UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

North American Electric Reliability Corporation	**)** **)**	**Docket No. _____**

PETITION OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION FOR APPROVAL OF PROPOSED RELIABILITY STANDARD EOP-010-1 – GEOMAGNETIC DISTURBANCE OPERATIONS

Gerald W. Cauley
President and Chief Executive Officer
North American Electric Reliability Corporation
3353 Peachtree Road, N.E.
Suite 600, North Tower
Atlanta, GA 30326
(404) 446-2560
(404) 446-2595 – facsimile

Charles A. Berardesco
Senior Vice President and General Counsel
Holly A. Hawkins
Assistant General Counsel
Stacey Tyrewala
Senior Counsel
Brady Walker
Associate Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
(202) 644-8099 – facsimile
charlie.berardesco@nerc.net
holly.hawkins@nerc.net
stacey.tyrewala@nerc.net
brady.walker@nerc.net

Counsel for the North American Electric Reliability Corporation

November 14, 2013

TABLE OF CONTENTS

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

North American Electric Reliability Corporation	**)**	**Docket No. _____**

PETITION OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION FOR APPROVAL OF PROPOSED RELIABILITY STANDARD EOP-010-1 – GEOMAGNETIC DISTURBANCE OPERATIONS

Pursuant to Section 215(d)(1) of the Federal Power Act ("FPA")[1] and Section 39.5[2] of the Federal Energy Regulatory Commission's ("FERC" or "Commission") regulations, the North American Electric Reliability Corporation ("NERC")[3] hereby submits proposed Reliability Standard EOP-010-1 for Commission approval. NERC requests that the Commission approve proposed Reliability Standard EOP-010-1 (**Exhibit A**) and find that the proposed Reliability Standard is just, reasonable, not unduly discriminatory or preferential, and in the public interest.[4] NERC also requests approval of the associated implementation plan (**Exhibit B**), Violation Risk Factors ("VRFs") and Violation Severity Levels ("VSLs") (**Exhibit F**), as detailed in this petition.

As required by Section 39.5(a)[5] of the Commission's regulations, this petition presents the technical basis and purpose of proposed Reliability Standard EOP-010-1, a demonstration that the proposed Reliability Standard meets the criteria identified by the Commission in Order

---

1 16 U.S.C. § 824o (2006).

2 18 C.F.R. § 39.5 (2013).

3 The Commission certified NERC as the electric reliability organization ("ERO") in accordance with Section 215 of the FPA on July 20, 2006. *N. Am. Elec. Reliability Corp.*, 116 FERC ¶ 61,062 (2006) ("ERO Certification Order").

4 Unless otherwise designated, all capitalized terms shall have the meaning set forth in the *Glossary of Terms Used in NERC Reliability Standards, available at* http://www.nerc.com/files/Glossary_of_Terms.pdf.

5 18 C.F.R. § 39.5(a) (2013).

No. 672[6] (**Exhibit C**) and a summary of the development history (**Exhibit H**). Proposed Reliability Standard EOP-010-1 was approved by the NERC Board of Trustees on November 7, 2013.

I. EXECUTIVE SUMMARY

Geomagnetic disturbances ("GMD") occur when solar storms on the sun's surface send electrically charged particles toward earth, where they interact with the earth's magnetic field. Proposed Reliability Standard EOP-010-1—Geomagnetic Disturbance Operations would be a new Reliability Standard that attempts to mitigate the effects of GMD events by implementing Operating Plans,[7] Operating Processes,[8] and Operating Procedures[9] and is responsive to Commission concerns in Order No. 779.[10]

In Order No. 779, the Commission directed the development of Reliability Standards to address GMDs in two stages.[11] In the first stage, the subject of this petition, NERC is submitting proposed Reliability Standard EOP-010-1, requiring owners and operators of the Bulk-Power System to develop and implement Operational Procedures to mitigate the effects of GMDs

---

[6] The Commission specified in Order No. 672 certain general factors it would consider when assessing whether a particular Reliability Standard is just and reasonable. *See 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, at P 262, 321-37, *order on reh'g*, Order No. 672-A, FERC Stats. & Regs. ¶ 31,212 (2006).

