

141 FERC ¶ 61,046
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

18 CFR Part 40

Docket No. RM12-4-000

Revisions to Reliability Standard for Transmission Vegetation Management

(Issued October 18, 2012)

AGENCY: Federal Energy Regulatory Commission.

ACTION: Notice of Proposed Rulemaking.

SUMMARY: Pursuant to section 215 of the Federal Power Act, the Commission proposes to approve Reliability Standard FAC-003-2 (Transmission Vegetation Management), submitted by the North American Electric Reliability Corporation (NERC), the Commission-certified Electric Reliability Organization. The proposed Reliability Standard would expand the applicability of the standard to include overhead transmission lines that are operated below 200 kV, if they are either an element of an Interconnection Reliability Operating Limit or an element of a Major WECC Transfer Path. In addition, the proposed Reliability Standard incorporates a new minimum annual vegetation inspection requirement, and incorporates new minimum vegetation clearance distances into the text of the standard.

The Commission also proposes to approve the three definitions, the implementation plan and the Violation Severity Levels associated with the proposed Reliability Standard. Finally, the Commission proposes to direct that NERC revise the

Violation Risk Factor for Requirement R2, and approve the remainder of the Violation Risk Factors.

DATES: Comments are due [INSERT DATE 60 days after publication in the **FEDERAL REGISTER**].

ADDRESSES: Comments, identified by docket number, may be filed in the following ways:

- Electronic Filing through <http://www.ferc.gov>. Documents created electronically using word processing software should be filed in native applications or print-to-PDF format and not a scanned format.
- Mail/Hand Delivery: Those unable to file electronically may mail or hand-deliver comments to: Federal Energy Regulatory Commission, Secretary of the Commission, 888 First Street, NE, Washington, DC 20426.

Instructions: For detailed instructions on submitting comments and additional information on the rulemaking process, see the Comment Procedures Section of this document.

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SUPPLEMENTARY INFORMATION:

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NOTICE OF PROPOSED RULEMAKING

(Issued October 18, 2012)

1. Pursuant to section 215 of the Federal Power Act (FPA),¹ the Commission proposes to approve Reliability Standard FAC-003-2 (Transmission Vegetation Management), submitted by the North American Electric Reliability Corporation (NERC), the Commission-certified Electric Reliability Organization (ERO). Proposed Reliability Standard FAC-003-2 modifies the currently effective standard, FAC-003-1 (the “Version 1” standard). The proposed modifications, in part, respond to certain Commission directives in Order No. 693, in which the Commission approved currently-effective Reliability Standard FAC-003-1.²
2. Proposed Reliability Standard FAC-003-2 has a number of features that make it an improvement over the Version 1 standard. For example, like Version 1, the proposed

¹ 16 U.S.C. § 824o (2006).

² See *Mandatory Reliability Standards for the Bulk-Power System*, Order No. 693, FERC Stats. & Regs. ¶ 31,242, *order on reh’g*, Order No. 693-A, 120 FERC ¶ 61,053 (2007).

Reliability Standard would apply to all overhead transmission lines operated at or above 200 kV, but unlike Version 1, it would explicitly apply to any lower voltage overhead transmission line that is either an element of an Interconnection Reliability Operating Limit (IROL) or an element of a Major WECC Transfer Path.³ This is a new class of transmission lines not previously required to comply with the Standard. The proposed Reliability Standard would also make explicit a transmission owner's obligation to prevent an encroachment into the minimum vegetation clearance distance (MVCD) for a line subject to the standard, regardless of whether that encroachment results in a sustained outage or fault.⁴ Also, for the first time, the proposed Reliability Standard would require transmission owners to annually inspect all transmission lines subject to the standard and to complete 100 percent of their annual vegetation work plan. The proposed Reliability Standard also incorporates the MVCDs into the text of the standard, and does not rely on

³ NERC defines "IROL" as "[a] System Operating Limit that, if violated, could lead to instability, uncontrolled separation, or Cascading outages that adversely impact the reliability of the Bulk Electric System." NERC defines "System Operating Limit" as "[t]he value (such as MW, MVar, Amperes, Frequency or Volts) that satisfies the most limiting of the prescribed operating criteria for a specified system configuration to ensure operation within acceptable reliability criteria." See NERC Glossary of Terms Used in Reliability Standards (NERC Glossary) at 26, 48. The Western Electric Coordinating Council maintains a listing of Major WECC Transfer Paths, *available at* <http://www.wecc.biz/Standards/Development/WECC-0091/Shared Documents/WECC-0091 Table Major Paths 4-28-08.doc>.

⁴ See Reliability Standard FAC-003-2, Requirements R1 and R2; *see also* Petition of the North American Electric Reliability Corporation for Approval of Proposed Reliability Standard FAC-003-2 – Transmission Vegetation Management at 4, 6 (NERC Petition). NERC proposes to define MVCD as "the calculated minimum distance stated in feet (meters) to prevent flash-over between conductors and vegetation, for various altitudes and operating voltages." *Id.* at 2.

(continued...)

clearance distances from an outside reference, as is the case with the currently-effective Version 1 standard. We believe these beneficial provisions, and others discussed below, support our proposal to approve FAC-003-2.

3. A recurring cause in many blackouts has been vegetation-related outages. In fact one of the initiating causes of the 2003 Northeast blackout was inadequate vegetation management practices that led to tree contact.⁵ Further, NERC has identified a focus on preventing non-random equipment outages such as those caused by vegetation as a top priority that will most likely have a positive impact on Bulk-Power System reliability.⁶ We also note that industry has made important strides in reducing the instances of vegetation contact.⁷ We believe that the revised FAC-003 standard we propose to approve in this rulemaking, together with a continued focus by industry on best practices for vegetation management, will serve to enhance the reliability of the Bulk-Power System. While we propose to approve NERC's use of the Gallet equation to determine the minimum vegetation clearing distances, we believe it is important that NERC develop

⁵ See U.S.-Canada Power System Outage Task Force, Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations at 18, 57-64 (April 2004) (2003 Blackout Report).

⁶ See Gerry Cauley written remarks for November 29, 2011 Reliability Technical Conference at 1, 4 and 5 (Docket No. AD12-1-000).

⁷ See, e.g., NERC's Second Quarter 2012 Vegetation-Related Transmission Outage Report at 6-7, available at http://www.nerc.com/fileUploads/File/Compliance/2Q2012_Vegetation%20Report_FINAL%20DRAFT.pdf.

empirical evidence that either confirms the MVCD values or gives reason to revisit the Reliability Standard. Accordingly, consistent with the activity that NERC has already initiated, the Commission proposes to direct that NERC conduct or commission testing to obtain empirical data and submit a report to the Commission providing the results of the testing.

4. We also propose to approve the three new or revised definitions associated with the proposed Reliability Standard for inclusion in NERC's Glossary. Specifically, we propose to approve the changes in the definition of "Right-of-Way (ROW)" and "Vegetation Inspection," as well as the addition of the term "Minimum Vegetation Clearance Distance (MVCD)" as defined in NERC's petition. We also propose to approve NERC's implementation plan for FAC-003-2.

5. While we believe that the proposed Reliability Standard will enhance reliability by requiring sub-200 kV transmission lines that are elements of an IROL or Major WECC Transfer Path to comply with its requirements, we seek comment on how NERC will ensure that IROLs are properly designated, as discussed in detail below. In addition, while we agree that a number of the proposed modifications clarify and make more explicit the transmission owner's obligations, we seek comment with regard to the enforceability of certain provisions.

6. We do not believe, however, that NERC has adequately supported the assignment of a "medium" Violation Risk Factor to Requirement R2, which pertains to preventing vegetation encroachments into the MVCD of transmission lines operated at 200 kV and above, but which are *not* part of an IROL or a Major WECC Transfer Path. As discussed

later, system events have originated from non-IROL facilities. Accordingly, as discussed below, we propose to direct that NERC submit a modification, within 60 days of the effective date of the Final Rule, assigning a “high” Violation Risk Factor for violations of Requirement R2.

I. Background

A. Section 215 of the FPA

7. Section 215 of the FPA requires the Commission-certified ERO to develop mandatory and enforceable Reliability Standards, subject to Commission review and approval. Once approved, the Reliability Standards may be enforced by the ERO subject to Commission oversight, or by the Commission independently.⁸ Pursuant to the requirements of FPA section 215, the Commission established a process to select and certify an ERO⁹ and, subsequently, certified NERC as the ERO.¹⁰

B. Reliability Standard FAC-003-1

8. Currently-effective Reliability Standard FAC-003-1 is applicable to transmission owners. The requirements of the Version 1 standard apply to (1) all transmission lines

⁸ See 16 U.S.C. § 824o(e)(3).

⁹ *Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval and Enforcement of Electric Reliability Standards*, Order No. 672, FERC Stats. & Regs. ¶ 31,204, *order on reh’g*, Order No. 672-A, FERC Stats. & Regs. ¶ 31,212 (2006).

¹⁰ *North American Electric Reliability Corp.*, 116 FERC ¶ 61,062, *order on reh’g and compliance*, 117 FERC ¶ 61,126 (2006) (certifying NERC as the ERO responsible for the development and enforcement of mandatory Reliability Standards), *aff’d sub nom. Alcoa Inc. v. FERC*, 564 F.3d 1342 (D.C. Cir. 2009).

operated at 200 kV or above, and (2) lower-voltage lines designated as “critical to the reliability of the electric system” by a Regional Entity.

9. Currently-effective FAC-003-1 contains four requirements. Requirement R1 requires each transmission owner to prepare, and keep current, a transmission vegetation management program (TVMP) that includes, *inter alia*, a Clearance 1 distance to be achieved at the time of vegetation management work, and a Clearance 2 distance to be maintained at all times. The Clearance 2 distance is set by each transmission owner at a level necessary to prevent flashover, but must be no less than the clearance distances established in the Institute of Electric and Electronics Engineers (IEEE) Standard 516-2003 (Guide for Maintenance Methods on Energized Power Lines). The Clearance 1 distances are established by each transmission owner, and the only numerical criterion under the current standard is that the “Clearance 1 distances shall be greater than those defined by Clearance 2.”¹¹ Further, Requirement R1.3 requires that “[a]ll personnel directly involved in the design and implementation of the TVMP shall hold appropriate qualifications and training, as defined by the Transmission Owner, to perform their duties.”

10. Requirement R2 of the Version 1 standard requires that each transmission owner develop and implement an “annual plan for vegetation management work,” allowing flexibility to adjust to “changing conditions.” Pursuant to Requirement R3, transmission

¹¹ FAC-003-1, R1.2.1.

owners must report quarterly to the relevant Regional Entity “sustained transmission line outages ... caused by vegetation.” Requirement R4 requires the Regional Entity to report the outage information to NERC.

C. Order No. 693 Discussion Regarding Vegetation Management

11. On March 16, 2007, in Order No. 693, the Commission approved 83 of 107 proposed Reliability Standards pursuant to FPA section 215(d), including currently-effective FAC-003-1.¹² In addition, pursuant to section 215(d)(5) of the FPA, the Commission directed NERC to develop modifications to FAC-003-1 to address certain issues identified by the Commission, discussed below.
12. In the Notice of Proposed Rulemaking (NOPR) that preceded Order No. 693, the Commission proposed two directives requiring modification of NERC’s proposed standard pursuant to section 215(d)(5) of the FPA.¹³ The first would have directed NERC to develop a minimum vegetation inspection cycle, and the second would have required NERC to remove the standard’s general limitation on applicability to transmission lines operated at 200 kV and above.¹⁴ In Order No. 693, the Commission decided not to require either modification at that time, but continued to express its

¹² See Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 735.

