet the basic project objectives.

IV. The Alternate Proposed Decision

As stated above, the CAISO supports the Alternate Proposed Decision because it meets reliability needs and is based on substantial evidence. The CAISO proposes certain clarifications to the Alternate Proposed Decision. Specific modifications to the Alternate Proposed Decision are included in Attachment 2.

A. The Alternate Proposed Decision Should Note the Overloaded Elements in the South Orange County Caused by Alternative J.

The Alternate Proposed Decision correctly notes that that CAISO analyzed Alternative J based on the recirculated draft EIR that found overloads on the single 230/138 kV Trabuco transformer and additional overloads if a second transformer was added to the Trabuco Substation.[53] The CAISO believes it is important to indicate the specific overloads that will occur even if the second transformer is added. The five facilities overloaded are as follows: (1) TL13835A of the Talega-San Mateo- Laguna Niguel three-terminal line from Talega Tap to Laguna Niguel; (2) TL13846A of the Talega-San Mateo-Pico three-terminal line from Talega to Talega Tap33; (3) TL13816 from Pico to Capistrano; (4) TL13836 from Talega to Pico; and (5) the Trabuco-Capistrano-Pico-Laguna Niguel 138 kV system.[54] The specific overload amounts for these facilities can be also referenced.[55] The discussion on pages 43 and 44 of the Alternate Proposed Decision should also reflect the increased thermal loading of the South Orange County 138 kV facilities when a second Trabuco transformed is added to Alternative J. These facts bolster the Alternate Proposed Decision's determination and provide additional evidence to support its conclusions.

B. The Alternate Proposed Decision Should Identify the CAISO Planning Standard That Would Not be Met by Alternative J.

The Alternate Proposed Decision notes that the CAISO determined that an SPS to meet overloads caused by Alternative J would be exceedingly complex and not meet CAISO Planning Standards. The CAISO Planning Standards are in the record, and the decision should reference

[53] Alternate Proposed Decision, p. 42.
[54] Exhibit CAISO-505, p. 6.
[55] Exhibit Frontlines-436, p. 7 of 10 (the rightmost column shows transmission element loading with the addition of a second transformer at the Trabuco Substation).

the standard this SPS would violate. Specifically, the Alternate Proposed Decision should note that an SPS cannot monitor more than four system elements or variables pursuant to Section III(1)(ISO SPS 6).[56] Because the CAISO identified more than four overloaded elements, an SPS would be infeasible.

V. Conclusion

The CAISO appreciates this opportunity provide comments on the Proposed Decision and the Alternate Proposed Decision. Based on the foregoing, the CAISO recommends that the Commission approve the Alternate Proposed Decision, with the minor modifications discussed above, as a reasonable means of meeting identified reliability issues in the South Orange County area. The Proposed Decision suffers from critical factual errors and should be rejected.

Respectfully submitted

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[56] Exhibit ORA-227, p. 10.

ATTACHMENT 1

Attachment 1

CAISO Recommended Corrections to the Proposed Decision

(Footnotes omitted unless modifications are proposed)

2.3.3. Reliability Conclusion

While the ISO has responsibility to ensure the reliability of the State's electrical system pursuant to Pub. Util. Code § 345, reliability planning and deciding that a particular transmission project should be built are two vastly different issues. Pub. Util. Code § 1001 places an ongoing responsibility on this Commission to evaluate the public convenience and necessity of proposed transmission projects, and therefore we independently assess the record developed in this proceeding to determine whether projects or alternatives are appropriate on the basis of reliability, as well as safety and economics. ~~Although we~~ We appreciate the CAISO's insights, ~~we are not required to defer to~~and recognize that the ~~rules or~~ mandatory reliability standards ~~it adopts~~ for transmission planning are controlling on the CAISO. With that recognition, we seek to approve transmission solutions that meet the identified reliability standards in a manner that is consistent with Pub. Util. Code § 1001. The parties devoted considerable time and effort to the question of whether the facilities at issue were local or a bulk electrical system under NERC. However, this distinction is of limited relevance in light of the revisions to NERC that took effect in January 2016, after hearings in this proceeding. Consistent with the new NERC provisions and our limited record on the issue, we will apply the 2016 NERC regulations to those project alternatives that carry a risk of a significant (>75 MW) loss of load under a single contingency. The projects affected by this limitation are the "No Project" alternative, the Group 2 alternatives which include B.1-B.4 and E, and Group 3 alternatives C1, C2, and D. Neither the 2016 NERC standard nor the BES exemption are relevant to Alternatives F, G, and J, as no single contingency (Category B, P1, P2) overloads/load shedding was found in the reliability studies of those alternatives as they do not carry a risk of a significant loss of load (>75 MW) under a single contingency and are not impacted by the new footnote 12.