[7] An "Operating Plan" is defined in the *Glossary of Terms Used in NERC Reliability Standards* as "A document that identifies a group of activities that may be used to achieve some goal. An Operating Plan may contain Operating Procedures and Operating Processes. A company-specific system restoration plan that includes an Operating Procedure for black-starting units, Operating Processes for communicating restoration progress with other entities, etc., is an example of an Operating Plan." *Available at* http://www.nerc.com/files/Glossary_of_Terms.pdf

[8] The term "Operating Procedure" is defined in the *Glossary of Terms Used in NERC Reliability Standards* as "A document that identifies specific steps or tasks that should be taken by one or more specific operating positions to achieve specific operating goal(s). The steps in an Operating Procedure should be followed in the order in which they are presented, and should be performed by the position(s) identified. A document that lists the specific steps for a system operator to take in removing a specific transmission line from service is an example of an Operating Procedure." *Available at* http://www.nerc.com/files/Glossary_of_Terms.pdf

[9] The term "Operating Process" is defined in the *Glossary of Terms Used in NERC Reliability Standards* as "A document that identifies general steps for achieving a generic operating goal. An Operating Process includes steps with options that may be selected depending upon Real-time conditions. A guideline for controlling high voltage is an example of an Operating Process." *Available at* http://www.nerc.com/files/Glossary_of_Terms.pdf

[10] *Reliability Standards for Geomagnetic Disturbances*, Order No. 779, 143 FERC ¶ 61,147 (2013)("Order No. 779").

[11] *Id.*

consistent with the reliable operation of the Bulk-Power System. The second stage of Reliability Standards to address GMDs, currently under development, requires NERC to develop proposed Reliability Standards that require owners and operators of the Bulk-Power System to conduct initial and on-going vulnerability assessments of the potential impact of benchmark GMD events on Bulk-Power System equipment and the Bulk-Power System as a whole.[12]

During a severe GMD event, geomagnetically-induced current ("GIC") flow in transformers (resulting in half-cycle saturation) can substantially increase absorption of reactive power, create harmonics, and, in some cases, cause transformer hot-spot heating, which could lead to loss of Reactive Power support-- thereby causing voltage instability, protective relay Misoperations and potential equipment loss-of-life or damage. As a high-impact, low-frequency event, GMDs pose a unique threat to Bulk-Power System reliability, and the proposed Reliability Standard is intended to lessen the impact of such events.

As the Commission noted in Order No. 779, "[o]perational procedures may help alleviate abnormal system conditions due to transformer absorption of reactive power during GMD events, helping to stabilize system voltage swings, and may potentially isolate some equipment from being damaged or misoperated."[13] The proposed Reliability Standard allows entities to tailor their Operating Plans, Processes and Procedures based on the responsible entity's assessment of entity-specific factors, such as geography, geology, and system topology. The coordination of the Operating Plans, Processes and Procedures would be overseen by the Reliability Coordinator, consistent with its wide-area perspective.

The proposed Reliability Standard is an important first step in addressing the issue of GMDs and can be implemented relatively quickly. While responsible entities will develop and

[12] *See* Order No. 779 at P 54. The Second Stage GMD Reliability Standard must identify what severity GMD events (*i.e.*, benchmark GMD events) that responsible entities will have to assess for potential impacts on the Bulk-Power System.

[13] *Id.* at P 36.

implement Operational Procedures or Operational Processes, NERC will continue to support those efforts through the GMD Task Force, for example, by identifying and sharing Operating Plans, Processes, and Procedures found to be the most effective.

NERC requests that the Commission approve proposed Reliability Standard EOP-010-1 and find that the proposed Reliability Standard is just, reasonable, not unduly discriminatory or preferential, and in the public interest.

II. NOTICES AND COMMUNICATIONS

Notices and communications with respect to this filing may be addressed to the following:[14]

Charles A. Berardesco*
Senior Vice President and General Counsel
Holly A. Hawkins*
Assistant General Counsel
Stacey Tyrewala*
Senior Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
(202) 644-8099 – facsimile
charlie.berardesco@nerc.net
holly.hawkins@nerc.net
stacey.tyrewala@nerc.net

Mark G. Lauby*
Vice President and Director of Standards
Laura Hussey*
Director of Standards Development
North American Electric Reliability Corporation
3353 Peachtree Road, N.E.
Suite 600, North Tower
Atlanta, GA 30326
(404) 446-2560
(404) 446-2595 – facsimile
mark.lauby@nerc.net
laura.hussey@nerc.net

III. BACKGROUND

A. Regulatory Framework

By enacting the Energy Policy Act of 2005,[15] Congress entrusted the Commission with the duties of approving and enforcing rules to ensure the reliability of the Nation's Bulk-Power System, and with the duties of certifying an ERO that would be charged with developing and

[14] Persons to be included on the Commission's service list are identified by an asterisk. NERC respectfully requests a waiver of Rule 203 of the Commission's regulations, 18 C.F.R. § 385.203 (2013), to allow the inclusion of more than two persons on the service list in this proceeding.

