

May 3, 2016

VIA ELECTRONIC FILING

Kirsten Walli, Board Secretary
Ontario Energy Board
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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 Standards BAL-005-1 and FAC-001-3. 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

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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 STANDARDS
BAL-005-1 AND FAC-001-3**

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OF THE PROVINCE OF ONTARIO**

**NORTH AMERICAN ELECTRIC)
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**PETITION OF THE
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION
FOR APPROVAL OF PROPOSED RELIABILITY STANDARDS
BAL-005-1 AND FAC-001-3**

The North American Electric Reliability Corporation (“NERC”) hereby requests approval of:

- proposed Reliability Standards BAL-005-1 (Balancing Authority Control) and FAC-001-3 (Facility Interconnection Requirements) (**Exhibits A and B**),
- proposed new or revised definitions to be incorporated into the *Glossary of Terms Used in NERC Reliability Standards* (“NERC Glossary”) for the following terms: (1) Actual Frequency, (2) Actual Net Interchange, (3) Scheduled Net Interchange, (4) Interchange Meter Error, (5) Automatic Time Error Correction, (6) Reporting ACE, (7) Automatic Generation Control (“AGC”), (8) Pseudo-Tie, and (9) Balancing Authority (“BA”) (**Exhibit D**);
- proposed retirement of currently effective Reliability Standards BAL-005-0.2b, FAC-001-2, and BAL-006-2 (proposed retirement of BAL-006-2 is shown in **Exhibit C**);
- associated Implementation Plans (**Exhibits D, E, and F**); and
- associated Violation Risk Factors (“VRFs”) and Violation Severity Levels (“VSLs”) (**Exhibits G and H**) (collectively, “NERC’s Proposal”).

NERC’s Proposal reflects revisions developed under Project 2010-14.2.1 Phase 2 of Balancing Authority Reliability-based Controls (“Project”) to clarify, consolidate, streamline, and enhance the Reliability Standards addressing frequency control. The NERC Board of Trustees adopted proposed Reliability Standards BAL-005-1 and FAC-001-3 and related retirement of BAL-006-2 on February 11, 2016.

NERC's Proposal is just, reasonable, not unduly discriminatory or preferential, and in the public interest. This filing presents the technical basis and purpose of proposed Reliability Standards BAL-005-1 and FAC-001-3 and proposed retirement of BAL-006-2, a summary of the development history and the complete record of development (**Exhibit N**), and a demonstration that the proposed Reliability Standards meet the Reliability Standards criteria (**Exhibit M**).

I. EXECUTIVE SUMMARY

Reliable Operation of the Bulk Power System ("BPS") depends on maintaining frequency within predefined boundaries approximating 60 Hertz ("Hz"). Frequency is the speed of rotation of an Interconnection, measured in cycles per second (or Hz). As a result, multiple NERC Reliability Standards, such as currently effective Reliability Standard BAL-005-0.2b, operate together to maintain reliable frequency control. The Project standard drafting team ("SDT") proposed revisions to currently effective Reliability Standards BAL-005-0.2b and FAC-001-2, modifications to several NERC definitions, and the retirement of Reliability Standard BAL-006-2, to clarify, consolidate, streamline, and enhance the manner in which NERC Reliability Standards address certain issues related to frequency control. The SDT developed the proposed modifications after review of the Federal Energy Regulatory Commission ("FERC") directives, Paragraph 81 Criteria,¹ and recommendations by the periodic review team that examined Reliability Standards BAL-005-0.2b and BAL-006-2 in 2013 ("PRT").

Currently effective Reliability Standard BAL-005-0.2b facilitates efforts to maintain frequency at 60 Hz by supporting the accurate and consistent calculation of a key frequency

¹ *N. Am. Elec. Reliability Corp.*, 138 FERC ¶ 61,193, at P 81 ("March 2012 Order"), *order on reh'g and clarification*, 139 FERC ¶ 61,168 (2012); *Petition of the North American Electric Reliability Corporation for Approval of Retirement of Requirements in Reliability Standards*, , at Exhibit A ("Paragraph 81 Criteria") (filed March 19, 2013); *N. Am. Elec. Reliability Corp.*, Order No. 788, 145 FERC ¶ 61,147 (2013).

control and reliability indicator – Reporting Area Control Error (“Reporting ACE”). Reporting ACE represents a Balancing Authority Area’s (“BAA”) Area Control Error (“ACE”) measured in megawatts (“MW”) as the difference between the BAAs Actual and Scheduled Net Interchange, plus its Frequency Bias Setting obligation and meter error corrections.² Reporting ACE helps Responsible Entities provide reliable frequency control by indicating the current state of the entity’s contribution to Reliability. As such, Reporting ACE is a key input to other frequency related Reliability Standards, such as BAL-001 and BAL-002.

Because Reporting ACE is key measure to maintaining frequency at 60 Hz, Responsible Entities must accurately calculate Reporting ACE using complete and correct data. NERC’s Proposal clarifies and refines Requirements for accurate, consistent, and complete Reporting ACE calculations. The proposed revisions include relocating Requirements to confirm that interconnecting Facilities are within a BAA’s metered boundary, and thereby captured in the Reporting ACE calculation, into Reliability Standard FAC-001-3. Similarly, NERC’s Proposal includes moving Requirement R3 of currently effective Reliability Standard BAL-006-2 into proposed Reliability Standard BAL-005-1, as this Requirement helps ensure that BAs will use consistent data sources to calculate Reporting ACE. To support these improvements to Reporting ACE calculations, NERC’s Proposal would also revise the following definitions: Actual Frequency, Actual Net Interchange, Scheduled Net Interchange, Interchange Meter Error, Automatic Time Error Correction, Reporting ACE, Automatic Generation Control (“AGC”), Pseudo-Tie, and Balancing Authority.

NERC’s Proposal would also retire ineffective or duplicative Requirements that do not affect reliability (such as commercial calculations). For example, NERC proposes retiring the

² As explained in this filing, NERC’s Proposal includes revising the definition of Reporting ACE to include Automatic Time Error Correction (“ATEC”) when calculating Reporting ACE in the Western Interconnection.

remaining Requirements in Reliability Standard BAL-006-2, as they pertain to administrative or commercial obligations such as the calculation of Inadvertent Interchange. The SDT prepared a White Paper regarding Inadvertent Interchange accumulations and their associated paybacks to explain inadvertent interchange calculations. Based on this White Paper, the SDT developed an Inadvertent Interchange Guideline to help ensure a seamless transition to the proposed integrated Reliability Standards. The Operating Committee (“OC”) is currently reviewing the draft Inadvertent Interchange Guideline.

Together, these revisions and enhancements will improve reliability by supporting efforts to maintain Interconnection frequency at 60 Hz in a manner consistent with FERC directives, technological developments, and NERC’s current framework of integrated Reliability Standards. NERC requests approval of proposed Reliability Standards BAL-005-1 and FAC-001-3 effective pursuant to the Implementation Plans attached at **Exhibit D and E**. In addition, NERC requests approval of retirement of Reliability Standard BAL-006-2 upon the effective date of Reliability Standard BAL-005-1 and the OC’s approval of an Inadvertent Interchange Guideline, per the Implementation Plan attached at **Exhibit F**.³ Finally, NERC also requests that the proposed definitions for Reporting ACE, Actual Frequency, Actual Net Interchange, Scheduled Net Interchange, Interchange Meter Error, and ATEC become effective immediately after the July 1, 2016 effective date of Reliability Standard BAL-001-2.⁴ Finally, NERC requests that the proposed definitions for AGC, Pseudo-Tie, and Balancing Authority become effective upon the effective date of Reliability Standard BAL-005-1. The effective dates associated with NERC’s

³ Reliability guidelines are not binding norms or mandatory requirements.

⁴ See, BAL-005-1 Implementation Plan, attached hereto as **Exhibit D**. The SDT intended that the definition of “Reporting ACE” approved in *Real Power Balancing Control Performance Reliability Standard*, Order No. 810, 151 FERC ¶ 61,048 at P 43 (2015) never take effect; however, NERC understands that there may be a period that the definition of “Reporting ACE” approved in Order No. 810 is in effect while this filing is being reviewed.