¹³ *Mandatory Reliability Standards for the Bulk Power System*, Notice of Proposed Rulemaking, 71 FR 64,770 (Nov. 3, 2006), FERC Stats. & Regs., Proposed Regulations 2004-2007 ¶ 32,608, at P 387 (2006).

¹⁴ *Id.*

concern about the standard's limited applicability and the lack of a minimum vegetation inspection requirement.

13. The Commission instead required NERC to address a modification to the applicability of the standard through its Standards development process, directing NERC to “modify [FAC-003-1] to apply to Bulk-Power System transmission lines that have an impact on reliability as determined by the ERO.”¹⁵ In doing so, the Commission stated that it supported the “suggestions by [certain commenters] to limit applicability to lower voltage lines associated with IROL” and noted that “these suggestions should be part of the input to the Reliability Standards development process.”¹⁶ Finally, in response to concerns raised about the cost of compliance with the standard, the Commission explained that the ERO must “develop an acceptable definition that covers facilities that impact reliability but balances extending the applicability of this standard against unreasonably increasing the burden on transmission owners.”¹⁷

14. Similarly, while the Commission decided not to require NERC to submit a modification to FAC-003-1 to incorporate a minimum vegetation inspection cycle as part of Order No. 693, the Commission noted that it “continues to be concerned with leaving

¹⁵ Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 706.

¹⁶ *Id.*

¹⁷ *Id.* P 708.

complete discretion to the transmission owners in determining inspection cycles.¹⁸ The Commission also rejected the notion that incorporating such a minimum requirement would lead to a “lowest common denominator” and thereby potentially reduce the frequency of inspections for transmission owners with aggressive inspection cycles.¹⁹ Although the Commission did not require a minimum inspection requirement as part of the standard, it directed NERC “to develop compliance audit procedures to identify appropriate inspection cycles based on local factors.”²⁰

15. With respect to minimum vegetation clearances distances, the Commission approved FAC-003-1’s general approach and “reaffirm[ed] its interpretation that FAC-003-1 requires sufficient clearances to prevent outages due to vegetation management practices under all applicable conditions.”²¹ However, the Commission directed NERC to “develop a Reliability Standard that defines the minimum clearance needed to avoid sustained vegetation-related outages that would apply to transmission lines crossing both federal and non-federal land”²² and “decline[d] to endorse the use of IEEE 516 as the only minimum clearance.”²³

¹⁸ *Id.* P 721.

¹⁹ *Id.* P 720.

²⁰ *Id.* P 735.

²¹ *Id.* P 729.

²² *Id.* P 732.

²³ *Id.* P 731.

16. Finally, the Commission directed NERC to address certain commenters' suggestion that, for purposes of the FAC-003 Reliability Standard, rights-of-way should be defined to encompass the required clearance area, and not the entire legal right-of-way, particularly where the legal right-of-way may greatly exceed the area needed for effective vegetation management.²⁴

II. NERC Petition and Proposed Reliability Standard FAC-003-2

A. NERC Petition

17. In its petition, NERC maintains that proposed Reliability Standard FAC-003-2 is just and reasonable, as the proposal meets or exceeds each of the criteria the Commission has identified for evaluating a proposed Reliability Standard.²⁵ NERC asserts that the proposed Reliability Standard “achieves the specific reliability goal of maintaining a reliable electric transmission system by using a defense-in-depth strategy to manage vegetation located on transmission ROW and minimize encroachments from vegetation located adjacent to the ROW, thus preventing the risk of those vegetation-related outages that could lead to Cascading.”²⁶ Moreover, NERC maintains that the proposed Reliability Standard contains a technically sound method to achieve that goal, as it requires transmission owners to prevent vegetation from encroaching into the flashover distances, requires consideration of conductor movement and growth rates (among other

²⁴ *Id.* P 734.

²⁵ *See* NERC Petition at 44.

²⁶ *Id.* at 45.

things), requires annual inspections, and requires completion of annual work needed to prevent encroachments. NERC asserts that FAC-003-2 is clear and unambiguous as to the requirements and penalties, and contains clear and objective measures for compliance.²⁷

18. Further, NERC maintains that proposed Reliability Standard FAC-003-2 represents an improvement over the currently-effective standard, as FAC-003-2 enhances reliability, facilitates enforceability, and preserves necessary flexibility for transmission owners to address local vegetation conditions.²⁸ NERC asserts that the proposed Reliability Standard was developed with the shortcomings of the currently-effective standard, as identified in Order No. 693, in mind, including the directive to develop a standard that defines the minimum clearance needed to avoid sustained vegetation-related outages without relying on IEEE-516 to set these clearances.²⁹ NERC states that the Standard Drafting Team (SDT) considered four potential methods for deriving flashover distances for various voltages and altitudes, and of those, selected the “Gallet equation” because the “information to support the development of the standard was readily available in an industry recognized reference.”³⁰ NERC asserts that the “distances

²⁷ *Id.* at 46-48; *see also id.* at 33-40.

²⁸ *Id.* at 3, 44-52.

²⁹ *See id.* at 5 (citing Order No. 693, FERC Stats. & Regs. ¶ 31,242 at PP 731-732).

³⁰ *Id.*, *see also* Ex. I, Appx. 1.

derived using the Gallet Equation result in the probability of flashover in the range of 10^{-6} (one in a million).³¹

19. NERC states that proposed FAC-003-2 continues to give transmission owners the necessary discretion to determine how to achieve the required clearances,³² but is more stringent than the currently effective standard because it “explicitly treat[s] any encroachment into the MVCD (without contact, with a flashover, with a momentary

³¹ NERC Petition at 6. As NERC explained in its response to Question 1 of the Commission’s Data Requests:

The probability of a flashover, given a drop in voltage to 85% of the ‘Critical Flashover Voltage (CFO),’ is roughly .135% (or approximately 10^{-3}). This value represents the probability of a flashover, assuming the specified CFO is achieved or exceeded.

However, this is not the only event being considered when attempting to model the probability of a vegetation flashover. The probability of achieving a maximum switching overvoltage (“Peak Voltage”) in excess of the CFO must also be considered. This is shown on page 40 in equation 6 of the Technical Reference Document, and is specified there as roughly 0.135% (also approximately 10^{-3}).

In other words, the conditional probability of flashover given that the 85% CFO has been exceeded is approximately 10^{-3} . However, the probability of the CFO being exceeded is *also* 10^{-3} . As these can be treated as two independent events, the probability is statistically “joint” (the probability of exceeding the CFO and the probability of a flashover given the exceeding of the CFO are independent events). Accordingly, the two probabilities are to be multiplied, yielding a probability on the order of magnitude of approximately 10^{-6} .

³² NERC Petition at 6, 19-22.

outage, or with a sustained outage) as a violation of the standard.”³³ According to NERC, the proposed Reliability Standard incorporates a new requirement to perform an annual inspection of all applicable lines and is “much more explicit regarding what actions must be taken to support vegetation management and reliability.”³⁴

20. NERC states that proposed FAC-003-2 was designed to address directives from Order No. 693, including the directives requiring that NERC address proposed modifications to expand the applicability of FAC-003-1, evaluate and consider specific proposals made by parties commenting on FAC-003-1, develop compliance audit procedures to identify appropriate inspection cycles, define the minimum clearances needed to avoid sustained vegetation-related outages applicable to transmission lines crossing both federal and non-federal land, and address suggestions that rights-of-way should be defined to encompass required clearance areas only. NERC also explains that proposed FAC-003-2 is one of the first Reliability Standards developed using NERC’s “results-based” approach and, therefore, includes some restructuring of the standard to focus on completing objectives and achieving goals, as well as to ensure that enforcement is undertaken in a consistent and non-preferential manner.³⁵

³³ *Id.* at 6.

³⁴ *Id.*

³⁵ *Id.* at 7.

21. NERC proposes an implementation plan for FAC-003-2.³⁶ For individual transmission lines that become subject to the vegetation management standard for the first time following designation as an element of an IROL or Major WECC Transfer Path, NERC asks that the requirements become effective the latter of (1) twelve months after the date of such designation, or (2) January 1 of the planning year when the line is forecast to become an element of an IROL or Major WECC Transfer Path.³⁷

22. Accordingly, NERC requests that the Commission approve proposed FAC-003-2 and the associated Violation Risk Factors and Violation Severity Levels. NERC requests as an effective date for the Reliability Standard, “the first day of the first calendar quarter that is twelve months following the effective date of a Final Rule in this docket.”³⁸

NERC further requests: (1) retirement of the Version 1 standard concurrent with the effective date of FAC-003-2; (2) approval of three definitions for inclusion in the NERC Glossary; and (3) approval of the implementation plan for proposed FAC-003-2.

B. Proposed Reliability Standard FAC-003-2 and NERC Explanation of Provisions

23. The proposed Reliability Standard includes seven requirements.

³⁶ *Id.* at Ex. B.

³⁷ In considering this aspect of the proposed implementation plan, we assume that NERC asks that the proposed standard become effective on the “later” of alternative (1) or (2), rather than the “latter.”

³⁸ *Id.* at 68.

24. **Requirements R1 and R2:** Pursuant to Requirements R1 and R2, transmission owners must “manage vegetation to prevent encroachments into the MVCD of its applicable line(s),” and any encroachment is considered a violation of these requirements regardless of whether it results in a sustained outage.³⁹ NERC characterizes this as a “zero tolerance” approach to vegetation management.⁴⁰ Further, NERC maintains that these requirements represent an improvement over the currently effective Version 1 Standard because the proposed standard makes the requirement to prevent encroachments explicit, and because it incorporates specific clearance distances into the standard itself based on “an established method for calculating the flashover distance for various voltages, altitudes, and atmospheric conditions.”⁴¹

25. NERC has bifurcated the basic requirement to prevent encroachment into the MVCDs. Requirement R1 applies to IROL elements and Major WECC Transfer Path elements and is assigned a high Violation Risk Factor. Requirement R2 sets forth the same substantive requirements but pertains to non-IROL and non-Major WECC Transfer Path elements and is assigned a medium Violation Risk Factor. NERC explains that it

³⁹ See Reliability Standard FAC-003-2, Requirements R1 and R2, subsection 1 (transmission owners must manage vegetation to prevent, *inter alia*, “an encroachment into the MVCD, as shown in FAC-003-Table 2, observed in Real-Time, absent a Sustained Outage”).

⁴⁰ NERC Petition at 6.

⁴¹ *Id.* at 22.

bifurcated the requirement to “eliminate commingling of higher risk reliability objectives and lesser risk reliability objectives.”⁴²

26. In addition, NERC has included a footnote describing certain conditions or scenarios, outside the transmission owner’s control, where an encroachment would be exempt from Requirements R1 and R2, including natural disasters and certain human or animal activity.⁴³ As NERC explains, the footnote “does not exempt the Transmission Owner from responsibility for encroachments caused by activities performed by their own employees or contractors, but it does exempt them from responsibility when other human activities, animal activities, or other environmental conditions outside their control lead to an encroachment that otherwise would not have occurred.”⁴⁴

27. **Requirement R3:** Requirement R3 requires a transmission owner to have “documented maintenance strategies or procedures or processes or specifications it uses to prevent the encroachment of vegetation into the MVCD of its applicable lines.” Requirement R3 requires that these strategies take into account movement of conductors (sag and sway), and the inter-relationship between vegetation growth rates, vegetation control methods, and inspection frequency. While NERC acknowledges that this requirement does not include the currently effective standard’s requirement to establish a

⁴² *Id.* at 22-23.

⁴³ *See* proposed Reliability Standard FAC-003-2, n.2.

⁴⁴ NERC Petition at 23.

