

Application No.: 12-05-020

Exhibit No.: \_\_\_\_\_

Witness: Neil Millar

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

**TESTIMONY OF NEIL MILLAR  
ON BEHALF OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR  
CORPORATION**

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**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.

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**Q. What is your name and by whom are you employed?**

**A.** My name is Neil Millar. I am employed by the California Independent System Operator Corporation (CAISO), 250 Outcropping Way, Folsom, California as the Executive Director, Infrastructure Development.

**Q. Please describe your educational and professional background.**

**A.** I received a Bachelor of Science in Electrical Engineering degree at the University of Saskatchewan, Canada, and am a registered professional engineer in the province of Alberta.

I have been employed for over 30 years in the electricity industry, primarily with a major Canadian investor-owned utility, TransAlta Utilities, and with the Alberta Electric System Operator and its predecessor organizations. Within those organizations, I have held management and executive roles responsible for preparing, overseeing, and providing testimony for numerous transmission planning and regulatory tariff applications. I have appeared before the Alberta Energy and Utilities Board, the Alberta Utilities Commission, and the British Columbia Utilities Commission. Since November, 2010, I have been employed at the ISO, leading the Transmission Planning and Grid Asset departments.

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1 **Q. What is the purpose of your testimony?**

2 **A.** The purpose of my testimony is to provide an overview of the CAISO's  
3 transmission planning process that led to the identification of the reliability need for  
4 transmission system reinforcement in the South Orange County area. I address the  
5 factors the CAISO took into account in making this determination and selecting the  
6 South Orange County Reliability Enhancement (SOCRE) project as the means to  
7 address that need.

8

9 **Q. What are your recommendations in this proceeding?**

10 **A.** I recommend that the Commission approve the Application filed by San Diego Gas  
11 & Electric Company (SDG&E) for a certificate of public convenience and necessity  
12 for the SOCRE project. As explained in my testimony and the supporting technical  
13 testimony of Mr. Robert Sparks, the SOCRE project is necessary to meet reliability  
14 requirements specified by the North American Electric Reliability Corporation  
15 (NERC) and the CAISO Planning Standards.

16

17

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1 **I. BACKGROUND**

2 **Q. Please explain the CAISO's role as a NERC-registered Planning Coordinator.**

3 **A.** The CAISO serves as the NERC Planning Coordinator for transmission network  
4 under its operational control. A Planning Coordinator coordinates and integrates  
5 transmission facility and service plans, resource plans, and protection system plans  
6 among the Transmission Planners, Resource Planners, and Distribution Providers  
7 within its area of purview. As a part of its Planning Coordinator services, the  
8 CAISO analyzes the need for transmission upgrades and additions in accordance  
9 with NERC reliability standards, which provide criteria for system performance  
10 requirements that must be met under a varied but specific set of operating  
11 conditions. The CAISO conducts this analysis through its annual transmission  
12 planning process.

13

14 **Q. What are the relevant reliability standards the CAISO uses to analyze the need**  
15 **for transmission upgrades and additions?**

16 **A.** The CAISO uses NERC reliability standards, Western Electricity Coordinating  
17 Council (WECC) regional criteria and CAISO planning standards across a ten-year  
18 planning horizon to identify necessary transmission upgrades and additions.

19

20 Specifically, the following NERC system performance reliability standards apply to  
21 the CAISO as a registered NERC planning authority and are the primary drivers  
22 determining reliability upgrade needs:

- 23
- 24 • TPL-001 — System Performance Under Normal Conditions (Category A);
  - 25 • TPL-002 — System Performance Following Loss of a Single Bulk Electric  
26 System (BES) Element (Category B);
  - 27 • TPL-003 — System Performance Following Loss of Two or More BES  
Elements (Category C); and

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- 1           • TPL-004 — System Performance Following Extreme BES Events (Category  
2           D).<sup>1</sup>

3  
4           In general, the aforementioned NERC standards require the CAISO to operate the  
5           transmission system to supply projected customer demands without exceeding  
6           applicable ratings for transmission system elements. TPL-001 tests the performance  
7           of the transmission system under normal operating condition. TPL-002 tests the  
8           system following the loss of a single element of the bulk electric system, and TPL-  
9           003 tests the system under a loss of two or more bulk electric system elements.  
10          Exceeding applicable ratings under any of the scenarios identified as a result of the  
11          TPL-001, 002 or 003 assessments indicates the need for mitigation.

12  
13          In addition to the NERC standards referenced above, the CAISO plans the  
14          transmission system to meet Western Electricity Coordinating Council and CAISO  
15          planning standards. The CAISO planning standards (1) address specific  
16          requirements not covered in the NERC reliability standards and WECC regional  
17          criteria; (2) interpret the NERC reliability standards and WECC regional criteria  
18          specific to the CAISO-controlled grid; and (3) identify whether specific criteria  
19          should be adopted that are more stringent than the NERC standards or WECC  
20          regional criteria.

