Application No.:	23-09-001
Exhibit No.:	
Witness:	Binaya Shrestha
ALJ:	Marcelo Poirier
Commissioner:	Karen Douglas

Application of PACIFIC GAS AND ELECTRIC COMPANY (U 39 E) for a Certificate of Public Convenience and Necessity Authorizing the Construction of the Northern San Joaquin 230 kV Transmission Project.	Application 23-09-001 (Filed September 1, 2023)

OPENING TESTIMONY OF BINAYA SHRESTHA ON BEHALF OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

November 10, 2025

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I. INTRODUCTION

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

A1. My name is Binaya Shrestha. I am employed by the California Independent System Operator Corporation (CAISO), 250 Outcropping Way, Folsom, California as Manager, Regional Transmission – North.

Q2. Please describe your educational and professional background.

A2. I am a licensed Professional Electrical Engineer in the State of California. I hold a Master's degree in Electrical Engineering from Wichita State University, Kansas, and a Bachelor's degree in Electrical Engineering from Tribhuwan University, Nepal.

Q3. What are your job responsibilities?

A3. I manage a group of engineers responsible for planning the CAISO controlled transmission system in northern California to ensure efficient and cost-effective compliance with requirements established by the North American Electric Reliability Corporation (NERC), Western Electricity Coordinating Council (WECC), and CAISO Transmission Planning Standards.

Q4. What is the purpose of your testimony?

A4. The purpose of my testimony is to address the following question set forth in the Assigned Commissioner's August 14, 2025 First Amended Scoping Memo and Ruling: *Does the Proposed Project serve a present or future public convenience and necessity?*

To answer this question, my testimony describes (1) the CAISO's identified need for the construction of the Northern San Joaquin 230 kV Transmission Project (the Project) and (2) recommends the California Public Utilities Commission (CPUC) issue a Certificate of Public Convenience and Necessity (CPCN) to allow the Project to proceed.

Q5. What are your recommendations?

A5. I recommend the CPUC authorize the Project to proceed for the following reasons: The Project will address identified thermal overloads and voltage concerns on Pacific Gas and

Electric Company's (PG&E) 230/60 kV transmission system during contingencies, which NERC Reliability Standard TPL-001-5 (Transmission System Planning Performance Requirements) requires the CAISO to address. This outcome will improve system reliability for PG&E's 10,000 customers in the service area, one of which is Lodi Electric Utility (LEU), which itself serves approximately 27,750 customers. The Project will also increase capacity to accommodate projected growth in demand. To improve system reliability and forecasted growth, the system needs to shift load from the 60 kV system to a new 230 kV facility.

II. BENEFITS OF THE PROPOSED PROJECT SUPPORT ISSUANCE OF A CPCN.

Q6. Please provide an overview of the Project as approved in the CAISO's transmission planning process.

A6. The scope of this approved Project is to construct a new double-circuit 230 kV line through the new PG&E Thurman Switching Station at LEU Industrial Substation. The PG&E 230 kV scope includes the expansion of Lockeford Substation to accommodate new 230 kV lines. As a related effort, LEU will construct a new 230/60 kV substation, referred to as Guild Substation, to receive the new 230 kV source from PG&E's new Thurman Switching Station. LEU's Guild Substation will step down the new 230 kV source to 60 kV and connect to LEU's Industrial Substation following certain modifications by LEU to that substation. PG&E would disconnect the three existing 60 kV lines currently connected to LEU Industrial Substation, Lodi-Industrial, Industrial Tap and Lockeford- Industrial, and reconfigure them outside of LEU Industrial Substation when the new 230 kV source is in-service.

Q7. Has the current Project changed since the CAISO first approved it in the 2012-2013 CAISO Transmission Plan?

A7. The project scope has changed from the original approval in the CAISO's 2012-2013 Transmission Plan. The CAISO approved a revised scope for the Project in its 2017-2018 Transmission Plan. The Lockeford – Lodi 60 kV system is shown in the schematic diagram in Figure 1. As part of its 2017-2018 Transmission Planning Process, the CAISO

revised the Lockeford – Lodi 230 kV project scope, with the schematic diagram shown in Figure 2, to address the reliability issues in the area. The loop-in of the Brighton – Bellota 230 kV line into Lockeford 230 kV substation helps address these reliability issues. The double circuit 230 kV line from Lockeford to Industrial substation will supply the Industrial Substation load from a 230 kV line so that the loading in the underlying 60 kV system will be within its capacity.