[15] 16 U.S.C. § 824o (2006).

enforcing mandatory Reliability Standards, subject to Commission approval. Section 215(b)(1)[16] of the FPA states that all users, owners, and operators of the Bulk-Power System in the United States will be subject to Commission-approved Reliability Standards. Section 215(d)(5)[17] of the FPA authorizes the Commission to order the ERO to submit a new or modified Reliability Standard. Section 39.5(a)[18] of the Commission's regulations requires the ERO to file with the Commission for its approval each Reliability Standard that the ERO proposes should become mandatory and enforceable in the United States, and each modification to a Reliability Standard that the ERO proposes should be made effective.

The Commission has the regulatory responsibility to approve Reliability Standards that protect the reliability of the Bulk-Power System and to ensure that such Reliability Standards are just, reasonable, not unduly discriminatory or preferential, and in the public interest. Pursuant to Section 215(d)(2) of the FPA[19] and Section 39.5(c)[20] of the Commission's regulations, the Commission will give due weight to the technical expertise of the ERO with respect to the content of a Reliability Standard.

B. NERC Reliability Standards Development Process

The proposed Reliability Standard was developed in an open and fair manner and in accordance with the Commission-approved Reliability Standard development process.[21] NERC develops Reliability Standards in accordance with Section 300 (Reliability Standards

---

16 *Id.* § 824(b)(1).

17 *Id.* § 824o(d)(5).

18 18 C.F.R. § 39.5(a) (2012).

19 16 U.S.C. § 824o(d)(2).

20 18 C.F.R. § 39.5(c)(1).

21 *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).

Development) of its Rules of Procedure and the NERC Standard Processes Manual.[22] In its ERO Certification Order, the Commission found that 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 satisfies certain of the criteria for approving Reliability Standards.[23] 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 a vote of stakeholders and the NERC Board of Trustees is required to approve a Reliability Standard before the Reliability Standard is submitted to the Commission for approval.

C. Technical Background: Geomagnetic Disturbances

A GMD is caused by solar events resulting in distortions of the earth's magnetic field, and can be of varying intensity. The science regarding the impacts of GMDs on electric power systems is still in the developmental stages and much remains to be learned about the unique threat GMDs pose to reliability. The characteristics of GMDs (*e.g.*, the peak and duration of induced geo-electric fields) experienced by the power system is dependent on a number of factors, including where the geomagnetic storm is centered, the direction of the fields along with their polarity, geomagnetic latitude, and the geology (electrical conductivity of the ground). As the Commission noted in Order No. 779, "while there is an ongoing debate as to how a severe GMD event will most likely impact the Bulk-Power System, there is a general consensus that GMD events can cause wide-spread blackouts due to voltage instability and subsequent voltage collapse, thus disrupting the reliable operation of the Bulk-Power System."[24]

---

[22] 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.

[23] 116 FERC ¶ 61,062 at P 250 (2006).

[24] Order No. 779 at P 24 (internal citation omitted).

D. History of Project 2013-03, Geomagnetic Disturbance Mitigation

In June 2010, NERC identified that GMDs were a serious threat to the reliable operation of the Bulk-Power System and that this issue required significant staff and industry attention with close monitoring of progress. Since that time, NERC has spent a substantial amount of time and effort working with experts across the North American power industry, U.S. and Canadian government agencies, transformer manufacturers, and other vendors, in developing scientifically sound and repeatable conclusions.

In early 2011, a NERC-sponsored GMD Task Force was formed to "develop a technical white paper describing the evaluation of scenarios of potential GMD impacts, identifying key bulk power system parameters under those scenario conditions, and evaluating potential reliability implications of these incidents."[25] The resulting report, the NERC Interim GMD Report evaluating the effects of GMDs on the Bulk-Power System, was issued in February 2012.[26]

In October 2012, the Commission issued a Notice of Proposed Rulemaking ("NOPR") proposing to direct that NERC submit to the Commission for approval proposed Reliability Standards that address the risks posed by GMDs to the reliable operation of the Bulk-Power System.[27] The NOPR stated that GMD vulnerabilities are not adequately addressed in the existing Reliability Standards and that this constitutes a reliability gap because GMD events can cause the Bulk-Power System to collapse suddenly and can potentially damage equipment on the

---

[25] NERC, Board of Trustees Minutes, Exhibit J, at 1 (Nov. 4, 2010), *available at* http://www.nerc.com/docs/docs/bot/BOT-1110m-open-complete.pdf.