21  
22          **Q. Please provide an overview of the CAISO's transmission planning process.**

23          **A.** The CAISO conducts an annual transmission planning process to identify and plan  
24          the development of solutions to meet the future needs of the CAISO controlled grid.  
25          This annual process culminates in the CAISO Board of Governors approving a  
26          comprehensive transmission plan. The plan identifies needed transmission solutions  
27          and authorizes their cost recovery through CAISO transmission rates, subject to

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<sup>1</sup> Analysis of TPL-004 Extreme Events (Category D) are not included within the Transmission Plan unless these requirements drive the need for mitigation plans to be developed.

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1 regulatory approval. The plan also identifies non-transmission solutions that will be  
2 pursued in other venues as alternatives to building additional transmission facilities.  
3 The CAISO develops the plan in the larger context of supporting important energy  
4 and environmental policies and facilitating the transition to a cleaner, lower  
5 emission future, while maintaining reliability through a resilient electric system.

6  
7 The transmission plan primarily identifies transmission facilities that are needed for  
8 three main purposes: reliability; public policy; and economics. In the planning  
9 process, the CAISO also considers and evaluates non-transmission alternatives,  
10 including conventional generation and preferred resources such as energy  
11 efficiency, demand response, renewables and energy storage. Although the CAISO  
12 cannot specifically approve non-transmission alternatives as projects or elements in  
13 the comprehensive transmission plan, the CAISO can identify such solutions as the  
14 preferred mitigation measures in the same manner that the CAISO can select  
15 operational solutions in lieu of transmission upgrades. To the extent the CAISO  
16 identifies a non-transmission alternative as the preferred solution, the CAISO is  
17 dependent upon other processes to cause the development of the alternative outside  
18 of the context of the CAISO's planning process. In addition to these "supply side"  
19 preferred resources, load modifying preferred resource assumptions are also  
20 incorporated into the demand forecasts adopted by the California Energy  
21 Commission (CEC).

22  
23 The annual planning process is structured in three consecutive phases with each  
24 planning cycle identified by a beginning year and a concluding year. Each annual  
25 cycle begins in January and extends into the subsequent year.

26  
27 In Phase 1 of the annual planning process, the CAISO establishes the assumptions  
28 and models to be used in the planning studies, develops and finalizes a study plan,  
29 and specifies the public policy mandates that planners will adopt as objectives in the  
30 current cycle. This phase takes roughly three months from January through March

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1 of the first year of the planning cycle. During Phase 1, the CAISO first posts a draft  
2 study plan for stakeholder review and then conducts a public stakeholder session. At  
3 the stakeholder session, the CAISO answers questions regarding the draft study plan  
4 and requests additional written comments from stakeholders. The CAISO then  
5 considers stakeholder comments in completing its final study plan.

6  
7 In Phase 2, the CAISO performs studies to identify transmission needs and the  
8 necessary solutions, culminating in the annual comprehensive transmission plan.  
9 Phase 2 takes approximately 12 months and involves three additional public  
10 stakeholder sessions at which the CAISO presents preliminary and draft results for  
11 vetting with stakeholders. After each stakeholder session, the CAISO requests and  
12 considers stakeholder comments on its planning analyses. Identifying non-  
13 transmission alternatives that the CAISO can rely upon in lieu of transmission  
14 solutions also occurs during Phase 2. After this process concludes, the draft  
15 transmission plan is presented to the CAISO's Board of Governors for final review  
16 and approval. Phases 1 and 2 take a total of 15 months to complete.

17  
18 During Phase 3, the CAISO solicits competitive bids for the construction and  
19 ownership of new transmission facilities identified in the approved transmission  
20 plan eligible for competition. In any given planning cycle, Phase 3 may or may not  
21 occur depending on whether the final plan includes transmission facilities that are  
22 open to competitive solicitation in accordance with criteria specified in the CAISO  
23 tariff.

24  
25 In addition, the CAISO may conduct specific studies during the planning process to  
26 support other state or industry informational requirements to efficiently provide  
27 study results that are consistent with the comprehensive transmission planning  
28 process.

29



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1 **Q. Have there been any modifications or improvements to the CAISO's**  
2 **transmission planning process since approval of the SOCRE project in the**  
3 **CAISO's 2010-2011 transmission plan?**

4 **A.** The fundamental process has not changed since the 2010-2011 planning process.  
5 However, the CAISO has made a number of refinements largely reflecting  
6 additional coordination with various state agencies as well as adapting the planning  
7 process to fully comply with FERC Order No. 1000.

