

Memorandum

To: ISO Board of Governors
From: Keith Casey, Vice President, Market & Infrastructure Development
Date: March 17, 2010
Re: **Briefing on the 2010 ISO Transmission Plan**

This memorandum does not require Board action.

EXECUTIVE SUMMARY

The purpose of this memorandum is to provide the ISO Board of Governors with an overview of the *2010 ISO Transmission Plan* which describes 29 needed transmission reliability projects. The transmission plan consists of three major components:

- A summary of the results of various technical power system studies conducted by the ISO during the planning cycle;
- A detailed discussion of the transmission reliability need analysis for the 2010-2019 time frame; and
- A description of the 29 reliability transmission projects, representing \$573 million in transmission infrastructure investment.

FERC Order No. 890 requires all transmission providers, including independent system operators, to implement and document, through open access tariffs and other public postings, a coordinated, open, and transparent transmission planning process that complies with the planning principles and other requirements articulated in the order. In addition, a primary function of the ISO is to plan for, and promote, the enhancement and expansion of transmission capabilities within its footprint. The ISO, with cooperation from participating transmission owners (PTOs), market participants, load serving entities (LSEs), neighboring transmission providers, regional and sub-regional planning groups, state regulatory authorities and other affected customers or entities, perform this function through the transmission planning process (TPP) in accordance with the terms of Section 24 of the ISO tariff. The TPP is an annual technical study process, which includes ISO's independent analyses and recommendations, supported by timely and meaningful opportunities for broad TPP Participant input. The results of this process are ultimately incorporated into an annual ISO

transmission plan, project-specific reports, and other specific transmission-dependent resource adequacy studies.

The ISO's transmission planning process requires the Board's approval for projects with an estimated cost over \$50 million, and Management approval for projects below that threshold. All projects in the 2010 transmission plan have received approval from the Board or Management. The only projects requiring Board approval in this planning cycle were the Alberhill Substation and Bayfront Substation projects, which the Board approved in December 2009 and February 2010, respectively.

The transmission plan serves as the ISO's formal documentation on demonstrating how the ISO is ensuring the reliability of the ISO controlled grid through its assessment of the North American Electric Reliability Corporation's (NERC) and ISO's planning standards. Finally, this transmission plan has been structured to meet the transmission process requirements described in the ISO's *Business Practice Manual for Transmission Planning* developed to comply with the transmission planning principles outlined by the Federal Energy Regulatory Commission in Order 890.

The ISO annual transmission planning process is a collaborative effort among the ISO, participating transmission owners and other stakeholders. During the 2009 planning cycle, the ISO sponsored three stakeholder meetings, each designed to collect information needed to prepare the transmission plan:

- The ISO held the first stakeholder meeting on March 24, 2009, where the overall study plan was presented, including the unified planning assumptions that were used in the studies and received comments from stakeholders;
- The ISO conducted a second meeting on October 26 – 27, 2009, where ISO staff presented and discussed all study results and presented new transmission projects identified as appropriate solutions to identified system needs. The ISO also received written comments from stakeholders.
- The final stakeholder meeting took place on February 16, 2010, where ISO staff presented the transmission plan and received comments from stakeholders.

Based on comments received from stakeholders at the February 16 meeting, ISO staff made clarifying revisions to draft plan presented at that meeting and prepared a current *Draft 2010 ISO Transmission Plan*.¹ Please refer to Attachment A for the detailed stakeholder matrix.

The final stage of the planning cycle is to present the plan to the ISO Board.² The transmission plan will be considered final once it is presented to the Board and will be posted to the ISO website.

¹ The current Draft 2010 ISO Transmission Plan can be found at <http://www.caiso.com/20a1/20a1dbe417300.html>. The ISO plans to issue a final version of the plan by the end of March.

² Section 24.2.4.1 of the ISO tariff requires the ISO to present the transmission plan to the Board in accordance with the schedule set forth in the Business Practice Manual.

FINDINGS AND TRANSMISSION PROJECTS

The reliability studies necessary to ensure compliance with NERC and ISO planning standards are a foundational element of the transmission plan. During 2009, ISO staff performed a comprehensive assessment of the ISO controlled grid to ensure compliance with applicable NERC reliability standards (TPL-001 through TPL-004). The analysis was performed across a ten-year planning horizon and modeled summer on-peak and off-peak system conditions. The ISO assessed transmission facilities across a voltage bandwidth of 60kilovolt (kV) to 500kV and where reliability concerns were identified, the ISO proposed mitigation plans to address these concerns. These mitigation plans include upgrades to the transmission infrastructure, implementation of new operating procedures, and/or installing automatic special protection schemes. All ISO analysis, results, and mitigation plans are documented in the transmission plan.

Finally, it is the ISO's responsibility to conduct its transmission planning process to ensure planning is appropriately coordinated across the ISO controlled grid and its connections with neighboring systems. The analysis that is required to prepare this transmission plan is complex and entails processing significant amount of data and information. While the details of the ISO's study are documented in greater detail in the transmission plan, the results have been refined to the key results shown in the following summary:

- 1) In March, Management approved 24 transmission projects, representing a cumulative investment of \$247 million. Each of these projects has capital costs under \$50 million.
- 2) In the fourth quarter of 2009, Management approved three transmission projects due to a request from the participating transmission owner for an early decision in order to complete construction in time for the summer 2010 operating date. These three projects are for the SDG&E power system and represent a total investment of \$26 million.
- 3) In December 2009 and February 2010, the Board approved two transmission projects, with total capital costs of \$300 million, for SCE and SDG&E power systems. These two projects include construction of new load-serving substations that have operating dates of June 2014 and December 2012, respectively.

In total, these 29 transmission projects represent an investment of \$573 million in infrastructure additions to the ISO controlled grid. These reliability projects are required to ensure compliance with the NERC and ISO planning standards. A summary of the number of projects and associated total costs in each of the three major PTOs' service territories is listed below in Table 1. In arriving at these projects, the ISO and PTOs performed power system studies to measure system performance based on the NERC reliability standards and ISO planning standards and identify reliability concerns, including among other things, facility overloads or voltage excursions. Mitigation measures were then evaluated, and cost-effective solutions were recommended by the ISO staff to Management and the Board for approval to be included as approved projects in the transmission plan.

Table 1 – Summary of Approved Reliability Projects in the ISO 2010 Transmission Plan

| Service Territory | Number of Projects | Costs |
|----------------------------------|---------------------------|----------------|
| Pacific Gas & Electric (PG&E) | 16 | \$135 M |
| Southern California Edison (SCE) | 2 | \$184 M |
| San Diego Gas & Electric (SDG&E) | 11 | \$254 M |
| Total | 29 | \$573 M |

Because PG&E and SDG&E have lower voltage transmission facilities (i.e., 138kV and below) that are under the ISO operational control, there were more projects submitted for ISO approval for mitigating identified reliability concerns, compared to SCE. The majority of identified reliability concerns are related to facility overloads or low voltage. Therefore, mitigation measures typically included line re-conductoring or facility upgrades for relieving overloading concerns, or installing voltage support devices for mitigating voltage concerns. For reliability concerns on high-voltage facilities, transmission solutions include construction of new load-serving substations to relieve identified loading concerns on existing transmission facilities. A detailed listing of all 29 projects is provided as Attachment B.

In addition to the 29 transmission projects included in the transmission plan, there are other on-going transmission projects that are still under review by the ISO for possible approval later in the year. These projects either do not have sufficient information for the ISO to approve them at this time, or they are being reviewed in conjunction with other potential transmission alternatives to determine the appropriate cost-effective solutions.