Proposal will ensure seamless transition to the improved, integrated Reliability Standards proposed in this filing.

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

NERC's Proposal 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) and Appendix 3D (NERC Standard Processes Manual) of the NERC Rules of Procedure.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-

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.

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.

B. Procedural History

1. BAL-005

On April 4, 2006, NERC submitted 102 Reliability Standards, including Reliability Standard BAL-005-0 (Automatic Generation Control). In approving BAL-005-0, FERC directed NERC to develop modifications to: (i) create a process to calculate the minimum regulating reserve for a BA with respect to expected load and generation variation and transactions being ramped into or out of the BA, (ii) revise the title of the Reliability Standard to be neutral as to the source of regulating reserves and to include technically qualified demand-side management (“DSM”) and direct control load management as regulating reserves, (iii) clarify the required type of transmission or backup plans when receiving regulation from outside the BA when using non-firm service, (iv) include levels of Non-Compliance and a Measure that provides for a verification process over the minimum required automatic generation control or regulating reserves that a BA must maintain, and (v) “consider those [Xcel and FirstEnergy] suggestions in its Reliability Standards development process.”⁶

On December 19, 2007, NERC submitted a formal interpretation request to FERC and proposed that the Commission approve the interpretation as Reliability Standard BAL-005-0a.⁷ While that interpretation was pending with FERC, NERC withdrew the request on April 15, 2008. On May 13, 2009, NERC submitted its second interpretation, titled BAL-005-0b, to

⁶ Order No. 693, *supra* n. 22, at PP 397, 418-420.

⁷ *Petition of the North American Electric Reliability Corporation for Approval of Formal Interpretations to Reliability Standards*, Docket No. RM06-16-000 (filed Dec. 19, 2007) (requesting clarification of Requirement R17 of BAL-005-0).

amend the proposed interpretation. On May, 13, 2009 and June 15, 2012, NERC filed errata to Reliability Standard BAL-005-0b, thus resulting in BAL-005-0.1b in 2009 and BAL-005-0.2b in 2012. The current Project addresses remaining FERC directives related to BAL-005. *See infra*, Section IV.A.

2. FAC-001

On April 4, 2006, NERC submitted Reliability Standard FAC-001-0. On August 27, 2012, NERC submitted Reliability Standard FAC-001-1, along with several other proposed standards, to revise the applicability of those Reliability Standards to include generator interconnection Facilities. Finally, on August 27, 2014, NERC submitted a filing for Reliability Standard FAC-001-2 to “ensure appropriate coordination and communication regarding the interconnection of Facilities

3. BAL-006

In September 11, 2006, NERC submitted Reliability Standard BAL-006-1 (Inadvertent Interchange). In approving BAL-006-1, FERC directed NERC to develop modifications to BAL-006-1 to (i) include Measures concerning the accumulation of large inadvertent imbalances and additional Levels of Non-Compliance, and (ii) modify the regional differences to reference only current Reliability Standards. On December 8, 2009, NERC submitted BAL-006-2, which removed the “RTO Inadvertent Interchange Accounting Waiver” from BAL-006-1 that was implemented to accommodate Midwest ISO as a multi-BA market. Midwest ISO’s eventual transition to a single BA mooted the need for any regional waivers, and FERC approved BAL-006-2 on January 6, 2011.⁸

⁸ *Order Approving Revisions to Two Reliability Standards and Directing a Compliance Filing*, 134 FERC ¶ 61,007 (2011) (directing NERC to submit a compliance filing identifying the entity or entities that are responsible under Reliability Standard BAL-006-2 for calculating Inadvertent Interchange among the Local Balancing Authority

4. Project 2010-14.2.1

The Project resulted from NERC's efforts over the past several years to address the directive in Order No. 693 to create a continent-wide Contingency Reserve standard. Over time, this initiative was separated into two phases. Phase 2 ultimately led to the proposed modifications described in this filing. At its genesis, Phase 2 was labeled Project 2010-14.2 and involved BAL-004,⁹ BAL-005, and BAL-006. Before work in Phase 2 began, NERC implemented a number of initiatives to improve Reliability Standards, including retirement of unnecessary or redundant requirements under Paragraph 81 Criteria,¹⁰ consideration of Independent Expert Review Panel recommendations, and implementation of results-based concepts. As such, Project 2010-14.2 evolved into a periodic review, and on September 19, 2013, the Standards Committee ("SC") appointed the PRT. The PRT presented recommended revisions to BAL-005-0.2b and BAL-006-2 based on its review of the standards and submitted a Standard Authorization Request ("SAR") to the SC for the development of these revisions.

The SDT posted the first draft of proposed Reliability Standards BAL-005-1, BAL-006-3, and FAC-001-3 on July 30, 2015. Based on industry feedback, the SDT eventually ceased development on BAL-006-3, consolidated certain aspects of BAL-006-2 in BAL-005-1, and proposed retirement of BAL-006-2. The final posting in the Project included proposed Reliability Standards BAL-005-1 and FAC-001-3, several revised NERC Glossary definitions, and retirement of Reliability Standard BAL-006-2. Industry approved NERC's Proposal through the NERC Reliability Standard Development Process set forth in Appendix 3D of the NERC

Areas within the Midwest ISO BAA); *N. Am. Elec. Reliability Corp.*, Docket No. RD10-4-000 (May 16, 2011) (unpublished letter order) (approving NERC's February 22, 2011 Compliance Filing explaining that there is only one Midwest ISO BAA).

⁹ NERC later separated Reliability Standard BAL-004-0 into an independent project, Project 2010-14.2.2.

¹⁰ Paragraph 81 Criteria, *supra*.

Rules of Procedure.¹¹ The development history of Reliability Standard BAL-005-1, BAL-006-2, and FAC-001-3 is attached as **Exhibit N**.

IV. JUSTIFICATION FOR APPROVAL

As described above, NERC's Proposal represents the technical findings of the SDT based on its review of the PRT recommendations, as well as stakeholder comments throughout the Project. NERC's Proposal is intended to replace and retire currently effective Reliability Standards BAL-005-0.2b, BAL-006-2, and FAC-001-2. NERC's Proposal represents substantial improvements over existing Reliability Standards by helping to support more accurate and comprehensive calculation of Reporting ACE and satisfying all remaining FERC directives for Reliability Standards BAL-005 and BAL-006. As discussed below and in **Exhibit M**, NERC's Proposal satisfies the Reliability Standards criteria and is just, reasonable, not unduly discriminatory or preferential, and in the public interest.

The following subsections provide (i) a description of each proposed Reliability Standard, its reliability purpose, the applicable entities, and a requirement-by-requirement justification for each proposed Reliability Standard, (ii) a description of enforceability, (iii) justification for retirement of Reliability Standard BAL-006-2, and (iv) justification for NERC's proposed revised definitions.

A. Proposed Reliability Standard BAL-005-1

1. Purpose and Overview of Proposed BAL-005-1

The purpose of proposed Reliability Standard BAL-005-1 is to establish "requirements for acquiring data necessary to calculate Reporting Area Control Error (Reporting ACE)." As further explained in the purpose statement for BAL-005-1, the standard "specifies minimum

¹¹ See *infra* n. 19.

periodicity, accuracy, and availability requirement for acquisition of the data and for providing the information to the System Operator.” Proposed BAL-005-1 is designed to ensure that BAs properly calculate and communicate Reporting ACE. As explained below, proposed Reliability Standard BAL-005-1 is an improvement to BAL-005-0.2b, as it consolidates unnecessary or repetitive Requirements and moves certain metrics for calculating Reporting ACE to the revised, proposed definition of Reporting ACE. Further, pursuant to a FERC directive in Order No. 693, the title of the Reliability Standard has been modified to “Balancing Authority Control” to reflect the connection to Reporting ACE and resource-neutral requirements.¹²

As stated above, Reporting ACE is an indicator of operational frequency and helps Responsible Entities provide reliable frequency control by indicating the current state of the entity’s contribution to Reliability. Proposed Reliability Standard BAL-005-1 supports system frequency by requiring entities to properly calculate and communicate Reporting ACE or notify the Reliability Coordinator (“RC”) when it is not possible to calculate Reporting ACE. Specifically, the proposed standard requires entities to take measures to obtain requisite data necessary to calculate Reporting ACE to enable Responsible Entities to balance resources and demand under Tie-Line Bias Control. The proposed Requirements of BAL-005-1 will improve reliability by ensuring that BAs have situational awareness capabilities that support BA decision-making responsibilities. These revisions also address all remaining FERC directives, as discussed below in Section IV.A.3.

