

Application No.: 17-01-023
Exhibit No.: _____
Witnesses: Jeff Billinton
ALJ: Patrick Petersen
Commissioner: Karen Douglas

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

Joint Application of Horizon West
Transmission, LLC (U222E) formerly
known as NextEra Energy Transmission
West, LLC, and Pacific Gas and Electric
Company (U39E) for Permits to Construct
the Estrella Substation and Paso Robles
Reinforcement Project.

Application 17-01-023
(Filed January 25, 2017)

**OPENING TESTIMONY OF JEFF BILLINTON ON BEHALF OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
ON ISSUE NUMBER 5**

Anthony J. Ivancovich
Deputy General Counsel
Sarah E. Kozal
Counsel
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel.: (916) 956-8838
Fax: (916) 608-7222
skozal@caiso.com

Attorneys for the California Independent
System Operator Corporation

Dated: September 1, 2023

**OPENING TESTIMONY OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
A.17-01-023**

1 **I. INTRODUCTION**

2 **Q1. What is your name and by whom are you employed?**

3 **A1.** My name is Jeff Billinton. I am employed by the California Independent System Operator
4 Corporation (CAISO), 250 Outcropping Way, Folsom, California as the Director of
5 Transmission Infrastructure Planning.

6 **Q2. Please describe your educational and professional background.**

7 **A2.** I received a Bachelor of Science degree in Electrical Engineering at the University of
8 Saskatchewan, Canada.

9 I have over 30 years of experience in the electric utility industry in distribution and
10 transmission system design, construction, operations, and planning.

11 **Q3. What is the purpose of your testimony?**

12 **A3.** The purpose of this testimony is to describe the specific reliability benefits of the Estrella
13 Substation and the 70 kV power line (“Proposed Project”) in response to issue #5
14 identified in the Commission’s Scoping Memo. This testimony provides an overview of
15 the technical analysis underlying the CAISO’s approval of the Proposed Project in its
16 transmission planning process. My testimony (1) presents an analysis of the reliability-
17 driven need for the Proposed Project, which alleviates thermal overloads and voltage
18 concerns in the Los Padres division, and (2) supports the Commission’s determination
19 that there are overriding considerations that merit project approval.

20 **II. BENEFITS OF THE PROPOSED PROJECT SUPPORT A DETERMINATION**
21 **OF OVERRIDING CONSIDERATIONS**

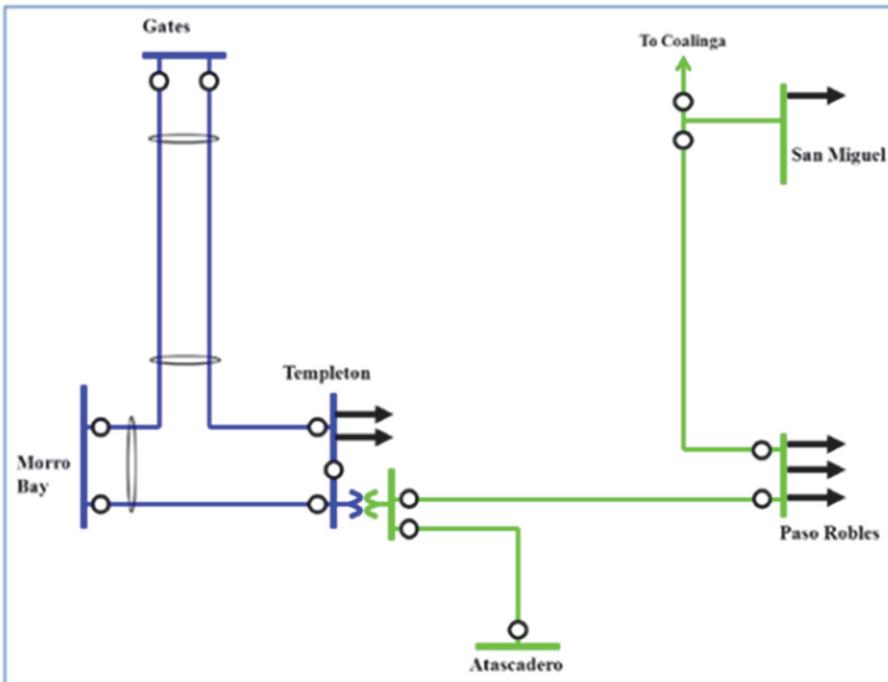
22 **Q4. Please provide an overview of the Proposed Project as approved in the CAISO’s**
23 **transmission planning process.**

24 **A4.** The Proposed Project was included in the CAISO’s 2013-2014 Transmission Plan, and
25 the CAISO approved it as a reliability-driven transmission solution in the Los Padres
26 division of the PG&E service territory.

