

NATF Redacted Operating Experience Report

Inadvertent Contact with Conductor Having Induced Voltage

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.

Open Distribution

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Topic

Inadvertent Contact with Conductor Having Induced Voltage

Description

A transmission crew was tasked with replacing a deteriorated wooden three-pole structure on a 115 kV circuit. The crew established bracket grounds by placing the first set of grounds 30 feet away and attached to an adjacent lattice tower that supports two 220 kV circuits. In addition, two driven ground rods were installed at an H-frame 400 feet away. The crew considered the 115 kV to be de-energized and grounded at this point.

The induced voltage was measured at approximately 30,000 volts. Prior to replacing the poles, the crew removed the jumper loops in order to create a window for installing the new poles. By doing so, this broke the equipotential bracket grounding scheme previously created. A total of five out of six down guys were installed with no incident. While attempting to install the last down guy wires, an apprentice lineman's elbow made inadvertent contact with a conductor having induced voltage from one of the nearby 220 kV circuits.

The apprentice lineman did not lose consciousness and motioned he was "okay" after the initial contact. The bucket was brought down to the ground and the apprentice lineman was transported by a co-worker to a nearby medical center. The apprentice lineman was deemed to sustain a third-degree burn to the right thumb and a second-degree burn to the left thigh.

Lessons Learned

1. The cause of the event was determined to be an inadequate grounding scheme for the task at hand.
2. There was inadequate training regarding the risk of working around induced voltages.

Actions Taken

1. Modification of the overhead grounding manual to require the overhead equipotential bracket grounding method to be applied at all work sites where induction is present, regardless of the distance between the bracket grounds.
2. Modification of transmission and distribution manuals related to grounding to include a more in-depth explanation of induction, risk associated with working around induced lines, and effects of grounding on de-energized lines subjected to induction.

Extent of Condition

All transmission and distribution crews may encounter induced-voltage lines while performing work.