¹² Order No. 693, *supra* n. 22, at P 404. In the same paragraph, FERC directed NERC to “allow the inclusion of technically qualified DSM and direct control load management as regulating reserves...” NERC notes that Requirement R2 of BAL-005-0.2b, which required entities to maintain regulating reserves, was retired on January 21, 2014 (see *supra* n. 7). Reliability Standard BAL-001-2 and proposed Reliability Standard BAL-002-2 (submitted on February 18, 2016) allows for the inclusion of DSM. Finally, the revised definition of Automatic Generation Control, described in this filing, assures a resource neutral process for controlling demand and resources. Accordingly, this directive has been addressed.

2. Applicability

The Requirements in proposed Reliability Standard BAL-005-1 apply to BAs. NERC's Proposal would move Requirements suitable for other Registered Entities to Reliability Standard FAC-001-3 and retire Requirements that are redundant or ineffective.

As explained in the BAL-005-1 Mapping Document (**Exhibit I**), the requirements in Reliability Standard BAL-005-0.2b that apply to Generator Operators ("GOP") and Transmission Operators ("TOPs") have been moved to Requirements R3 and R4 in proposed Reliability Standard FAC-001-3. NERC proposes to move these requirements to FAC-001-3 because the Facilities Design, Connections, and Maintenance (FAC) Reliability Standard suite is the appropriate location for a requirement for Transmission Owners ("TOs") and Generator Owners ("GO") to define a process for confirming that interconnecting Facilities are within a BAA's metered boundaries. As described in Section IV.B below, Reliability Standard FAC-001-3 sets out Interconnection-related requirements. Further, NERC proposes to retire Requirement R1.3 in existing Reliability Standard BAL-005-0.2b as redundant and unnecessary, consistent with the removal of the Load Serving Entity ("LSE") functional registration category from the NERC Compliance Registry and the limited utility of requiring the LSE to ensure that its loads are included within the metered boundaries of a BAA.¹³

3. Requirement-by-Requirement Justification

Currently effective Reliability Standard BAL-005-0.2b consists of seventeen requirements. The SDT determined that Requirements R2, R7, and R15 of currently effective BAL-005-0.2b are redundant, ineffective, and should be retired based on Paragraph 81 Criteria.

¹³ See, e.g., *Notice of Filing of the North American Electric Reliability Corporation of Risk-Based Registration Initiative Rules of Procedure Revisions*, (filed January 6, 2015); *Notice of Filing of the North American Electric Reliability Corporation of Revisions to NERC Compliance Registry and Rules of Procedure Revisions Compliance Filing*, (filed July 29, 2015).

Further, the SDT proposes to incorporate Requirements R9, R10, and R11 into the proposed definitions used in the calculation of Reporting ACE. NERC proposes to consolidate the remaining Requirements and related NERC Glossary definitions to improve clarity and efficiency. As a result, proposed Reliability Standard BAL-005-1 consists of seven Requirements that address FERC's outstanding directives in Order No. 693¹⁴ and comply with the Reliability Standards criteria for standard development, as further supported in **Exhibit M**.

a) **Requirement R1**

R1. The Balancing Authority shall use a design scan rate of no more than six seconds in acquiring data necessary to calculate Reporting ACE. [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time Operations*]

A critical component of the accuracy of Reporting ACE is the timeliness of collection of sample data used to calculate the Reporting ACE. Proposed Requirement R1 requires BAs to acquire real-time operation information as it relates to the calculation of Reporting ACE using a design scan rate of no more than six seconds. By mandating that BAs use a constant design scan rate for data samples used to calculate Reporting ACE, Requirement R1 will ensure that information provided to Operators regarding calculation of Reporting ACE exposes real-time conditions and not historical data. A required design scan rate of less than or equal to six seconds ensures that this information is real-time information, and it limits the latency associated with data collection.¹⁵ Given the inherent connection between Reporting ACE and frequency, Requirement R1 will allow operators to maintain reliability using accurate, timely information about Reporting ACE.

b) **Requirement R2**

¹⁴ Order No. 693, *supra* n. 22, at P 356.

¹⁵ See **Exhibit L**, *Calculating and Using Reporting ACE in a Tie Line Bias Control Program* at n. 18.

R2. A Balancing Authority that is unable to calculate Reporting ACE for more than 30-consecutive minutes shall notify its Reliability Coordinator within 45 minutes of the beginning of the inability to calculate Reporting ACE. *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*

As the entity responsible for coordinating reliability across a wide area system, the RC must be aware of instant system conditions in order to assess unintended reliability scenarios. Proposed Requirement R2 mandates information sharing by requiring BAs to provide RCs with real-time information regarding the BA's inability to calculate Reporting ACE. Proposed Requirement R2 improves upon currently effective Requirement R6 of Reliability Standard BAL-005-0.2b because it maintains the currently effective 30-minute threshold in between calculations of Reporting ACE and clarifies the performance expectations for notification from the BA to the RC of an exceedance of this 30-minute threshold. By requiring BAs to notify the RC within 15 minutes of the end of the 30-minute period (or 45 minutes of the beginning of an inability to determine Reporting ACE), proposed Reliability Standard BAL-005-1 ensures that RCs are constantly apprised of disturbances in Reporting ACE calculations. This assurance enables the RC to coordinate with member BAs and take action as necessary.

c) Requirement R3

R3. Each Balancing Authority shall use frequency metering equipment for the calculation of Reporting ACE: *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*

- 3.1.** that is available a minimum of 99.95% for each calendar year; and,
- 3.2.** with a minimum accuracy of 0.001 Hz.

Proposed Requirement R3 combines aspects of Requirements R8 and R17 of currently effective BAL-005-0.2b and sets a standard for frequency metering equipment that ensures that BAs consistently gather accurate frequency data to support Reporting ACE calculations.

Proposed Requirement R3 also addresses two FERC directives in Order No. 693. In Order No. 693, FERC directed NERC “to revise the Violation Risk Factor for BAL-005-0, Requirement R17 to medium.”¹⁶ FERC also stated that, “the comments of Xcel and FirstEnergy should be addressed by the ERO when this Reliability Standard [BAL-005-0] is revisited as part of the ERO’s Work Plan.”¹⁷ Xcel and FirstEnergy questioned the application of Requirement R17 to equipment that would require unnecessary costs of compliance for little reliability benefit.¹⁸

In its Interpretation filing filed on May 13, 2009, NERC addressed part of FirstEnergy’s concern by clarifying that Requirement R17 of BAL-005-0 applies to devices within operations control rooms *and* external devices that “transmit said time error and frequency information from a source remote to the control centers.”¹⁹ As NERC explained, “time error and frequency devices that serve as input into the reporting or compliance of the ACE equation... must be annually checked and calibrated.”²⁰

Proposed Requirement R3 addresses the remainder of the comments of Xcel and FirstEnergy not addressed in the Interpretation filing, as NERC proposes to retire part of currently effective Requirement R17 of BAL-005-0.2b as moot and move part of the existing Requirement to proposed Requirement R3. Proposed Requirement R3 includes streamlined obligations to use specific frequency metering equipment that is necessary for operation of AGC and accurate calculation of Reporting ACE, as this ensures that costs associated with

¹⁶ Order No. 693, *supra* n. 22, at P 58.

¹⁷ *Id.* at P 415 (directing NERC to consider comments by Xcel and FirstEnergy regarding the applicability of Requirement R17 of Reliability Standard BAL-005-0).

¹⁸ *Id.* at PP 410-411 (noting Xcel’s comment suggesting that Requirement R17 should be limited only to equipment necessary for interchange metering in balancing areas where errors in generating metering are critical for imbalance calculations; also noting FirstEnergy’s comment requesting that FERC limit the devices applicable under Requirement R17 to “control center devices” and noted that the term “check” in Requirement R17 should be clarified).

¹⁹ Interpretation filing at p. 8.

