NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

March 17, 2016

VIA ELECTRONIC FILING

Kirsten Walli, Board Secretary
Ontario Energy Board
P.O Box 2319
2300 Yonge Street
Toronto, Ontario, Canada
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RE: *North American Electric Reliability Corporation*

Dear Ms. Walli:

The North American Electric Reliability Corporation ("NERC") hereby submits Petition of the North American Electric Reliability Corporation for Approval of Proposed Reliability Standard FAC-003-4. NERC requests, to the extent necessary, a waiver of any applicable filing requirements with respect to this filing.

Please contact the undersigned if you have any questions.

Respectfully submitted,

/s/ Holly A. Hawkins

Holly A. Hawkins
Associate General Counsel for the North American Electric Reliability Corporation

Enclosure

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ONTARIO ENERGY BOARD
OF THE PROVINCE OF ONTARIO

NORTH AMERICAN ELECTRIC	**)**
RELIABILITY CORPORATION	**)**

PETITION OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION FOR APPROVAL OF PROPOSED RELIABILITY STANDARD FAC-003-4

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March 17, 2016

TABLE OF CONTENTS

ONTARIO ENERGY BOARD
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NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION)
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PETITION OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION FOR APPROVAL OF PROPOSED RELIABILITY STANDARD FAC-003-4

The North American Electric Reliability Corporation ("NERC") hereby requests approval of proposed Reliability Standard FAC-003-4 (*Transmission Vegetation Management*) (Exhibit A), the associated Implementation Plan (Exhibit B), and retirement of currently-effective Reliability Standard FAC-003-3. Proposed Reliability Standard FAC-003-4 will apply the same Violation Risk Factors ("VRFs") and Violation Severity Levels ("VSLs") as applicable to currently effective Reliability Standard FAC-003-3. Therefore, this filing does not include a separate justification for the VRFs and VSLs. This filing also attaches copies of those Electric Power Research Institute ("EPRI") reports (Exhibit E), which led to the revisions proposed in Reliability Standard FAC-003-4.The NERC Board of Trustees adopted proposed Reliability Standard FAC-003-4 on February 11, 2016.

The proposed Reliability Standard FAC-003-4 is just, reasonable, not unduly discriminatory or preferential, and in the public interest. NERC also requests acceptance of the proposed Implementation Plan and retirement of Reliability Standard FAC-003-3 effective as provided in the Implementation Plan. On this effective date, proposed Reliability Standard FAC-003-4 will supersede and replace FAC-003-3.

This filing presents the technical basis and purpose of proposed Reliability Standard FAC-003-4, a summary of the development history (Exhibit F), and a demonstration that the proposed Reliability Standard meets the Reliability Standards criteria.

I. EXECUTIVE SUMMARY

The purpose of proposed Reliability Standard FAC-003-4 is to require entities to manage vegetation located on transmission rights of way (ROW) and minimize encroachments from vegetation located adjacent to the ROW to reduce the risk of vegetation-related outages that could lead to Cascading. Proposed Reliability Standard FAC-003-4 reflects revisions developed under Project 2010-07.1 Vegetation Management to provide a revised gap factor applied in the Gallet equation supporting the appropriate Alternating Current Minimum Vegetation Clearance Distances (referred to herein as "MVCD values") stated under the Reliability Standard.[1] The MVCD value reflects the minimum distance between vegetation and conductors to prevent a flash-over. This revised gap factor was developed as a result of the 2015 Technical Report prepared by EPRI entitled *Supplemental Testing to Confirm or Refine Gap Factor Utilized in Calculation of Minimum Vegetation Clearance Distances ("MVCD"): Tests: Results and Analysis* ("EPRI Report"),[2] filed at the Federal Energy Regulatory Commission ("FERC") in compliance with FERC's directive in Order No. 777.[3] The EPRI Report, the preliminary report preceding it, and EPRI's recent update to the EPRI Report are attached at Exhibit E.

As reflected in this filing and the attached exhibits, the EPRI test results indicated that MVCD values under currently effective Reliability Standard FAC-003-3 might not be suitable or sufficiently conservative in all situations. The EPRI testing revealed that the gap factor used to

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[1] Non-substantive edits are also included for the standard.

