

## 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. When this standard has received ballot approval, the text boxes will be moved to the Guideline and Technical Basis Section.*

### **Right-of-Way (ROW)**

A corridor of land on which electric lines may be located. The applicable Transmission Owner or applicable Generator Owner may own the land in fee, own an easement, or have certain franchise, prescription, or license rights to construct and maintain lines.

The current glossary definition of this NERC term was modified to include applicable Generator Owners.

FAC-003-2 was developed under Project 2007-07. The standard was balloted and adopted by the NERC Board of Trustees, but the Project 2010-07 drafting team does not want to assume that FAC-003-2 will be approved by FERC and other governmental authorities. Thus, the Project 2010-07 drafting team has developed two sets of proposed changes: one to this version, FAC-003-1, the current FERC-approved version of the standard, and one to FAC-003-2, the version developed by the Project 2007-07 team and adopted by NERC's Board of Trustees.

## A. Introduction

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

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

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 Entity (RE) and the North American Electric Reliability Council (NERC).

Within the text of NERC Reliability Standard FAC-003-X, “transmission line(s)” and “applicable line(s)” can also refer to the generation Facilities as referenced in 4.4 and its subsections.

### 4. Applicability:

4.1. Applicable Transmission Owner

4.1.1. Transmission Owner that owns overhead transmission lines operated at 200 kV and above and to any lower voltage lines designated by the RE as critical to the reliability of the electric system in the region.

4.2. Applicable Generator Owner

4.2.1. Generator Owner that owns an overhead transmission line(s) that (1) extends greater than one mile or 1.609 kilometers beyond the fenced area of the generating station switchyard to the point of interconnection with a Transmission Owner's Facility or (2) does not have a clear line of sight<sup>1</sup> from the generating station switchyard fence to the point of interconnection with a Transmission Owner's Facility and is operated at 200 kV and above and any lower voltage lines designated by the Regional Entity as critical to the reliability of the electric system in the region.

### 5. Effective Dates:

There are three effective dates associated with this implementation plan:

The first effective date applies to Transmission Owners.

In those jurisdictions where regulatory approval is required, all requirements applied to the Transmission Owner become effective upon regulatory approval. In those jurisdictions where no

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<sup>1</sup> “Clear line of sight” means the distance that can be seen by the average person without special instrumentation (e.g., binoculars, telescope, spyglasses, etc.) on a clear day.

regulatory approval is required, all requirements applied to the Transmission Owner become effective upon Board of Trustees' adoption.

The second effective date allows Generator Owners time to prepare a formal transmission vegetation management program as outlined in Requirement R1.

In those jurisdictions where regulatory approval is required, Requirement R1 applied to the Generator Owner becomes effective on the first calendar day of the first calendar quarter one year after the date of the order approving the standard from applicable regulatory authorities where such explicit approval for all requirements is required. In those jurisdictions where no regulatory approval is required, Requirement R3 becomes effective on the first day of the first calendar quarter one year following Board of Trustees adoption.

The third effective date allows entities time to comply with Requirements R2, R3, and R4.

In those jurisdictions where regulatory approval is required, Requirements R2, R3, and R4 applied to the Generator Owner become effective on the first calendar day of the first calendar quarter two years after the date of the order approving the standard from applicable regulatory authorities where such explicit approval for all requirements is required. In those jurisdictions where no regulatory approval is required, Requirements R2, R3, and R4 become effective on the first day of the first calendar quarter two years following Board of Trustees adoption.

## **B. Requirements**

**R1.** Each applicable Transmission Owner or applicable Generator Owner shall prepare, and keep current, a formal transmission vegetation management program (TVMP). The TVMP shall include the applicable Transmission Owner's or applicable Generator Owner's objectives, practices, approved procedures, and work specifications<sup>2</sup>.

**R1.1.** The TVMP shall define a schedule for and the type (aerial, ground) of ROW vegetation inspections. This schedule should be flexible enough to adjust for changing conditions. The inspection schedule shall be based on the anticipated growth of vegetation and any other environmental or operational factors that could impact the relationship of vegetation to the applicable Transmission Owner's or applicable Generator Owner's transmission lines.