Clearance 1 as part of the required TVMP, NERC notes that Clearance 1 levels are currently left largely to the discretion of the transmission owner and that the only numerical criterion for Clearance 1 is that it “must be some undefined amount larger than the minimum flashover distance [Clearance 2].”⁴⁵ NERC maintains that the proposed standard’s requirement to avoid encroachments after taking into account conductor movement, vegetation growth rates, etc., “still retains the same obligations defined by ‘Clearance 1.’”⁴⁶

28. **Requirement R4:** Requirement R4 requires a transmission owner that has observed a vegetation condition likely to produce a fault to notify, “without any intentional time delay,” the appropriate control center with switching authority for that transmission line. NERC states that the proposed requirement is an improvement over the Version 1 standard, in that it makes explicit the obligation to communicate imminent threats, rather than merely establish and document a process for doing so, as is currently required.⁴⁷ In addition, NERC explains that the currently-effective Reliability Standard’s requirement that the process allow for “immediate” notification was “impractical at best,” and was therefore replaced with the phrase “without any intentional time delay,” which still requires timely notification.

⁴⁵ *Id.* at 20.

⁴⁶ *Id.*

⁴⁷ *See id.* at 25-26 (referencing Requirement R1.5 of FAC-003-1).

29. **Requirement R5:** Requirement R5 requires a transmission owner constrained from performing vegetation management work needed to prevent a vegetation encroachment into the MVCD prior to implementation of the next annual work plan to take corrective action to prevent such encroachments. NERC contends that this proposed requirement represents an improvement over the currently-effective provision, Requirement R1.4, which merely requires the transmission owner to develop mitigation measures to address such circumstances, but does not affirmatively require the transmission owner to take corrective action. The proposed measures for determining compliance associated with proposed Requirement R5 provide examples of the kinds of corrective actions expected, including increased monitoring, line de-ratings, and revised work orders.⁴⁸

30. **Requirement R6:** Pursuant to Requirement R6, each transmission owner shall inspect 100 percent of its applicable lines at least once per year and with no more than 18 months between inspections on the same Right-of-Way. NERC maintains that the new requirement is “an improvement to the standard that reduces risks,” and notes that the currently effective standard allows the transmission owner to develop its own schedule for inspections (with no standard minimum time) and contains no explicit requirement that the transmission owner meet its established schedule.⁴⁹

⁴⁸ *See id.* at 24-25.

⁴⁹ *Id.* at 17-18.

31. **Requirement R7:** Pursuant to Requirement R7, the transmission owner must complete 100 percent of its annual vegetation work plan, allowing for documented changes to the work plan as long as those modifications do not allow encroachment into the MVCD. NERC argues that this requirement represents an improvement over the currently effective standard because the current Requirement (R2) “does not mandate that entities plan to prevent encroachments into the MVCD, but simply that they implement whatever is included in the plan.”⁵⁰

32. NERC explains in its petition that certain requirements in the currently-effective Reliability Standard have not been translated into a requirement in the proposed standard. In particular, NERC notes that the Version 1 standard’s reporting requirements, R3 and R4, have been moved into the compliance section of proposed standard FAC-003-2.⁵¹ NERC maintains that the reporting requirement remains enforceable under NERC’s Rules of Procedure, which gives NERC authority, *inter alia*, to require entities to provide “such information as is necessary to monitor compliance with the reliability standards.”⁵² NERC further notes that it can take action against any entity that fails to comply with such a reporting requirement (which would amount to a failure to comply with a NERC Rule of Procedure) pursuant to NERC Rule of Procedure Section 100, and that it is

⁵⁰ *Id.* at 28.

⁵¹ *Id.* at 29-31.

⁵² *Id.* at 31 (quoting NERC Rule of Procedure Section 400.3). This provision actually is located at Section 401.3.

obligated to notify the applicable governmental authorities of the entity's failure to comply.⁵³

33. In addition, NERC acknowledges that the proposed standard no longer contains a requirement that personnel involved in the design and implementation of a vegetation management program have appropriate qualifications and training (currently set out in sub-requirement R1.3).⁵⁴ According to NERC, this provision of the Version 1 standard is “effectively meaningless,” since “appropriate” qualifications and training are undefined and left entirely to the discretion of the transmission owner. Thus, NERC maintains that elimination of this sub-requirement does not impact reliability.

34. NERC is also seeking to revise the definitions of Right-of-Way (ROW) and Vegetation Inspection, and to add a new definition for MVCD.⁵⁵ NERC proposes that Right-of-Way be defined as the “corridor of land under a transmission line(s) needed to operate the line(s),” which may not exceed the Transmission Owner's legal rights but may be smaller. NERC proposes to modify “Vegetation Inspection” to allow both maintenance inspections and vegetation inspections to be performed concurrently. Finally, NERC proposes a new definition, “MVCD,” to be “[t]he calculated minimum

⁵³ *See id.* at 31-32.

⁵⁴ *Id.* at 23-24.

⁵⁵ *See* NERC Petition, Ex. C.

distance stated in feet (meters) to prevent flash-over between conductors and vegetation, for various altitudes and operating voltages.”

35. NERC explains in its petition how it will approach enforcement of each Requirement under FAC-003-2, noting that each Requirement has an associated compliance measure that identifies what is required and how the Requirement will be enforced. NERC explains, *inter alia*, that the measures for Requirements R1 and R2 require each transmission owner to have “evidence that it managed vegetation to prevent encroachment into the MVCD,” and to be able to produce records “indicating the requirements were not violated.”⁵⁶ In order to show compliance with Requirement R3, NERC explains that a transmission owner will be “obligated to show documentation, and that documentation must be sufficient to satisfy the auditor that the information contained in that documentation is sufficient that the Transmission Owner can use it to prevent encroachment into the MVCD.”⁵⁷ Similarly, NERC explains that “entities will not be able to comply with [Requirement R7] without having a documented plan.”⁵⁸

36. NERC asserts that it has addressed seven directives in Order No. 693 regarding NERC’s vegetation management standard.⁵⁹ First, NERC asserts that it has addressed the concerns in applying the vegetation management standard only to transmission lines that

⁵⁶ NERC Petition at 34.

⁵⁷ *Id.* at 35.

⁵⁸ *Id.* at 39.

⁵⁹ *See id.* at 40-44.

are 200 kV or above.⁶⁰ NERC notes that it has addressed that concern (and related directives) by extending the applicability of the proposed standard to overhead transmission lines that are either 200 kV and above, or less than 200 kV if the line is an element of an IROL or a Major WECC Transfer Path. In addition, NERC explains that it has developed an appropriate implementation plan for any new lines covered by the standard, thereby satisfying the Commission's directive to consider a delayed implementation date if lower-voltage facilities are included.⁶¹ NERC further maintains that it has addressed the Commission's concern about allowing transmission owners full discretion to set inspection schedules by requiring inspections at least once per year, has satisfied the Commission's directive to define minimum clearances for both federal and non-federal lands by adopting MVCDs that apply to lines on both federal and non-federal lands, and has satisfied the Commission's directive to consider whether modifications to the definition of Right-of-Way were necessary through the proposed revision to that definition.⁶²

III. PNNL Report and Comments

A. PNNL Report

37. As NERC explains in its petition, the Standard Drafting Team applied the "Gallet equation" to derive the MVCDs set forth in FAC-003-2. NERC describes the Gallet

⁶⁰ *Id.* at 40-42.

⁶¹ *Id.* at 42-43.

⁶² *Id.* at 43-44.

equation as a “well-known method of computing the required strike distance for proper insulation coordination.”⁶³

38. The Commission’s Office of Electric Reliability retained the Pacific Northwest National Laboratory (PNNL) to undertake an “analysis of the mathematics and documentation of the technical justification behind the application of the Gallet equation and the assumptions used in the technical reference paper [Exh. A of NERC’s petition].”⁶⁴

39. PNNL’s final *Report on the Applicability of the “Gallet Equation” to the Vegetation Clearances of NERC Reliability Standard FAC-003-2* (PNNL Report) was posted as part of the record in this docket on April 23, 2012, along with a notice inviting comment on the PNNL Report within 30 days.

40. While the PNNL Report points out benefits of the use of the Gallet equation, it raises questions about potential inconsistencies in NERC’s filing.⁶⁵ The PNNL Report raises concerns about NERC’s use of an assumed gap factor of 1.3, asserting that that figure has not been adequately supported for use with vegetation and that there is no

⁶³ NERC Petition, Ex. I (Technical Reference Document) at 39.

⁶⁴ See April 23, 2012 Notice Inviting Comments on Report.

⁶⁵ PNNL Report at iv-v (“The equation [the Gallet equation] is a good and simple-to-use way to solve a problem made difficult by the nonlinear interactions of the variables. However, in spite of the evident usefulness of the equation, inconsistencies are found in the NERC filing . . .”).

evidence that statistics relating to tower design are usable with vegetation.⁶⁶ Instead, the PNNL Report suggests that a “rod-plane gap and tree branch might have about the same gap factor (i.e., $k=1$),”⁶⁷ but does not provide any other indication of an appropriate gap factor for use with vegetation.

41. The PNNL Report further asserts that without NERC’s assumption “that the gap between a power line and growing vegetation is stronger (by 30%) than the reference gap used in developing the Gallet equation,” the minimum distances calculated would be about 50% larger.⁶⁸

42. The PNNL Report also asserts that “[t]hough there is no obvious way to relate tower clearance to vegetation clearance,” the proposed MVCDs in FAC-003-2 are small when compared to transmission tower design clearances:

The values for tower clearance for a line at 500 kV in the Transmission Line Reference Book range from 8.3 ft. to over 17 ft. The NERC filing requires a gap less than 6 ft for the same voltage, even at high altitude. There is no reason to suppose that a tree could safely be allowed so much closer to a line (less than 6 ft) than a tower.⁶⁹

⁶⁶ *See id.* at 11-13, 19.

⁶⁷ PNNL Report at 13.

⁶⁸ *Id.* at v.

⁶⁹ *Id.* at 19.

B. Comments in Response to PNNL Report

43. Nine sets of comments were filed in response to the PNNL Report, with timely submissions made by NERC, the Canadian Electricity Association, American Electric Power (AEP), Duke Energy Corporation (Duke), Oncor Electric Delivery Company LLC (Oncor), Kansas City Power & Light and KCP&L Greater Missouri Operations Company (KCP&L), Arizona Public Service Company (APS), and Salt River Project Agricultural Improvement and Power District (Salt River), as well as a joint submission by the Edison Electric Institute, the American Public Power Association, the National Rural Electric Cooperative Association and the Electric Power Supply Association (collectively, the Trade Associations).

44. In its comments, NERC asserts that the PNNL Report “(a) improperly juxtaposes data included in the FAC-003-2 Reliability Standard; (b) disregards NERC’s justification regarding the selection of transient overvoltage calculations; (c) fails to consider joint probability of independent events when analyzing flashover probability; and (d) disagrees with the choice of gap factor for vegetation without providing any empirical evidence, scientific reasoning or expert consensus on what an appropriate gap factor should be.”⁷⁰

45. With regard to the assertion in the PNNL Report that there is no evidence that statistics relating to tower design are usable with vegetation, NERC explains the rationale for its use of the Gallet equation in some detail (discussed further in PP 47 - 48 below),

⁷⁰ NERC Comments on PNNL Report at 1-2 (NERC Comments).

and notes that the PNNL Report “disagrees with [NERC’s] choice of gap factor for vegetation without providing any empirical evidence, scientific reasoning, or expert consensus on what an appropriate gap factor should be.”⁷¹ NERC explains that the Standard Drafting Team “relied on the scientific body of available knowledge and the opinions of experts (applied conservatively) currently working in the industry” to support a gap factor of 1.3.⁷² By contrast, NERC asserts that “there is no justification for the suggestion that the gap factors for vegetation could be less than unity,” and considers the PNNL Report’s suggestion of a gap factor of 1.0 to be based “purely on speculation.”⁷³

46. With regard to PNNL’s assertion that “inconsistencies are found in NERC’s filing”, NERC states that the “inconsistencies” identified by the PNNL Report in NERC’s Technical Reference Document result from PNNL erroneously comparing two separate sets of data developed for different purposes. According to NERC, one set of data was developed to demonstrate the consistency between the clearance values set out in the IEEE-516 standard and the values generated using the Gallet equation when using similar assumptions as those used in the IEEE-516 standard. The second set of data was designed to generate appropriate clearance values using the Gallet equation and “a set of assumptions determined by the [SDT] to be consistent with the purposes of the

⁷¹ *Id.* at 2.