8

9 **Q. How does the CAISO account for previously approved transmission upgrades**  
10 **or additions in subsequent transmission planning processes?**

11 **A.** In general, in subsequent transmission planning processes the CAISO assumes that  
12 previously approved projects are proceeding. The CAISO verifies the updated  
13 forecast for completion of previously approved projects with the project sponsors,  
14 and this assumption is reflected in the draft study plan for the upcoming  
15 transmission planning process. However, if, during the course of any subsequent  
16 transmission planning process, the CAISO or any stakeholder identifies a material  
17 change in circumstances for a previously approved transmission project, the CAISO  
18 will review the circumstances and determine whether there is a continuing need for  
19 the project.

20

21 **II. THE SOCRE PROJECT**

22 **Q. Please describe the SOCRE project.**

23 **A.** The SOCRE project consists of:

- 24       • Replacing an existing approximately 8-mile, 138 kV transmission line  
25       (TL13835) with a new 230 kV double-circuit extension between SDG&E's  
26       Capistrano and Talega Substations. One side will form part of a new 230 kV  
27       circuit from San Onofre bypassing the Talega substation and connecting to  
28       the Capistrano substation, and the other side will extend from the Capistrano  
29       substation to tap the existing Talega-Escondido 230 kV line near Talega;

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- 1           • Looping in two 138 kV transmission lines that currently bypass the existing  
2           substation into the Capistrano Substation;
- 3           • Building a new 230 kV partially enclosed gas insulated substation at the  
4           existing 138/12 kV Capistrano Substation site; and
- 5           • Rebuilding and expanding the existing Capistrano Substation 138 kV facility  
6           with a new partially enclosed gas insulated substation.
- 7

8   **Q.    Please describe the process by which the CAISO identified the SOCRE project**  
9   **as a necessary reliability upgrade in its 2010-2011 transmission plan.**

10 **A.**   The CAISO followed its FERC-approved transmission planning process, as  
11   generally described above. The CAISO identified a reliability need in the South  
12   Orange County area. In accordance with the CAISO tariff, SDG&E submitted a  
13   potential solution to the reliability concern during the 2010 Request Window.  
14   SDG&E also identified the need for extensive capital upgrades at the Capistrano  
15   138 kilovolt (kV) substation necessitating a rebuild of the facility. These projects  
16   highlighted both the CAISO-identified reliability concerns and shortcomings in  
17   being able to accommodate planned maintenance and construction outages in the  
18   area.

19

20   The CAISO analyzed a number of alternatives to address the South Orange County  
21   reliability issues, including proposals from SDG&E. The transmission solution  
22   ultimately approved by the CAISO's Board of Governors was refined through the  
23   planning and consultation process. The SOCRE project presented for approval in  
24   this proceeding is materially unchanged from the project approved by the CAISO  
25   Board of Governors in the 2010-2011 transmission plan.

26

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1 **Q. Was the CAISO's treatment of the SOCRE project in the transmission**  
2 **planning processes subsequent to the 2010-2011 proceeding consistent with its**  
3 **normal practices?**

4 **A.** Yes. The CAISO is not aware of receiving any comments in the 2011-2012, 2012-  
5 2013, 2013-2014 or 2014-2015 transmission planning cycles suggesting that there  
6 were material changes necessitating a review of the need for the SOCRE project,  
7 and the CAISO itself did not identify any materially changed circumstances.

8

9 **III. CAISO RELIABILITY OBJECTIVES FOR THE SOCRE PROJECT**

10 **Q. What is the primary driver for the need for the SOCRE project in the South**  
11 **Orange County area?**

12 **A.** As noted in the 2010-2011 transmission plan, the primary driver for the SOCRE  
13 project was the exceedance of applicable ratings during multiple Category C  
14 contingencies under TPL-003. In addition, the CAISO identified excessively  
15 complex remedial action schemes in the study area coupled with the dependence on  
16 a single 230 kV feed into the area. The timing was driven in major part by the need  
17 for capital maintenance to be conducted by SDG&E. This provided a unique and  
18 timely opportunity to leverage other construction work to address the excessively  
19 complex remedial action schemes in the area, creating project and cost efficiencies.  
20 Also, this reconfirmed the inadequacy of the existing system to accommodate  
21 maintenance or construction-related outages.

22

23 Based on the CAISO's updated analysis presented in this proceeding, the same  
24 reliability issues identified in the CAISO's 2010-2011 transmission plan are still  
25 present today. As well, the limitations on maintenance outage opportunities have  
26 now been categorized as Category B contingency criteria violation issues.

