Standard Development Roadmap

This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.

Development Steps Completed:

1. The standard authorization request (SAR) was posted for industry comment in May 2004.
2. A standard drafting team was selected in July 2004.
3. The standard drafting team received comments on the SAR from nearly 60 separate entities.
4. The proposed standard documents were posted for comment in January 2005.
5. Draft 2 of the standard was posted for comment in June 2006

Description of Current Draft:

The current draft reflects significant changes since draft 1 based on stakeholder input and also reflects a consolidation from three individual standards to one comprehensive standard. The intent for this proposed standard would be to completely replace the existing FAC-003-0.

Future Development Plan:

Anticipated Actions	Anticipated Date
1. Balloting may begin after consideration of industry comment received as a result of the current draft.	To be determined

Definitions of Terms Used in Standard

This section includes all newly defined or revised terms used in the proposed standard. Terms already defined in the Reliability Standards Glossary of Terms are not repeated here. New or revised definitions listed below become approved when the proposed standard is approved. When the standard becomes effective, these defined terms will be removed from the individual standard and added to the Glossary.

Altitude Correction Factor: A multiplier applied to specify distances that adjusts those distances to account for the change in relative air density (RAD) from the RAD used to determine the specified distance. Altitude correction factors apply to both minimum worker approach distances and to minimum vegetation clearance distances.

Fire Risk: The likelihood that a fire will ignite or spread in a particular geographic area.

Flashover: An electrical discharge through air around or over the surface of insulation, between objects of different potential, caused by placing a voltage across the air space that results in the ionization of the air space.

IEEE: Institute of Electrical and Electronics Engineers.

Inspection: The systematic examination of a transmission corridor to document or control encroaching vegetation.

Operating Voltage: The voltage level by which an electrical system is designated and to which certain operating characteristics of the system are related; also, the effective (root-mean-square) potential difference between any two conductors or between a conductor and the ground. The actual voltage of the circuit may vary somewhat above or below this value.

Rated Electrical Operating Conditions: The specified or reasonably anticipated conditions under which the electrical system or an individual electrical circuit is intend/designed to operate.

Right(s)-of-Way (ROW): A corridor of land occupied or unoccupied by transmission lines, where the transmission owner has legal rights to manage vegetation.

Transmission Line: A system of structures, wires, insulators and associated hardware that carry electric energy from one point to another in an electric power system. Lines are operated at relatively high voltages varying from 69 kV up to 765 kV, and are capable of transmitting large quantities of electricity over long distances.

Vegetation: All plant material, growing or not, living or dead.

Introduction

1. **Title:** **Transmission Vegetation Management Program**

2. **Number:** FAC-003-1

3. **Purpose:** To improve the reliability of the electric transmission systems by preventing outages from vegetation located on transmission rights-of-way (ROW) and minimizing outages from vegetation located adjacent to ROW, maintaining clearances between transmission lines and vegetation on and along transmission ROW, and reporting vegetation-related outages of the transmission systems to the respective Regional Reliability Organizations (RRO) and the North American Electric Reliability Council (NERC).

4. **Applicability:**

   4.1. Transmission Owner

      4.1.1. This Standard shall apply to all transmission lines operated at 200 kV and above and to any lower voltage lines designated by the RRO as critical to the reliability of the electric system in the Region.

   4.2. Regional Reliability Organization

5. **(Proposed) Effective Date:**

   5.1. One calendar year from the date of adoption by the NERC Board of Trustees for requirements R1 and R2

   5.2. 60 calendar days from the date of adoption by the NERC Board of Trustees for requirements R3 and R4

B. Requirements

R1. The Transmission Owner (TO) shall prepare, and keep current, a formal Transmission Vegetation Management Program (TVMP). The TVMP shall include the TO's objectives, practices, approved procedures, and work specifications[1].

R1.1. The TVMP shall define a schedule for and the type (aerial, ground) of ROW vegetation inspections. The inspection schedule shall be based on the anticipated growth of vegetation and any other environmental factors that could impact the relationship of vegetation to the TO's transmission lines.

