

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. SC approved SAR for initial posting (January 11, 2007).
2. SAR posted for comment (January 15–February 14, 2007).
3. SAR posted for comment (April 10–May 9, 2007).
4. SC authorized moving the SAR forward to standard development (June 27, 2007).

Proposed Action Plan and Description of Current Draft:

This is the initial posting of the proposed revisions to the requirements and measures in the standard. Once there is consensus on the language in the requirements and measures, the drafting team will add compliance elements to the standard.

Future Development Plan:

Anticipated Actions	Anticipated Date
1.	
2.	
3.	
4.	
5.	
6.	
7.	

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.

Active Transmission Line Right of Way — A strip of land that is occupied by active transmission facilities. This corridor does not include the inactive or unused part of the Right of Way intended for other facilities.

Critical Clearance Zone — The area mapped by the radial distance around a conductor specified in Table I of Attachment 1 to reliability standard FAC-003-2 — Transmission Vegetation Management Program when the conductor is energized and operating between no-load and its Rating, including the design blowout, however, the zone shall not extend beyond the limits of the Active Transmission Line Right of Way.

A. Introduction

1. Title: Transmission Vegetation Management Program

2. Number: FAC-003-2

3. Purpose: To improve the reliability of the Bulk Electric System by preventing vegetation related outages that could lead to Cascading.

4. Applicability

4.1. Functional Entities:

4.1.1. Transmission Owner

4.1.2. Reliability Coordinator

4.2. Facilities:

4.2.1. Transmission lines (“applicable lines”) operated at 200kV or higher, and transmission lines operated below 200kV designated by the Reliability Coordinator as being subject to this standard including but not limited to those that cross lands owned by federal¹, state, provincial, public, private, or tribal entities.

4.2.2. Transmission lines operated below 200kV designated by the Reliability Coordinator as being subject to this standard become subject to this standard 12 months after the date the Reliability Coordinator initially designates the transmission line as being subject to this standard.

4.2.3. Existing transmission line(s) operated at 200kV or higher that are newly acquired by a Transmission Owner and were not previously subject to this standard, become subject to this standard 12 months after the acquisition date of the transmission line(s).

5. Effective Dates:

In those jurisdictions where regulatory approval is required, the first calendar day of the first calendar quarter one year after applicable regulatory authority approval for all requirements; or, in those jurisdictions where no regulatory approval is required, the first calendar day of the first calendar quarter one year following Board of Trustees adoption.

¹ EPAAct 2005 section 1211c: “Access approvals by Federal agencies”

B. Requirements

- R1.** Each Transmission Owner shall have a documented transmission vegetation management program designed to control vegetation on its Active Transmission Lines' Rights of Way. The transmission vegetation management program shall:
- R1.1.** Specify the methodologies that the Transmission Owner uses to control vegetation.²
 - R1.2.** Specify a vegetation inspection frequency of at least once per calendar year that takes into account local³ and environmental factors.
 - R1.3.** Require an annual plan that identifies the applicable lines to be maintained and associated work to be performed during the year. It shall be flexible to adjust to changing conditions and to findings from vegetation inspections. Adjustments to the plan within the year are permissible. The plan shall take into consideration permitting and scheduling requirements from landowners or regulatory authorities. It shall support the objectives of the transmission vegetation management program and use the methodologies outlined in the transmission vegetation management program.
 - R1.4.** Require a process or procedure for response to imminent threats of a vegetation related Sustained Outage. The process or procedure shall specify actions which shall include immediate communication of the threat to the Transmission Operator, and may include actions such as a temporary reduction in line Rating, switching lines out of service, or other actions.
 - R1.5.** Specify an interim corrective action process for use when the Transmission Owner is constrained from performing vegetation maintenance as planned.
- R2.** Each Transmission Owner shall implement its imminent threat procedure when the Transmission Owner has knowledge, obtained through normal operating practices or notification from others, that the Critical Clearance Zone is approached by vegetation to prevent an encroachment of the Critical Clearance Zone.
- R3.** Each Transmission Owner shall conduct inspections of all applicable lines in accordance with the frequency specified in its transmission vegetation management program.
- R4.** Each Transmission Owner shall prevent encroachment within the Critical Clearance Zone of its applicable lines with the following exceptions:

² 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.