[2] *North American Electric Reliability Corporation submits Electric Power Research Institute 2015 Technical Report*, Docket No. RM12-4-002 (filed Aug. 12, 2015) (attaching the EPRI Report, as attachment 1).

[3] *See Revisions to Reliability Standard for Transmission Vegetation Management*, Order No. 777, 142 FERC ¶ 61,208, at P 59 (2013) (stating, "direct NERC to conduct or contract testing to develop empirical data regarding the flashover distances between conductors and vegetation…. A statistical analysis would then evaluate the test results and provide empirical evidence to support an appropriate gap factor to be applied in calculating minimum clearance distances using the Gallet equation"); *and North American Electric Reliability Corporation submits Electric Power Research Institute 2015 Technical Report*, Docket No. RM12-4-002 (filed Aug. 12, 2015) ("EPRI Report"). Unless otherwise designated, capitalized terms shall have the meaning set forth in the *Glossary of Terms Used in NERC Reliability Standards* ("NERC Glossary of Terms"), *available at* http://www.nerc.com/files/Glossary_of_Terms.pdf.

determine those MVCD values under the Gallet equation was too high for all situations with varying tree and conductor configurations. The gap factor is a multiplier that adjusts MVCD values for different configurations of vegetation and conductors to avoid flashover (a lower gap factor correlates to higher MVCD values). The EPRI tests thus led to the conclusion that MVCD values under existing Reliability Standard FAC-003-4 appeared low. The EPRI test results demonstrated the Gallet equation should apply a more conservative, lower, gap factor of 1.0 to calculate MVCD values for Reliability Standard FAC-003-4. Proposed Reliability Standard FAC-003-4, therefore proposes higher and more conservative MVCD values. These higher MVCD values will enhance reliability and provide additional confidence by applying a more conservative approach to determining the vegetation clearing distances.

This filing accomplishes NERC's stated intention, in submitting the EPRI Report, to initiate a Standards Authorization Request to adjust the MVCD values in the Reliability Standard to reflect the results of the EPRI Report.[4] The proposed Reliability Standard FAC-003-4 and the associated Implementation Plan are just, reasonable, not unduly discriminatory or preferential, and in the public interest.

[4] *See*, *supra* n. [7], at attachment 2, NERC Summary *FAC-003-3 Minimum Vegetation Clearance Distances*, at p. 1 (stating, "This final report includes the final gap-factor testing results that will be used to initiate a focused Standard Authorization Request (SAR) to adjust the MVCD values in NERC Reliability Standard FAC-003-3.").

II. NOTICES AND COMMUNICATIONS

Notices and communications with respect to this filing may be addressed to:

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III. BACKGROUND

A. NERC Reliability Standards Development Procedure

The proposed Reliability Standard was developed in an open and fair manner and in accordance with the Reliability Standard development process. NERC develops Reliability Standards in accordance with Section 300 (Reliability Standards Development) of its Rules of Procedure and the NERC Standard Processes Manual.[5]

NERC's proposed rules provide for reasonable notice and opportunity for public comment, due process, openness, and a balance of interests in developing Reliability Standards, and thus satisfy certain of the criteria for approving Reliability Standards. The development process is open to any person or entity with a legitimate interest in the reliability of the Bulk-Power System. NERC considers the comments of all stakeholders, and stakeholders must approve, and the NERC Board of Trustees must adopt a Reliability Standard before the Reliability Standard is submitted to the applicable governmental authorities for approval.

[5] The NERC *Rules of Procedure* are available at http://www.nerc.com/AboutNERC/Pages/Rules-of-Procedure.aspx. The NERC *Standard Processes Manual* is available at http://www.nerc.com/comm/SC/Documents/Appendix_3A_StandardsProcessesManual.pdf.

B. Procedural History of Proposed Reliability Standard FAC-003-4

This section summarizes the development history of proposed Reliability Standard FAC-003-4.