⁷² *Id.*, Att. A at 8.

⁷³ *Id.*

standard.”⁷⁴ NERC responds that PNNL’s comparison of the two sets of data is therefore “misleading.”⁷⁵

47. With respect to the gap factor, NERC maintains that it relied on a widely known and regarded source for determining the appropriate gap factor, which indicates that an appropriate gap factor for a conductor-to-lateral structure configuration is in the range of 1.25 to 1.40.⁷⁶ Specifically, NERC explains that the Standard Drafting Team (SDT) relied on the “widely regarded” *Insulation Coordination for Power Systems*, by Andrew Hileman, to develop the proposed gap factor of 1.3.⁷⁷ NERC indicated that there is a range of gap factors that could be used in the Gallet equation, each factor designed to represent the difference in voltage withstand capability⁷⁸ between a given object, i.e., the transmission wire or conductor, and a reference case, i.e., the object for which the distance from the wire must be established. The gap factor varies based on the nature of the “gap configuration” of the reference case. In its response to the PNNL Report, NERC

⁷⁴ *Id.*, Att. A at 2.

⁷⁵ *Id.*

⁷⁶ *Id.*, Att. A at 6-7.

⁷⁷ *Id.* (citing Andrew Hileman, *Insulation Coordination for Power Systems* 167 (Marcel Dekker, New York, NY 1999)).

⁷⁸ The PNNL Report defines “withstand” in this context as “[t]he capability of an insulation system to function as an insulator when a high voltage is applied.” PNNL Report at 1.

provided the following table showing the range of gap factors (shown as k_g in the table below) based on the gap configuration:

Typical Value of Gap Factors k_g for Phase-Ground Insulations

Gap Configuration	Range of k_g	Typical value of k_g
Rod-plane	1.00	1.00
Rod-rod (vertical)	1.25 – 1.35	1.30
Rod-rod (horizontal)	1.25 – 1.45	1.35
Conductor-lateral structure	1.25 – 1.40	1.30
Conductor-lower rod	1.40 – 1.60	1.50

48. NERC then states that use of a gap factor of 1.3 is conservative:

It is worth noting that the gap factors for many shapes that could approximate vegetation are even higher than the 1.3 used in FAC-003-2, with ranges that include values as high as 1.6. Hileman notes that in regards to the substation environment (which includes many objects, conducting and non-conducting, with varying shapes and configurations): “Practically, the lowest gap factor in the substations is 1.3, which normally is conservative.”

...

[T]he [SDT] did not rely on any specific properties inherent in trees, rather, the [SDT] conservatively assumed that vegetation had the same properties as metal. The [SDT] elected to use the “typical” value for “conductor to lateral structure.” Unlike the other examples given, which specify a “typical” value that is equivalent to the midpoint of the range, this value (1.3) is within the conservative third of the range (1.25 – 1.4).⁷⁹

⁷⁹ *Id.* at 7.

49. In response to the assertion in the PNNL Report that “[t]here is no reason to suppose that a tree could safely be allowed so much closer to a line . . . than a tower” (see P 42, *supra*), NERC explains in its comments why NERC’s proposed MVCDs may not be directly comparable to distances based on tower design:

[C]are must be taken when making an interpretation of the tabular data, as the original survey participants may have answered the questions in a general context involving multiple structure designs. The final structure design parameters provided in the Red Book include the CFO gap plus other factors (such as insulator geometry, personnel safety and extreme lightning events). Accordingly, they should not be considered the final word with regard to Vegetation Management, as those distances were established to address a number of other issues. FAC-003-2 is not intended to mandate the parameters for all future line designs; it is focused solely on the distances necessary to mitigate the risk of vegetation related outages.

50. In addition to providing a response to the technical issues raised by the PNNL Report, NERC argues that the Commission is obligated under FPA section 215(d)(2) to give due weight to NERC’s technical expertise with respect to the content of proposed standards.

51. Trade Associations, Duke, Oncor and other commenters support NERC’s technical analysis. AEP and Oncor agree with NERC that the PNNL report contains inappropriate comparisons of data NERC presented in its petition and supporting materials, and that if NERC’s Gallet-generated numbers are compared to the distances calculated under IEEE-516, the “clearances determined by the two calculations are in fact

closely aligned.”⁸⁰ AEP and Oncor further maintain that the PNNL Report does not offer a “better alternative” to the use of the Gallet equation, and that it does not dispute the Standard Drafting Team’s rationale for its selection of transmission overvoltages.⁸¹ AEP and Oncor note that the PNNL Report acknowledges “that the Gallet Equation is ‘a fair representation of the performance of an air gap of a few meters, a simple-to-use way to solve a problem made difficult by the nonlinear interactions of the variables’ and that NERC has used the complete method that includes all the factors that go into the estimate of peak voltage.”⁸² AEP and Oncor also assert that proposed FAC-003-2, taken as a whole, will serve to improve the reliability of the system. AEP notes that the MVCDs included in Table 2 of the proposed Reliability Standard are merely the first piece of an overall strategy the transmission owner must develop to manage vegetation, and that the transmission owner must have documented strategies to prevent encroachments within all rated operating conditions, after taking into account sag, sway, and vegetative growth.

52. KCP&L comments that the PNNL Report should have “included discussion regarding a correction factor in the clearance calculation using the Gallet Equation due to the difference in the conductive properties of the metal rod compared to vegetation.”⁸³

⁸⁰ AEP Comments and Oncor Comments at 2.

⁸¹ *Id.*

⁸² *Id.* at 3 (citing PNNL Report at 19).

⁸³ KCP&L Comments at 2-3.

KCP&L supports use of the Gallet equation as an “improvement over the industry’s current means of determining clearance distances.”⁸⁴

53. APS questions whether either the Gallet equation or the IEEE standard incorporated in currently-effective FAC-003-1 “provides a demonstrable indicator of the flash-over distance between conductors and ground vegetation . . . ,”⁸⁵ and accordingly suggests that the Commission ask the Department of Energy to experimentally verify the distances derived from the IEEE and Gallet methodologies. APS takes the position that, until such data are developed, the Gallet methodology “seems more reasonable” than the IEEE standard as a basis for developing a clearance requirement.⁸⁶

54. Salt River supports the PNNL Report’s analysis, noting that it has questioned the applicability of the Gallet equation for vegetation clearances throughout the development of FAC-003-2. Salt River further agrees that there is insufficient evidence to suggest that a tree could safely be allowed much closer to a line than a tower. Finally, Salt River supports the experimental verification of any proposed guidelines regarding required vegetation clearances.

⁸⁴ *Id.* at 3. KCP&L also points out what it characterizes as a technical error in the PNNL Report related to the impact of multiple gaps on flashover probabilities, maintaining that in the example given by the PNNL Report, the flashover probability with 20 gaps should be 4% rather than 33%. *Id.*

⁸⁵ APS Comments at 2.

⁸⁶ *Id.*

C. NERC Response to Data Request

55. On May 4, 2012, Commission staff issued data requests to NERC. NERC submitted a timely response to the data requests on May 25, 2012, addressing matters such as the correct understanding and enforceability of certain provisions of the proposed Reliability Standard. Relevant elements of NERC's response to the data requests are discussed further below.

IV. Discussion

56. Pursuant to section 215(d) of the FPA, we propose to approve Reliability Standard FAC-003-2, including the associated new and revised definitions and implementation plan, as just, reasonable, not unduly discriminatory or preferential, and in the public interest. As discussed in Section A below, we believe the proposed Reliability Standard will enhance reliability and satisfies a number of the outstanding directives from Order No. 693. In addition, we seek further comment on certain aspects of the proposed Reliability Standard. Accordingly, we discuss the following matters below: (A) proposal to approve FAC-003-2; (B) applicability of the standard to sub-200 kV transmission lines; (C) clearance distances; (D) appropriate Violation Risk Factor for Requirement R2; (E) enforcement issues; (F) inclusion of reporting obligations as a compliance measure; and (G) proposed definitions.

A. The Commission Proposes to Approve FAC-003-2

57. We believe that proposed standard FAC-003-2 is an improvement over the currently-effective Version 1 standard, will support vegetation management practices that can effectively protect against vegetation-related transmission outages, and satisfies a

number of the outstanding directives from Order No. 693. As discussed earlier, NERC has explained how many of the Requirements improve upon the currently-effective Version 1 standard. In support of our proposal to approve FAC-003-2, we highlight several of these improvements. For example, in accordance with our directives in Order No. 693, as discussed further below, NERC has expanded the applicability of the Reliability Standard so that it now applies not only to all transmission lines above 200 kV, but also to transmission lines operated *below* 200 kV if they are an element of an IROL or an element of a Major WECC Transfer Path.

58. In addition, NERC has incorporated minimum clearance distances into the text of the Reliability Standard, and no longer includes a required clearance distance based on distances set by IEEE-516 which, as indicated in Order No. 693, served a different purpose than vegetation management. Proposed FAC-003-2 requires a transmission owner to prevent an encroachment into the MVCD, even if the encroachment does not result in a flashover or fault. As NERC explains, “FAC-003-2 presents a ‘zero-tolerance’ approach to vegetation management, explicitly treating any encroachment into the MVCD . . . as a violation”⁸⁷ Finally, encroachments must be prevented under all rated operating conditions, and must take into account sag and sway of the line, as well as vegetative growth rates and frequency of inspection and maintenance.

⁸⁷ NERC Petition at 6.

59. While the Commission did not require NERC to adopt a minimum inspection cycle as part of Order No. 693, the Commission did express concern both prior to and as part of Order No. 693 that inspection cycles should not be left entirely to the discretion of the transmission owner. Accordingly, in Order No. 693, the Commission stated that:

The Commission continues to be concerned with leaving complete discretion to the transmission owners in determining inspection cycles, which limits the effectiveness of the Reliability Standard. Accordingly, the Commission directs the ERO to develop compliance audit procedures . . . which would identify appropriate inspection cycles based on local factors. These inspections cycles are to be used in compliance auditing of FAC-003-1 by the ERO or Regional Entity to ensure such inspection cycles and vegetation management requirements are properly met by the responsible entities.⁸⁸

NERC has addressed this concern by incorporating a *minimum* inspection cycle requirement in the proposed Reliability Standard (at least once per calendar year and no more than 18 months between inspections).⁸⁹

60. Thus, based on the overall benefits of proposed FAC-003-2, we propose to approve Reliability Standard FAC-003-2 and propose to direct a change in the VRF level assigned to Requirement R2, as discussed further below.

61. In considering whether to approve Reliability Standard FAC-003-2, we give due weight to NERC's technical expertise. In light of our proposal to approve the proposed

⁸⁸ Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 721.

⁸⁹ See NERC Petition at 43.

Reliability Standard, commenters' suggestions that we have failed to give due weight to NERC's technical expertise are moot. Below, however, we will discuss our substantive consideration of the proposed minimum clearance distances derived based on application of the Gallet equation and certain technical points raised by the PNNL Report and commenters.