[26] North American Electric Reliability Corp., *2012 Special Reliability Assessment Interim Report: Effects of Geomagnetic Disturbances on the Bulk Power System* (February 2012) ("NERC Interim GMD Report"), *available at* http://www.nerc.com/files/2012GMD.pdf.

[27] *Reliability Standards for Geomagnetic Disturbances*, Notice of Proposed Rulemaking, 77 FR 64,935 (Oct. 24, 2012), 141 FERC ¶ 61,045 (2012) ("NOPR").

Bulk-Power System.[28] In May 2013, the Commission issued Order No. 779 directing NERC to develop proposed Reliability Standards addressing GMD events in two stages, as explained herein.

IV. JUSTIFICATION FOR APPROVAL

As discussed in detail in **Exhibit C**, proposed Reliability Standard EOP-010-1--Geomagnetic Disturbance Operations satisfies the Commission's criteria in Order No. 672 and is just, reasonable, not unduly discriminatory or preferential, and in the public interest. The purpose of proposed Reliability Standard EOP-010-1 is to mitigate the reliability impacts of GMD events by implementing Operating Plans, Processes, and Procedures. Provided below is an explanation of the applicability of the proposed Reliability Standard and a justification on a Requirement-by-Requirement basis.

A. Applicability of EOP-010-1 – Geomagnetic Disturbance Operations

The proposed Reliability Standard is applicable to: (1) Transmission Operators with a Transmission Operator Area that includes a power transformer with a high side wye-grounded winding with terminal voltage greater than 200 kV, and (2) Reliability Coordinators.[29] This applicability is consistent with Order No. 779 and the NERC Functional Model.

As the Commission noted in Order No. 779, "[b]ecause many Bulk-Power System transformers are grounded, the GIC appears as electrical current to the Bulk-Power System and flows through the ground connection and conductors, such as transformers and transmission lines."[30] The applicability of proposed Reliability Standard EOP-010-1 recognizes the technical considerations of the impact of a GMD on the Bulk-Power System.

---

[28] *Id.* at P 4.

[29] A power transformer with a "high side wye-grounded winding" refers to a power transformer with windings on the high voltage side that are connected in a wye configuration and have a grounded neutral connection.

[30] Order No. 779 at P 6 citing North American Electric Reliability Corp., *2012 Special Reliability Assessment*

The NERC Functional Model is structured to ensure that there are no gaps or overlaps in the performance of operation Tasks in the operating timeframe anywhere in the Bulk Electric System.[31] A Reliability Coordinator has responsibility and authority for reliable operation within the Reliability Coordinator Area. A Reliability Coordinator's scope includes a wide-area view with situational awareness of neighboring Reliability Coordinator Areas. Its scope includes both transmission and balancing operations, and it has the authority to direct other functional entities to take certain actions to ensure that its Reliability Coordinator Area operates reliably.

Like the Reliability Coordinator, the Transmission Operator has responsibility and authority for the reliable operation of the transmission system within a specified area. The Transmission Operator is responsible for the Real-time operating reliability of the transmission assets under its purview, which is referred to as the Transmission Operator Area. The Transmission Operator has the authority to take certain actions to ensure that its Transmission Operator Area operates reliably.

Together, the inclusion of these two functional entities— Reliability Coordinators and Transmission Operators— in proposed Reliability Standard EOP-010-1, provides for the development and implementation of Operational Procedures and coordination across regions.[32]

Interim Report: Effects of Geomagnetic Disturbances on the Bulk Power System at ii (February 2012) (*NERC Interim GMD Report*), *available at* http://www.nerc.com/files/2012GMD.pdf.

