

# Texas RE*minders*



November 2018

## **Upcoming Texas RE Events:**

[November 9 at 2:30 p.m.](#) — Member Representatives Committee Conference Call

November 22 & 23 — Texas RE Office Closed

[November 29 at 1:30 p.m.](#) — Talk with Texas RE

[December 5 at 8:30 a.m.](#) — Annual Membership Meeting

[December 5 at 9:00 a.m.](#) — Member Representatives Committee Meeting

[December 5 at 12:00 p.m.](#) — Audit, Governance, and Finance Committee Meeting

[December 5 at 1:30 p.m.](#) — Board of Directors Meeting

[December 6 at 9:30 a.m.](#) — NSRF Meeting (at Texas RE)

[December 13 at 1:30 p.m.](#) — Talk with Texas RE

## **2019 Membership Roster**

November 1, 2018 marks the beginning of the Texas RE 2019 membership term. A full list of member companies is available [here](#). If your company is interested in joining Texas RE, complete a [Membership Application](#) and send it to [information@texasre.org](mailto:information@texasre.org).

## **Fall Standards and Compliance Workshop Recap**

Texas RE held its Fall Standards and Compliance Workshop on October 17, 2018. The workshop focused on showing how the various parts of compliance monitoring and enforcement work together. Specifically, two interdepartmental group presentations—Lifecycle of a NERC Standard: From Development to Enforcement and ICE and Beyond: How Internal Controls Affect Compliance—examined the perspective of multiple teams within Texas RE on specific compliance issues.

In addition, Texas RE staff provided updates on enforcement, CMEP technology projects, and implementation guidance. Many thanks to Lori Cral from BP Wind Energy, who gave a stakeholder's perspective on best practices for PRC-004-5, protection system misoperation.

Thanks to everyone who participated in the event. If you have a topic that you would like to see addressed in future outreach activities, please contact [information@texasre.org](mailto:information@texasre.org). If you were unable to attend the workshop, materials are available [here](#).

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## **FERC Actions:**

**On October 18, 2018, FERC issued an [order](#) accepting 2019 Business Plans and Budgets of NERC and the Regional Entities.**

- FERC accepted the plans for the seven Regional Entities and the Western Interconnection Regional Advisory Body (WIRAB).

**On October 18, 2018, FERC issued Order [No. 850](#) on Supply Chain Risk Management. The Order:**

- Approved Reliability Standards [CIP-005-6](#), [CIP-010-3](#), and [CIP-013-1](#).
- Directed NERC to develop modifications to the CIP standards to include EACMS within the scope of the supply chain risk management Reliability Standards (Paragraph 30).
- Regarding PACS and PCAs, directed NERC to file the BOT study's final report with the Commission.
- Retired: CIP-005-5, CIP-010-2
- Link to [Implementation Plan](#)
- Effective Date: 7/1/2020

## **NERC Actions**

**On October 1, 2018, NERC filed an Informational Filing Regarding Reliability Standard BAL-001-2 in accordance with the FERC directive in Order No. 810.**

- The Commission directed NERC to submit an informational filing after implementation of the standard regarding potential impacts on System Operating Limit and Interconnection Reliability Operating Limit exceedances in the Western and Eastern Interconnections.

**On October 12, 2018, NERC submitted a Filing for Approval of Revisions to the Implementation Plans for Reliability Standards MOD-026-1 and MOD-027-1.**

- Implementation Plans for both MOD-026 and MOD-027 erroneously referenced "verification date" instead of "transmittal date" to set the periodicity for reverification under each standard.

**On October 16, 2018, NERC submitted its Petition for Approval of Proposed Revisions to Appendix 4E to the Rules of Procedure.**

- The purpose of the proposed revisions is to align the rules and procedural steps of the Hearing Procedures used in the Compliance Monitoring and Enforcement Program (CMEP) per the Compliance and Certification Committee (CCC) charter.

**On October 24, 2018, NERC submitted Comments in Support of Notice of Proposed Rulemaking.**

- NERC supports FERC's NOPR to revise the Commission regulations at 18 CFR Section 38.1(b) to remove the incorporation by reference of Wholesale Electric Quadrant WEQ-006 Time Error Correction Business Practice Standards as adopted by NAESB in its WEQ Version 003.0 Businesses Practice Standards.

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## **NERC Lessons Learned**

### **Networking Packet Broadcast Storms**

When a second network cable was connected from a voice over internet protocol (VOIP) phone to a network switch lacking proper settings, a packet broadcast storm prevented network communications from functioning, and supervisory control and data acquisition (SCADA) was lost for several hours. Broadcast storm events have also arisen from substation local area network (LAN) issues.