B. Applicability

62. The currently-effective Reliability Standard, FAC-003-1, is applicable to any transmission line operated at 200 kV and above, and to any line of lesser voltage designated by a Regional Entity⁹⁰ as "critical to the reliability of the electric system in the region."⁹¹ As discussed above, the Commission accepted this approach in Order No. 693, but directed NERC to address a modification to the applicability of the standard through its Reliability Standards development process:

We will not direct NERC to submit a modification to the general limitation on applicability as proposed in the NOPR. However we will require the ERO to address the proposed modification through its Reliability Standards development process. As explained in the NOPR, the Commission is concerned that the bright-line applicability threshold of 200 kV will exclude a significant number of transmission lines that could impact Bulk-Power System reliability We support the suggestions by Progress Energy, SERC and MISO to limit applicability to lower voltage lines associated

⁹⁰ Reliability Standard FAC-003-1 refers to Regional Reliability Organizations (RROs), the precursors to Regional Entities.

⁹¹ To date, no Regional Entity has designated any lower voltage lines as critical to regional reliability and therefore subject to FAC-003-1.

with IROL and these suggestions should be part of the input to the Reliability Standards development process.

....

[Other commenters] raise concerns about the cost of implementing this Reliability Standard if the applicability is expanded to lower-voltage facilities. We recognize these concerns . . . and we direct the ERO to develop an acceptable definition that covers facilities that impact reliability but balances extending the applicability of this standard against unreasonably increasing the burden on transmission owners.⁹²

63. We believe that NERC has satisfied this directive by considering the various concerns raised by the commenters as noted in Order No. 693, and ultimately by revising the Reliability Standard so that it applies to not only to lines that are 200 kV and above, but also to any sub-200 kV transmission line that is an element of an IROL or a Major WECC Transfer Path. We believe that NERC has supported its approach to the expansion in applicability, noting that proposed FAC-003-2 provides specific criteria to determine applicability for sub-200 kV transmission lines. In addition, NERC has used an impact-based approach for determining applicability rather than a bright-line threshold as a means of balancing the potential increased burden on transmission owners under a standard with expanded applicability.⁹³

64. While we view the modified applicability as a significant improvement, there are two aspects on which we seek comment. First, section 4.2.2 of proposed FAC-003-2 provides that the standard applies to overhead transmission lines operated below 200 kV

⁹² Order No. 693, FERC Stats. & Regs. ¶ 31,242 at PP 706, 708.

⁹³ NERC Petition at 41-42.

identified as an IROL under NERC Standard FAC-014 by the planning coordinator. However, FAC-014-2 does not explicitly require the planning coordinator to provide information about IROL status to transmission owners. Further, IROLs may change with changing system conditions. Given these factors, we seek a better understanding of how FAC-003-2 will be applied to facilities designated as IROLs. For example, we seek comment on how information regarding IROL status will be transmitted to transmission owners that must comply with FAC-003-2 and how transmission owners can effectively implement vegetation management per FAC-003-2 given that such programs are generally implemented annually and a change in IROL status can take place at any time given changing system conditions.⁹⁴

65. Second, in Order No. 693, the Commission directed that the proposed Reliability Standard apply to “Bulk-Power System transmission lines that have an impact on reliability as determined by the ERO.”⁹⁵ The Commission noted evidence that some lines below 200 kV can have significant impacts on the Bulk-Power System, including IROLs and System Operating Limits (SOLs).⁹⁶ The Commission directed the ERO, however, to balance extending the applicability of the standard against unreasonably increasing the

⁹⁴ For example, if a line is designated to be an IROL element by the planning coordinator, how will the transmission owner know to thereafter apply FAC-003-2 to that line? If the designation of an IROL changes with changes in system conditions, how will a transmission owner document management of vegetation over time?

⁹⁵ Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 706.

⁹⁶ *Id.* P 710.

burden on transmission owners.⁹⁷ Thus, we seek comment on how the applicability of the proposed Reliability Standard complies with the directive that the standard cover “lines that have an impact on reliability.” In addition, since the issuance of Order No. 693, we note that Commission staff and NERC stated in their joint report on the 2011 Southwest outage that failure to properly designate IROLs was a major cause of the outage.⁹⁸ Therefore, as part of the broader inquiry into whether the standard covers “lines that have an impact on reliability,” we seek comment on how NERC will assure that IROLs are properly designated.

C. Requirements R1 and R2

1. Minimum Clearance Values

66. We find that NERC has relied on a reasonable method for setting the MVCD, and has supported the inputs and assumptions it used to develop those minimum clearance distances, at least until such time that empirical data is developed and is available for use in setting MVCDs. We note that the MVCDs are roughly equivalent to, or slightly larger than, the minimum Clearance 2 distances in the current standard.

67. NERC explains that the MVCD is the result of a conservative gap factor. Further, the MVCD clearances represent only one aspect of proposed FAC-003-2. The MVCD

⁹⁷ *Id.* P 708.

⁹⁸ *See* FERC and NERC Staff Report, Arizona- Southern California Outages on Sept. 8, 2011: Causes and Recommendations at 6, 97-100 (April 2012).

establishes a “*minimum*[] required to prevent Flash-over.”⁹⁹ The proposed standard requires transmission operators to manage vegetation to ensure that vegetation does not encroach into that minimum clearance distance, which requires transmission owners to manage vegetation to a distance further than the MVCD. For example, transmission owners are required to have documented compliance strategies, procedures, processes, or specifications under Requirement R3 to prevent encroachments into the MVCDs after taking into account sag and sway of the lines, as well as vegetative growth rates, planned control methods and frequency of inspections. Similarly, under Requirement R7, a transmission owner is required to “complete 100% of its annual vegetation work plan of applicable lines to ensure no vegetation encroachments occur within the MVCD.”¹⁰⁰ Indeed, as NERC has explained, the “Transmission Owner is obligated to show detailed documentation that clearly explains their system with regard to the geography and how the Transmission Owner will execute the plan to prevent encroachment.”¹⁰¹ Further, NERC has indicated that a transmission owner’s documentation approach will generally contain the following elements:

1. the maintenance strategy used (such as minimum vegetation-to-conductor distance or maximum vegetation

⁹⁹ NERC Petition, Ex. A (Proposed Reliability Standard FAC-003-2) at 26 (Table 2 – Minimum Vegetation Clearance Distances (MVCD) For Alternating Current Voltages), n. 7 (emphasis added).

¹⁰⁰ Proposed Reliability Standard FAC-003-2 R7.

¹⁰¹ See NERC Response to Data Request Q2.

height) *to ensure that MVCD clearances are never violated.*

2. the work methods that the Transmission Owner uses to control vegetation
3. a stated Vegetation Inspection frequency
4. an annual work plan¹⁰²

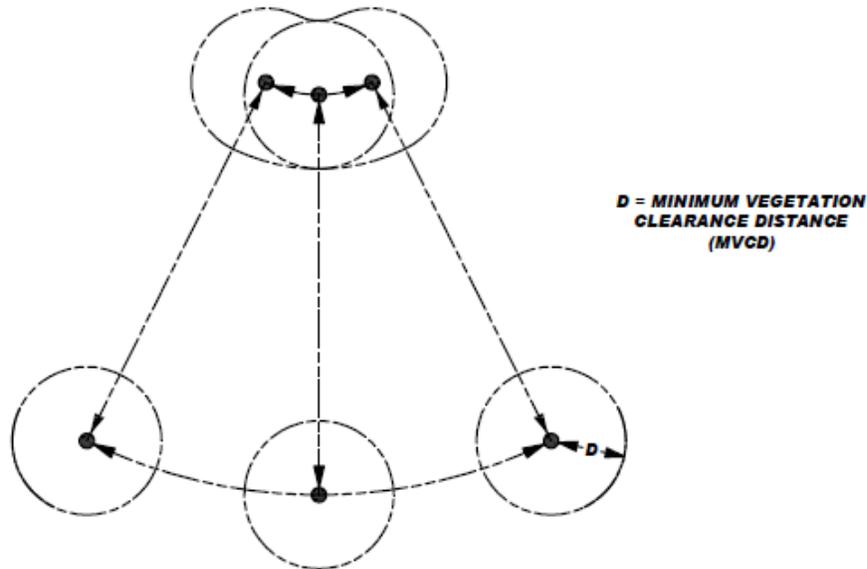
NERC also has indicated in its filing that “prudent vegetation maintenance practices dictate that substantially greater distances [than the applicable MVCD] will be achieved at time of vegetation maintenance.”¹⁰³

68. NERC also explains that a conductor’s position in space at any point in time continuously changes in reaction to a variety of factors, such as the amount of thermal and physical loading, air temperature, wind velocity and direction, and precipitation. The following diagram is a cross-section view of a single conductor at a given point along the span that illustrates six possible conductor positions due to movement resulting from thermal and mechanical loading:¹⁰⁴

¹⁰² NERC Response to Data Request Q4 (emphasis added) (citing NERC Petition, Ex. A at 19-20).

¹⁰³ NERC Petition, Ex. A (Proposed Reliability Standard FAC-003-2) at 26 (Table 2 – Minimum Vegetation Clearance Distances (MVCD) For Alternating Current Voltages), n. 7.

¹⁰⁴ NERC Petition, Ex. A at 20-21.



NERC indicates that conductor movements must be taken into account under FAC-003-2, and that the transmission owner is required to show that its approach to vegetation management under Requirement R3 will prevent encroachments under all expected line positions.¹⁰⁵ Thus, a transmission owner must manage vegetation to ensure it does not encroach into the MVCD under multiple conditions.

69. Finally, as NERC explains in its Technical Reference Document, transmission owners will have to clear vegetation to levels “well away from” the minimum spark-over zone:

As the conductor moves through various positions [due to thermal loading and physical loading], a spark-over zone surrounding the conductor moves with it. . . . At the time of making a field observation, however, it is very difficult to precisely know where the conductor is in relation to its wide

¹⁰⁵ See *id.* and Requirement R3 of FAC-003-2; see also NERC Petition, Ex. I (Technical Reference Document) at 20-29.

range of all possible positions. Therefore, Transmission Owners must adopt maintenance approaches that account for this dynamic situation.

...

In order to maintain adequate separation between vegetation and transmission line conductors, the Transmission Owner must craft a maintenance strategy that keeps vegetation well away from the spark-over zone mentioned above.¹⁰⁶

70. Thus, while clearances required at the time of maintenance may vary from one region or area to another, our proposed approval of FAC-003-2 is based on our understanding, which is drawn directly from NERC's statements in its petition, that transmission operators will manage vegetation to distances beyond the MVCD to ensure no encroachment into the MVCD.

71. As discussed above, the PNNL Report identifies specific potential concerns regarding NERC's approach to calculating minimum clearance values, such as the appropriate "gap factor" to apply. In its response to the PNNL Report, NERC explains the Standard Drafting Team's approach to reach a 1.3 gap factor and how it considered the matters raised in the PNNL Report. For example, with regard to the gap factor, NERC indicates that the drafting team relied on an authoritative source and chose a conservative gap factor value.¹⁰⁷ Based on the record in this proceeding, the application of the Gallet equation appears to be one reasonable method to calculate MVCD values.

¹⁰⁶ NERC Petition, Ex. I (Technical Reference Document) at 21-24.

¹⁰⁷ NERC Comments on PNNL Report at 6-7.

Further, while questions have been raised regarding certain inputs into the mathematical formula, we believe that NERC has supported use of the MVCD values set forth in FAC-003-2.