**OPENING TESTIMONY OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
A.17-01-023**

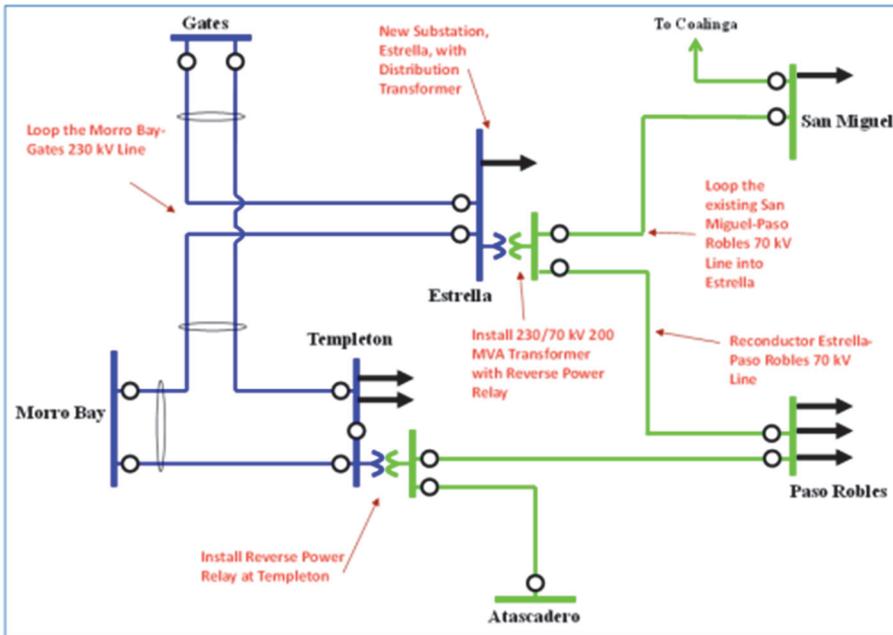
1 The scope of this approved project is to construct a new 230/70 kV substation, Estrella,
2 approximately five miles east of the existing Paso Robles Substation. The Estrella
3 substation will also be located relatively close to the Morro Bay-Gates and Templeton-
4 Gates 230 kV transmission corridor. The Estrella 230 kV bus will be looped into the
5 Morro Bay-Gates 230 kV line. A new 230/70 kV transformer will be installed at the
6 Estrella substation. In addition, a 45 MVA distribution transformer was proposed to be
7 installed on the Estrella 230 kV bus. The Estrella 70 kV bus will be looped into the
8 existing San Miguel-Paso Robles 70 kV line. A reverse power relay will be installed on
9 the Estrella 230/70 kV and the existing Templeton 230/70 kV #1 transformer banks to
10 prevent the 70 kV system from feeding the 230 kV system. The Paso Robles-Estrella 70
11 kV line will be reconducted sufficiently to prevent thermal overloads, and it will
12 operate at, a minimum, summer normal and summer emergency ratings of 825 and 975
13 amps, respectively. Figures 1 and 2 show the Paso Robles system before and after the
14 Proposed Project is in-service.

Figure 1: Paso Robles area existing system



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CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
A.17-01-023**

Figure 2: Paso Robles area after the Estrella project is in-service



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The CAISO determined that the facilities in the Proposed Project eligible for competitive solicitation under the CAISO's tariff are the 230 kV buswork and termination equipment, and the 230/70 kV transformers. The 70 kV buswork and termination equipment and modifications to existing facilities are not eligible for competitive solicitation. Thus, the Proposed Project consists of two separate, but interdependent, parts: (1) the Estrella Substation consisting of a new 230/70 kV substation, and a 230 kV line; and (2) the 70 kV double-circuit power line between the new 70 kV substation and the existing San Miguel-Paso Robles 70 kV power line, and the reconductoring of approximately three miles of the existing San Miguel-Paso Robles 70 kV power line. However, as these two parts are interdependent, the CAISO's analysis and this testimony covers both parts as a single project, the Proposed Project.