[31] The NERC Reliability Functional Model is available at: http://www.nerc.com/pa/Stand/Functional%20Model%20Archive%201/Functional_Model_V5_Final_2009Dec1.pdf

[32] The NERC Functional Model describes the relationships between functional entities in performing their reliability related tasks. The Reliability Coordinator "Coordinates with Transmission Operators on system restoration plans, contingency plans, and reliability-related services" ahead of time, and " Issues corrective actions and emergency procedures directives to Transmission Operators, Balancing Authorities, Generator Operators, Distribution Providers, and Interchange Coordinators" in real time.
Available at:
http://www.nerc.com/pa/Stand/Functional%20Model%20Archive%201/Functional_Model_V5_Final_2009Dec1.pdf
See also, **Exhibit E**.

As explained in **Exhibit D**, the applicability threshold of greater than 200 kV is based on analysis by the standard drafting team. There are several key parameters in assessing the impacts of a GMD, including:

- Transformer grounding and core construction;
- System topology;
- Geographic location;
- Resistance values of the elements of the DC network used to evaluate GIC distribution within the network.

Based on an analysis of these factors, the standard drafting team determined that a voltage threshold of greater than 200 kV is appropriate. This finding is supported by operating experience and the preponderance of peer-reviewed studies on GMD effects.[33] Further, the standard drafting team determined that the effect of GIC in networks less than 200 kV has negligible impact on the reliability of the interconnected transmission system. Therefore, as noted above, the applicability of proposed Reliability Standard EOP-010-1 also recognizes the technical considerations of the impact of a GMD on the Bulk-Power System.

B. Requirements in EOP-010-1 – Geomagnetic Disturbance Operations

The proposed Reliability Standard consists of three Requirements. Requirement R1 addresses coordination within a Reliability Coordinator Area. Requirement R2 addresses the dissemination of space weather information to ensure that entities within a Reliability Coordinator Area have the appropriate information necessary to take action and that the same information is available to all entities. Requirement R3 requires the development of GMD Operating Procedures or Processes. Collectively, these Requirements satisfy the Commission's

[33] *See* **Exhibit D**.

directives in Order No. 779 and are intended to mitigate the effects of GMD events through the implementation of Operating Plans, Processes, and Procedures.

Proposed Requirements

R1. Each Reliability Coordinator shall develop, maintain, and implement a GMD Operating Plan that coordinates GMD Operating Procedures or Operating Processes within its Reliability Coordinator Area. At a minimum, the GMD Operating Plan shall include:

1.1 A description of activities designed to mitigate the effects of GMD events on the reliable operation of the interconnected transmission system within the Reliability Coordinator Area.

1.2 A process for the Reliability Coordinator to review the GMD Operating Procedures or Operating Processes of Transmission Operators within its Reliability Coordinator Area.

Requirement R1 of proposed Reliability Standard EOP-010-1 requires several actions from Reliability Coordinators: development, maintenance, and implementation of a GMD Operating Plan, as well as coordination. An Operating Plan is *maintained* when it is kept relevant by taking into consideration system configuration, conditions, or operating experience, as needed to accomplish its purpose. An Operating Plan is *implemented* by carrying out its stated actions. The *coordination* is intended to ensure that Operating Procedures and Operating Processes within a Reliability Coordinator Area[34] are not in conflict with one another; it is *not* intended to be a review by the Reliability Coordinator of the technical aspects of the GMD Operating Procedures or Processes. Transmission Operators are responsible for the technical integrity of their Operating Procedures or Processes pursuant to Requirement R3. For example, if Company A submitted an Operating Procedure proposing to take Line X out of service under specified GMD conditions, and Company B submitted an Operating Procedure that relies on Line X remaining in service in the event of a GMD -- it is the responsibility of the Reliability

[34] The term "Reliability Coordinator Area" is defined in the *Glossary of Terms Used in NERC Reliability Standards* as "The collection of generation, transmission, and loads within the boundaries of the Reliability Coordinator. Its boundary coincides with one or more Balancing Authority Areas." *Available at* http://www.nerc.com/files/Glossary_of_Terms.pdf

Coordinator to *identify* this conflict. The Reliability Coordinator could then require Company A and Company B to resolve this conflict and resubmit their Operating Procedures.

Part 1.1 of Requirement R1 requires Reliability Coordinators to describe the activities that must be undertaken in order to mitigate the effects of a GMD. Those activities could require a Balancing Authority to take action. Pursuant to IRO-001, the Reliability Coordinator has clear decision-making authority to act and to direct actions to be taken by Transmission Operators, Balancing Authorities, Generator Operators, Transmission Service Providers, Load-Serving Entities, and Purchasing-Selling Entities within its Reliability Coordinator Area to preserve the integrity and reliability of the Bulk Electric System. Part 1.2 of Requirement R1 requires Reliability Coordinators to establish a process to review the GMD Operating Procedures or Operating Processes of the Transmission Operators in the Reliability Coordinator Area

R2. Each Reliability Coordinator shall disseminate forecasted and current space weather information to functional entities identified as recipients in the Reliability Coordinator's GMD Operating Plan.