1. History of Reliability Standard FAC-003-4 and Order No. 777

NERC submitted FAC-003-1 on April 4, 2006.[6] Thereafter, on February 2, 2012, NERC filed Reliability Standard FAC-003-2 to expand applicability of the Reliability 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. Reliability Standard FAC-003-2 incorporated a new minimum annual inspection requirement, and incorporated new minimum vegetation clearance distances into the text of the standard. On March 21, 2013, in Order No. 777, FERC approved Reliability Standard FAC-003-2.[7] In Order No. 777, FERC stated:

> While we approve NERC's use of the Gallet equation to determine the minimum vegetation clearance distances, we believe it is important that NERC develop empirical evidence that either confirms assumptions used in calculating the MVCD values based on the Gallet equation, or gives reason to revisit the Reliability Standard. Accordingly, consistent with the Notice of Proposed Rulemaking (NOPR) proposal, the Commission directs that NERC conduct or contract testing to obtain empirical data and submit a report to the Commission providing the results of the testing.[8]

NERC contracted EPRI to assist NERC with performing a collaborative research project, to comply with FERC's directive.

While Reliability Standard FAC-003-2 was pending, NERC filed Reliability Standard FAC-003-3 on August 27, 2012 to maintain a reliable electric transmission system by using a

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[6] Order No. 693, at P 735.

[7] *Revisions to Reliability Standard for Transmission Vegetation Management*, Order No. 777, 142 FERC ¶ 61,208 (2013).

[8] Order No. 777, at P 3.

defense-in-depth strategy to manage vegetation located on transmission rights of way and minimize encroachments from vegetation located adjacent to the rights of way, thus helping to prevent the risk that vegetation-related outages could lead to Cascading. Reliability Standard FAC-003-3 applied a phased-in effective date, to provide Generator Owners with an opportunity to transition to compliance with the standard.

Throughout this time, NERC continued working with stakeholders and EPRI to develop empirical data regarding flashover distances between conductors and vegetation to calculate MVCD values. On July 31, 2014, NERC submitted an informational filing to to FERC to provide an interim status update on NERC's activities.[9] NERC's interim status update explained that, consistent with NERC's earlier 2013 compliance filing, NERC's primary objective under this project was to determine the appropriate gap factor for use in the Gallet equation. Preliminary results in 2014 indicated that the gap factor should be adjusted from 1.3 to 1.0, to result in MVCD values that are higher than those in the currently effective standard.[10]

2. Project 2010-07.1 Vegetation Management and EPRI Report

In 2015, NERC worked with EPRI to finalize gap factor verification. On August 12, 2015, NERC submitted to FERC the final EPRI Report reflecting the final results of this gap-factor testing.[11] Exhibit E reflects the EPRI Report and a preliminary report, which later

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[9] *Informational Filing of the North American Electric Reliability Corporation*, Docket Nos. RM12-4-000 et. al. (filed Jul. 31, 2014).

[10] *Id.* at pp. 2-3. *See also, id.* at n. 4 (explaining that the Gallet equation is an accepted method for calculating the air gap required between a conductor and a transmission line tower (*i.e.*, the grounded object) to avoid flashover. The Gallet equation is used to calculate the minimum air gap that could exist between a conductor and vegetation (conductor-to-vegetation gap) to avoid a flashover. This calculated minimum conductor-to-vegetation gap would then be used to set the MVCD values. The Gallet equation is particularly useful as it works for a variety of conductor-to-vegetation gap configurations. The conductor-to-vegetation gap configuration may consist of the conductor being located vertically above and horizontally to the side of the vegetation in concern, or any combination thereof.).

[11] *North American Electric Reliability Corporation submits Electric Power Research Institute 2015 Technical Report*, Docket No. RM12-4-002 (filed Aug. 12, 2015) (attaching the EPRI Report, as attachment 1)

culminated in the EPRI Report. Exhibit E also includes an update prepared by EPRI in anticipation of this filing. The results of the EPRI Report and testing confirmed the preliminary results identified in 2014 and resulted in NERC Project 2010-07.1 Vegetation Management. That project resulted in this filing with revised MVCD values that have been calculated using the revised gap factor.

IV. JUSTIFICATION FOR APPROVAL

As discussed below and in Exhibit C, proposed Reliability Standard FAC-003-4 satisfies the Reliability Standards criteria and is just, reasonable, not unduly discriminatory or preferential, and in the public interest. The proposed Reliability Standard is also consistent with FERC's directive in Order No. 777, that the standard apply MVCD values supported by empirical data. The following subsections provide: (A) a description of the proposed standard, its reliability purposes, and applicable entities; (B) justification for the proposed Reliability Standard, detailing the proposed revisions; and (C) discussion of the enforceability of the proposed Reliability Standard.