R1.2. The TO's TVMP shall identify, document, establish, and maintain clearances between vegetation and any overhead, ungrounded supply conductors, taking into consideration transmission line voltage, the effects of ambient temperature on conductor sag under maximum design loading, and the effects of wind velocities on conductor sway. Specifically, the TO shall establish clearances to be achieved at the time of vegetation management work identified herein as Clearance 1, and shall also establish and maintain a set of clearances identified herein as Clearance 2 to prevent flashover between vegetation and overhead ungrounded supply conductors.

R1.2.1. Clearance 1 — The TO shall determine and document appropriate clearance distances to be achieved at the time of transmission vegetation management work based upon local or regional conditions and the expected time frame in which the TO plans to return for future vegetation management work. Local or regional conditions may include, but are not limited to: operating voltage, appropriate vegetation management techniques, fire risk, reasonably anticipated tree and conductor movement, species types and growth rates,

[1] ANSI A300, Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices, is considered to be an industry best practice.

species failure characteristics, local climate and rainfall patterns, line terrain and elevation, location of the vegetation within the span, and worker approach distance requirements. Clearance 1 distances shall be greater than those defined by Clearance 2 below.

R1.2.2. Clearance 2 — The TO shall determine and document specific radial clearances to be maintained between vegetation and conductors under all rated electrical operating conditions. These minimum clearance distances are necessary to prevent flashover between vegetation and conductors and will vary due to such factors as altitude and operating voltage. These TO-specific minimum clearance distances shall be no less than those set forth in the Institute of Electrical and Electronics Engineers (IEEE) Standard 516-2003 (*Guide for Maintenance Methods on Energized Power Lines*) and as specified in its Section 4.2.2.3, Minimum Air Insulation Distances Without Tools in the Air Gap.

R1.2.2.1 Where transmission system transient overvoltage factors are not known, clearances shall be derived from Table 5, IEEE 516-2003, phase-to-ground distances, with appropriate altitude correction factors applied.

R1.2.2.2 Where transmission system transient overvoltage factors are known, clearances shall be derived from Table 7, IEEE 516-2003, phase-to-phase voltages, with appropriate altitude correction factors applied.

R1.3. All personnel directly involved in the design and implementation of the TO's TVMP shall hold appropriate qualifications and training, as defined by the TO, to perform their duties.

R1.4. Each TO shall identify right of way areas that do not meet the TO's standard for vegetation management and the mitigating measures used in order to achieve sufficient clearances for the protection of the transmission facilities.

R1.5. Each TO shall establish and document a process, including time frames and the positions responsible for taking action, for the immediate communication of right of way conditions that present an immediate threat of a transmission line outage to the appropriate authority, as determined by the TO. This is so that action (temporary reduction in line rating, switching line out of service, etc.) may be taken until the threat is relieved.

R2. The TO shall create and implement an annual plan for vegetation management work, including manual clearing, mechanical clearing, herbicide treatment, and other actions. The plan should be flexible enough to adjust to changing conditions, taking into consideration anticipated growth of vegetation and all other environmental factors that may have an impact on the reliability of the transmission systems. The plan should take into consideration the time required to obtain permissions or permits from landowners or regulatory authorities. Each TO shall have systems and procedures capable of documenting and tracking the planned vegetation management work and ensuring that the vegetation management work was completed according to work specifications.

R3. The TO shall report quarterly to its RRO, or the RRO's designee, sustained transmission line outages determined by the TO to have been caused by vegetation.

R3.1. Multiple outages on an individual line, if caused by the same vegetation, shall be reported as one outage regardless of the actual number of outages within a 24-hour period,

R3.2. The TO is not required to report to the RRO, or its designee, certain sustained transmission line outages caused by vegetation: (1) Vegetation-related outages that

result from vegetation falling into lines from outside the ROW that result from natural disasters or are storm related shall not be considered reportable (examples of disasters that could create non-reportable outages are earthquake, fire, tornados, hurricanes, wind shear (micro-bursts), severe thunderstorms, ice storms, hailstorms, and floods.), and (2) Vegetation-related outages due to human or animal activity shall not be considered reportable (examples of human or animal activity that could cause a non-reportable outage include logging, animal severing tree, vehicle contact with tree, arboricultural activities or horticultural or agricultural activities, or removal or digging of vegetation).