2.4.8. Alternative J

2.4.8.1. Reliability

…

The CAISO offers several arguments in opposition to Alternative J. For example, ~~in briefs~~ the CAISO ~~claims to have~~ performed an analysis of Alternative J in response to the Recirculated (RDEIR) and found overloads on the single proposed 230/138 kV transformer at Trabuco Substation.~~75 However, contrary to the CAISO's claims, t~~The single proposed transformer is ~~not mentioned as~~ a limiting factor based on~~in~~ the testimony the CAISO cites. The CAISO did further analysis based on the assumption that a second transformer would be added at the Trabuco Substation. This analysis identified five transmission elements in the South Orange

County system that incur thermal overloads even with the second Trabuco transformer in place.[1] In addition, the CAISO found that thermal overloading issues on the SCE transmission system are exacerbated by Alternative J.[2]~~, and the concerns raised by the CAISO pertain to effects on the SCE system under severe circumstances that allow load drop. Moreover, the CAISO acknowledges that the only overload shown for Alternative J that is not also an overload with the SOCRE Project, is wholly mitigated by the Trabuco second transformer alternative.76 Thus, while the CAISO claims to have found additional thermal overloads "caused by Alternative J," the evidence the CAISO relies on shows that there are also thermal overloads of nearly identical magnitude during the contingencies presented for the SOCRE Project and other alternatives. Thus, Alternative J cannot be said to cause the thermal overloads.~~

The CAISO also argues that an additional 100 MW of generation or storage would be required for the San Diego area as a consequence of the slight (2%) additional overload of the parallel 230 kV SCE-owned lines caused by Alternative J in a P6 contingency. However, as described in Exhibit CAISO-505 (at 4), CAISO's 2015-2016 Transmission Planning Process identified overload and voltage stability concerns on SCE's adjacent Ellis-Santiago and Ellis-Johanna 220 kV lines and the Johanna/Santiago/Ellis substations for the same NERC Category P6 contingencies. Based on the CAISO's own studies, it appears these concerns could be addressed by implementing 2107 MW of preferred resources and energy storage as mitigation. The need for the 2107 MW is irrespective of the SOCRE project, and Alternative J's requiring an additional 100 MW is a~~ small fraction of the resources already required regardless of which project is selected~~ real and costly impact on the SCE transmission system.

~~While t~~The CAISO ~~claims to have~~ reviewed whether these issues could be resolved by the institution of an SPS, and found that such an SPS would be infeasible (as it would trigger an exceedingly complex SPS that would not meet the CAISO Planning Standards), when ~~repeatedly~~ asked about this issue during hearings the CAISO witness ~~was unable or unwilling to~~ provided a clear explanation ~~of his reasoning~~that such an SPS would not meet CAISO SPS guidelines or grid planning standards. This detail is further explained by reference to the CAISO's Planning Standards, which specifically state that an SPS "should not be monitoring more than 4 system elements or variables."[3] ~~Ultimately however, the CAISO acknowledged that a second transformer at Trabuco would mitigate its overloading concerns.78~~

~~In addition to agreeing with the CAISO's general opposition to Alternative J, SDG&E opposes the Talega addition on claims that there is not sufficient space at the facility to allow the necessary construction.79 SDG&E's contention in this regard appears based on a company standard which SDG&E failed to document and itself does not appear to follow.80~~

2.4.8.3. Loop Flow

…

[1] Exhibit Frontlines-436, p. 7 of 10.
[2] Exhibit CAISO-505, p. 8.
[3] Exhibit ORA-227, p. 10 (See ISO SPS6).