A. Proposed Reliability Standard FAC-003-4 and Applicable Entities

The purpose of proposed Reliability Standard FAC-003-4 is "[t]o maintain a reliable electric transmission system by using a defense-in-depth strategy to manage vegetation located on transmission rights of way (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."

The standard applies to Applicable Transmission Owners and Applicable Generator Owners. These are the same entities currently subject to Reliability Standard FAC-003-3. The Reliability Standard establishes Applicable Transmission Owners and Applicable Generator Owners as follows:

- Applicable Transmission Owners are Transmission Owners that own the following Transmission Facilities defined in Section 4.2 of the Reliability Standard:

  4.2. Facilities: Defined below (referred to as "applicable lines"), including but not limited to those that cross lands owned by federal , state, provincial, public, private, or tribal entities:
  4.2.1. Each overhead transmission line operated at 200kV or higher.
  4.2.2. Each overhead transmission line operated below 200kV identified as an element of an IROL under NERC Standard FAC-014 by the Planning Authority.[12]
  4.2.3. Each overhead transmission line operated below 200 kV identified as an element of a Major WECC Transfer Path in the Bulk Electric System by WECC.
  4.2.4. Each overhead transmission line identified above (4.2.1 through 4.2.3) located outside the fenced area of the switchyard, station or substation and any portion of the span of the transmission line that is crossing the substation fence

- Applicable Generator Owners are Generator Owners that own the following generation Facilities defined in Section 4.3 of the Reliability Standard:

  4.3. Generation Facilities: Defined below (referred to as "applicable lines"), including but not limited to those that cross lands owned by federal , state, provincial, public, private, or tribal entities:
  4.3.1. Overhead transmission lines that (1) extend greater than one mile or 1.609 kilometers beyond the fenced area of the generating station switchyard to the point of interconnection with a Transmission Owner's Facility or (2) do not have a clear line of sight from the generating station switchyard fence to the point of interconnection with a Transmission Owner's Facility and are:
  4.3.1.1. Operated at 200kV or higher; or
  4.3.1.2. Operated below 200kV identified as an element of an IROL under NERC Standard FAC-014 by the Planning Authority; or
  4.3.1.3. Operated below 200 kV identified as an element of a Major WECC Transfer Path in the Bulk Electric System by WECC.

[12] Non-substantive edits included updating the Reliability Standard and Implementation Plan to the current Results-Based template for Reliability Standards. Apart from the Reliability Standard, the Standard Drafting Team took the opportunity to update the information Guideline and Technical Basis for the proposed Reliability Standard.

B. Justification for Proposed Reliability Standard FAC-003-4 and Revisions

The proposed Reliability Standard is updated in order to reflect the revised MVCD values, as adjusted for the revised, lower, gap factor reflected in the EPRI Report, and to reflect certain non-substantive edits to bring the Reliability Standard into conformity with more recently developed Reliability Standards. The gap factor is a multiplier within the Gallet equation, which adjusts the MVCD values required for different configurations of objects and conductors.[13] A lower gap factor, for example, correlates with a higher MVCD values and a higher gap factor correlates to a lower MVCD values.

In particular, the EPRI testing (i) determined the switching impulse strength of the air gap between a conductor and natural trees, (ii) validated the revision of the gap factor to 1.0, and (iii) determined the proper MCVD values for Reliability Standard FAC-003.[14] As planned when NERC submitted the EPRI Report, the EPRI test results led to a Standards Authorization Request to adjust MVCD values in Reliability Standard FAC-003-4, for submission to the applicable governmental authorities by the end of the first quarter of 2016.[15] Since that time, NERC has worked with industry to develop proposed Reliability Standard FAC-003-4, by updating Table 2 of the standard to reflect the results of the EPRI Report and make non-

[13] As the Standard Drafting Team discussed in Exhibit D, "The '*Transmission Vegetation Management NERC Standard FAC-003-2 Technical Reference'* states that the probability of an air gap flashover between a conductor and a tree at MVCDs is 10-6; however, [the Standard Drafting Team] have been unsuccessful in confirming the assumptions associated with the statement. Based on [the Standard Drafting Team] best understanding of the approach developed by the original authors, [the Standard Drafting Team] have used accepted methodology to provide an estimate. The resulting calculated risk of a flashover is 2.49 X 10-4, based on a probability of flashover of 0.135% at MVCD and a transient overvoltage that has a 2% probability of exceeding the defined levels. This equates to less than one flashover across MVCDs per 4000 switching surges." *See,* Exhibit D, at p. 5 (internal citations omitted).

