

Lesson Learned

Vegetation Management — Tree Contact

Primary Interest Groups

Generator Owners
Transmission Owners

Problem Statement

An event occurred when a 345 kV circuit operated and locked out as a result of a tree contact.

Details

A 345 kV circuit operated and locked out. Initial inspections carried out by aerial and ground patrols that were based on the fault location estimate did not immediately identify the cause of the lock out. With no obvious cause found, the line was re-energized and held. The day following the event, additional patrols were conducted in the area of the calculated fault location. Personnel found evidence that arcing had occurred between the 345 kV circuit and a crossing distribution circuit. The distribution circuit was lowered to provide additional clearance. Two days after the event ground patrols located a tree on the right-of-way that had grown into the line. The tree was located a number of miles away from the estimated fault location.

Inspections for vegetation encroachments on this 345 kV circuit are conducted by aerial patrol in the spring and fall of each year. Comprehensive ground inspections of the tower line are conducted on a 10-year cycle.

The tree identified as the cause of the event was missed during the aerial patrols on more than one occasion; further investigation determined the tree was approximately five years old. Failure to perform a comprehensive review of the right-of-way for vegetation encroachments was determined to be the root cause.

Corrective Actions

More comprehensive and frequent ground patrols, in addition to aerial patrols, may be necessary depending on the location of the line and surrounding vegetation.

Lesson Learned

Visual inspections during aerial patrols may not provide an accurate assessment of vegetation encroachments. Aerial inspections should be followed up with regularly-scheduled ground patrols to determine if vegetation encroachments exist which may not have been evident during the aerial inspection. This is particularly important when, during the aerial inspection, the inspector is unable to view a profile of the line, which is generally the case in heavily wooded areas. The frequency of ground patrols should be adjusted in recognition of the type of vegetation exposure and the growth rate of that vegetation.

Inspector qualifications should also be reviewed. The inspector should be knowledgeable of tree species and growth rates for the area, as well as conductor sag and movement, in order to determine if any vegetation will pose a reliability concern before the next scheduled inspection. Inspections should be forward-looking, and any transmission vegetation maintenance program should be flexible enough to account for changing weather conditions. Time periods with above normal precipitation may make it necessary to increase the frequency of inspection.

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