72. Notwithstanding our approval of the proposed MVCD, we remain concerned, as indicated in Order No. 693, over the lack of empirical data with regard to actual flashover distances observed through testing or analysis of flashover events.¹⁰⁸ NERC states in its petition that the Electric Power Research Institute (EPRI) is planning to undertake “the first known field tests of energized high voltage conductor flash-over to vegetation” at its Lenox facility, and that EPRI could be ready to commence such testing by the summer of 2013.¹⁰⁹ We seek comment on the status of this project and any other similar testing that is planned or ongoing of which NERC or other commenters are aware.

73. NERC further states that “the results of those [EPRI] tests may be useful to the industry for future reviews of this NERC standard.”¹¹⁰ We agree with NERC. While we accept NERC’s approach to determine the MVCDs between conductors and vegetation needed to prevent flashovers, we believe it is important that NERC develop empirical evidence that either confirms the MVCD values or gives reason to revisit the Reliability Standard. Accordingly, consistent with the activity that NERC has already initiated, the

¹⁰⁸ Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 735.

¹⁰⁹ NERC Petition at 5, n. 10.

¹¹⁰ *Id.*

Commission proposes to direct that NERC conduct or commission testing to obtain empirical data and submit a report to the Commission providing the results of the testing. We seek comment on this proposal, as well as the appropriate time frame for completion of the required testing and the submission of a report.

2. Designation of Medium VRF for Requirement R2

74. Requirement R1 of currently-effective Reliability Standard FAC-003-1 requires a transmission owner to maintain a “transmission vegetation management program” pursuant to which a transmission owner must maintain certain clearance distances between applicable transmission lines and vegetation. Requirement R1 of the Version 1 standard is assigned a “high” Violation Risk Factor.

NERC Petition

75. Under FAC-003-2, NERC proposes to bifurcate the assigned Violation Risk Factor levels, depending on the type of transmission line involved. NERC proposes to assign a high Violation Risk Factor to Requirement R1, which requires transmission owners to “manage vegetation to prevent encroachments into the MVCD of its applicable line(s) which are either an element of an IROL, or an element of a Major WECC Transfer Path.” Requirement R2 of the proposed Reliability Standard, which is assigned a medium Violation Risk Factor, provides that “[e]ach Transmission Owner shall manage vegetation to prevent encroachments into the MVCD of its applicable line(s) which are not either an element of an IROL, or an element of a Major WECC Transfer Path.”

[Emphasis in original.] Thus, the substantive obligation set forth in Requirements R1

and R2 are identical, but the Violation Risk Factors differ based on whether a transmission line is an element of an IROL or Major WECC Transfer Path.

76. NERC maintains that the assignment of a medium Violation Risk Factor for Requirement R2 is appropriate pursuant to existing Violation Risk Factor definitions and guidelines. NERC maintains that “[l]ines that are not IROLs and are not Major WECC Transfer Paths by definition have less potential for leading to cascading, separation or instability.”¹¹¹ Thus, NERC asserts that the separation into high risk and medium risk categories “ensure entities properly understand the risk to reliability associated with specific actions.”¹¹²

Commission Proposal

77. Based on the information provided in NERC’s Petition, it is not clear that NERC has adequately supported a medium Violation Risk Factor designation for Requirement R2. The Commission-approved definition of a “medium” risk requirement is:

A requirement that, if violated, could directly affect the electrical state or the capability of the bulk electric system, or the ability to effectively monitor and control the bulk electric system. However, violation of a medium risk requirement is *unlikely to lead to bulk electric system instability, separation, or cascading failures*¹¹³

¹¹¹ NERC Petition at 53.

¹¹² *Id.* at 54.

¹¹³ See *North American Electric Reliability Corp.*, 119 FERC ¶ 61,145 at P 9, *order on compliance*, 121 FERC ¶ 61,179, at n.2, Appx. A (2007) (emphasis added).

The definition of a high Violation Risk Factor is:

A requirement that, if violated, *could directly cause or contribute to* bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures¹¹⁴

NERC's support for the medium designation is that transmission lines that are not IROLs and are not Major WECC Transfer Paths "have less potential for leading to cascading, separation, or instability" than lines that are IROLs or Major WECC Transfer Paths.¹¹⁵

But NERC does not explain *why* outages on these relatively high voltage lines (200 kV or higher) would not likely lead to cascading, separation, or instability, or provide any indication of the number of transmission lines and transmission line-miles that would now be subject to a reduced (i.e., medium) Violation Risk Factor designation if FAC-003-2 were in effect.

78. Moreover, transmission lines not designated as an IROL element (or the equivalent) have been instrumental in causing major blackouts, including the August 2003 Northeast blackout. In that case, at least three of the four 345 kV lines (Star-S Canton, Harding-Chamberlin, and Hanna-Juniper) that tripped due to tree contact were not monitored as a flowgate, which could be viewed as the technical equivalent of

¹¹⁴ *Id.* (emphasis added).

¹¹⁵ NERC Petition at 53.

an IROL at that time.¹¹⁶ These three lines were the second, third and fourth lines to trip.¹¹⁷

79. Likewise, an August 10, 1996 blackout in WECC began with the trip of a 500 kV line (due to a tree contact) that was not identified as part of WECC's relevant path catalog at the time, i.e., the line was not identified as one of the critical paths subject to WECC monitoring and oversight similar to that required for a Major WECC Transfer Path today.¹¹⁸

80. Pursuant to proposed Requirements R1 and R2, transmission owners must "manage vegetation to prevent encroachments into the MVCD of its applicable lines," and any encroachment is considered a violation of these requirements regardless of whether it results in a sustained outage. NERC explains that it bifurcated the requirement to eliminate commingling of higher risk reliability objectives and lesser risk reliability objectives. However, analysis of the two aforementioned system disturbances suggests

¹¹⁶ 2003 Blackout Report at 55, 57, 60. The NERC Glossary defines a flowgate as: "1.) A portion of the Transmission system through which the Interchange Distribution Calculator calculates the power flow from Interchange Transactions. 2.) A mathematical construct, comprised of one or more monitored transmission Facilities and optionally one or more contingency Facilities, used to analyze the impact of power flows upon the Bulk Electric System." NERC Glossary at 20.

¹¹⁷ 2003 Blackout Report at 46 (Fig. 5.1).

¹¹⁸ The blackout originated with the trip of the Keeler-Allston 500 kV line, *see* NERC 1996 System Disturbances: Review of Selected Electric System Disturbances in North America (August 2002) at 40, 47, and affected 7.5 million people and 28,000 MW of load across fourteen states. 2003 Blackout Report at 106.

that lines that are not designated as an IROL or a Major WECC Transfer Path at a given point in time (i.e., proposed Requirement R2 lines), may still be associated with higher-risk consequences, including outages that can lead to Cascading.

81. Accordingly, pursuant to our Violation Risk Factor guidelines, which require, among other things, consistency within a Reliability Standard (guideline 2) and consistency between requirements that have similar reliability objectives (guideline 3), we propose to modify the Violation Risk Factor assigned to Requirement R2 from medium to high. However, in its comments on this NOPR, NERC is free to provide additional explanation than provided thus far to demonstrate the lines identified in Requirement R2 are properly assigned a medium Violation Risk Factor.

D. Enforceability

NERC Petition

82. In its petition, NERC describes its approach to enforcement with respect to each of the Reliability Standard's requirements, noting that each requirement is associated with a specific measure for evaluating compliance and Violation Severity Level guidance. With respect to Requirements R1 and R2, NERC explains that the associated measure sets out the types of evidence or documentation that will be required to show that vegetation was managed to prevent encroachments.

83. NERC acknowledges that proposed Requirements R1 and R2 include a general footnote (Footnote 1) describing multiple conditions exempting a transmission owner from these requirements so as not to be held accountable for an encroachment (e.g., a natural disaster or a "major storm" as defined either by the transmission owner or an

applicable regulatory body). However, NERC explains that this exception would only apply to situations that are beyond the control of the transmission owner or its duly appointed delegate.¹¹⁹ Further, any determination by the Commission or any other “applicable regulatory body” as to whether a given event does or does not qualify as a “major storm” would override any such determination by the transmission owner.¹²⁰

84. With respect to the Requirement R3 obligation that a transmission owner document its approach to vegetation management, NERC explains that the transmission owner must not only demonstrate that its program takes into account “the movement of the conductor, as well as growth rate, control method, and inspection frequency,” it must also provide “documentation that is sufficient to satisfy the auditor that the information contained in that documentation is sufficient that the Transmission Owner can use it to prevent encroachment into the MVCD.”¹²¹ NERC further explains that “[a]uditors will have to use judgment to evaluate the appropriateness of the documentation provided given the particular circumstances of the entity being audited.”¹²²

85. With respect to the obligation in Requirement R4 to provide notice to the applicable control center of a confirmed vegetation condition likely to cause a fault, NERC again explains that auditors may have to use judgment based on the specific

¹¹⁹ NERC Petition at 34.

¹²⁰ NERC Petition at 34.

¹²¹ *Id.* at 35.

¹²² *Id.*

circumstances, “but it is expected that an entity that does not make this reporting a top priority would be in violation of the standard.”¹²³ In addition, NERC explains that the obligation to notify without intentional delay generally “can be understood to include an immediate (within 1 hour of the observation) communication notwithstanding a safety issue to the personnel, other immediate priority maintenance functions to ensure reliability or system stability, or communications equipment failure that precludes immediate communication.”¹²⁴

86. With respect to Requirement R5, NERC explains that in the case where a transmission owner is prevented from taking actions needed to prevent an encroachment into the MVCD, the transmission owner must de-energize or de-rate the line to reduce the MVCD as needed to avoid a violation, and must show proof that it has taken that action if needed.¹²⁵

87. With respect to Requirement R7 covering vegetation work plans, NERC notes that the requirement does not explicitly require the creation of such a plan, but states that “entities will not be able to comply with the requirement without having a documented plan.”¹²⁶ While NERC acknowledges that R7 allows transmission owners to have a

¹²³ *Id.*

¹²⁴ *Id.* at 37.

¹²⁵ *Id.*

¹²⁶ *Id.* at 39.

“dynamic work plan,” it points out that any modifications to the plan must be executed to avoid encroachment of vegetation into the MVCD. Moreover, NERC notes that “[a]ny such encroachment would be a violation of R1 or R2, and any changes to the plan that resulted in such an encroachment would be a violation of R7.”¹²⁷ Finally, NERC notes that auditors will be able to request and review initial work plans for comparison with completed work plans in order to assess compliance with these requirements.¹²⁸

88. In addition, NERC has identified what it expects a transmission owner’s vegetation management program to contain. See P 67, *supra*.

89. The proposed Reliability Standard, as filed, includes a “Guideline and Technical Basis” document that further explains NERC’s expectations on how the requirements will be enforced and how compliance can be demonstrated. For example, with respect to Requirement R3, NERC explains in greater detail that the documentation showing the transmission owner’s approach to vegetation management must provide “the basis for evaluating the intent, allocation of appropriate resources, and the competency of the Transmission Owner in managing vegetation.”¹²⁹ While NERC notes that there are many acceptable approaches to vegetation management, the transmission owner must be able to

¹²⁷ *Id.*

¹²⁸ *Id.* at 40.

¹²⁹ *Id.*, Ex. A at 19.

show how it conducts work to maintain the required clearances.¹³⁰ In addition, as discussed in paragraphs 67-71 above, transmission owners cannot show compliance with the standard without adopting a vegetation management program that keeps vegetation away from the MVCDs under changing conditions.

Commission Proposal

90. We support NERC's overall efforts to develop explicit, verifiable measures for each requirement in order to allow for consistent, non-preferential enforcement.