[14] *See* Exhibit E and Exhibit D (including the EPRI analyses and Standard Drafting Team summary review).

[15] *Id*. at Transmittal.

substantive edits. The proposed Reliability Standard is intended to replace and retire Reliability Standard FAC-003-3, consistent with the Implementation Plan.

The revisions described herein and reflected at Table 2 of FAC-003-4 are reflected in Exhibit A.[16] Table 2 was also moved out of the Guideline and Technical Basis document for clarity. The modifications to Table 2 will require responsible entities to implement MVCD values that reflect the appropriate gap factor resulting from the empirical data and analysis summarized in the EPRI Report. In addition, based on feedback received from the advisory group,[17] the Standard Drafting Team added MVCD values up to 15,000 feet (4,267 meters).[18] These changes to Table 2 are the only substantive changes made to the currently effective version of the Reliability Standard.

C. Enforceability of Proposed Reliability Standard FAC-003-4

The proposed Reliability Standard includes Measures that support each Requirement to help ensure that the Requirements will be enforced in a clear, consistent, non-preferential manner and without prejudice to any party. The proposed Reliability Standard also includes VRFs and VSLs for each Requirement. The VSLs and VRFs are part of several elements used to determine an appropriate sanction when the associated Requirement is violated. The VSLs provide guidance on the way that NERC will enforce the Requirements of the proposed Reliability Standards. The VRFs assess the impact to reliability of violating a specific Requirement.

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[16] *See* Exhibit A for full redline.

[17] The advisory group was the team of NERC Staff, arborists, and industry members that assisted in developing the EPRI test plan and scope of work for the EPRI testing.

[18] Non-substantive edits included updating the Reliability Standard and Implementation Plan to the current Results-Based template for Reliability Standards. Apart from the Reliability Standard, the Standard Drafting Team took the opportunity to update the information Guideline and Technical Basis for the proposed Reliability Standard.

In this filing, NERC proposes to utilize the same VRFs and VSLs in effect for FAC-003-3 for FAC-004-4. As a result, the VRFs and VSLs for the new Requirements in proposed Reliability Standard comport with NERC and FERC guidelines.

V. EFFECTIVE DATE

Where approval by an applicable governmental authority is required, Reliability Standard FAC-003-4 shall become effective on the first day of the first calendar quarter that is 3 months after the effective date of the applicable governmental authority's order approving the standard, or as otherwise provided for by the applicable governmental authority. Where approval by an applicable governmental authority is not required, Reliability Standard FAC-003-4 shall become effective on the first day of the first calendar quarter that is 3 months after the date the standard is adopted by the NERC Board of Trustees, or as otherwise provided for in that jurisdiction. In addition, NERC requests retirement of Reliability Standard FAC-003-3. Reliability Standard FAC-003-4 will replace and supersede currently-effective Reliability Standard FAC-003-3.

VI. CONCLUSION

For the reasons set forth above, NERC respectfully requests approval of (i) proposed Reliability Standard FAC-003-4 as reflected in Exhibit A; (ii) the Implementation Plan included in Exhibit B; and (iii) the retirement of currently-effective Reliability Standard FAC-003-3.

Respectfully submitted,

/s/ Candice Castaneda

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Counsel for the North American Electric Reliability Corporation

Date: March 17, 2016

EXHIBITS A – B and D – G

(Available on the NERC Website at

http://www.nerc.com/FilingsOrders/ca/Canadian%20Filings%20and%20Orders%20DL/FAC-003-4_exhibits.pdf)

Exhibit C

Reliability Standards Criteria

EXHIBIT C

Reliability Standards Criteria

The discussion below explains how the revisions reflected in proposed Reliability Standard has met or exceeded the Reliability Standards criteria.