Requirement R2 of proposed Reliability Standard EOP-010-1 addresses the dissemination of space weather information; such information can be used for situational awareness and safe posturing of the system. Space weather information can also be used for monitoring the progress of a GMD event. As the entity with a wide-area view, the Reliability Coordinator is responsible for disseminating space weather information to ensure coordination and consistent awareness in its Reliability Coordinator Area.

Requirement R2 of proposed Reliability Standard EOP-010-1 replaces IRO-005-3.1a, Requirement R3. IRO-005- 3.1a, Requirement R3 states:

> Each Reliability Coordinator shall ensure its Transmission Operators and Balancing Authorities are aware of Geo-Magnetic Disturbance (GMD) forecast information and assist as needed in the development of any required response plans.

Reliability Standard IRO-005-4, which addresses reliability coordination for current day operations, has been adopted by the NERC Board and filed with the Commission, and would retire IRO-005-3.1a , Requirement R3.[35] Therefore, to ensure responsibility for disseminating space weather information in the Reliability Coordinator Area is maintained while avoiding duplicative requirements being enforceable at the same time, if proposed Reliability Standard EOP-010-1 becomes effective prior to the retirement of IRO-005-3.1a, Requirement R2 of EOP-010-1 shall become effective on the first day following retirement of IRO-005-3.1a as detailed in **Exhibit B**.

R3. Each Transmission Operator shall develop, maintain, and implement a GMD Operating Procedure or Operating Process to mitigate the effects of GMD events on the reliable operation of its respective system. At a minimum, the Operating Procedure or Process shall include:

3.1. Steps or tasks to receive space weather information.
3.2. System Operator actions to be initiated based on predetermined conditions.
3.3. The conditions for terminating the Operating Procedure or Operating Process.

Requirement R3 of proposed Reliability Standard EOP-010-1 requires Transmission Operators to develop Operating Procedures or Operating Processes to address GMD events. Similar to Requirement R1, an Operating Procedure or Operating Process is *implemented* by carrying out its stated actions. An Operating Procedure or Operating Process is *maintained* when it is kept relevant by taking into consideration system configuration, conditions, or operating experience, as needed to accomplish its purpose. Requirement R3 is not prescriptive and allows

[35] Reliability Standard IRO-005-4 provides:
Requirement R1. When the results of an Operational Planning Analysis or Real-time Assessment indicate an anticipated or actual condition with Adverse Reliability Impacts within its Reliability Coordinator Area, each Reliability Coordinator shall notify all impacted Transmission Operators and Balancing Authorities in its Reliability Coordinator Area.
Requirement R2. Each Reliability Coordinator that identifies an anticipated or actual condition with Adverse Reliability Impacts within its Reliability Coordinator Area shall notify all impacted Transmission Operators and Balancing Authorities in its Reliability Coordinator Area when the problem has been mitigated.

entities to tailor their Operational Procedures or Processes based on the responsible entity's assessment of entity-specific factors, such as geography, geology, and system topology. This approach is consistent with the development of results-based Reliability Standards.[36] As the Commission noted in Order No. 779, owners and operators of the Bulk-Power System are most familiar with their own equipment and system configurations.[37]

Part 3.1 of Requirement R3 requires Transmission Operators to specify in their Operating Procedures or Processes steps or tasks that must be conducted to receive space weather information. Part 3.2 of Requirement R3 requires Transmission Operators to specify what actions must be taken under what conditions and such conditions must be predetermined. Part 3.3 of Requirement R3 requires Transmission Operators to specify when and under what conditions the Operating Procedure or Process is exited. For example, if an Operating Procedure specifies that certain actions must be taken when a space weather alert is received, the Operating Procedure should specify when such actions would be terminated. Collectively, these Parts of Requirement R3 ensure that there is a baseline level of detail in the Operating Procedures or Processes while maintaining necessary flexibility in order to allow responsible entities to tailor their Operating Procedures or Processes as needed. Furthermore, the proposed Reliability Standard is technology neutral.