The third source SDG&E sites in support of this contention~~,~~ is testimony provided by the CAISO~~, is similarly flawed. In addition to being similarly admonished by the ALJ for providing evasive answers, t~~The CAISO witness indicated that using an SPS to eliminate loop flow overloads ~~in South Orange County~~ was ~~not analyzed by CAISO but deemed~~ feasible to be implemented and still meet the ISO SPS guidelines or grid planning standards.[4] ~~"not feasible because SPS was presumed not to meet CAISO guidelines."~~ ~~Notably, on further cross-examination the CAISO witness could not identify a single standard that would be violated by using SPS to open up the Trabuco transformers.98~~

~~Though hampered by less than cooperative witnesses,~~ ORA, FRONTLINES, and SJC provide ~~cogent~~ rebuttals to the loop flow issue identified by SDG&E. According to ORA, while loop flow can be an issue under Alternative J such loop flow issues only become a concern in the unlikely event ~~-~~that there is "no load at all in the SOC [South Orange County] area" and these loop flow issues can be mitigated by installing Special Protection Systems. ORA concludes, "[l]oop flow and path rating issues of the Trabuco Alternative are of minimal concern." ORA provides no actual power flow data or comparable studies to support these assertions.

For its part, FRONTLINES ~~points out~~asserts that the CAISO's witness confirmed that opening the transformer connection at Trabuco would indeed reduce the flow out of Trabuco to zero, and eliminate any overload created by loop flow through the transformer. However, this statement is not relevant to the outcome of this proceeding, because, as the CAISO witness further testified, the SPS necessary to reduce the flow would be infeasible.[5] The Commission cannot approve a transmission solution that it knows will create thermal overloading issues on the hope that the CAISO will put in place an SPS that violates its Planning Standards. ~~FRONTLINES notes that SDGE does not dispute its testimony that loop flow through South Orange County can be eliminated by disconnecting South Orange County from the Santiago- Trabuco line when extreme circumstances occur.103~~

Given the record developed over the course of the proceeding on this issue, ~~we conclude that it is difficult, if not impossible, to absolutely avoid~~ loop flow issues created by Alternative J are unacceptable ~~when there are multiple power sources to a local area~~. ~~Where SDG&E highlights the likelihood of loop flow issues and overstates the difficulty of addressing these issues as they relate to Alternative J, SDG&E ignores the loop flow issues associated with the SOCRE Project entirely.~~

Findings of Fact, Conclusions of Law and Ordering Paragraphs

In addition to the changes recommended above, the CAISO believes that the Findings of Fact, Conclusions of Law and Ordering Paragraphs in the Alternate Proposed Decision should be adopted in place of those in the Proposed Decision, with the modifications recommended in Attachment 2.

[4] Tr. p. 336, ln. 24-26.
[5] Tr. at p. 344, ln. 13-16.

ATTACHMENT 2

Attachment 2

CAISO Recommended Corrections to the Alternate Proposed Decision

(Footnotes omitted unless modifications are proposed)

3.3.8.1. Reliability

Supporters of Alternative J advance several arguments in favor of this alternative's reliability function. FRONTLINES submits that the Trabuco alternative offers the benefit of providing a power source that is "far" from the Talega Substation and thus mitigates the risk to the entire SOC load (see discussion above). FRONTLINES also asserts that the Trabuco alternative is superior to the SOCRE Project because it:

- is far less costly, will not cause load shedding even if Trabuco is removed from service while Talega remains operational.
- can be supplied with voltage support in the event Talega is removed from service via the Synchronous condensers recently installed at Santiago.
- is fully redundant to Talega because South Orange County load will be fully served by Trabuco in the event Talega is removed from service, and South Orange County load will be fully served by Talega in the event Trabuco is removed from service.

ORA and the SJC also offer general support for the Trabuco Alternatives. Both SDG&E and CAISO, however, contest the feasibility of Alternative J and raise electric reliability problems that can arise affecting the larger transmission grid, outside of the SOC area. The CAISO's greatest concerns with the Trabuco Alternative are the risk of loop flows and reduction in transfer capability between San Diego to the Los Angeles Basin.

SDG&E argues that, even if it were feasible to construct Alternative J on the proposed site, the Trabuco Alternative would cause loop flows on the SOC system and on SCE's system. SDG&E asserts that its power flow analyses show that the SCE interconnection called for under this alternative can cause loop flow. According to SDG&E, it and the CAISO testified to, and Southern California Edison (SCE) expressed concerns about, likely adverse impacts from paralleling SDG&E's 138 kV and SCE 220 kV systems.