²⁰ *Id.*

implementation are commensurate with reliability benefit. Finally, as described below in Section IV.C, NERC has assigned Requirement R3 a VRF of “Medium” with a Time Horizon of “Real-time Operations” based on guidelines, thus addressing the remaining FERC directive in Order No. 693.²¹

d) **Requirement R4**

R4. The Balancing Authority shall make available to the operator information associated with Reporting ACE including, but not limited to, quality flags indicating missing or invalid data. [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time Operations*]

System Operators use Reporting ACE as a critical input to assess whether and to what extent actions or operating instructions are necessary to maintain system stability. Proposed Requirement R4 links Reporting ACE to an entity’s operations by requiring BAs to share Reporting ACE with System Operators. Thus, proposed Requirement R4 combines elements of currently effective Requirements R14 and R16 of Reliability Standard BAL-005-0.2b that require BAs to provide real-time values and Reporting ACE data status to operators. This consolidation ensures that BAs provide all Reporting ACE data to operators, thereby reducing the possibility of that undue delay or incorrect data might cause adverse events.

e) **Requirement R5**

R5. Each Balancing Authority’s system used to calculate Reporting ACE shall be available a minimum of 99.5% of each calendar year. [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Assessment*]

Proposed Requirement R5 introduces a new obligation into Reliability Standard BAL-005 to assure the availability of a BA’s system used to calculate Reporting ACE. This Requirement will help ensure that entities can rely on Reporting ACE calculations provided by a BA. Requirement R5 differs from Requirement R4 because proposed Requirement R4 obligates

²¹ Order No. 693, *supra* n. 22, at P 58.

entities to provide all data associated with Reporting ACE at a given time, whereas proposed Requirement R5 establishes constant availability of the system used to calculate Reporting ACE.

f) **Requirement R6**

R6. Each Balancing Authority that is within a multiple Balancing Authority Interconnection shall implement an Operating Process to identify and mitigate errors affecting the accuracy of scan rate data used in the calculation of Reporting ACE for each Balancing Authority Area. *[Violation Risk Factor: Medium] [Time Horizon: Same-day Operations]*

Scan rate data is a critical input in the calculation of Reporting ACE, and inaccurate Reporting ACE can lead to inappropriate operating decisions. Persistent errors in calculation of Reporting ACE may cause operators to question Reporting ACE, thus delaying decisions and causing adverse consequences. To mitigate instances of inaccurate Reporting ACE calculations, Requirement R6 supports the accurate collection of scan rate data used in calculating the Reporting ACE by requiring entities to design procedures in an Operating Process to identify and mitigate errors.

A successful Operating Process should include certain steps to support accurate Reporting ACE. First, the Operating Process must allow BAAs to agree upon hourly accumulated Tie Line megawatt hours (“MWh”) values to mitigate or avoid errors in calculating Reporting ACE. Second, the Operating Plan should include the ability to compare the integration of instantaneous metered values with accumulated MWh values for each BA. Third, to establish that accumulated MWh metering for one BA is equivalent to accumulated MWh on Adjacent Balancing Authorities (“ABA”) on the same tie line, the Operating Plan should include a comparison of a BA’s accumulated MWh value with the accumulated MWh value for its ABA. If there is a difference between these values, the Operating Process should instruct the BAs to

agree on a common value for the tie lines to accommodate the difference between the accumulated values or some other method to address the inconsistency.²²

g) Requirement R7

R7. Each Balancing Authority shall ensure that each Tie Line, Pseudo-Tie, and Dynamic Schedule with an Adjacent Balancing Authority is equipped with: [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*]

7.1. a common source to provide information to both Balancing Authorities for the scan rate values used in the calculation of Reporting ACE; and,

7.2. a time synchronized common source to determine hourly megawatt-hour values agreed-upon to aid in the identification and mitigation of errors under the Operating Process as developed in Requirement R6.

Because Reporting ACE is an essential measurement of a BA's contribution to the reliability of an Interconnection, consistency in the calculation of Reporting ACE across BAs is important to avoid confusion and delayed or incorrect operator action. The use of common source data among BAs ensures consistency in the calculation of Reporting ACE. Proposed Requirement R7 is designed based on Requirement R12, R13, and R14 of currently effective Reliability Standard BAL-005-0.2b and Requirement R3 of Reliability Standard BAL-006-2 to address common source data issues for Tie Lines, Pseudo-Ties, and Dynamic Schedules. Proposed Requirement R7 accomplishes these issues by obligating ABAs to utilize common source data with respect to scan rate values used when calculating Reporting ACE and a time synchronized common source when identifying and mitigating errors per the Operating Process developed under proposed Requirement R6.²³ This will help avoid confusion and inaccuracies

²² The SDT developed provisions in the Whitepaper (attached herein as **Exhibit L**) to cover the practice of comparing the hourly megawatt-hour values gathered at the end of the hour against the hourly integrated values of the scan-rate data operated to, in order to determine if significant error exists. See, *Periodic Review of BAL-005-0.2b – Automatic Generation Control and BAL-006-2 – Inadvertent Interchange (Recommendation to Revise both Standards)*, pg. 21 (May 22, 2014), accessible online at [http://www.nerc.com/pa/Stand/Project%20201014%20Phase%20of%20Balancing%20Authority%20Re/Recommendation to Revise BAL-005 and BAL-006 Clean BAL PRT FINAL 07162014.pdf](http://www.nerc.com/pa/Stand/Project%20201014%20Phase%20of%20Balancing%20Authority%20Re/Recommendation%20to%20Revise%20BAL-005%20and%20BAL-006%20Clean%20BAL%20PRT%20FINAL%2007162014.pdf).

²³ As noted above, NERC's Proposal would retire current Requirement R7.

that may arise if ABAs use inconsistent data sources. As recommended by the PRT, proposed Requirement R7 now includes a requirement for BAs to agree on common values to be used in real-time.

B. Proposed Reliability Standard FAC-001-3

Proposed Reliability Standard FAC-001-3 consists of the same four Requirements that are in currently effective Reliability Standard FAC-001-2, with new Requirement subparts added to Requirement R3 and Requirement R4 to extend certain obligations to TOs and GOs. As these new sub-requirements are the only proposed revisions, the justification provided below is limited to these sub-requirements. As further supported in **Exhibit M**, the proposed Requirements outlined below comply with the criteria for Reliability Standards. Additionally, the transition described below is explained in the FAC-001-3 Mapping Document, attached herein as **Exhibit J**.

1. Purpose and Overview of Proposed FAC-001-3

The purpose of proposed Reliability Standard FAC-001-3 is to “avoid adverse impacts on the reliability of the Bulk Electric System” by requiring TOs and applicable GOs to “document and make Facility interconnection requirements available so that entities seeking to interconnect will have the necessary information.” Along with the obligations on TOs and certain GOs to ensure that all potential interconnecting parties have fair and unrestricted access to relevant interconnection requirements, proposed Reliability Standard FAC-001-3 also captures a variety of specific processes to ensure that entities take appropriate steps when interconnecting. For example, the Reliability Standard requires TOs and GOs to address, in the interconnection requirements, procedures for studies and analyses of interconnections and communication regarding each facility interconnection.

Proposed Reliability Standard FAC-001-3 replaces and strengthens currently effective Reliability Standard FAC-001-2 by moving currently effective Requirement R1 of Reliability Standard BAL-005-0.2b to proposed FAC-001-3 thus requiring that TO and GO interconnection requirements include procedures for confirming that new or materially modified Facilities connecting to the BES are within a BAA’s metered boundaries. These interconnection requirements should be relocated to Reliability Standard FAC-001-3, as FAC-001-3 establishes Facility interconnection requirements.

2. Applicability

The Requirements under proposed Reliability Standard FAC-001-3 continue to apply only to TOs and Applicable GOs. As defined in Section 4.1 of currently effective FAC-001-2 and proposed FAC-001-3 (attached as **Exhibit B**), an Applicable GO is defined as a “Generator Owner with a fully executed Agreement to conduct a study on the reliability impact of interconnecting a third party Facility to the Generator Owner’s existing Facility that is used to interconnect to the Transmission system.”

