Memorandum

To: ISO Board of Governors

From: Keith Casey, Vice President of Market and Infrastructure Development

Date: March 8, 2017

Re: Transmission Maintenance Coordination Committee update

This memorandum does not require Board action.

EXECUTIVE SUMMARY

The Transmission Maintenance Coordination Committee (TMCC) met on October 20, 2016 and January 19, 2017. The following were the main topics discussed:

October 20, 2016

1. TBC presentation on its Quick Start project;
2. SCE presentation on vegetation management and the California drought;
3. PG&E presentation on its Mission substation modernization;
4. NERC reliability standards and compliance;
5. Major grid events.

January 19, 2017

1. ISO presentation on alternatives to SF6;
2. ISO transmission maintenance standards;
3. NERC reliability standards and compliance;
4. Major grid events.

The TMCC will be holding a conference call on March 13, 2017 to nominate and confirm membership for four open positions. The next regular scheduled TMCC meeting will be held on April 20, 2017 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 Board for decision.

SUMMARY OF TMCC RECENT ACTIVITIES – October 20, 2016

Trans Bay Cable presentation on the Quick Start project:

Steven Powell, Trans Bay Cable's Director of Operations, gave a presentation on the completion of TBC's Quick Start project. The project was designed to address a Category D contingency of loss of transmission from the southern peninsula to the City of San Francisco.

Southern California Edison presentation on Vegetation Management and the California Drought:

Raymond Fugere, Southern California Edison's Manager of Compliance Strategy, gave a presentation on the challenges being faced by SCE due to the drought in southern California. SCE has implemented a vegetation identification and removal program to address trees succumbed to pine bark beetle infestation resulting from drought conditions.

Pacific Gas & Electric presentation on their Mission Substation Modernization:

Tom Wright, Pacific Gas & Electric's Director Substations Maintenance & Construction, gave a presentation on the rebuild of PG&E's Mission substation. The modernization was completed in three phases. Phase I, completed in 2010, involved the replacement of a portion the distribution equipment while Phase II, completed in 2013, involved the replacement of the remaining distribution equipment. Phase III was completed in 2015 and consisted of the replacement of the transmission equipment and the installation of a GIS to replace the 115kV ring bus.

NERC reliability standards and compliance:

Attendees were informed that revisions are pending to NERC regulations EOP-005-2 and EOP-006-2 with a January 1, 2017 implementation date.

Jack Vranish, PacifiCorp's Director of Asset Management, also informed the attendees of upcoming revisions to the NERC CIP Standards to address issues identified by the Version 5 Advisory Group.

Major grid events:

Tom Wright provided an update on the partial discharge monitor installs related to the ELIN 500/230kV 420 MVA transformers failures PG&E reported on at the April meeting.

Raymond Fugere shared SCE's recent experience with the power outage that resulted in the flaring at the Torrance refinery in September and October.

SUMMARY OF TMCC RECENT ACTIVITIES – January 19, 2017

California ISO presentation on alternatives to SF6:

Chris Hillman, ISO Lead Grid Asset Engineer, gave a presentation on a new insulating gas technology being offered as an alternative to SF6. The new insulating gas is a fluoroketone based mixture with similar insulating properties to SF6 but with a significantly less Global Warming Potential (GWP <1 versus 23,500 for SF6). The new gas cannot be used as a direct replacement for SF6 but some new installations in Europe are exploring the option.

California ISO transmission maintenance standards:

Chris Hillman reviewed the current ISO transmission maintenance standards with the committee and requested members to submit proposals for updates or revisions.

NERC reliability standards and compliance:

Tyson Swetek, SDG&E's Substation Operations and Engineering Manager, reported that protocol converters are excluded from cyber assets even though it has microprocessors because they are simply switched and not configurable.

Steve Powell added that voice over internet protocol is presently excluded from the critical cyber assets definition.

Major grid events:

Tom Wright provided an update on the manufacture's recommendations related to the ELIN 500/230kV 420 MVA transformers failures PG&E experienced.

Tyson Swetek provided an update that the cracked 230kV bushings discovered at one of SDG&E's substation were due to an isolated lot issue and not related to a design defect.

Steve Powell reported that TBC experienced a DC Reactor failure which resulted in a 28 hour outage. Fortunately they discovered the failing reactor prior to catastrophic failure due to audible "clicking" and noted that nothing was observed in their most recent IR scan.