**R1.2.** Each applicable Transmission Owner or applicable Generator Owner, in the TVMP, shall identify and document 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 applicable Transmission Owner or applicable Generator Owner 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 applicable Transmission Owner or applicable Generator Owner shall determine and document appropriate clearance distances to be achieved at the time of transmission vegetation management work based upon local conditions and the expected time frame in which the applicable Transmission Owner or applicable Generator Owner plans to return for future vegetation management work. Local conditions may include, but are not

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<sup>2</sup> ANSI A300, Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices, while not a requirement of this standard, is considered to be an industry best practice.

limited to: operating voltage, appropriate vegetation management techniques, fire risk, reasonably anticipated tree and conductor movement, species types and growth rates, 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 applicable Transmission Owner or applicable Generator Owner 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 applicable Transmission Owner-specific or applicable Generator Owner-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 TVMP shall hold appropriate qualifications and training, as defined by the Transmission Owner or Generator Owner, to perform their duties.

**R1.4.** Each applicable Transmission Owner or applicable Generator Owner shall develop mitigation measures to achieve sufficient clearances for the protection of the transmission facilities when it identifies locations on the ROW where the Transmission Owner or applicable Generator Owner is restricted from attaining the clearances specified in Requirement 1.2.1.

**R1.5.** Each Transmission Owner or applicable Generator Owner shall establish and document a process for the immediate communication of vegetation conditions that present an imminent threat of a transmission line outage. This is so that action (temporary reduction in line rating, switching line out of service, etc.) may be taken until the threat is relieved.

[VRF – High]

**R2.** Each applicable Transmission Owner or applicable Generator Owner shall create and implement an annual plan for vegetation management work to ensure the reliability of the system. The plan shall describe the methods used, such as manual clearing, mechanical clearing, herbicide treatment, or 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. Adjustments to the plan shall be documented as they occur. The plan should take into consideration the time required to obtain permissions or permits from landowners or regulatory authorities. Each applicable Transmission Owner or applicable Generator Owner shall have systems and procedures for documenting and tracking the planned vegetation

management work and ensuring that the vegetation management work was completed according to work specifications.

*[VRF – High]*

- R3.** Each applicable Transmission Owner or applicable Generator Owner shall report quarterly to its Regional Entity, or the Regional Entity’s designee, sustained transmission line outages determined by the applicable Transmission Owner or applicable Generator Owner to have been caused by vegetation.
- R3.1.** Multiple sustained 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 applicable Transmission Owner or applicable Generator Owner is not required to report to the Regional Entity, or the Regional Entity’s 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 shall not be considered reportable (examples of disasters that could create non-reportable outages include, but are not limited to, earthquakes, fires, tornados, hurricanes, landslides, wind shear, major storms as defined either by the applicable Transmission Owner or applicable Generator Owner or an applicable regulatory body, ice storms, 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, but are not limited to, 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 applicable Transmission Owner or applicable Generator Owner to the Regional Entity, or the Regional Entity’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 applicable Transmission Owner or applicable Generator Owner.
- R3.4.** An outage shall be categorized as one of the following:
- R3.4.1.** Category 1 — Grow-ins: Outages caused by vegetation growing into lines from vegetation inside and/or outside of the ROW;
  - R3.4.2.** Category 2 — Fall-ins: Outages caused by vegetation falling into lines from inside the ROW;
  - R3.4.3.** Category 3 — Fall-ins: Outages caused by vegetation falling into lines from outside the ROW.

*[VRF – Lower]*

- R4.** The Regional Entity shall report the outage information provided to it by applicable Transmission Owners or applicable Generator Owners, as required by Requirement 3, quarterly to NERC, as well as any actions taken by the Regional Entity as a result of any of the reported outages.

*[VRF – Lower]*

**C. Measures**

- M1.** Each applicable Transmission Owner or applicable Generator Owner has a documented TVMP, as identified in Requirement 1.