Proposed Reliability Standard EOP-010-1 does not prescribe specific actions that must be taken by responsible entities because a "one-size fits all" approach to crafting GMD Reliability Standards would fail to recognize the important role of locational differences.[38] Indeed, the

---

[36] Results-based Reliability Standards focus on required actions or results and not necessarily the methods by which those actions or results must be accomplished.

[37] Order No. 779 at P 38.

[38] As Commissioner LaFleur has noted, the panelists at the April 30, 2012 FERC technical conference agreed that "there can be considerable differences in GMD exposure and impacts depending on geography, where you are in the earth, ground conditions, grid configuration, and equipment condition…" *See* Electric Infrastructure Security Summit III, London, May 14-15, 2012, The House of Parliament, United Kingdom at p. 25.

Commission stated in Order No. 779 that it "do[es] not expect that owners and operators of the Bulk-Power System will necessarily develop and implement the *same* operational procedures."[39] The standard drafting team determined that the variability in the impacts of GMD precludes the development of prescriptive requirements.[40]

For these reasons, the proposed Reliability Standard is just and reasonable and should mitigate the effects of GMD events through the implementation of Operating Plans, Processes, and Procedures.

C. Commission Directives Addressed

As explained in **Exhibit G**, the proposed Reliability Standard satisfies all of the Commission's directives in Order No. 779 with respect to Stage 1 of the GMD Reliability Standards. Requirements R1 and R3 of proposed Reliability Standard EOP-010-1 satisfy the Commission's directive to submit "within six months of the effective date of this Final Rule, one or more Reliability Standards requiring owners and operators of the Bulk-Power System to develop and implement operational procedures to mitigate the effects of GMDs consistent with the reliable operation of the Bulk-Power System."[41] Requirement R1 requires Reliability Coordinators to develop, maintain and implement a GMD Operating Plan that coordinates GMD Operating Procedures within its Reliability Coordinator Area. Requirement R3 requires Transmission Operators to develop, maintain, and implement an Operating Procedure or Operating Process to mitigate the effects of GMD events on the reliable operation of its respective system. Order No. 779 became effective on July 22, 2013 and the instant petition is being submitted within six months, in compliance with the Commission's directive. The

---

39 Order No. 779 at P 38 (emphasis added).
40 *See* Consideration of Comments: Project 2013-03 (August 30, 2013) at p. 37.
41 Order No. 779 at P 30.

proposed Reliability Standard satisfies the Commission's directives and also addresses the Commission's concerns regarding the need for flexibility in Operational Procedures.

D. Enforceability of EOP-010-1

The proposed Reliability Standard includes Violation Risk Factors ("VRFs") and Violation Severity Levels ("VSLs"). The VSLs provide guidance on the way that NERC will enforce the Requirements of the proposed Reliability Standard. The VRFs are one of several elements used to determine an appropriate sanction when the associated Requirement is violated. The VRFs assess the impact to reliability of violating a specific Requirement. The VRFs and VSLs for the proposed Reliability Standards comport with NERC and Commission guidelines related to their assignment. For a detailed review of the VRFs, the VSLs, and the analysis of how the VRFs and VSLs were determined using these guidelines, please see **Exhibit F**.

The proposed Reliability Standard also include Measures that support each Requirement by clearly identifying what is required and how the Requirement will be enforced. These Measures help ensure that the Requirements will be enforced in a clear, consistent, and non-preferential manner and without prejudice to any party.[42]

[42] Order No. 672 at P 327 ("There should be a clear criterion or measure of whether an entity is in compliance with a proposed Reliability Standard. It should contain or be accompanied by an objective measure of compliance so that it can be enforced and so that enforcement can be applied in a consistent and non-preferential manner.").

V. CONCLUSION

For the reasons set forth above, NERC respectfully requests that the Commission:

- approve the proposed Reliability Standard and associated elements included in **Exhibit A,** effective as proposed herein;
- approve the implementation plan included in **Exhibit B** as proposed herein.

Respectfully submitted,

/s/ Stacey Tyrewala

Charles A. Berardesco
Senior Vice President and General Counsel
Holly A. Hawkins
Assistant General Counsel
Stacey Tyrewala
Senior Counsel
Brady Walker
Associate Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
(202) 644-8099 – facsimile
charlie.berardesco@nerc.net
holly.hawkins@nerc.net
stacey.tyrewala@nerc.net
brady.walker@nerc.net

Counsel for the North American Electric Reliability Corporation

Date: November 14, 2013