

Memorandum

To: ISO Board of Governors
From: Neil Millar, Vice President of Infrastructure and Operations Planning
Date: July 12, 2023
Re: **Briefing on 2023-2024 Transmission Planning Process Eldorado 230 kV Short Circuit Duty Mitigation Project**

This memorandum does not require ISO Board of Governors action.

EXECUTIVE SUMMARY

A transmission upgrade project is needed to reduce short circuit current levels exceeding the interrupting capability of the 230 kV circuit breakers at Eldorado Substation. The project scope is to extend the bus to add new positions, then split the bus and relocate 230 kV lines and other equipment within the substation to balance the short circuit contribution to each bus section.

The increased short circuit levels are due to the addition of renewable generation in the area, with associated transmission upgrades, interconnecting to NV Energy (NVE), Los Angeles Water and Power (LADWP), and ISO controlled Southern California Edison (SCE) facilities. They are expected to exceed the breaker ratings by 2024. The proposed project will reduce the short circuit current levels at Eldorado joint-owned 230 kV bus by about 21.4 kA to about 53.9 kA, well below the 63 kA breaker ratings.

The estimated cost of this project is \$67 million with \$48.8 million going into the ISO transmission access charge, and \$18.2 million will be allocated to LADWP and NVE. ISO management plans to approve this transmission project by the end of July 2023, as it meets the requirements set out in the ISO tariff for expedited management approval and described as follows. The ISO portion of the project is less than \$50 million, there is an urgent need for the project, and there is a high degree of certainty that the project will not conflict with other solutions to be considered in the 2023-2024 transmission planning process. Further, this memo meets the tariff requirement to publicly brief the ISO Board prior to management approval.

DISCUSSION AND ANALYSIS

The expected in-service year for the project is 2029. SCE submitted the mitigation plan to reduce short circuit current levels on May 31, 2023, upon becoming aware of the increases in fault current exceeding existing capabilities. Due to complexities in developing the mitigation plan, this did not allow the project to be included in the 2022-2023 Transmission Plan. With the urgency of the need for the project, the ISO plans to approve project through expedited Management approval within the 2023-2024 transmission planning process. Interim operational measures such as temporary electrical reconfigurations of disconnecting transmission lines from the Eldorado substation will be utilized until the project is completed. The following alternatives were considered but not chosen:

New Substation: This alternative would site a new substation and move some lines to that location. It was not recommended due to high cost, licensing issues and long lead time to construct.

80 kA System: This alternative would upgrade the substation and all of the circuit breakers to 80 kA interrupting capability. It was not recommended due to high cost, and long lead time to construct.

Bus Reactors: This alternative would split the north and south buses and install 10 Ohm reactors. However, the size of the reactors prevents the installation of required protection and isolation equipment within the existing substation.

Line Reactors: This alternative would add line reactors to the most impactful line that contributes to the short circuit duty. However, the sufficient reactor impedance for short circuit duty purposed would cause very low voltages in the system. Accordingly, this alternative was not recommended.

De-loop Lines: This alternative would move lines around so that breakers can be opened to de-loop lines going in and out of the substation. This alternative would have little headroom for any expansion in the area and was not recommended.

POSITIONS OF THE PARTIES

SCE identified the short circuit current level problem in the September 2022 ISO transmission planning stakeholder meeting, and submitted a proposed project on May 31, 2023, for ISO approval. A stakeholder call was held on June 28, 2023. Stakeholders did not have any comments on the call opposing the recommended project. The window for written comments has not yet closed, and no opposing comments have been submitted at this time.

CONCLUSION

This memorandum does not require ISO Board of Governors action. ISO Management plans to approve this transmission project by the end of July 2023.