- M1.1.** Each applicable Transmission Owner or applicable Generator Owner has documentation that the applicable Transmission Owner or applicable Generator Owner performed the vegetation inspections as identified in Requirement 1.1.
- M1.2.** Each applicable Transmission Owner or applicable Generator Owner has documentation that describes the clearances identified in Requirement 1.2.
- M1.3.** Each applicable Transmission Owner or applicable Generator Owner has documentation that the personnel directly involved in the design and implementation of the applicable Transmission Owner's or applicable Generator Owner TVMP hold the qualifications identified by the Transmission Owner or applicable Generator Owner as required in Requirement 1.3.
- M1.4.** Each applicable Transmission Owner or applicable Generator Owner has documentation that it has identified any areas not meeting the applicable Transmission Owner's or applicable Generator Owner's standard for vegetation management and any mitigating measures the Transmission Owner or applicable Generator Owner has taken to address these deficiencies as identified in Requirement 1.4.
- M1.5.** Each applicable Transmission Owner or applicable Generator Owner has a documented process for the immediate communication of imminent threats by vegetation as identified in Requirement 1.5.
- M2.** Each applicable Transmission Owner or applicable Generator Owner has documentation that the Transmission Owner implemented the work plan identified in Requirement 2.
- M3.** Each applicable Transmission Owner or applicable Generator Owner has documentation that it has supplied quarterly outage reports to the Regional Entity, or the Regional Entity's designee, as identified in Requirement 3.
- M4.** The Regional Entity has documentation that it provided quarterly outage reports to NERC as identified in Requirement 4.

**D. Compliance**

**1. Compliance Monitoring Process**

**1.1. Compliance Enforcement Authority**

Compliance Monitor:

- Regional Entity for the Transmission Owner and Generator Owner
- Electric Reliability Organization or another Regional Entity approved by the ERO and FERC or other applicable government authorities

**1.2. Compliance Monitoring and Enforcement Processes:**

Compliance Audits

Self-Certifications

Spot Checking

Compliance Violation Investigations

Self-Reporting

Complaints

**1.3. Data Retention**

The applicable Transmission Owner and applicable Generator Owner shall keep data or evidence to show compliance as identified below unless directed by its Compliance

Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation:

- The applicable Transmission Owner and applicable Generator Owner shall retain evidence of Requirement 1, Measure 1, Requirement 2, Measure 2, and Requirement 3, Measure 3 from its last audit.

**1.4. Additional Compliance Information**

None.

**2. Violation Severity Levels**

| R #  | Lower VSL  | Moderate VSL   | High VSL   | Severe VSL   |
|------|--|--|--|--|
| R1   | The responsible entity did not include and keep current one of the four required elements of its TVMP, as directed by the requirement. | The responsible entity did not include and keep current two of the four required elements of its TVMP, as directed by the requirement. | The responsible entity did not include and keep current three of the four required elements of its TVMP, as directed by the requirement.                         | The responsible entity did not include and keep current all required elements of the TVMP, as directed by the requirement.   |
| R1.1 | N/A  | N/A  | The applicable entity TVMP did not define a schedule, as directed by the requirement, or the type of ROW vegetation inspections, as directed by the requirement. | The applicable entity TVMP did not define a schedule, as directed by the requirement, nor the type of ROW vegetation inspections, as directed by the requirement.  |
| R1.2 | N/A  | N/A  | N/A  | The responsible entity, in its TVMP, failed to identify and document clearances between vegetation and any overhead, ungrounded supply conductors.<br><br>OR<br><br>The responsible entity, in its TVMP, failed to take into |

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|        |     |     |     | <p>consideration transmission line voltage, or the effects of ambient temperature on conductor sag under maximum design loading, or the effects of wind velocities on conductor sway.</p> <p>OR</p> <p>The responsible entity, in its TVMP, failed to establish Clearance 1 or Clearance 2 values.</p>   |
| R1.2.1 | N/A | N/A | N/A | <p>The responsible entity failed to determine and document an appropriate clearance distance to be achieved at the time of transmission vegetation management work taking into account local conditions and the expected time frame in which the responsible entity expects to return for future vegetation management work.</p> <p>OR</p> <p>The responsible entity documented a Clearance 1 value that was smaller than its Clearance 2 value.</p> |

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|----------|--|--|--|--|
| R1.2.2   | N/A  | N/A  | N/A  | The responsible entity failed to determine and document Clearance 2 values taking into account local conditions and the expected time frame in which the responsible entity expects to return for future vegetation management work. |
| R1.2.2.1 | N/A  | N/A  | N/A  | Where transmission system transient overvoltage factors were known, clearances were not derived from Table 5, IEEE 516-2003, phase-to-phase voltages, with appropriate altitude correction factors applied.                          |
| R1.2.2.2 | N/A  | N/A  | N/A  | Where transmission system transient overvoltage factors are known, clearances were not derived from Table 7, IEEE 516-2003, phase-to-phase voltages, with appropriate altitude correction factors applied.                           |
| R1.3     | For responsible entities directly involving fewer than 20 persons in the design and implementation of the TVMP, one of those persons did not hold appropriate qualifications and | For responsible entities directly involving fewer than 20 persons in the design and implementation of the TVMP, two of those persons did not hold appropriate qualifications and | For responsible entities directly involving fewer than 20 persons in the design and implementation of the TVMP, three of those persons did not hold appropriate qualifications and | For responsible entities directly involving fewer than 20 persons in the design and implementation of the TVMP, more than three of those persons did not hold appropriate qualifications and   |