27

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1 **Q. Do changes in forecast load growth since the CAISO’s approval of the 2010-**  
2 **2011 transmission plan affect the need for the SOCRE project?**

3 **A.** No. Although there have been changes in load levels and load forecast, these  
4 changes have not eliminated the reliability concerns the SOCRE project is intended  
5 to mitigate. Load growth increases the consequences of an outage event, but it is not  
6 the primary factor driving the existing system performance issues.

7

8 **Q. Based on the CAISO’s most recent analysis, is the SOCRE project still**  
9 **necessary to meet reliability needs in South Orange County?**

10 **A.** Yes. For this proceeding, the CAISO updated its analysis of the need for the  
11 SOCRE project to meet applicable NERC and CAISO Planning Standards. The  
12 updated analysis focused on the 2024 time frame and built on the models developed  
13 for the 2014-2015 transmission planning cycle. The project objectives include  
14 meeting NERC mandatory standards and the CAISO Planning Standards, as well as  
15 enabling SDG&E to perform necessary equipment replacement. As set out in Mr.  
16 Sparks’ testimony, without the SOCRE project, the CAISO’s updated analysis  
17 identified 13 unique contingencies causing a total of 26 thermal overloads on eight  
18 distinct facilities during Category C contingencies. During planned maintenance  
19 outage scenarios the CAISO identified four Category B contingencies and an  
20 additional 53 Category C contingencies that result in a full or partial blackout in the  
21 South Orange County area. Based on the CAISO’s analysis, there are essentially no  
22 adequate periods for maintenance or planned construction activities without risking  
23 blackout or non-consequential load loss. Considering the updated studies and the  
24 additional exploration of accommodations for routine maintenance outages, the need  
25 for the SOCRE project is greater than the CAISO had identified in 2010.

26

27 These reliability concerns cannot be resolved through a Special Protection System  
28 (SPS). Based on CAISO Planning Standards, an SPS should not be used to monitor  
29 (1) more than six local contingencies or (2) more than four transmission system

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1 elements. Any SPS designed to meet the reliability concerns identified by the  
2 CAISO would be in excess of both limitations and would be exceedingly complex.  
3 This analysis demonstrates a persistent and immediate need for the project to  
4 remedy CAISO-identified reliability problems.

5  
6 The CAISO's updated analysis also included studying the alternatives proposed in  
7 DEIR in lieu of the SOCRE project. Those results clearly indicate that the DEIR  
8 alternatives either fail to meet the identified reliability concerns or negatively affect  
9 transfer capabilities on the Southern California 230 kV transmission network. The  
10 DEIR alternatives are not adequate substitutes to address local reliability issues  
11 identified in the South Orange County area. Mr. Sparks' testimony provides a more  
12 detailed analysis of the DEIR alternatives.

13  
14 **Q. Are there any additional transmission planning concerns that the CAISO took**  
15 **into account in approving the SOCRE project?**

16 **A.** Yes. In addition to addressing the reliability issues within the immediate South  
17 Orange County area, the CAISO gave consideration to ensuring that mitigations for  
18 the immediate area reliability issues would not compromise the overall effectiveness  
19 or reliability of the bulk electric system in Southern California. This is particularly  
20 important given the progress on renewable generation and other environmentally-  
21 focused issues affecting generation resources in California and the high degree of  
22 uncertainty as to where and what type of new resources will develop. These  
23 considerations particularly affect the viability of various transmission options that  
24 negatively affect the transfer capability between the Los Angeles basin and San  
25 Diego areas. Based on studies conducted for this proceeding, the CAISO has  
26 identified negative effects on transfer capabilities that would result from DEIR  
27 alternatives C1, C2 and D. At a high level, these alternatives negatively affect  
28 transfer capabilities because they would parallel the existing 230 kV corridor  
29 between San Diego and the Los Angeles basin with the 138 kV network. The  
30 CAISO does not recommend alternatives that limit the capabilities of an important

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1           230 kV corridor that plays a key role in the reliability of the LA Basin and San  
2           Diego in order to address a local reliability issue that can instead be addressed by  
3           the SOCRE project. These concerns are addressed in more detail in CAISO's review  
4           of DEIR alternatives C1, C2 and D in Mr. Sparks' testimony.

5

6   **IV. CONCLUSION**

7   **Q. Please summarize your recommendations.**

8   **A.** As explained in my testimony and the supporting technical testimony of Mr. Robert  
9           Sparks, the SOCRE project is necessary to meet reliability requirements specified  
10          by the North American Electric Reliability Corporation (NERC) and the CAISO  
11          Planning Standards. As a result, I recommend that the Commission approve the  
12          Application filed by San Diego Gas & Electric Company (SDG&E) for a certificate  
13          of public convenience and necessity for the SOCRE project.

14

15   **Q. Does this conclude your testimony?**

16   **A.** Yes, it does.

17