R3.3. The outage information provided by the TO to the RRO, or the RRO's designee, shall include at a minimum: the name of the circuit(s) outaged, the date, time and duration of the outage; a description of the cause of the outage; other pertinent comments; and any countermeasures taken by the TO. An outage shall be categorized as one of the following: Category 1 - Grow-ins: Outages caused by vegetation growing into lines from vegetation inside and/or outside of the right-of-way; Category 2 - Fall-ins: Outages caused by vegetation falling into lines from inside the right-of-way; or 3) Category 3 – Fall-ins: Outage caused by vegetation falling into lines from outside the right-of-way.

R4. The RRO shall report results quarterly to NERC. The RRO report to NERC shall include all of the information provided to it by the TO as well as any actions taken by the RRO as a result of any of the reported outages.

C. Measures

M1. The TO has a documented TVMP, as identified in R1.

M1.1. The TO has documentation that the TO performed the inspections as identified in R1.1.

M1.2. The TO has documentation that describes the clearances identified in R1.2.

M1.3. The personnel directly involved in the design and implementation the TO's TVMP hold the qualifications identified by the TO as required in R1.3.

M1.4. The TO has identified any areas not meeting the TO's standard for vegetation management and any mitigating measures the TO has taken to address these deficiencies as identified in R1.4.

M1.5. The TO has a documented communication procedure for the TO's personnel to immediately notify the TO of adverse ROW conditions that require immediate action as identified in R1.5.

M2. The TO has documentation that the TO implemented the work plan identified in R2.

M3. The TO has documentation that it has supplies quarterly outage reports to the RRO, or its designee, as identified in R3.

M4. The RRO has documentation that it provided quarterly outage reports to NERC as identified in R4.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Regional Reliability Organization

NERC

1.2. Compliance Monitoring Period and Reset

One calendar Year

1.3. Data Retention

Five Years

1.4. Additional Compliance Information

The TO shall demonstrate compliance through self-certification submitted to the Compliance Monitor (RRO) annually that its TVMP meets the requirements of NERC Standard FAC-003-1. The Compliance Monitor shall conduct an on-site audit every five years or more frequently as reliability performance may indicate to be necessary to review documentation related to the TVMP. Field audits of right-of-way vegetation conditions may be conducted if determined to be necessary by the Compliance Monitor.

2. Levels of Non-Compliance

2.1. Level 1:

2.1.1. The TO's Transmission Vegetation Management Program (TVMP) was incomplete in one of the requirements specified in R1 or any subpart of R1, or;

2.1.2. Documentation of the TO's annual work plan, as specified in R2, was incomplete when presented to the Compliance Monitor during an on-site audit, or;

2.1.3. The RRO provided an outage report to NERC that was incomplete and did not contain the information required in R4.

2.2. Level 2:

2.2.1. The TO's TVMP was incomplete in two of the requirements specified in R1 or any subpart of R1, or;

2.2.2. The TO was unable to certify during its annual self-certification that it fully implemented its annual work plan as specified in R2.

2.3. Level 3:

2.3.1. The TO reported one Category one or one Category two transmission vegetation-related outage in a calendar year, or;

2.3.2. The TO did not maintain a set of clearances (Clearance 2), as defined in R1.2.2, to prevent flashover between vegetation and overhead ungrounded supply conductors, or;

2.3.3. The TO's TVMP was incomplete in three of the requirements specified in R1 or any subpart of R1.

2.4. Level 4:

2.4.1. The TO reported more than one Category one or Category two transmission vegetation-related outage in a calendar year, or;

2.4.2. The TO's TVMP was incomplete in four or more of the requirements specified in R1 or any subpart of R1.

E. Regional Differences

None Identified

Version History

Version	Date	Action	Change Tracking