CAISO, the FERC-approved operator of the transmission system, agrees. CAISO performed an analysis of Alternative J based on the RDEIR's configuration and found overloads on the single proposed 230/138 kV transformer at Trabuco Substation,[1] and even found overloads if there were two 230/138 kV transformers installed. The CAISO did analysis based on the assumption that a second transformer would be added at the Trabuco Substation. This analysis identified five transmission elements in the South Orange County system that incur thermal overloads even with the second Trabuco transformer in place.[2] In addition, the

[1] Exhibit CAISO-505, p. 8.
[2] Exhibit Frontlines-436, p. 7 of 10.

CAISO found that thermal overloading issues on the SCE transmission system are exacerbated by Alternative J.[3]

ORA, FRONTLINES, and SJC rebut the loop flow issue identified by SDG&E. According to ORA, while loop flow can be an issue under Alternative such loop flow issues only become a concern in the unlikely event that there is "no load at all in the SOC area" and these loop flow issues can be mitigated by installing Special Protection Systems. ORA concludes, "[l]oop flow and path rating issues of the Trabuco Alternative are of minimal concern."

For its part, FRONTLINES points out that the CAISO's witness confirmed that opening the transformer connection at Trabuco would indeed reduce the flow out of Trabuco to zero, and eliminate any overload created by loop flow through the transformer. FRONTLINES notes that SDGE does not dispute its testimony that loop flow through South Orange County can be eliminated by disconnecting South Orange County from the Santiago- Trabuco line when extreme circumstances occur.

Some parties have urged that the installation of a Special Protection System (SPS) would mitigate the overloads. CAISO, however, similarly analyzed this and determined that an SPS would be infeasible as it would "trigger an exceedingly complex SPS that would not meet CAISO Planning Standards." This detail is further explained by reference to the CAISO's Planning Standards, which specifically state that an SPS "should not be monitoring more than 4 system elements or variables."[4]

One of CAISO's main concerns with Alternative J is that it would lead to loop flows if SOC's 138 kV system is parallel with the 230 kV system. Because electricity travelling on the transmission system follows the path of least resistance, power from the 230 kV system would flow through the 138 kV SOC system if, say, the 230 kV SONGS-Santiago line is lost. Because the SOC system is not thermally rated to accommodate power flows from a 230 kV path, there is a risk of overload at an expanded Trabuco Substation.[5] Even if there were two transformers installed at Trabuco, CAISO continues, the two transformers would not prevent overload, as intended, but would instead worsen the risk of overload on the SOC system because the two transformers would actually reduce impedance and cause more power, not less, to travel over the SOC 138 kV system. The CAISO identified five specific elements in the SOC system that are overloaded in this circumstance.[6] CAISO also submits that an SPS can only address an initial overloading.[7]

SDG&E and CAISO have argued that Alternative J will impact SCE's transfer capability on the four 230 kV lines connecting SCE and SDG&E. These four lines (known as Path 43) are significantly larger, with nearly two times the MVA power on each line, than the 230 kV lines in the proposed project. Alternative J could reduce or restrict SCE's ability to import power through Path 43 by as much as 1000 MW. ORA, FRONTLINES, and SJC dispute that

[3] Exhibit CAISO-505, p. 9-11.
[4] Exhibit ORA-227, p. 10 (See ISO SPS6).
[5] Exhibit CAISO-505, p. 8.
[6] Exhibit Frontlines-436, p. 7 of 10.
[7] Exhibit ORA-227, p. 10 (See ISO SPS6); Tr. at p. 336, ln. 23-27.

this concern has been proven and argue that any concerns about overloading can be addressed, as even acknowledged by CAISO, by a second transformer at Trabuco. However, the CAISO's power flow analysis confirms that Alternative J exacerbates overloading in the SCE system in a multitude of scenarios.[8]

Findings of Fact

~~30. The 2015 Peak load in SOC was only 415 MW.~~

31. The CAISO updated its analysis of the need for the SOCRE Project based on the Energy Commission's Net Peak Load forecast for SOC ~~since approving SOCRE in 2011~~.

32. The ~~CAISO now predicts a~~updated load forecast indicates a 1-in-10 peak load of 446 MW ~~peak load~~ in 2024 and ~~a~~ 453 MW ~~Peak Load~~ in 2025.

36. There is uncertainty regarding projected load growth in the SOC 138kV system as with any ten-year forecast.

[8] Exhibit CAISO-505, p. 9-11.