³ Local factors include treatment cycle, extent and type of treatment, and their relationship to the normal growth rate.

- Encroachments of the Critical Clearance Zone that result from natural disasters.⁴
 - Encroachments of the Critical Clearance Zone that result from human or animal activity.⁵
- R5.** Each Transmission Owner shall prevent Sustained Outages of applicable lines⁶ due to vegetation growing into a conductor operating between no-load and its Rating with the following exceptions:
- Sustained Outages of applicable lines that result from natural disasters.⁴
 - Sustained Outages of applicable lines that result from human or animal activity.⁵
- R6.** Each Transmission Owner shall prevent Sustained Outages of applicable lines⁶ due to the blowing together of vegetation and a conductor within an Active Transmission Line Right of Way (operating within design blow-out conditions) with the following exception:
- Sustained Outages of applicable lines that result from sustained winds or gusts due to natural disasters.⁴
- R7.** Each Transmission Owner shall prevent Sustained Outages of applicable lines⁶ due to vegetation falling into a conductor from within an Active Transmission Line Right of Way with the following exceptions:
- Sustained Outages of applicable lines that result from natural disasters.⁴
 - Sustained Outages of applicable lines that result from human or animal activity.⁵
- R8.** Each Transmission Owner shall implement its annual work plan for vegetation management to accomplish the purpose of this standard within the extent of its easement and/or legal rights.
- R9.** Each Reliability Coordinator in consultation with its Transmission Owner(s) and neighboring Reliability Coordinator(s) shall jointly prepare and keep current, a list of designated applicable lines that are operated below 200kV, if any, which are subject to this standard.
- R10.** Each Reliability Coordinator shall document its method for assessing the reliability significance of sub-200kV lines considering all of the following:

⁴ Examples include, but are not limited to, earthquakes, fires, tornados, hurricanes, landslides, wind shear, fresh gale, major storms as defined either by the Transmission Owner or an applicable regulatory body, ice storms, and floods.

⁵ Examples 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.

⁶ Multiple Sustained Outages on an individual line, if caused by the same vegetation, shall be considered as one outage regardless of the actual number of outages within a 24-hour period.

R10.1 Transmission lines whose loss would result in the exceedance of an Interconnection Reliability Operating Limit (IROL)

R10.2 Transmission lines whose loss would place the grid at an unacceptable risk of instability, separation, or cascading failures.

B. Measures

M1. The Transmission Owner has a documented transmission vegetation management program designed to control vegetation on the Active Transmission Line Right of Way. (R1)

M1.1 The Transmission Owner's transmission vegetation management program specifies the methodologies that the Transmission Owner uses to control vegetation.

M1.2 The Transmission Owner's transmission vegetation management program specifies a vegetation inspection frequency that takes into account local and environmental factors. This inspection frequency shall be at least once per calendar year.

M1.3 The Transmission Owner's transmission vegetation management program requires an annual plan and it identifies the applicable lines to be maintained and related vegetation management work to be performed during the calendar year while taking into consideration permitting and scheduling requirements from landowners or regulatory authorities.

M1.4 The Transmission Owner's transmission vegetation management program requires an imminent threat process or procedure for responding to imminent threats of a vegetation-related Sustained Outage including immediate communication of the threat to the Transmission Operator, and may include a temporary reduction in line Rating, switching lines out of service, and/or other actions that may be taken until the threat is relieved.

M1.5 The Transmission Owner's transmission vegetation management program specifies the interim corrective action process for use when the Transmission Owner is constrained from performing vegetation maintenance as planned.