91. As noted above, NERC has provided information we believe is useful to an overall understanding of the intent of the standard and how it will be interpreted and enforced, including the information that NERC has provided in its petition, in the Guideline and Technical Basis document that is attached as part of Exhibit A to the petition, and in its May 25, 2012 responses to the Commission staff's data requests. We believe these additional resources, while not setting forth requirements or themselves determining whether compliance has occurred, provide guidance with respect to uniform compliance with the proposed Reliability Standard.¹³¹ We expect that NERC will approach its compliance, auditing and enforcement obligations as described in each of these submitted materials. We seek comment as to whether this material should be consolidated as reference material to complement the proposed compliance measures in order that entities

¹³⁰ *Id.* at 20.

¹³¹ Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 253.

that must comply can find these materials in one place and assure implementation of the proposed standard as NERC has supported in its filings.

92. In addition, Requirement R4 requires transmission owners to notify “without intentional time delay” the control center with switching authority for the applicable line when the transmission owner has confirmed the existence of a vegetation condition that is likely to cause an imminent fault. We seek comment on how NERC would or should treat a delay in communication caused by the negligence of the transmission owner or one of its employees, where the delay may be significant and “unintentional.”

E. Reporting Requirements

93. Reliability Standard FAC-003-1, Requirements R3 and R4, require quarterly reporting to the Regional Entities of sustained transmission outages caused by vegetation. While the proposed Reliability Standard moves these reporting requirements to the “Additional Compliance Information” section as a Periodic Data Submittal, NERC maintains that the reporting requirements remain enforceable under NERC’s Rules of Procedure. Among other things, NERC states that it and Regional Entities can require entities to provide “such information as is necessary to monitor compliance with the reliability standards” under Section 401.3 of NERC’s Rules of Procedure.¹³² In addition, NERC asserts that it “has certain courses of action it may undertake as necessary to

¹³² NERC Rules of Procedure Section 401.3.

ensure the entity complies with the Rules,” pursuant to NERC Rule of Procedure Section 100, including notifying the Commission of the entity’s failure to comply.¹³³

94. We agree that pursuant to section 401.3 of NERC’s Rules of Procedure, NERC and the Regional Entities can require transmission owners to make quarterly reports of sustained transmission outages because these reports provide information relating to compliance with the requirements of proposed FAC-003-2. This rule states: “All Bulk Power System owners, operators and users shall provide to NERC and the applicable Regional Entity such information as is necessary to monitor compliance with the Reliability Standards.” Further, a periodic data submittal is a requirement to provide compliance information pursuant to section 3.6 of NERC’s Compliance Monitoring and Enforcement Program.¹³⁴ However, we seek comment on NERC’s statement regarding the “courses of action” that are available to it in order to ensure compliance, other than notifying the Commission of the entity’s failure to comply.

F. Definitions

95. We propose to accept the new definition of Minimum Vegetation Clearance Distance and the revised definitions of Vegetation Inspection and Right-of-Way for

¹³³ See NERC Petition at 31-32. See NERC Rule of Procedure, Section 100 (“[e]ach Bulk Power System owner, operator, and user shall comply with all Rules of Procedure of NERC that are made applicable to such entities If NERC determines that a Rule of Procedure has been violated, or cannot practically be complied with, NERC shall notify [the Commission] and take such other actions as NERC deems appropriate to address the situation”).

¹³⁴ NERC Rules of Procedure, Appx. 4C § 3.6.

inclusion in the NERC Glossary of Terms. However, we seek further comment regarding the proposed revision to the definition of Right-of-Way, as discussed below.

Revised Definition of Right-of-Way

96. As noted above, we directed NERC in Order No. 693 to consider FirstEnergy's suggestion that "rights-of-way be defined to encompass the required clearance areas instead of the corresponding legal rights, and that the standards should not require clearing the entire right-of-way when the required clearance for an existing line does not take up the entire right-of-way."¹³⁵ In response to this directive, NERC now proposes the following new definition of Right-of-Way (ROW):

The corridor of land under a transmission line(s) needed to operate the line(s). The width of the corridor is established by engineering or construction standards as documented in either construction documents, pre-2007 vegetation maintenance records, or by the blowout standard in effect when the line was built. The ROW width in no case exceeds the Transmission Owner's legal rights but may be less based on the aforementioned criteria.

97. Under Requirements R1.1 and R2.1 of the proposed Reliability Standard, encroachments into the MVCD observed in real time would be violations of R1 or R2 regardless of whether they cause a sustained outage and regardless of whether the vegetation is within the Right-of-Way as defined under FAC-003-2. However, under proposed Requirements R1.2, R1.3 and R1.4 and the corresponding sub-requirements of R2, fall-ins, blow-ins and grow-ins that cause a sustained outage are violations of the

¹³⁵ See Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 734.

proposed standard only if they occur from *inside* this newly-defined Right-of-Way, which could give transmission owners the perverse incentive to “define” a particular Right-of-Way as narrowly as possible in order to limit the likelihood of an R1 or R2 violation.

98. In response to the Commission staff data requests, NERC has provided information suggesting that encroachments from within the legal right-of-way (i.e., the area within the transmission owner’s control) would, in most cases, still be violations of FAC-003-2, even if the Right-of-Way is more narrowly defined. In response to Commission staff’s question about a transmission owner’s obligation to respond when it identifies a vegetation condition that might encroach into the MVCD if the vegetation is located outside of the Right-of-Way (as proposed under the new definition), but within the transmission owner’s *legal* right-of-way, NERC provided the following explanation:

1. A grow-in from a tree or the tree wall into the ROW. The definition of ROW provides for “The corridor of land under a transmission line(s) needed to operate the line(s).” Therefore, in order to operate the line consistent with its rating, the ROW includes space for “blowout” of the lines within the context of the MVCD. With respect to the grow in of a tree from outside the ROW as defined but within the legal ROW, the TO will use vegetations [sic] inspections to identify “those vegetation conditions under the Transmission Owner’s control that are likely to pose a hazard to the line(s) prior to the next planned maintenance or inspection.” In the event, an inspection shows that a tree has already grown inside the MVCD, the TO would be in violation of R1 item 1 or R2 item 1. Another way to consider this issue is that tree growing into the MVCD from the side is no different from a tree growing into the MVCD from below the line.

2. A fall-in of danger timber (dead, diseased or dying) from outside of the ROW but within the TO’s control. The definition of inspection covers vegetation “....vegetation conditions on a Right-of-Way and those vegetation conditions

under the Transmission Owner's control that are likely to pose a hazard to the line(s) prior to the next planned maintenance or inspection.” Under this requirement, if the TO is regularly identifying its danger trees and has a program for managing the risk of fall-in there would be no violation. Conversely, if an outage occurs and it is confirmed that the TO was not attempting to identify its danger timber risk, the TO would be in violation of R6. . . . Also, if the TO identifies the danger tree but puts no plan into effect to manage the risk of fall-in, the TO would be in violation of R7¹³⁶

99. NERC distinguishes these cases from a case where a fall-in occurs from a *green or healthy tree* outside the corridor-based Right-of-Way, but within the right-of-way controlled by the transmission owner. In that case, NERC acknowledges that there would be no violation under the proposed standard, and maintains that the “fact that the Transmission Owner owns additional ROW over and above . . . that needed by the MVCD is insufficient reason to cut healthy green trees. To require the cutting of green, healthy trees that pose no known threat would likely not be environmentally, socially, or politically acceptable.”¹³⁷

100. We agree with NERC that in the situation in which a fall-in occurs from a green or healthy tree outside the corridor based Right-of-Way, but within the ROW controlled by the transmission owner, there would be no violation under the revised Reliability Standard. Moreover, we note that the proposed Reliability Standard does not require clear-cutting along the right-of-way, but instead gives the transmission owner the

¹³⁶ NERC Data Responses, Responses to Q9 (May 25, 2012).

¹³⁷ *Id.*, Response to Q 9 at P 3.

flexibility to adopt an appropriate vegetation management strategy to comply with FAC-003-2 based on the particular circumstances for a given line. As NERC notes in its Technical Reference Document, different vegetation management strategies may be appropriate for different areas, and FAC-003-2 gives transmission owners the option to adopt strategies to comply with FAC-003-2 that encourage active vegetation management and Integrated Vegetation Management rather than clear-cutting.¹³⁸ NERC's Technical Reference Document describes ANSI A-300 – Best Management Practices for Tree Care Operations and identifies Integrated Vegetation Management as a best management practice, including incorporation of wire-border zone management techniques and the establishment and maintenance of compatible vegetation.

101. However, we seek further comment on NERC's enforcement approach with respect to a fall-in by "danger timber" (dead, diseased or dying trees or limbs) from within the transmission owner's legally-owned and controlled right-of-way. Specifically, NERC indicates in its data responses (restated in P 98, *supra*) that "if the TO is regularly identifying its danger trees and has a program for managing the risk of fall-in there would be no violation." The Commission's concern is that this statement could be read to mean that, as long as the transmission owner identifies danger trees and has a program to manage the risk of those trees, an encroachment into the MVCD from a location within the transmission owner's control would not be a violation. The Commission would not

¹³⁸ See NERC Petition, Ex. I (Technical Reference Document) at 24-29.

agree with such a reading. The mere existence of a program to identify danger trees and a program to manage risk should not shield a transmission owner from enforcement if, notwithstanding the existence of the program, an encroachment into the MVCD occurred. The Commission seeks comment on this reading and, based on the comments, will consider whether changes are needed.

102. We also note that the proposed definition of Right-of-Way includes guidance as to how the transmission owner may define its Right-of-Way, requiring that it be based on construction documents, pre-2007 vegetation maintenance records, or as-built blowout standards. We seek comment on how the identified guidance in the new definition will be used: (1) by the transmission owner to establish criteria to determine an appropriate Right-of-Way; and (2) by auditors to establish criteria to determine compliance with the proposed standard.

G. Implementation Plan

103. We propose to approve the Implementation Plan as submitted in Ex. B of NERC's petition.

V. Information Collection Statement

104. The following collection of information contained in the Proposed Rule is subject to review by the Office of Management and Budget (OMB) under section 3507(d) of the Paperwork Reduction Act of 1995 (PRA).¹³⁹ OMB's regulations require that OMB

¹³⁹ 44 U.S.C. § 3507(d) (2006).

approve certain reporting and recordkeeping requirements (collections of information) imposed by an agency.¹⁴⁰ Upon approval of a collection of information, OMB will assign an OMB control number and expiration date. Respondents subject to the filing requirements of this rule will not be penalized for failing to respond to these collections of information unless the collections of information display a valid OMB control number.

105. The Commission is proposing to submit these reporting and recordkeeping requirements to OMB for its review and approval under section 3507(d) of the PRA. Comments are solicited on the Commission's need for this information, whether the information will have practical utility, the accuracy of the provided burden estimate, ways to enhance the quality, utility, and clarity of the information to be collected, and any suggested methods for minimizing the respondent's burden, including the use of automated information techniques.

106. This Notice of Proposed Rulemaking proposes to approve Reliability Standard FAC-003-2, which includes certain requirements to create and maintain records related to a transmission owner's vegetation management work plan and its performance of inspections. Because transmission owners have vegetation management plans they follow per the existing transmission vegetation management standard (FAC-003-1), and must compile and maintain similar records and provide similar reports under the existing standard, the proposed revisions are expected to have a minor impact on the burden of

¹⁴⁰ 5 C.F.R. § 1320.11 (2012).

record-keeping and reporting. In addition, by allowing greater flexibility compared to the currently-effective Version 1 standard with regard to the materials that must be maintained for a vegetation management plan or strategy, the NERC proposal may prove to reduce the reporting burden for some entities.