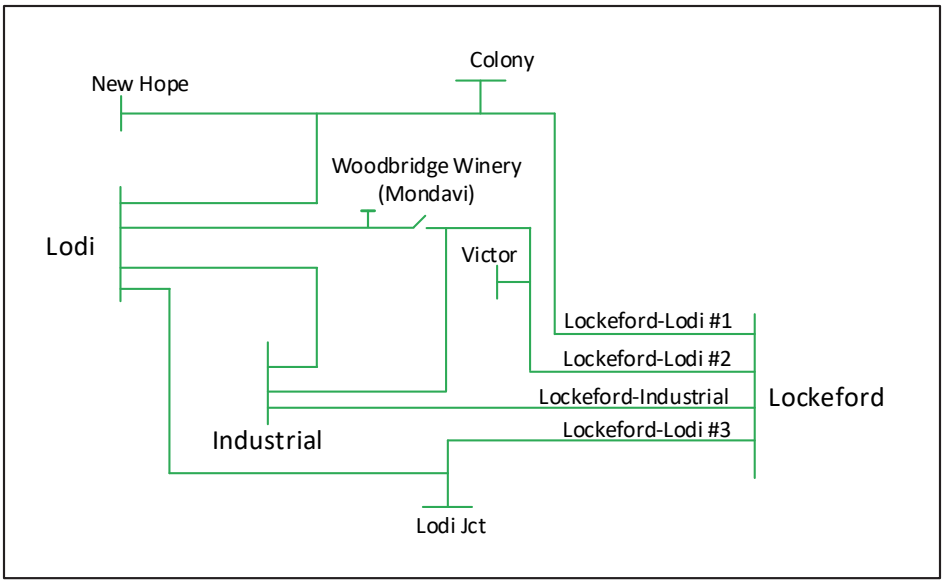

Figure 1: Schematic Diagram of the system in the study area

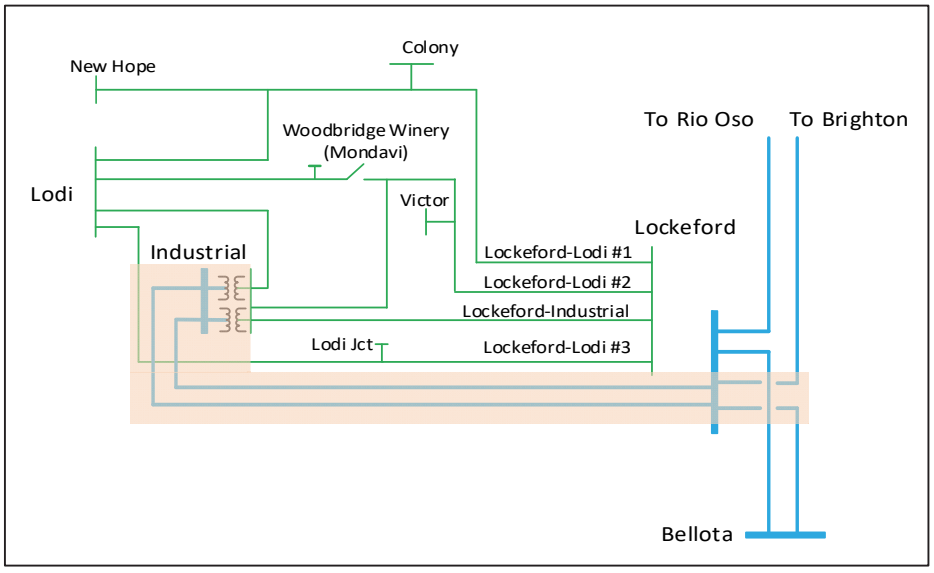

Figure 2: Lockeford-Lodi 230 kV Project scope approved in 2017-2018 Transmission Plan

Q8. Please explain the approach the CAISO used to identify the need for the Project.

A8. The CAISO performs an annual reliability assessment that includes comprehensive power flow studies, transient stability analysis, and voltage stability studies. The annual reliability assessment identifies existing facilities that may not meet applicable performance requirements set by NERC standards, WECC regional criteria, and the CAISO's own planning standards. The CAISO evaluates reliability benefits, such as the potential to defer reliability upgrades or alleviate reliability concerns, by comparing power flow impacts on associated facilities with and without proposed projects. In this case, the CAISO identified the need for the Project to meet thermal overload and low voltage concerns in the Northern San Joaquin region. Thermal overloads can cause damage to equipment due to overheating. Severe low voltage can cause local area outages due to voltage collapse.

Q9. What reliability benefits does the Project provide?

A9. The Project will allow the PG&E Lockeford-Lodi system to increase its current normal load serving capability of 194 MW to approximately 404 MW under normal operating conditions, and from its emergency load serving capability of 152 MW to approximately 456 MW. Connecting a new 230 kV source to LEU and removing LEU from its current PG&E 60 kV sources will resolve low voltage and thermal overload issues on the PG&E 230/60 kV system with less overall power demand on the PG&E 60 kV system.

The Project would eliminate the need for a current operational solution to address thermal and voltage issues in connection with Lockeford – Lodi 60 kV system The current operating solution relies on the potential need for load shedding during high load conditions, which does not meet the performance requirement of the NERC TPL-001-5 Standard. The requirements of TPL-001-5 include the need for corrective actions to maintain steady state voltages and post-contingency voltage deviations within acceptable limits.