3. Requirement-by-Requirement Justification

R3. Each Transmission Owner shall address the following items in its Facility interconnection requirements: *[Violation Risk Factor: Lower] [Time Horizon: Long-Term Planning]*

3.1. Procedures for coordinated studies of new or materially modified existing interconnections and their impacts on affected system(s).

3.2. Procedures for notifying those responsible for the reliability of affected system(s) of new or materially modified existing interconnections.

3.3. Procedures for confirming with those responsible for the reliability of affected systems that new or materially modified Facilities are within a Balancing Authority Area’s metered boundaries.

R4. Each applicable Generator Owner shall address the following items in its Facility interconnection requirements: *[Violation Risk Factor: Lower] [Time Horizon: Long-Term Planning]*

4.1. Procedures for coordinated studies of new interconnections and their impacts on affected system(s).

4.2. Procedures for notifying those responsible for the reliability of affected system(s) of new interconnections.

4.3. Procedures for confirming with those responsible for the reliability of affected systems that new or materially modified Facilities are within a Balancing Authority Area's metered boundaries.

NERC proposes to consolidate all interconnection requirements by moving Requirement R1 of currently effective Reliability Standard BAL-005-0.2b to proposed Requirements R3.3 and R4.4 of proposed FAC-001-3. As the purpose of FAC-001-3 is more commensurate with interconnection responsibilities, interconnection procedures contained in currently effective BAL-005-0.2b should be included in proposed Reliability Standard FAC-001-3. These proposed revisions clarify that responsible entities must have interconnection procedures to ensure that Facilities are within the metered boundaries of the BAA. Without these Requirements, Facilities may be connected to the grid outside of a BAA, causing these Facilities to be outside the scope of a BA's resource plans, balancing calculations, and frequency control oversight.

C. Enforceability of Proposed Reliability Standards BAL-005-1 and FAC-001-3

Proposed Reliability Standards BAL-005-1 and FAC-001-3 include Measures to support each Requirement to clarify necessary evidence or actions for compliance and to help ensure that the Requirements will be enforced in a clear, consistent, non-preferential manner, and without prejudice to any party. Proposed Reliability Standard BAL-005-1 includes seven Measures. Proposed Reliability Standard FAC-001-3 includes four Measures. While inclusion of these Measures associated with each Reliability Standard is consistent with the elements of a

Reliability Standard,²⁴ NERC developed the Measures for proposed Reliability Standard BAL-005-1 in consideration of FERC's directive in Order No. 693 to revise the VRF for Requirement R17 of BAL-005-0 to "Medium."²⁵

Proposed Reliability Standards BAL-005-1 and FAC-001-3 also include 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 and each comports with the NERC and FERC guidelines relate to their assignment. 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 and represent one of several elements used to determine an appropriate sanction when the associated Requirement is violated. All of the Requirements in proposed Reliability Standard BAL-005-1 have been assigned a "Medium" VRF with a Time Horizon criterion of "Real-time Operations." All of the Requirements in proposed Reliability Standard FAC-001-3 have been assigned a "Lower" VRF with a "Long-Term Planning" Time Horizon criterion. **Exhibit G** includes the detailed analysis of the assignment of VRFs and the VSLs for proposed Reliability Standards BAL-005-1 and FAC-001-3. As described in that document, the VRFs and VSLs for the proposed Reliability Standard comport with NERC and FERC guidelines.²⁶

D. Proposed Retirement of Reliability Standard BAL-006-2

Currently effective Reliability Standard BAL-006-2 consists of five Requirements, each

²⁴ See, NERC Rules of Procedure, at Appendix 3A, at Section 2.5.

²⁵ Order No. 693, *supra* n. 22, at P 58. NERC notes that, while currently effective Requirement R17 of BAL-005-0.2b is proposed to be retired, part of that requirement is located in proposed Requirement R3 of BAL-005-1 and has been assigned a VRF of Medium.

²⁶ See, e.g., *N. Am. Elec. Reliability Corp.*, 119 FERC ¶ 61,145, *order on reh'g and compliance filing*, 120 FERC ¶ 61,145 (2007).

applicable to BAs. In an ongoing effort to remove unnecessary Reliability Standards from its suite of Reliability Standards, NERC proposes to retire four Requirements as “administrative in nature” as defined in the Paragraph 81 Criteria.²⁷ As provided above, NERC also proposes to move Requirement R3 to Reliability Standard BAL-005-1 because the Requirement supports accurate Reporting ACE and falls squarely within the scope of BAL-005-1. As NERC proposes to retire or move the Requirements in BAL-006-2 as explained in the BAL-006-2 Mapping Document (**Exhibit K**), NERC proposes to retire BAL-006-2 in its entirety.

1. Overview

The purpose of currently effective Reliability Standard BAL-006-2 is to define “a process for monitoring BAs to ensure that, over the long term, BAAs do not excessively depend on other BAAs in the Interconnection for meeting their demand or Interchange obligations.” Aside from the obligations in Requirement R3 of BAL-006-2, which have been moved to proposed BAL-005-1 as described below, the SDT determined that each of the remaining Requirements in BAL-006-2 are energy accounting standards and should be retired as “administrative” pursuant to Criteria B1 of the Paragraph 81 Criteria.²⁸ The purpose of BAL-006-2, excerpted above, describes a commercial practice that addresses inadvertent balances. This purpose continues to be fulfilled by entities as described in the Inadvertent Interchange Guideline, currently under review by the NERC OC.

In approving BAL-006 in Order No. 693, FERC directed NERC “to develop a modification to BAL-006-1 that adds Measures concerning the accumulation of large inadvertent

²⁷ Paragraph 81 Criteria, *supra* n. 7 at Exhibit A (proposing to retire standards as “Administrative” if the “Reliability Standard requirement requires responsible entities to perform a function that is administrative in nature, does not support reliability and is needlessly burdensome.”); Order No. 788, *supra* n. 7.

²⁸ *Id.*

imbalances and Levels of Non-Compliance,” because “large imbalances represent dependence by some balancing authorities on their neighbors and are an indication of less than desirable balancing of generation with load.”²⁹ Further, FERC stated that “large interchange imbalances are indicative of an underlying problem related to balancing of resources and demand,” and “[s]ince the ERO indicates that the reliability aspects of this issue will be addressed in a Reliability Standards filing later this year, the Commission asks the ERO, when filing the new Reliability Standard, to explain how the new Reliability Standard satisfies the Commission’s concerns.”³⁰

The SDT solicited feedback from industry regarding the disposition of BAL-006-2 and eventually determined that the calculation of Inadvertent Interchange is an accounting process and is not appropriate for a NERC Reliability Standard. During periods when the Reporting ACE of a BA is negatively affecting the Interconnection frequency beyond a predefined bound, Reliability Standard BAL-001-2 requires BAs to maintain its clock-minute ACE within the Balancing Authority ACE Limit (“BAAL”). Reliability Standard BAL-001-2 also requires entities to take a rolling 12-month measure of overall control performance using clock-minute performance data. To further support frequency, Reliability Standard BAL-003-1 and proposed Reliability Standard BAL-002-2 require entities to restore of Reporting ACE within predefined bounds and to maintain and dispatch Frequency Response, as necessary.³¹ These “real-time” measures of control performance require entities to maintain Interconnection frequency, limiting operation when it is detrimental to Interconnection frequency and encouraging operation when in

²⁹ Order No. 693, *supra* n. 22, at P 428.

³⁰ *Id.* at P 438.

³¹ See, e.g., *Petition of the North American Electric Reliability Corporation for Approval of Proposed Reliability Standard BAL-002-2*, (filed Feb. 18, 2016); *Clarifying Supplemental Information for Petition for Approval of BAL-002-2*, (filed Feb. 26, 2016); *Supplemental Information for Petition of the North American Electric Reliability Corporation for Approval Of Proposed Reliability Standard BAL-002-2*, (filed April 6, 2016).

support of Interconnection frequency. Because entities are supporting frequency through this coordinated suite of reliability standards, entities will not excessively depend on other entities in the Interconnection such that the purely economic issue that was addressed by BAL-006-2 becomes a reliability issue for a NERC Reliability Standard.