M2. The Transmission Owner has evidence that it implemented its imminent threat procedure when it obtained knowledge that the Critical Clearance Zone was approached by vegetation. (R2)

M3. The Transmission Owner has evidence that it conducted vegetation inspections of all applicable transmission lines in accordance with the frequency specified in its transmission vegetation management program. (R3)

M4. The Transmission Owner has evidence such as inspection records, imminent threat reports or quality assurance reports, demonstrating there were no vegetation encroachments into the Critical Clearance Zone. (R4)

M5. The Transmission Owner has evidence that there was not a Sustained Outage of an applicable line due to vegetation growing into a conductor operating between no-load and its Rating. (R5)

- M6.** The Transmission Owner has evidence that there was not a Sustained Outage of an applicable line due to the blowing together of vegetation and a conductor within the Active Transmission Line Right of Way. (R6)
- M7.** The Transmission Owner has evidence that there was not a Sustained Outage of an applicable line due to vegetation falling into a conductor from within the Active Transmission Line Right of Way. (R7)
- M8.** The Transmission Owner has evidence that it is implementing, or has implemented, its annual work plan. (R8)
- M9.** The Reliability Coordinator has evidence that it consulted with its Transmission Owner(s) and adjacent Reliability Coordinator(s), prepared and kept current a list of designated sub-200kV transmission lines, if any, which are subject to this standard. (R9)
- M10.** The Reliability Coordinator has evidence that it has defined its methods for assessing the reliability significance of sub-200kV lines and has developed selection criteria for listing any sub-200kV lines. (R10)

C. Compliance (To be added)

D. Regional Differences

None identified.

E. Associated Technical Reference Documents

FAC-003 Reference — Transmission Vegetation Management — White Paper.

Version History

Version	Date	Action	Change Tracking
1	TBA	1. Added “Standard Development Roadmap.” 2. Changed “60” to “Sixty” in section A, 5.2. 3. Added “Proposed Effective Date: April 7, 2006” to footer. 4. Added “Draft 3: November 17, 2005” to footer.	01/20/06
1	April 4, 2007	Regulatory Approval — Effective Date	New

FAC-003-2 Attachment 1

The Critical Clearance Zone is the area mapped by the radial distance around a conductor specified in Table I below when the conductor is energized and operating between no-load and its Rating, including the design blow-out, however, the zone shall not extend beyond the limits of the Active Transmission Line Right of Way.

**TABLE I — Minimum Vegetation Clearance Distances
For Alternating Current Voltages**

(AC) Nominal System Voltage (kV)	(AC) Maximum System Voltage (kV)	D feet (meters) sea level	D feet (meters) 3,000ft (914.4m)	D feet (meters) 4,000ft (1219.2m)	D feet (meters) 5,000ft (1524m)	D feet (meters) 6,000ft (1828.8m)
765	800	8.06ft (2.46m)	8.89ft (2.71m)	9.17ft (2.80m)	9.45ft (2.88m)	9.73ft (2.97m)
500	550	5.06ft (1.54m)	5.66ft (1.73m)	5.86ft (1.79m)	6.07ft (1.85m)	6.28ft (1.91m)
345	362	3.12ft (0.95m)	3.53ft (1.08m)	3.67ft (1.12m)	3.82ft (1.16m)	3.97ft (1.21m)
230	242	2.97ft (0.91m)	3.36ft (1.02m)	3.49ft (1.06m)	3.63ft (1.11m)	3.78ft (1.15m)
161*	169	2ft (0.61m)	2.28ft (0.69m)	2.38ft (0.73m)	2.48ft (0.76m)	2.58ft (0.79m)
138*	145	1.7ft (0.52m)	1.94ft (0.59m)	2.03ft (0.62m)	2.12ft (0.65m)	2.21ft (0.67m)
115*	121	1.41ft (0.43m)	1.61ft (0.49m)	1.68ft (0.51m)	1.75ft (0.53m)	1.83ft (0.56m)
88*	100	1.15ft (0.35m)	1.32ft (0.40m)	1.38ft (0.42m)	1.44ft (0.44m)	1.5ft (0.46m)
69*	72	0.82ft (0.25m)	0.94ft (0.29m)	0.99ft (0.30m)	1.03ft (0.31m)	1.08ft (0.33m)

*As designated by the Reliability Coordinator

TABLE I — Minimum Vegetation Clearance Distances (D)
For Alternating Current Voltages

