North American Transmission FORUM

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NATF Redacted Operating Experience Report

Incorrect Live Line Work Location

About NATF Redacted Operating Experience (OE) Reports

North American Transmission Forum (NATF) operating experience reports highlight positive or negative transmission (reliability or resiliency) experiences worth sharing for learning opportunities or potential trending. The overall goal is to help each other learn without experiencing the same issues first-hand. This sharing originates confidentially within the NATF membership.

Redacted operating experience reports are posted on the NATF public website to allow the NATF and its members to more broadly share information, especially safety-related alerts and learnings, with contractors and other utilities to benefit the industry at large.

The NATF member company that submitted the initial restricted distribution OE report for this topic/event has approved the NATF to issue this redacted OE report.

Topic

Incorrect Live Line Work Location

Description

In the days following a severe ice storm (with high winds) that damaged our transmission system, our company's transmission maintenance, electrical maintenance, line construction, and vegetation management crews worked to make the needed repairs to structures. Live line work and clearance requests were being called into the system operations center and outage coordinators as items in need of attention were discovered. At the time of the event, one particular 69 kV line (Line X) was in the middle of a scheduled, long-term rebuild project, which resulted in a section of this line being isolated between two substations.

At the start of a work day, a construction line-worker contacted the System Operator to discuss a needed live-line permit on Line X to straighten poles impacted by the ice storm. The work location would be on the Substation A side of the ongoing construction clearance zone. Substation A breaker BXX5 reclosing was disabled by the System Operator and a live-line permit was issued to the construction line-worker on Line X out of Substation A.

Later that same morning, a second construction line-worker from a different construction crew contacted the System Operator to receive a live-line permit on Line X to straighten poles impacted by the ice storm. The System Operator noted that the first construction line-worker had already received a live-line permit on Line X that morning and asked if this second live-line permit would be in the same area. The second construction line-worker indicated that he was not going to be in the same area as the other personnel and required a separate live-line permit.

The System Operator issued a live-line permit to the second construction line-worker on Line X, also out of Substation A breaker BXX5. Three-part communication was utilized correctly throughout.

Shortly after the second live-line permit was issued, area transmission maintenance personnel contacted the System Operator to discuss the many live-line permits being requested in their area. It was during this communication that the second live-line permit on Line X was discussed. Transmission maintenance personnel noted that the second construction line-worker was actually working on the opposite end of the construction outage and not at the Substation A end of the line. It was clear that an error was made in terms of the second Transmission construction crew's physical location on Line X.

The area transmission maintenance line-worker contacted the second transmission construction line-worker immediately and directed them to stop work. The System Operator contacted the second transmission construction line-worker and directed them to release the issued live-line permit. A discussion verified that this crew was indeed working on the opposite end of the construction clearance. The System Operator and transmission construction line-worker discussed the breakers at Substation B that would require reclosing disabled for the corrected work location. Substation B breakers BXX6 and BXX7 reclosing was disabled by the System Operator and a live-line permit was issued to the second construction line-worker on Line X out of Substation B.

Reference: NATF-OER-499

Lessons Learned

1. The transmission construction line-worker picking up the live-line permit was unfamiliar with his work location on Line X. When the incorrect breaker was read off during the issuance of the live-line permit, the transmission construction line-worker did not recognize the error or correct the System Operator. When informed by the second transmission construction line-worker that he would not be working in the same location as the first transmission construction line-worker, the System Operator assumed he would still be working on the Substation A end of the construction outage. An additional probing question may have brought this information out and prevented the error.
2. Transmission construction personnel in the area did not have a copy of our company system operating diagrams available to verify the breakers that would be in manual for the live-line permit.

Actions Taken

1. Copies of the system operating diagrams will be made available to the construction and vegetation management crews.
2. Our company power delivery leadership emphasized to field staff that during significant system events (e.g., storm response), where transmission construction and vegetation management personnel are taking part in the restoration efforts, a local transmission maintenance employee, familiar with the transmission system in the area, will be assisting them.
3. System Operations Center personnel will include additional knowledge requirements in the Switching Training and Qualifications Manual to ensure qualified live-line permit holders can effectively use the system operating diagrams and identify the circuit breakers needed to be placed in non-reclose for the work.

Extent of Condition

The risk of repeating this type of event is heightened during similar severe system events, when restoration activities by multiple work groups are taking place in areas of the system that are unfamiliar to the personnel.