As further support for this retirement, the SDT provided an in-depth justification for why a NERC Reliability Standard is not necessary for Inadvertent Interchange accounting in its Inadvertent Interchange White Paper. The Inadvertent Interchange White Paper was posted for 10 days for industry input on September 16, 2015 and was the basis for creation of the Inadvertent Interchange Guideline. In order to address any remaining or potential concerns with retirement of BAL-006-2, NERC proposes that the retirement of currently effective BAL-006-2 be effectuated upon the NERC OC approval of the Inadvertent Interchange Guideline.³²

2. Requirement-by-Requirement Retirement Justification

a) **Requirements R1, R2, R4, and R5**

The SDT proposes to retire Requirements R1, R2, R4, and R5, as these requirements are “administrative” in nature based on the Paragraph 81 Criteria B1.³³ However, because large and long-held Inadvertent Interchange accumulations may impact commercial relationships, and because the related paybacks can create impacts to reliability if not conducted in an appropriate manner, the SDT also developed an Inadvertent Interchange White Paper to define typical practices for isolating and eliminating sources of Inadvertent accounting errors. The SDT and the OC Resources Subcommittee developed the Inadvertent Interchange Guideline based on the

³² Reliability guidelines are documents that suggest approaches or behavior in a given technical area for the purpose of improving reliability. Reliability guidelines are not binding norms or mandatory requirements. Reliability guidelines are usually sponsored by a NERC committee and are made available for industry comment prior to finalization. The concepts in guidelines may be adopted by a Responsible Entity in accordance with its own facts and circumstances.

³³ Paragraph 81 Criteria, *supra* n. 6 at Exhibit A.

evidence presented in the Inadvertent Interchange White Paper. As described above, the Inadvertent Interchange Guideline is currently under review by the OC.

Pursuant to NERC’s Paragraph 81 Criteria, a requirement may be retired if it “requires responsible entities (“entities”) to conduct an activity or task that does little, if anything, to benefit or protect the reliable operation of the BES,” and it meets another one of the criteria described in Criteria B of that document.³⁴ One of those criteria, Criteria B1 (Administrative), states that a Reliability Standard requirement may be retired if it “requires responsible entities to perform a function that is administrative in nature, does not support reliability and is needlessly burdensome.”³⁵ Criteria B1 also states that it is

designed to identify requirements that can be retired or modified with little effect on reliability and whose retirement or modification will result in an increase in the efficiency of the ERO compliance program...Strictly administrative functions do not inherently negatively impact reliability directly and, where possible, should be eliminated or modified for purposes of efficiency and to allow the ERO and entities to appropriately allocate resources.³⁶

The draft Inadvertent Interchange Guideline explains the relationship between Inadvertent Interchange and reliability, current industry account practices to calculate and compensate for Inadvertent Interchange, and options for potential commercial accounting standards. As explained in the draft Inadvertent Interchange Guideline, the calculation requirements in Requirements R1, R2, R4, and R5 of BAL-006-2 are commercial energy accounting requirements and do not contribute to Reliable Operation of the BES. For example, Inadvertent Interchange generally occurs because of a variety of factors, including accounting errors such as bilateral or unilateral Inadvertent payback, false schedules implemented to correct

³⁴ *Id.*
³⁵ *Id.*
³⁶ *Id.*

a perceived metering error, hourly interchange calculations that do not compensate for ramps, or minor calculation errors. Balancing Authority Areas routinely monitor and account for Inadvertent Interchange using standard accounting procedures.³⁷ If the Requirements of proposed Reliability Standard BAL-005-1 are met, responsible entities will have all data necessary to calculate Reporting ACE and will avoid potential reliability issues caused by Inadvertent Interchange. The remaining issues associated with Inadvertent Interchange accumulations are commercial issues and may be addressed as such. As such, Requirements R1, R2, R4, and R5 should be retired as administrative under Criteria B1.

a) **Requirement R3**

Requirement R3 of currently effective Reliability Standard BAL-006-2 has been moved to proposed Requirement R7 of BAL-005-1. *See supra*, discussion at Section IV.A.3.g above.

E. Proposed NERC Glossary Definitions

The SDT developed several new and modified NERC Glossary definitions in connection with proposed Reliability Standards BAL-005-1 and FAC-001-3 to enhance the effectiveness of those Standards in maintaining reliability. Specifically, NERC proposes new and modified definitions of the following terms: Automatic Generation Control, Actual Frequency, Actual Net Interchange, Scheduled Net Interchange, Interchange Meter Error, Automatic Time Error Correction, Reporting ACE, Pseudo-Tie, and Balancing Authority.

With respect to FERC's directive in Order No. 693 regarding modification to the definition of Operating Reserves,³⁸ NERC developed Reliability Standard BAL-002-2 and

³⁷ Certain procedures followed by BAAs may be based on standard accounting practices, compliance with NAESB Standard WEQ-007 Business Practice Requirements (Inadvertent Interchange Payback) (this standard only accounts for the payback of Inadvertent Interchange), or other accounting rules.

³⁸ Order No. 693, *supra* n. 22, at P 1896; *see also, id. supra* n. 22, at PP 336, 340, 343-344, 405, 1887 (providing additional clarity regarding the directed revisions).

associated proposed revisions to the definition of Contingency Reserve (now pending) to ensure a continent-wide, technology neutral reserve policy.³⁹ The proposed revised definitions below are also technology neutral. NERC has removed the term Operating Reserve in the BAL Reliability Standards and has developed an Operating Reserve Guideline to help address any remaining potential concerns. As a result, NERC's Proposal addresses remaining directives regarding terms used in the BAL Reliability Standards.

1. Automatic Generation Control

Automatic Generation Control (AGC): ~~Equipment that automatically adjusts generation in a Balancing Authority Area from a central location to maintain the Balancing Authority's interchange schedule plus Frequency Bias. AGC may also accommodate automatic inadvertent payback and time error correction.~~ A process designed and used to automatically adjust a Balancing Authority Areas' Demand and/or resources to help maintain the Reporting ACE in that of a Balancing Authority Area within the bounds required by applicable NERC Reliability Standards.

The definition of Automatic Generation Control describes the process by which an entity controls its Reporting ACE in Reliability Standard BAL-005-1. This definition has been revised as shown to reflect modernization of the industry and to set forth a resource-neutral process for controlling demand and resources. The proposed definition allows the entity the flexibility to perform necessary reliability functions in the most effective and reliable manner.

2. Reporting ACE

Reporting ACE: The scan rate values of a Balancing Authority Area's (BAA) Area Control Error (ACE) measured in MW includes the difference between the Balancing Authority Area's Actual Net Interchange and its Scheduled Net Interchange, plus its Frequency Bias Setting obligation, plus correction for any known meter error. In the Western Interconnection, Reporting ACE includes Automatic Time Error Correction (ATEC).

Reporting ACE is calculated as follows:

³⁹ *Petition of the North American Electric Reliability Corporation for Approval of Proposed Reliability Standard BAL-002-2, supra* n. 57, at pp. 3-4, 15-16, and Contingency Event Standard Background Document (Feb. 18, 2016).

$$\text{Reporting ACE} = (\text{NI}_A - \text{NI}_S) - 10B (F_A - F_S) - I_{ME}$$

Reporting ACE is calculated in the Western Interconnection as follows:

$$\text{Reporting ACE} = (\text{NI}_A - \text{NI}_S) - 10B (F_A - F_S) - I_{ME} + I_{ATEC}$$

Where:

- NI_A = Actual Net Interchange.
- NI_S = Scheduled Net Interchange.
- B = Frequency Bias Setting.
- F_A = Actual Frequency.
- F_S = Scheduled Frequency.
- I_{ME} = Interchange Meter Error.
- I_{ATEC} = Automatic Time Error Correction.

All NERC Interconnections operate using the principles of Tie Line Bias (TLB) Control and require the use of an ACE equation similar to the Reporting ACE defined above. Any modification(s) to this specified Reporting ACE equation that is(are) implemented for all BAAs on an Interconnection and is(are) consistent with the following four principles of Tie Line Bias control will provide a valid alternative to this Reporting ACE equation:

1. All portions of the Interconnection are included in exactly one BAA so that the sum of all BAAs' generation, load, and loss is the same as total Interconnection generation, load, and loss;
2. The algebraic sum of all BAAs' Scheduled Net Interchange is equal to zero at all times and the sum of all BAAs' Actual Net Interchange values is equal to zero at all times;
3. The use of a common Scheduled Frequency F_S for all BAAs at all times; and,
4. Excludes metering or computational errors. (The inclusion and use of the I_{ME} term corrects for known metering or computational errors.)