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|      | training to perform their duties. For responsible entities directly involving 20 or more persons in the design and implementation of the TVMP, 5% or less of those persons did not hold appropriate qualifications and training to perform their duties. | training to perform their duties. For responsible entities directly involving 20 or more persons in the design and implementation of the TVMP, more than 5% up to (and including) 10% of those persons did not hold appropriate qualifications and training to perform their duties. | training to perform their duties. For responsible entities directly involving 20 or more persons in the design and implementation of the TVMP, more than 10% up to (and including) 15% of those persons did not hold appropriate qualifications and training to perform their duties. | training to perform their duties. For responsible entities directly involving 20 or more persons in the design and implementation of the TVMP, more than 15% of those persons did not hold appropriate qualifications and training to perform their duties. |
| R1.4 | N/A  | N/A  | N/A   | The responsible entity's TVMP does not include mitigation measures to achieve sufficient clearances where restrictions to the ROW are in effect.  |
| R1.5 | N/A  | N/A  | N/A   | The responsible entity did not establish or did not document a process for the immediate communication of vegetation conditions that present an imminent threat of line outage, as directed by the requirement.   |
| R2   | The responsible entity did not meet one of the three required elements (including in the annual plan a description of methods used for vegetation management, maintaining documentation of adjustments to the  | The responsible entity did not meet two of the three required elements (including in the annual plan a description of methods used for vegetation management, maintaining documentation of adjustments to the  | The responsible entity did not meet the three required elements (including in the annual plan a description of methods used for vegetation management, maintaining documentation of adjustments to the  | The responsible entity does not have an annual plan for vegetation management.<br><br>OR<br><br>The responsible entity has not implemented the annual plan for vegetation   |

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|    | annual plan, or having systems and procedures for tracking work performed as part of the annual plan) specified in the requirement.  | annual plan, or having systems and procedures for tracking work performed as part of the annual plan) specified in the requirement. | annual plan, or having systems and procedures for tracking work performed as part of the annual plan) specified in the requirement.            | management.  |
| R3 | <p>The responsible entity failed to provide a quarterly outage report, but did not experience any reportable outages.</p> <p>OR</p> <p>The responsible entity provided a quarterly report, but failed to report in the manner specified by one or more of the following subcomponents of Requirement R3: R3.1 or R3.2.</p> | <p>The responsible entity provided a quarterly report, but failed to include information required by R3.3.</p>                      | <p>The responsible entity provided a quarterly outage report, but failed to include a reportable Category 3 outage as described in R3.4.3.</p> | <p>The responsible entity experienced reportable outages but failed to provide a quarterly report.</p> <p>OR</p> <p>The responsible entity provided a quarterly outage report, but failed to include a reportable Category 1 (as described in R3.4.1) or Category 2 outage (as described in R3.4.2).</p> |
| R4 | N/A  | N/A   | N/A  | N/A  |

**E. Regional Differences**

None Identified.

**Version History**

| Version | Date | Action  | Change Tracking |
|---------|------|---|-----------------|
| 1       | TBA  | <ol style="list-style-type: none"> <li>1. Added “Standard Development Roadmap.”</li> <li>2. Changed “60” to “Sixty” in section A, 5.2.</li> <li>3. Added “Proposed Effective Date: April 7, 2006” to footer.</li> <li>4. Added “Draft 3: November 17, 2005” to footer.</li> </ol> | 01/20/06        |

**Standard FAC-003-X — Transmission Vegetation Management Program**

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|---|--------------|--|--------------------------------|
| X | May 16, 2011 | Made standard applicable to certain qualifying Generator Owners and brought overall standard format up to date | Revision under Project 2010-07 |
|   |              |  |                                |