Q10 Do these findings continue to apply today?

A10 Yes, they do. Table 1 reflects current post-contingency voltage levels of the current Lockeford – Lodi 60 kV system without the Project in 2027, 2030, 2035, and 2040. These voltage levels create an unacceptable reliability risk from a planning perspective because after the identified contingency they may result in voltage collapse.

Table 1. Voltage Results

		Contingency Voltage				
Bus	**Contingency**	2027	2030	2035	2040	2040 (with project)
Lockeford 60 kV	LOCKEFORD-BELLOTA 230KV	1.04	1.01	0.88	0.66	1.03
Lockeford 230 kV	LOCKEFORD-BELLOTA 230KV	0.93	0.89	0.79	0.63	0.96

Table 2 reflects current post-contingency loading of the current Lockeford – Lodi 60 kV system without the Project in 2027, 2030, 2035, and 2040. At present, there is only one thermal overload issue reported in this area for 2027. However, the N-1 loading on the other line sections and the Lockeford 230/60 kV transformer banks remain high, around 90 percent. Rerunning the N-1 analysis with the Project removed shows that all the 60 kV lines and the transformer banks will have significant thermal overloads in the long-term scenarios. Table 2 reflects these results with the red font reflecting thermal overloads.

Table 2: Contingency Results.

		Final AC % Loading				
Facility	**Worst Contingency**	**2027**	**2030**	**2035**	**2040**	**2040 (with project)**
Lockeford 230/60 kV Bank #2	Lockeford 230/60KV TB 3	91.5	103.9	121.2	133.8	47.6
Lockeford 230/60 kV Bank #3	Lockeford 230/60KV TB 2	91.7	104.2	121.3	134.3	47.74
Lockeford-Industrial	Lockeford-Lodi #2 60kV	97.8	107.6	127.6	141.8	<10
Industrial-Lodi	Lockeford-Industrial 60 kV	79.55	81.4	97.4	106.6	<10
Lockeford-Lodi #1	Lockeford-Industrial 60 kV	82.0	88.0	107.0	122.8	39.3
Lockeford-Lodi #2	Lockeford-Industrial 60 kV	103.8	111.1	131.5	147.7	38.06
Lockeford-Lodi #3	Lockeford-Industrial 60 kV	97.8	102.6	122.5	137.5	31.03

Q10. When is the Project needed?

A10. The need for this Project exists now and will continue to exist. The Project will address an ongoing reliability issue. By connecting a new 230 kV source to LEU and removing LEU from its current PG&E 60 kV sources, the Project will resolve low voltage and thermal overload issues on the PG&E 230/60 kV system, eliminate the need for the current temporary operational procedure used to address voltage issues, and increase capacity for peak loading. The Project will improve system reliability and accommodate existing and forecasted growth in electrical needs beyond the existing capacity

Q11 What additional reliability benefit, if any, does the Project provide?

A11 The Project will increase capacity to accommodate forecasted summer peak load in the area. Load forecasts for the area continue to increase over the relevant planning horizon and are set forth in Table 3. The load forecasts for 2027, 2030, and 2035 are based on the Central Valley summer peak cases in the CAISO's 2025-2026 transmission planning process. The 2040 load values are extrapolated from the 2035 load profile using California Energy Commission (CEC) load growth forecast.

Table 3: 1-in-10 summer peak forecast in MW

Load Bus Name	Bus Number	2027	2030	2035	2040
Mettler	33718	5.92	6.4	7.93	9.6
Lodi	33728	13.69	14.97	17.83	21.7
Industrial	38060	107.48	111.82	132.31	144.0
Victor	336008	12.94	13.49	14.24	16.8
Victor Junction	33726	0.22	0.54	1.29	1.9
New Hope	33723	3.63	4.02	4.3	5.2
Mondavi	33727	6.51	6.51	6.51	6.5
Colony	33732	3.71	5.23	8	11.0
McLane	38121	35.82	37.27	44.1	48.0
Total		189.92	200.25	236.51	264.70

Shifting load from the 60 kV system to a new 230 kV facility will increase the ability to meet this forecasted electric load growth.

Q13. Has the CAISO considered alternatives to the Project?

A13. Yes, the CAISO has considered a possible reconductoring of the overloaded 60 kV line segments. This alternative includes a 230 kV line loop-in, 60 kV lines reconductoring, and a third Lockeford 230/60 transformer bank. The CAISO does not support this alternative for several reasons, including the potential delays to permit and deploy this alternative as well as the fact that the Project subject to this proceeding will serve as an important step to connect the Lockeford 230 kV and Stagg 230 kV systems over the longer-term. This connection will bring a reliable 230 kV source into the Lodi area where the load forecasts are increasing.

Q14. Does this conclude your testimony?

A14. Yes.