The currently effective definition of Reporting ACE defines several components used to calculate Reporting ACE. The revised, proposed definition of Reporting ACE is clearer because it includes only the Reporting ACE calculation. NERC's Proposal would separately define each of the components used to calculate Reporting ACE as discussed immediately below.

3. Components of Reporting ACE

Actual Frequency (F_A): The Interconnection frequency measured in Hertz (Hz).

Actual Net Interchange (NI_A): The algebraic sum of actual megawatt transfers across all Tie Lines, including Pseudo-Ties, to and from all Adjacent Balancing Authority areas within the same Interconnection. Actual megawatt transfers on asynchronous DC tie lines

that are directly connected to another Interconnection are excluded from Actual Net Interchange.

Scheduled Net Interchange (NIS): The algebraic sum of all scheduled megawatt transfers, including Dynamic Schedules, to and from all Adjacent Balancing Authority areas within the same Interconnection, including the effect of scheduled ramps. Scheduled megawatt transfers on asynchronous DC tie lines directly connected to another Interconnection are excluded from Scheduled Net Interchange.

Interchange Meter Error (I_{ME}): A term, normally zero, used in the Reporting ACE calculation to compensate for data or equipment errors affecting any other components of the Reporting ACE calculation.

Automatic Time Error Correction (IATEC): The addition of a component to the ACE equation for the Western Interconnection that modifies the control point for the purpose of continuously paying back Primary Inadvertent Interchange to correct accumulated time error. Automatic Time Error Correction is only applicable in the Western Interconnection.

$$I_{ATEC} = \frac{PII_{accum}^{on/off\ peak}}{(1-Y)*H} \quad \text{when operating in Automatic Time Error Correction Mode.}$$

The absolute value of I_{ATEC} shall not exceed L_{max}.

I_{ATEC} shall be zero when operating in any other AGC mode.

- L_{max} is the maximum value allowed for I_{ATEC} set by each BA between 0.2*|B_i| and L₁₀, 0.2*|B_i| ≤ L_{max} ≤ L₁₀.
- L₁₀ = 1.65 * ε₁₀ √((-10B_i)(-10B_S)).
- ε₁₀ is a constant derived from the targeted frequency bound. It is the targeted root-mean-square (RMS) value of ten-minute average frequency error based on frequency performance over a given year. The bound, ε₁₀, is the same for every Balancing Authority Area within an Interconnection.
- Y = B_i / B_S.
- H = Number of hours used to payback primary inadvertent interchange energy. The value of H is set to 3.
- B_i = Frequency Bias Setting for the Balancing Authority Area (MW / 0.1 Hz).
- B_S = Sum of the minimum Frequency Bias Settings for the Interconnection (MW / 0.1 Hz).
- Primary Inadvertent Interchange (PII_{hourly}) is (1-Y) * (II_{actual} - B_i * ΔTE/6)
- II_{actual} is the hourly Inadvertent Interchange for the last hour. ΔTE is the hourly change in system Time Error as distributed by the Interconnection time monitor, where: ΔTE = TE_{end hour} - TE_{begin hour} - TD_{adj} - (t)*(TE_{offset})
- TD_{adj} is the Reliability Coordinator adjustment for differences with Interconnection time monitor control center clocks.
- t is the number of minutes of manual Time Error Correction that occurred during the hour.
- TE_{offset} is 0.000 or +0.020 or -0.020.

- PII_{accum} is the Balancing Authority Area’s accumulated PII_{hourly} in MWh. An On-Peak and Off-Peak accumulation accounting is required, where:

$$PII_{accum}^{on/offpeak} = \text{last period's } PII_{accum}^{on/offpeak} + PII_{hourly}$$

As explained above, NERC’s Proposal moves the components of Reporting ACE from that term to separate *NERC Glossary* terms. This separation will improve reliability by reducing potential confusion associated with definitions embedded within a term. The proposed definition of ATEC also improves the current definition by addressing a FERC directive. Specifically, the proposed definition addresses FERC’s directive in Order No. 810 for NERC to “revise the definition of Reporting ACE to include the ‘Lmax’ upper payback limit and the bounds of that upper payback limit prior to the effective date of Reliability Standard BAL-001-1.”⁴⁰ The proposed definition of ATEC, which is incorporated into the proposed definition of Reporting ACE (as explained above) and is only applicable in the Western Interconnection, states that “[t]he absolute value of I_{ATEC} shall not exceed L_{max} .”

4. Pseudo-Tie

Pseudo-Tie: A time-varying energy transfer that is updated in Real-time and included in the Actual Net Interchange term (NIA) in the same manner as a Tie Line in the affected Balancing Authorities’ ~~control~~ Reporting ACE equation (or alternate control processes).

The proposed definition of the term Pseudo-Tie has been updated to reflect the use of the term “Reporting ACE” instead of the more general “control ACE.” The proposed definition is clearer and reduces confusion associated with outdated terminology.

⁴⁰ Order No. 810, *supra* n. 9. FERC also explained that the Lmax upper payback limit and the bounds of that limit were necessary for the Western Interconnection.

5. Balancing Authority

Balancing Authority: The responsible entity that integrates resource plans ahead of time, maintains ~~load-interchange-generation-balance~~ Demand and resource balance within a Balancing Authority Area, and supports Interconnection frequency in real time.

To ensure consistency with the proposed definition of AGC, the SDT revised the definition of a BA to more accurately describe the BA's resource demand function. The standard drafting team for Project 2015-04 (Alignment of Terms) also highlighted inconsistent use of the term "load-interchange-generation" and recommended that an open BAL Standard project address the issue. Therefore, the proposed changes promote clarity and consistency with other definitions and with various Reliability Standards.

V. EFFECTIVE DATE

Proposed Reliability Standards BAL-005-1 and FAC-001-3 will go into effect pursuant to the respective Implementation Plans in **Exhibits D and E** of this filing. In addition, NERC requests approval of the retirement of Reliability Standard BAL-006-2 upon the effective date of Reliability Standard BAL-005-1 and the OC's approval of an Inadvertent Interchange Guideline, as stated in the Implementation Plan attached at **Exhibit F**.⁴¹ NERC also requests that the proposed definitions for the definitions of Reporting ACE, Actual Frequency, Actual Net Interchange, Schedule Net Interchange, Interchange Meter Error, and ATEC become effective immediately after the July 1, 2016 effective date of Reliability Standard BAL-001-2 to ensure proper coordination of the proposed definitions and Reliability Standard BAL-001-2.⁴² Finally, NERC requests that the proposed definitions for AGC, Pseudo-Tie, and Balancing Authority

⁴¹ *Supra* n. 55.

⁴² *See*, BAL-005-1 Implementation Plan, attached hereto as **Exhibit D**. This Implementation Plan reflects the SDT's intent to supersede the "Reporting ACE" definition approved in Order No. 810, *supra* n. 9, P 43 (2015). As explained above in note 8, the SDT intended that the definition of "Reporting ACE" approved in Order No. 810 never take effect. The definition of "Reporting ACE" approved in Order No. 810 may, however, be in effect for some limited period of time while this filing and the proposed definitions under NERC's Proposal are pending.

become effective upon the effective date for Reliability Standard BAL-005-1. These effective dates will ensure coordinated implementation of NERC's proposed revisions, avoid reliability gaps, and effect a seamless transition to NERC's Proposal.

VI. CONCLUSION

For the reasons set forth above, NERC respectfully requests approval of NERC's Proposal regarding (i) proposed Reliability Standards BAL-005-1 and FAC-001-3, proposed NERC Glossary Definitions, and other associated elements in **Exhibits A and B** (the proposed NERC Glossary definitions are set forth in **Exhibit D**); (ii) the Implementation Plans for BAL-005-1 and FAC-001-3 in **Exhibits D, E, and F**; (iii) the VRFs and VSLs in **Exhibits G and H**; (iv) and retirement of currently effective Reliability Standards BAL-005-0.2b, FAC-001-2, and BAL-006-2 (proposed retirement of BAL-006-2 is shown in **Exhibit C**).