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Q5. Please explain how the CAISO identified the need for the Proposed Project.

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A5. The CAISO performs an annual reliability assessment that includes comprehensive power flow studies, transient stability analysis, and voltage stability studies. The annual reliability assessment focus is to identify facilities that potentially might not meet the

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**OPENING TESTIMONY OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
A.17-01-023**

1 applicable performance requirements set by the North American Electric Reliability
2 Corporation (NERC) standards, Western Electricity Coordinating Council (WECC)
3 regional criteria, and the CAISO's own planning standards.

4 The CAISO evaluated reliability benefits, such as the potential to defer reliability
5 upgrades or alleviate reliability concerns, by comparing power flow impacts on
6 associated facilities with and without the Proposed Project.

7 The CAISO determined the Proposed Project was identified as necessary to meet thermal
8 overload and low voltage concerns in the Los Padres system. Thermal overloads can
9 cause damage due to overheating. Severe low voltage can cause local area blackouts due
10 to voltage collapse.

11 **Q6. Please explain the approach the CAISO used in its analysis.**

12 **A6.** The CAISO conducted a detailed planning assessment based on study methodology in
13 compliance with applicable reliability standards, as described above. The CAISO
14 performed conventional and governor power flow and stability studies for the backbone
15 system assessment to evaluate system performance under normal conditions and
16 following power system contingencies for voltage levels 230 kV and above. Additionally,
17 the CAISO performed conventional power flow studies for the local area non-
18 simultaneous assessments under normal system and contingency conditions for voltage
19 levels 60 kV through 230 kV. The local areas include the Central Coast and Los Padres
20 areas within the PG&E service area, where the this Proposed Project will be located.

21 **Q7. Does the Proposed Project provide a reliability benefit by alleviating potential**
22 **thermal overloads and voltage concerns?**

23 **A7.** Yes. The Proposed Project will mitigate the thermal overloads and low voltage concerns
24 identified in the Los Padres 70 kV system specifically, in the San Miguel, Paso Robles,
25 Templeton, Atascadero, Cayucos and San Luis Obispo areas following Category P1
26 contingencies due to loss of either the Templeton 230/70 kV #1 Bank or the Paso Robles-
27 Templeton 70 kV Line. Category P1 (formerly named Category B) contingencies refer to

**OPENING TESTIMONY OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
A.17-01-023**

1 those contingencies described by the North American Electric Reliability Corporation
2 (NERC) as the system performance that is expected immediately following the loss of a
3 single transmission element, such as a transmission circuit, a generator, or a transformer.
4 These two Category P1 contingencies put approximately 60-70 MW of load at Paso
5 Robles at risk by activating the existing Paso Robles Under Voltage Load Shedding
6 (UVLS) during summer peak conditions to alleviate the thermal and low voltage
7 concerns.

8 The table below shows the voltage risk under the loss of the Paso Robles-Templeton 70
9 kV line, both without and with the proposed project. Without the Proposed Project, this
10 contingency would result in voltage collapse.

Substation	Worst Contingency	Without Proposed Project (pu)	With Proposed Project (pu)
Paso Robles area 70 kV	Paso Robles- Templeton 70 kV	Voltage collapse	0.96

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13 The Proposed Project will provide robust system reinforcement to the Paso Robles and
14 Templeton 70 kV system operations.

15 **Q8. Is the Proposed project needed to comply with the NERC, WECC, and CAISO**
16 **Reliability Standards?**

17 **A8.** Yes. Category P1 system performance requires that all thermal and voltage limits be
18 within their “Applicable Rating,” which, in this case, are the emergency ratings as
19 generally determined by the PTO or facility owner. NERC Reliability Standard TPL-
20 001, as reflected in the ISO planning standards, governs this.