1. **Proposed Reliability Standards must be designed to achieve a specified reliability goal and must contain a technically sound means to achieve that goal.**

The Purpose of proposed Reliability Standard FAC-003-4, attached as Exhibit A, is to maintain a reliable electric transmission system by using a defense-in-depth strategy to manage vegetation located on transmission rights of way (ROW) and minimize encroachments from vegetation located adjacent to the ROW. Proposed Reliability Standard FAC-003-4 utilizes three different types of requirements Performance-based, Risk based and Competency-based requirements to provide layers of protection to prevent vegetation related outages that could lead to Cascading. Specifically, proposed FAC-003-4 requires Transmission Owners and Generator Owners to manage vegetation to prevent vegetation encroachment, providing the highest priority on the management of vegetation. By using a defense-in-depth approach the proposed Reliability Standard improves the reliability of the electric Transmission system.

2. **Proposed Reliability Standards must be applicable only to users, owners and operators of the bulk power system, and must be clear and unambiguous as to what is required and who is required to comply.**

The proposed Reliability Standard is applicable only to users, owners, and operators of the bulk power system and is clear and unambiguous as to what is required and who is to comply. The proposed Reliability Standard applies to Transmission Owners and Generator Owners. The proposed Reliability Standard clearly articulates the actions that such entities must take to comply with the standard, each of which are triggered by articulated actions and situations.

3. **A proposed Reliability Standard must include clear and understandable consequences and a range of penalties (monetary and/or non-monetary) for a violation.**

The Violation Risk Factor ("VRF") and Violation Severity Level ("VSL") for the proposed Reliability Standard, comport with NERC and FERC guidelines related to their assignment. The assignment of the severity level of each VSL is consistent with the corresponding Requirement and will ensure uniformity and consistency in the determination of penalties. The VSLs do not use any ambiguous terminology, thereby supporting uniformity and consistency in the determination of similar penalties for similar violations. For these reasons, the proposed Reliability Standard includes clear an understandable consequences.

4. **A proposed Reliability Standard must identify clear and objective criterion or measure for compliance, so that it can be enforced in a consistent and nonpreferential manner.**

The proposed Reliability Standard contains Measures that support each Requirement by clearly identifying what is required to demonstrate compliance and how the Requirement will be enforced. The Measures are as follows:

> **M1**. Each applicable Transmission Owner and applicable Generator Owner has evidence that it managed vegetation to prevent encroachment into the MVCD as described in R1. Examples of acceptable forms of evidence may include dated attestations, dated reports containing no Sustained Outages associated with encroachment types 2 through 4 above, or records confirming no Real-time observations of any MVCD encroachments.
>
> **M2.** Each applicable Transmission Owner and applicable Generator Owner has evidence that it managed vegetation to prevent encroachment into the MVCD as described in R2. Examples of acceptable forms of evidence may include dated attestations, dated reports containing no Sustained Outages associated with encroachment types 2 through 4 above, or records confirming no Real-time observations of any MVCD encroachments.
>
> **M3.** The maintenance strategies or procedures or processes or specifications provided demonstrate that the applicable Transmission Owner and applicable Generator Owner can prevent encroachment into the MVCD considering the factors identified in the requirement.

M4. Each applicable Transmission Owner and applicable Generator Owner that has a confirmed vegetation condition likely to cause a Fault at any moment will have evidence that it notified the control center holding switching authority for the associated transmission line without any intentional time delay. Examples of evidence may include control center logs, voice recordings, switching orders, clearance orders and subsequent work orders.

M5. Each applicable Transmission Owner and applicable Generator Owner has evidence of the corrective action taken for each constraint where an applicable transmission line was put at potential risk. Examples of acceptable forms of evidence may include initially-planned work orders, documentation of constraints from landowners, court orders, inspection records of increased monitoring, documentation of the de-rating of lines, revised work orders, invoices, or evidence that the line was de-energized.

M6. Each applicable Transmission Owner and applicable Generator Owner has evidence that it conducted Vegetation Inspections of the transmission line ROW for all applicable lines at least once per calendar year but with no more than 18 calendar months between inspections on the same ROW. Examples of acceptable forms of evidence may include completed and dated work orders, dated invoices, or dated inspection records.