Respectfully submitted,

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Date: May 3, 2016

EXHIBITS A – L and N – O

(Available on the NERC Website at

<http://www.nerc.com/FilingsOrders/ca/Canadian%20Filings%20and%20Orders%20DL/ALL%20Exhibits%20Combined.pdf>)

Exhibit M

Reliability Standards Criteria

The discussion below explains how the 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 proposed Reliability Standards BAL-005-1 and FAC-001-3, attached as **Exhibit A** and **Exhibit B**, respectively, achieve specific reliability goals using sound methods to achieve those goals. First, Reliability Standard BAL-005-1 accomplishes the goal of “establishing requirements for acquiring data necessary to calculate Reporting Area Control Error (Reporting ACE)” and specifying “a minimum periodicity, accuracy, and availability requirement for acquisition of the data and for providing the information to the System Operator.” The proposed standard accomplishes that goal by identifying all information necessary to calculate Reporting ACE so that the balancing of resources and demand can be achieved under Tie-Line Bias Control and requiring applicable entities to acquire that information for those calculations. Second, proposed Reliability Standard FAC-001-3 accomplishes the goal of avoiding “adverse impacts on the reliability of the Bulk Electric System, Transmission Owners and applicable Generator Owners.” The proposed standard accomplishes this goal by setting forth interconnection requirements for each entity that has Facility interconnection requirements.

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.

Proposed Reliability Standards BAL-005-1 and FAC-001-3 are clear and unambiguous as to what is required and who is required to comply.

The proposed Reliability Standards clearly articulate the actions that such entities must take to comply with the standard, each of which are triggered by specific actions and situations. Further, each requirement of the proposed Reliability Standards clearly states who is required to comply with that requirement. Proposed Reliability Standard BAL-005-1 applies to Balancing Authorities, and proposed Reliability Standard FAC-001-3 applies to Transmission Owners and Applicable Generator Owners. As defined in the Applicability section of the standard document, attached herein as **Exhibit B**, an Applicable Generator Owner is a “Generator Owner with a fully executed Agreement to conduct a study on the reliability impact of interconnecting a third party Facility to the Generator Owner’s existing Facility that is used to interconnect to the Transmission system.”

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 Factors (“VRF”) and Violation Severity Levels (“VSL”) for proposed Reliability Standards BAL-005-1 and FAC-001-3, attached as **Exhibit G** and **Exhibit H**, respectively, comport with NERC and FERC guidelines related to their assignment. The assignment of the severity level for each VSL is consistent with the corresponding Requirement and the VSLs should 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 Standards include clear and 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 non preferential manner.

Proposed Reliability Standard BAL-005-1 contains seven measures that support each of the seven requirements by clearly identifying what is required to demonstrate compliance and how each Requirement will be enforced. The Measures are as follows:

M1. Each Balancing Authority will have dated documentation demonstrating that the data necessary to calculate Reporting ACE was designed to be scanned at a rate of no more than six seconds. Acceptable evidence may include historical data, dated archive files; or data from other databases, spreadsheets, or displays that demonstrate compliance.

M2. Each Balancing Authority will have dated records to show when it was unable to calculate Reporting ACE for more than 30 consecutive minutes and that it notified its Reliability Coordinator within 45 minutes of the beginning of the inability to calculate Reporting ACE. Such evidence may include, but is not limited to, dated voice recordings, operating logs, or other communication documentation.

M3. The Balancing Authority shall have evidence such as dated documents or other evidence in hard copy or electronic format showing the frequency metering equipment used for the calculation of Reporting ACE had a minimum availability of 99.95% for each calendar year and had a minimum accuracy of 0.001 Hz to demonstrate compliance with Requirement R3.

M4. Each Balancing Authority Area shall have evidence such as a graphical display or dated alarm log that provides indication of data validity for the real-time Reporting ACE based on both the calculated result and all of the associated inputs therein.

M5. Each Balancing Authority will have dated documentation demonstrating that the system necessary to calculate Reporting ACE has a minimum availability of 99.5% for each calendar year. Acceptable evidence may include historical data, dated archive files; or data from other databases, spreadsheets, or displays that demonstrate compliance.

M6. Each Balancing Authority shall have a current Operating Process meeting the provisions of Requirement R6 and evidence to show that the process was implemented, such as dated communications or incorporation in System Operator task verification.

M7. The Balancing Authority shall have dated evidence such as voice recordings or transcripts, operator logs, electronic communications, or other equivalent evidence that will be used to demonstrate a common source for the components used in the calculation of Reporting ACE with its Adjacent Balancing Authority.

Proposed Reliability Standard FAC-001-3 contains four measures that support each of the four requirements by clearly identifying what is required to demonstrate compliance and how each Requirement will be enforced. The Measures are as follows:

M1. Each Transmission Owner shall have evidence (such as dated, documented Facility interconnection requirements) that it met all requirements in Requirement R1.

M2. Each applicable Generator Owner shall have evidence (such as dated, documented Facility interconnection requirements) that it met all requirements in Requirement R2.

M3. Each Transmission Owner shall have evidence (such as dated, documented Facility interconnection requirements addressing the procedures) that it met all requirements in Requirement R3.

M4. Each applicable Generator Owner shall have evidence (such as dated, documented Facility interconnection requirements addressing the procedures) that it met all requirements in Requirement R4.

The above excerpted Measures work in coordination with the respective Requirements to ensure that the Requirements will each be enforced in a clear, consistent, and non-preferential 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 Standards achieve the reliability goals effectively and efficiently. Proposed Reliability Standard BAL-005-1 improves reliability by establishing specific requirements for Balancing Authorities for acquiring necessary data for calculating Reporting ACE so that balancing of resources and demand can be achieved under Tie-Line Bias Control. In an effort to consolidate standards, proposed BAL-005-1 includes a requirement from currently effective Reliability Standard BAL-006-2 related to calculating Reporting ACE. Because the other requirements in BAL-006-2 relate to commercial practices and are not appropriate for a NERC Reliability Standard, BAL-006-2 is proposed for retirement. Finally, proposed Reliability Standard FAC-001-3 improves reliability by setting forth all interconnection requirements that require applicable entities to confirm that all Facilities being interconnected to the Bulk Electric System are within a Balancing Authority Area’s metered boundaries.

While both of the proposed standards achieve the respective reliability goals effectively and efficiently, these do not reflect “best practices” that do not take into account implementation cost or historical regional infrastructure design. Rather, the standard drafting team developing these standards considered all factors relevant to creating effective, efficient Reliability Standards.

- 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 Standards and definitions do not reflect a “lowest common denominator” approach. To the contrary, the proposed Reliability Standards represent a significant improvement over the previous versions as described herein because the proposed standards streamline requirements, improve language in currently effective standards, and add requirements needed to ensure proper calculation of Reporting ACE.

- 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 Standards and definitions apply throughout North America and do 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 Standards have no undue negative impact on competition. The proposed Reliability Standards require the same performance by each applicable entity. The

standards do not unreasonably restrict the available transmission capability or limit use of the Bulk-Power System in a preferential manner.

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

The proposed effective dates for the proposed Reliability Standards are just and reasonable and appropriately balance the urgency in the need to implement the standards against the reasonableness of the time allowed for those who must comply to develop necessary procedures, software, facilities, staffing or other relevant capability. The proposed Implementation Plan, attached as **Exhibit D, E, and F**, will allow applicable entities adequate time to ensure compliance with the requirements.

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

The proposed Reliability Standards and definitions were developed in accordance with NERC's ANSI- accredited processes for developing and approving Reliability Standards.

Exhibit N includes a summary of the Reliability Standard development proceedings, and details the processes followed to develop the standard.

These processes included, among other things, multiple comment periods, pre-ballot review periods, and balloting periods. Additionally, all meetings of the drafting team were properly noticed and open to the public. The initial and recirculation ballots both achieved a quorum and exceeded the required ballot pool approval levels.

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

NERC has identified no competing public interests regarding the request for approval of these proposed Reliability Standards and definitions. No comments were received that indicated the proposed Standards conflict with other vital public interests.

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

No other negative factors relevant to whether the proposed Reliability Standards are just and reasonable were identified.