21 **Q9. Did the CAISO consider any alternative routing, such as that included in the**
22 **environmentally superior alternative?**

23 **A9.** The CAISO’s transmission planning process considers alternative solutions but it does
24 not specifically consider the specific the routing of the transmission solution it has

**OPENING TESTIMONY OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
A.17-01-023**

1 identified. The focus of the studies and solutions is on eliminating reliability issues in a
2 particular location or between specific points. It does not dictate specific routes for
3 identified lines.

4 **Q10. Does the CAISO have any concerns with the alternative routing, such as that**
5 **included in the environmentally superior alternative?**

6 **A10.** The CAISO understands the environmentally superior alternative identified in the Final
7 Environmental Impact Report involves an alternative route for the 70 kV line that
8 traverses a more rural area in the Paso Robles area. This alternative, described in the
9 FEIR, is electrically similar and meets the same reliability needs as the transmission line
10 the CAISO approved.

11 The longer line will have slightly higher impedance and line loss. However, these
12 changes are not significant enough to make any material difference in the power flow and
13 the system performance.

14 **Q11. When is the Proposed Project needed?**

15 **A11.** The project already is needed because it is based on a current reliability issue. Currently,
16 the system relies on load tripping through UVLS, which does not meet the performance
17 requirement of the TPL-001 Standard and the ISO planning standards.

18 **Q12. Did the CAISO conduct any updated analysis in the need for the Proposed Project**
19 **in any more recent transmission plans?**

20 **A12.** The CAISO performs need assessments on a case-by-case basis if any major assumption
21 change significantly. In the 2023-2024 Transmission Planning Process the CAISO did
22 not model the Proposed Project as in-service in the near-term (2025) study scenario based
23 on the expected in-service date of the Proposed Project, and the results showed the
24 continued need for the Proposed Project. The table below lists the overloads the CAISO
25 observed in the area for the identified contingencies. This shows reliability constraints of
26 overloading multiple 70 kV lines as well as voltage collapse in the area for the N-1
27 contingencies.

**OPENING TESTIMONY OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
A.17-01-023**

Monitored Facility	Contingency Name	Category	Loading %	
			2025 Summer Peak (Estrella Substation Project not included)	2028 Summer Peak (Estrella Substation Project included)
Coalinga #1-San Miguel 70 kV Line	Paso Robles-Templeton 70 kV Line	P1	Diverge (DC 250%)	30
San Miguel-Paso Robles 70 kV Line			Diverge (DC 169%)	NA
Coalinga #1-San Miguel 70 kV Line	San Miguel-Paso Robles 70 kV Line	P1	118	NA
Coalinga #1-San Miguel 70 kV Line	Templeton 230/70KV Transformer Bank #1	P1	161	31
Atascadero-San Luis Obispo 70 kV Line			115	27
Baywood-San Luis Obispo 70 kV Line			112	48
Coalinga #1-San Miguel 70 kV Line	Templeton 230-70 kV Battery (Failure of non-redundent battery)	P5	Diverge (DC 250%)	35
San Miguel-Paso Robles 70 kV Line			Diverge (DC 169%)	NA
Atascadero-San Luis Obispo 70 kV Line	Morro Bay-Templeton 230 kV Line & Templeton-Gates 230 kV Line	P6	111	26
Baywood-San Luis Obispo 70 kV Line			109	48
Coalinga #1-San Miguel 70 kV Line	Morro Bay-Calf Flats Switching Station 230 kV Line & Templeton-Gates 230 kV Line	P7	110	29
Temblor-San Luis Obispo 115 kV Line			100	79
Coalinga #1-San Miguel 70 kV Line	Templeton-Atascadero 70 kV & Templeton-Paso Robles 70 kV Lines	P7	Diverge (DC 250%)	31
San Miguel-Paso Robles 70 kV Line			Diverge (DC 169%)	NA

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2 **III. CONCLUSION**

3 **Q13. Please summarize your testimony.**

4 **A13.** The CAISO identified the Proposed Project as necessary to meet reliability needs in the
5 Los Padres division. The Proposed Project will provide Paso Robles Substation with
6 more reinforced 70 kV sources from Templeton and Estrella and address thermal
7 overload risks and low voltage concerns.

8 **Q14. Does this conclude your testimony?**

9 **A14.** Yes.