M7. Each applicable Transmission Owner and applicable Generator Owner has evidence that it completed its annual vegetation work plan for its applicable lines. Examples of acceptable forms of evidence may include a copy of the completed annual work plan (as finally modified), dated work orders, dated invoices, or dated inspection records.

The above Measures work in coordination with the respective Requirements to ensure that the Requirements will each be enforced in a clear, consistent, and non-prudential manner without prejudice to any party.

5. Proposed Reliability Standards should achieve a reliability goal effectively and efficiently — but do not necessarily have to reflect "best practices" without regard to implementation cost or historical regional infrastructure design.

The proposed Reliability Standard achieves its reliability goals effectively and efficiently. The Electric Power Research Institute (EPRI) was retained to conduct testing to support appropriate Minimum Vegetation Clearance Distances (MVCDs). The MVCDs in FAC-003-4 Reliability Standard were calculated based on application of the Gallet equation which

incorporates a gap factor. The preliminary test result findings determined that the gap factor applied in the Gallet equation requires adjustment. The EPRI report lead to the change in Table 2. The resulting adjustment increased MVCDs for all alternating current system voltages covered by Table 2 of the Standard.

6. **Proposed Reliability Standards cannot be "lowest common denominator," *i.e.*, cannot reflect a compromise that does not adequately protect Bulk-Power System reliability. Proposed Reliability Standards can consider costs to implement for smaller entities, but not at consequences of less than excellence in operating system reliability.**

The proposed Reliability Standard does not reflect a "lowest common denominator" approach. To the contrary, the proposed standard represents a significant improvement over the previous version as described herein.

7. **Proposed Reliability Standards must be designed to apply throughout North America to the maximum extent achievable with a single Reliability Standard while not favoring one geographic area or regional model. It should take into account regional variations in the organization and corporate structures of transmission owners and operators, variations in generation fuel type and ownership patterns, and regional variations in market design if these affect the proposed Reliability Standard**.

The proposed Reliability Standard applies throughout North America and does not favor one geographic area or regional model.

8. **Proposed Reliability Standards should cause no undue negative effect on competition or restriction of the grid beyond any restriction necessary for reliability**.

The proposed Reliability Standard has no undue negative effect on competition or result in any unnecessary restrictions.

9. **The implementation time for the proposed Reliability Standard is reasonable**.

The proposed effective date for the standard is just and reasonable and appropriately balances the urgency in the need to implement the standard against the reasonableness of the

time allowed for those who must comply to develop necessary procedures, software, facilities, staffing or other relevant capability. Where approval by an applicable governmental authority is required, Reliability Standard FAC-003-4 shall become effective on the first day of the first calendar quarter that is 3 months after the effective date of the applicable governmental authority's order approving the standard, or as otherwise provided for by the applicable governmental authority. Where approval by an applicable governmental authority is not required, Reliability Standard FAC-003-4 shall become effective on the first day of the first calendar quarter that is 3 months after the date the standard is adopted by the NERC Board of Trustees, or as otherwise provided for in that jurisdiction. The proposed implementation period are designed to allow sufficient time for the applicable entities to make any changes in their internal process necessary to implement the proposed revisions. The proposed effective date is explained in the proposed Implementation Plan, attached as Exhibit B.

10. The Reliability Standard was developed in an open and fair manner and in accordance with the Reliability Standard development process.

The proposed Reliability Standard was developed in accordance with NERC's ANSI-accredited processes for developing and approving Reliability Standards.[1]

Exhibit F includes a summary of the standard development proceedings, and details the processes followed to develop the Reliability Standard. These processes included, among other things, multiple comment periods, pre-ballot review periods, and balloting periods. Additionally, all meetings of the standard drafting team were properly noticed and open to the public.

[1] *See* NERC Rules of Procedure, Section 300 (Reliability Standards Development) and Appendix 3A (Standard Processes Manual).

11. NERC must explain any balancing of vital public interests in the development of proposed Reliability Standards.

NERC has not identified competing public interests regarding the request for approval of the proposed Reliability Standard FAC-003-4. No comments were received that indicated the proposed Reliability Standard conflict with other vital public interests.

12. Proposed Reliability Standards must consider any other appropriate factors.

No other factors relevant to whether the proposed Reliability Standard FAC-003-4 are just and reasonable were identified.