

Memorandum

To: ISO Board of Governors
From: Keith Casey, Vice President of Market and Infrastructure Development
Date: March 14, 2018
Re: Transmission Maintenance Coordination Committee update

This memorandum does not require Board action.

EXECUTIVE SUMMARY

The Transmission Maintenance Coordination Committee (TMCC) held a conference call on September 11, 2017 and held in-person meetings on October 17, 2017 and January 18, 2018. The following were the main topics discussed:

September 11, 2017

1. Nominate and confirm a TMCC member replacement for San Diego Gas & Electric.

October 17, 2017

1. GridLiance West Transco presentation on galloping conductor mitigation measures;
2. Pacific Gas & Electric presentation on transformer failures;
3. Review and approve revisions to Maintenance Procedures 5 and 6.

January 18, 2018

1. NextEra presentation on hurricane preparation and response to hurricane Irma;
2. California ISO presentation on congestion revenue rights auction efficiency analysis;
3. Status of revisions to Maintenance Procedure 2.

The next regular scheduled TMCC meeting will be held on April 19, 2018 at the ISO Folsom Headquarters.

BACKGROUND

The TMCC is an advisory committee to ISO Management. TMCC membership includes one member representing each participating transmission owner with transmission facilities subject to the ISO transmission maintenance standards, two members representing organizations representing labor interests, five members representing other organizations, and the ISO vice president responsible for transmission maintenance, or his or her designee, who serves as the Chair of the TMCC.

Members of the TMCC perform duties specified in Appendix C to the transmission control agreement, including:

- Convey transmission facility maintenance related information to the ISO vice president responsible for transmission maintenance;
- Seek input from other participating transmission owners and interested stakeholders regarding the ISO transmission maintenance standards; and
- Review any proposed changes to the ISO transmission maintenance standards, submitted by the ISO, a participating transmission owner, or any interested stakeholder; and recommend revisions to the ISO transmission maintenance standards for submittal to the ISO Board of Governors for decision.

Summary of September 11, 2017 conference call

The purpose of the conference call was to review San Diego Gas & Electric's nomination to replace their outgoing TMCC member representative. The nomination was approved and Bret Ball, Manager, Transmission Construction and Maintenance was appointed to serve on the TMCC for the remainder of the term until March 31, 2018.

Summary of October 17, 2017 meeting

GridLiance West Transco presentation on galloping conductor mitigation measures:

Jason Murray, Director of Transmission Maintenance for GridLiance, gave a presentation on issues they faced with a transmission line in Oklahoma that is prone to vertical oscillations during high winds (i.e., galloping conductor). Mr. Murray explained that they were piloting a new technology to control the amplitude of galloping. This technology uses an offset weight to change the conductor angle relative to the wind during a galloping event.

Pacific Gas & Electric presentation on transformer failures:

Vince Steinman, of Pacific Gas & Electric (PG&E), presented on PG&E's findings from the Bank 4 failure experienced at the Metcalf Substation in 2015. Mr Steinman reported that the transformer failed catastrophically and that the main tank walls were distorted and physically breached in more than one location. The initiating point of failure was determined to be an

internal flashover between the de-energized tap changer and load tap changer leads. . PG&E has 19 units by the same manufacturer currently in service and in an effort to prevent future failures, performed partial discharge tests on all units and have increased the frequency of diagnostic testing on these transformers.

ISO Transmission Maintenance Standards:

Minor revisions to the transmission maintenance procedures were reviewed and approved. The maintenance procedures revised were:

- Procedure 5 – Classifying Forced Outages
- Procedure 6 – Supervisory Control and Data Acquisition (SCADA) Performance Criteria

Summary of January 18, 2018 meeting

NextEra presentation on Hurricane Preparation & Irma Response:

James Alligan, NextEra Energy Transmission's Project Director, presented on Florida Light & Power's response to hurricane Irma and the benefits realized from their hurricane preparedness efforts. Mr. Alligan reported that Florida Light & Power (FL&P) hurricane preparedness efforts helped reduce the average customer outage time from 5.4 days after Hurricane Wilma, to 2.3 days after Hurricane Irma. Mr. Alligan reported that FL&P hardened or undergrounded approximately 40% of their lines, upgraded their substations with storm surge and flood mitigation and cleared vegetation for 15,000 miles of their lines annually. Mr Alligan explained that hurricane Irma was roughly the size of Texas and was slow moving. FL&P estimates that recovery from Irma will ultimately cost \$1.3 billion and the restoration utilized the largest workforce ever assembled by FL&P, much of which was pre-staged around Florida prior to the hurricane making landfall.

California ISO presentation on Congestion Revenue Rights Auction Efficiency Analysis:

Perry Servedio, Senior Market Design Policy Developer at the California ISO, presented on the issues outlined in the Congestion Revenue Rights (CRR) Auction Efficiency Analysis report. Mr Servedio explained the purpose and use of CRRs and the potential impacts of inaccurate system models used in the auctions. He reviewed the ISO tariff requirements for reporting planned outages and explained that the PTOs were not consistently meeting the requirements. Mr. Servedio also provided a high level overview of the ongoing CRR auction efficiency stakeholder process in which the ISO is considering potential policy changes.

ISO Transmission Maintenance Standards:

Chris Hillman, California ISO Lead Grid Asset Engineer, provided an update on the status of the proposed revisions to Procedure 2 – Outage Data File Format. Mr. Hillman

explained that the ISO is investigating the impacts of the revisions to the Outage Management System (WebOMS) as the application pulls its outage cause codes from the primary cause list in Procedure 2. Mr. Hillman will report back to the TMCC on the outcome of the ISO investigation.