Similar events have occurred elsewhere. In one case, a substation technician performing routine system maintenance at a substation inadvertently connected an unused ethernet cable between two ethernet switches where an ethernet connection was already established. This created a communications loop with multiple ports seeing a duplicate MAC address. This loop created a broadcast storm that ultimately caused a loss of SCADA capability from the remote terminal units (RTUs) to the utility's EMS. Eventually, the cable was identified as the problem and removed, and EMS capability was fully restored.

Another case involved substation data and commercial data on separate virtual local area networks (VLANs) passing through the same physical network switches. When station data was defeated by a broadcast storm due to an issue at a station under construction, the switches became overwhelmed, and the separate business traffic ceased as well.

### **Corrective Actions**

In the IP phone case, the entity worked to narrow down the switching loop network location by isolating network segments, pinpointing the trouble spot, and finally shutting down the device and the port it was utilizing. They worked with the network hardware vendor to help review hardware global settings and receive remediation recommendations based on this specific incident. The vendor recommended that network port settings be set to block BPDU packet propagation from non-spanning tree protocol enabled devices unless purposely allowed. In the station case, locating and eliminating the unintended loop was the corrective action. In some cases, incompatibilities between network device manufacturers complicates use of spanning tree protocol. In the cloned IP case, the solution was removing one of the two switches and assigning it a different IP address.

### **Lessons Learned**

- Entities should use BPDU packet propagation prevention where a non-spanning tree protocol enabled device could be connected.
- Complete physical separation between SCADA Operations networks and business networks, VoIP, and external facing networks is preferred over VLAN to avoid network traffic congestion and security issues.
- Where physical separation is not feasible, and Layer 2 Quality of Service (QoS) settings are supported, Layer 2 QoS can be used to avoid issues of heavy network traffic cutting off vital traffic.

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## Incorrect Field Modification and RAS Operation Lead to Partial System Collapse

Planned work was underway to replace the 500 kV Line A disconnect switch at Station A. As part of this project, a temporary bypass was installed to keep the circuit in-service during the replacement. Believing that the Line A disconnect switch was in the open position (as is typical for line outages), the Field Protection & Control (P&C) staff member toggled the position of an auxiliary contact multiplier relay to maintain protection adequacy of Line A with the bypass circuit in-service. The P&C personnel was not aware that the disconnect switch was requested closed during this period to facilitate its removal due to clearance issues. During this modification, the physical position of the disconnect switch was not verified and neither was the OPEN & CLOSED labeling on the auxiliary multiplier relays to confirm the current line switch position. Due to this incorrect assumption, this action resulted in the auxiliary contact multiplier being placed in the opposite position, indicating to the protective relays that the disconnect switch was open. The circuit, along with the bypass, was then placed back in-service.

With the circuit in-service and the line disconnect switch being indicated as open to the protection relays, the line stub bus protection was enabled and the detection of a Line A contingency in the RAS became disabled as designed after one second. The TO does not normally receive any indication when a RAS contingency becomes disabled. By mid-day, as generation and flows in the region increased, the power flow on Line A exceeded the stub bus protection pickup threshold; this, combined with the perceived open disconnect switch, looked exactly like a major fault to the protection system and resulted in the undesirable trip.

When the Line A contingency occurred, the RAS was armed to trip Line B, Line C, Line D, some generation, and large industrial loads in the region (see Figure 2). An assessment by the RC indicated that the arming of the RAS was correct based on the system conditions at the time. However, the RAS did not trip as expected (Line B remained in service) due to the detection of a Line A contingency being previously disabled. Instead, Line B tripped from overvoltage protection 58 seconds after the initial contingency. A security feature of the RAS prevents it from detecting the Line A contingency after one second following its initiation.

## Corrective Actions

The position of the auxiliary multiplier was corrected for the Line A disconnect switch. Associated process documents will be revised to clearly state that a status check (both primary and auxiliary devices) must be performed prior to operating auxiliary devices.

## Lessons Learned

- Ensure field staff always verify the status of the equipment prior to making changes on an auxiliary contact multiplier and include this in your procedures if it doesn't already exist.
- Reinforce proper communications between control room staff and field P&C staff so that both parties understand the purpose of the auxiliary switching.
- Consider adding an alarm or status change when a RAS Contingency is inadvertently blocked by any means other than the "Master Block" control point.