107. Public Reporting Burden: Our estimate below regarding the number of respondents is based on the NERC compliance registry as of July 24, 2012. According to the compliance registry, NERC has registered 330 transmission owners within the United States. Transmission owners must report and retain certain data pursuant to the currently effective Version 1 Standard. Thus, the burden estimate below is based on the potential change in the reporting burden imposed by proposed FAC-003-2. As discussed earlier, Requirement R3 of NERC's proposal provides more flexibility for transmission owners in preparing and maintaining a vegetation management program, and the incremental change in the burden may be negligible or even decrease for some portion of transmission owners. The individual burden estimates are based on each transmission owner having to perform a one-time review of the revised Reliability Standard's information collection requirements and to make any required modifications to its existing vegetation management plans and documentation procedures. In addition, the burden estimate takes into account an on-going, albeit very minor increase in the quarterly reporting burden, based on the increased burden to confirm whether or not reportable outages have occurred on lines not previously subject to FAC-003-1's requirements. Further, the burden estimate takes into account the increased recordkeeping burden associated with the proposed standard's annual vegetation inspection requirements, which is estimated to

increase the inspection cycles (and the associated documentation to demonstrate compliance) for about one third of transmission owners (110 transmission owners).

FAC-003-2 (Transmission Vegetation Management)	Number of Transmission Owner Respondents (1)	Number of Responses per Respondent (2)	Average Burden Hours Per Response (3)	Total Annual Burden Hours (1)x(2)x(3)
One time review and modifications to existing documentation, plans and procedures	330	1	16	5,280 (one-time)
Quarterly Reporting	115	4	0.5	330 ¹⁴¹
Annual Vegetation Inspections Documentation	110	1	2	220
Total				5,830

Total Annual Hours for Collection: (Compliance/Documentation) = 5,830 hours.

Quarterly Reporting Cost for Transmission Owners: = 330 hours @ \$70/hour¹⁴² =
\$23,100.

¹⁴¹ While approval of FAC-003-2 is not expected to increase the number of reports made or the number of reportable outages experienced, some utilities may experience a very slight increase in the amount of time required to confirm whether or not any reportable outages occurred due to the increased applicability of the standard to certain sub-200 kV transmission lines.

¹⁴² This figure is the average of the salary plus benefits for a manager and an engineer. The figures are taken from the Bureau of Labor and Statistics at http://bls.gov/oes/current/naics3_221000.htm.

Annual Vegetation Inspections Documentation: = 220 hours @ \$28/hour¹⁴³ = \$6,160.

Total Annual Cost (Reporting + Record Retention): = \$23,100 + \$6,160 = \$29,260.

One-Time Review and Modification of Plans and Documentation: 5,280 hours @ \$52/hour¹⁴⁴ = \$274,560.

Title: Mandatory Reliability Standards for the Bulk-Power System

Action: Proposed revisions to collection FERC-725A.

OMB Control No.: 1902-0244.

Respondents: Businesses or other for-profit institutions; not-for-profit institutions.

Frequency of Responses: Annual, quarterly, and one-time.

Necessity of the Information: The proposed revision of NERC standard FAC-003-2

Transmission Vegetation Management is part of the implementation of the Congressional mandate of the Energy Policy Act of 2005 to develop mandatory and enforceable Reliability Standards to better ensure the reliability of the nation's Bulk Power System. Specifically, the proposal would ensure that transmission owners are protecting transmission lines from encroachment of vegetation.

Internal Review: The Commission has reviewed the proposed revision to the current Reliability Standard and made a determination that its action is necessary to implement

¹⁴³ Wage figure is based on a Commission staff study of record retention burden.

¹⁴⁴ This figure is the average of the salary plus benefits for an engineer and a forester. The figures are taken from Bureau of Labor and Statistics at http://bls.gov/oes/current/naics3_221000.htm.

section 215 of the FPA. The Commission has assured itself, by means of its internal review, that there is specific, objective support for the burden estimate associated with the information requirements.

108. Interested persons may obtain information on the reporting requirements by contacting the following: Federal Energy Regulatory Commission, 888 First Street, NE, Washington, DC 20426 [Attention: Ellen Brown, Office of the Executive Director, e-mail: DataClearance@ferc.gov, phone: (202) 502-8663, fax: (202) 273-0873].

109. For submitting comments concerning the collection of information and the associated burden estimate, please send your comments to the Commission and to the Office of Management and Budget, Office of Information and Regulatory Affairs, Washington, DC 20503 [Attention: Desk Officer for the Federal Energy Regulatory Commission, phone: (202) 395-4638, fax: (202) 395-7285]. For security reasons, comments to OMB should be submitted by e-mail to: oira_submission@omb.eop.gov. Comments submitted to OMB should include Docket Number RM12-04 and OMB Control Number 1902-0244.

VI. Regulatory Flexibility Act Certification

110. The Regulatory Flexibility Act of 1980 (RFA)¹⁴⁵ generally requires a description and analysis of proposed rules that will have significant economic impact on a substantial number of small entities. The RFA mandates consideration of regulatory alternatives that

¹⁴⁵ 5 U.S.C. §§ 601-612 (2006).

accomplish the stated objectives of a proposed rule and that minimize any significant economic impact on a substantial number of small entities. The Small Business Administration's (SBA's) Office of Size Standards develops the numerical definition of a small business.¹⁴⁶ The SBA has established a size standard for electric utilities, stating that a firm is small if, including its affiliates, it is primarily engaged in the transmission, generation and/or distribution of electric energy for sale and its total electric output for the preceding twelve months did not exceed four million megawatt hours.¹⁴⁷

111. Proposed Reliability Standard FAC-003-2 will be applicable to overhead transmission lines operated at 200 kV or higher, and, for the first time, to transmission lines operated at less than 200 kV if they are elements of an IROL as defined by FAC-014 or elements of a Major WECC Transfer Path. In addition, Proposed Reliability Standard FAC-003-2 will require annual vegetation inspections for all applicable lines, which could result in an increase in annual inspections performed for a subset of transmission owners.

112. Comparison of the NERC Compliance Registry with data submitted to the Energy Information Administration on Form EIA-861 indicates that, of the 330 transmission owners in the United States registered by NERC, 127 of these entities qualify as small businesses. The Commission estimates that the 127 transmission owners that qualify as

¹⁴⁶ 13 C.F.R. § 121.101 (2012).

¹⁴⁷ 13 C.F.R. § 121.201, Sector 22, Utilities & n.1.

small businesses will incur increased costs associated solely with a one-time review of the proposed standard and modification to existing plans and procedures. As described in the information collection section of this NOPR, the estimated cost for the increased data collection and retention is approximately \$1,000 per entity.

113. Further, some transmission owners that qualify as small entities will incur costs associated with an increase in frequency of inspections. As indicated above, currently-effective FAC-003-1 requires periodic vegetation management inspections of transmission line rights-of-way at an interval determined by each transmission owner. Requirement R6 of the proposed standard would require each transmission owners to inspect 100 percent of the transmission lines at least once per year. Based on a review of available information, including data provided in response to a 2004 vegetation management study performed by Commission staff,¹⁴⁸ we estimate that approximately one third, i.e., 42, of the transmission owners that qualify as small entities would incur costs associated with more frequent inspection cycles. Assuming that (1) such small entities own approximately 50-200 miles of transmission lines, (2) approximately 15-20 miles of transmission line can be inspected per day and (3) cost of labor is approximately \$47 per hour,¹⁴⁹ the estimated increase in inspection cost for these

¹⁴⁸ See *Utility Vegetation Management and Bulk Electric Reliability Report from the Federal Energy Regulatory Commission*, p. 8-10 (Sept. 7, 2004). Available at: <http://www.ferc.gov/industries/electric/indus-act/reliability/veg-mgmt-rpt-final.pdf>.

¹⁴⁹ The wage figure is taken from the Bureau of Labor and Statistics at http://bls.gov/oes/current/naics3_221000.htm.

42 small entities is in the range of approximately \$5,000 to 10,000 per entity. As discussed above, NERC's proposal would modify the applicability of the Reliability Standard to include overhead transmission lines that are operated below 200 kV if they are either an element of an IROL or an element of a Major WECC Transfer Path. Based on a review of the Major WECC Transfer Paths and a sample of sub-200 kV IROLs in the Eastern Interconnect, the Commission believes that most, if not all, of the transmission lines subject to the expanded applicability of proposed FAC-003-2 are owned by large entities. Thus, the increased cost of the new rule to small entities appears to be negligible with respect to the expanded applicability of the Reliability Standard.

114. Based on the above, the Commission does not consider the cost of the NERC proposal to be a significant economic impact for small entities because it should not represent a significant percentage of an affected small entity's operating budget.

115. Based on the above, the Commission certifies that the new or revised requirements set forth in proposed Reliability Standard FAC-003-2 will not have a significant economic impact on a substantial number of small entities. Accordingly, no regulatory flexibility analysis is required.

VII. Environmental Analysis

116. The Commission is required to prepare an Environmental Assessment or an Environmental Impact Statement for any action that may have a significant adverse effect

on the human environment.¹⁵⁰ The Commission has categorically excluded certain actions from this requirement as not having a significant effect on the human environment. The actions proposed here fall within the categorical exclusion in the Commission's regulations for rules that are clarifying, corrective or procedural or that do not substantially change the effect of the regulations being amended.¹⁵¹ The actions proposed herein fall within this categorical exclusion in the Commission's regulations.

VIII. Comment Procedures

117. The Commission invites interested persons to submit comments on the matters and issues proposed in this notice to be adopted, including any related matters or alternative proposals that commenters may wish to discuss. Comments are due [INSERT DATE 60 days after publication in the **FEDERAL REGISTER**]. Comments must refer to Docket No. RM12-4-000, and must include the commenter's name, the organization they represent, if applicable, and their address in their comments.

118. The Commission encourages comments to be filed electronically via the eFiling link on the Commission's web site at <http://www.ferc.gov>. The Commission accepts most standard word processing formats. Documents created electronically using word processing software should be filed in native applications or print-to-PDF format and not

¹⁵⁰ *Regulations Implementing the National Environmental Policy Act of 1969*, Order No. 486, 52 FR 47897 (Dec. 17, 1987), FERC Stats. & Regs., Regulations Preambles 1986-1990 ¶ 30,783 (1987).

¹⁵¹ 18 C.F.R. § 380.4(a)(2)(ii) (2012).

in a scanned format. Commenters filing electronically do not need to make a paper filing.

119. Commenters that are not able to file comments electronically must send an original of their comments to: Federal Energy Regulatory Commission, Secretary of the Commission, 888 First Street, NE, Washington, DC 20426.

120. All comments will be placed in the Commission's public files and may be viewed, printed, or downloaded remotely as described in the Document Availability section below. Commenters on this proposal are not required to serve copies of their comments on other commenters.

IX. Document Availability

121. In addition to publishing the full text of this document in the Federal Register, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the Internet through the Commission's Home Page (<http://www.ferc.gov>) and in the Commission's Public Reference Room during normal business hours (8:30 a.m. to 5:00 p.m. Eastern time) at 888 First Street, NE, Room 2A, Washington, DC 20426.

122. From the Commission's Home Page on the Internet, this information is available on eLibrary. The full text of this document is available on eLibrary in PDF and Microsoft Word format for viewing, printing, and/or downloading. To access this document in eLibrary, type the docket number excluding the last three digits of this document in the docket number field.

123. User assistance is available for eLibrary and the Commission's website during normal business hours from the Commission's Online Support at (202) 502-6652 (toll free at 1-866-208-3676) or email at ferconlinesupport@ferc.gov, or the Public Reference Room at (202) 502-8371, TTY (202) 502-8659. E-mail the Public Reference Room at public.referenceroom@ferc.gov.

List of subjects in 18 CFR Part 40

Electric power; Electric utilities; Reporting and recordkeeping requirements.

By direction of the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.