(AC) Nominal System Voltage (kV)	(AC) Maximum System Voltage (kV)	D feet (meters) 7,000ft (2133.6m)	D feet (meters) 8,000ft (2438.4m)	D feet (meters) 9,000ft (2743.2m)	D feet (meters) 10,000ft (3048m)	D feet (meters) 11,000ft (3352.8m)
765	800	10.01ft (3.05m)	10.29ft (3.14m)	10.57ft (3.22m)	10.85ft (3.31m)	11.13ft (3.39m)
500	550	6.49ft (1.98m)	6.7ft (2.04m)	6.92ft (2.11m)	7.13ft (2.17m)	7.35ft (2.24m)
345	362	4.12ft (1.26m)	4.27ft (1.30m)	4.43ft (1.35m)	4.58ft (1.40m)	4.74ft (1.44m)
230	242	3.92ft (1.19m)	4.07ft (1.24m)	4.22ft (1.29m)	4.37ft (1.33m)	4.53ft (1.38m)
161*	169	2.69ft (0.82m)	2.8ft (0.85m)	2.91ft (0.89m)	3.03ft (0.92m)	3.14ft (0.96m)
138*	145	2.3ft (0.70m)	2.4ft (0.73m)	2.49ft (0.76m)	2.59ft (0.79m)	2.7ft (0.82m)
115*	121	1.91ft (0.58m)	1.99ft (0.61m)	2.07ft (0.63m)	2.16ft (0.66m)	2.25ft (0.69m)
88*	100	1.57ft (0.48m)	1.64ft (0.50m)	1.71ft (0.52m)	1.78ft (0.54m)	1.86ft (0.57m)
69*	72	1.13ft (0.34m)	1.18ft (0.36m)	1.23ft (0.37m)	1.28ft (0.39m)	1.34ft (0.41m)

*As designated by the Reliability Coordinator

TABLE I — Minimum Vegetation Clearance Distances (D)
For Direct Current Voltages

(DC) Pole to Pole Nominal Voltage (kV)	D feet (meters) sea level	D feet (meters) 3,000ft (914.4m) Alt.	D feet (meters) 4,000ft (1219.2m) Alt.	D feet (meters) 5,000ft (1524m) Alt.	D feet (meters) 6,000ft (1828.8m) Alt.
1500	13.92ft (4.24m)	15.07ft (4.59m)	15.45ft (4.71m)	15.82ft (4.82m)	16.2ft (4.94m)
1200	10.07ft (3.07m)	11.04ft (3.36m)	11.35ft (3.46m)	11.66ft (3.55m)	11.98ft (3.65m)
1000	7.89ft (2.40m)	8.71ft (2.65m)	8.99ft (2.74m)	9.25ft (2.82m)	9.55ft (2.91m)
800	4.78ft (1.46m)	5.35ft (1.63m)	5.55ft (1.69m)	5.75ft (1.75m)	5.95ft (1.81m)
500	3.43ft (1.05m)	4.02ft (1.23m)	4.02ft (1.23m)	4.18ft (1.27m)	4.34ft (1.32m)

Pole to Pole Nominal Voltage (kV)	D feet (meters) 7,000ft (2133.6m) Alt.	D feet (meters) 8,000ft (2438.4m) Alt.	D feet (meters) 9,000ft (2743.2m) Alt.	D feet (meters) 10,000ft (3048m) Alt.	D feet (meters) 11,000ft (3352.8m) Alt.
1500	16.55ft (5.04m)	16.9ft (5.15m)	17.27ft (5.26m)	17.62ft (5.37m)	17.97ft (5.48m)
1200	12.3ft (3.75m)	12.62ft (3.85m)	12.92ft (3.94m)	13.24ft (4.04m)	13.54ft (4.13m)
1000	9.82ft (2.99m)	10.1ft (3.08m)	10.38ft (3.16m)	10.65ft (3.25m)	10.92ft (3.33m)
800	6.15ft (1.87m)	6.36ft (1.94m)	6.57ft (2.00m)	6.77ft (2.06m)	6.98ft (2.13m)
500	4.5ft (1.37m)	4.66ft (1.42m)	4.83ft (1.47m)	5ft (1.52m)	5.17ft (1.58m)