

November 17, 2016

VIA ELECTRONIC FILING

Ms. Erica Hamilton, Commission Secretary
British Columbia Utilities Commission
Box 250, 900 Howe Street
Sixth Floor
Vancouver, B.C.
V6Z 2N3

Re: *North American Electric Reliability Corporation*

Dear Ms. Hamilton:

The North American Electric Reliability Corporation hereby submits Notice of Filing of the North American Electric Reliability Corporation of Retirement of Reliability Standard BAL-004-0. 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 concerning this filing.

Respectfully submitted,

/s/ Shamai Elstein

Shamai Elstein
*Senior Counsel for the North American Electric
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Enclosure

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**BEFORE THE
BRITISH COLUMBIA UTILITIES COMMISSION
OF THE PROVINCE OF BRITISH COLUMBIA**

**NORTH AMERICAN ELECTRIC)
RELIABILITY CORPORATION)**

**NOTICE OF FILING OF THE NORTH AMERICAN ELECTRIC RELIABILITY
CORPORATION
OF RETIREMENT OF RELIABILITY STANDARD BAL-004-0**

The North American Electric Reliability Corporation (“NERC”) respectfully provides notice of retirement of Reliability Standard BAL-004-0 (*Time Error Correction*) and the associated Implementation Plan (Exhibit B). This proposal is consistent with the Federal Energy Regulatory Commission’s (“FERC”) March 2012 Order and NERC’s resulting Paragraph 81 Criteria (Exhibit A),¹ the 2013 Periodic Review Team (“PRT”) Recommendations (Exhibit C-2), and the 2013 Independent Expert Review Report.² In particular, NERC’s proposed retirement of BAL-004-0 reflects findings that Reliability Standard BAL-004-0 has become redundant and ineffective for supporting reliability of the Bulk-Power System (“BPS”), with more recent Reliability Standards managing continued adherence to frequency approximating 60 Hertz over long-term averages. As demonstrated in this filing, Reliability Standard BAL-004-0 can be retired with little or no effect on reliability and with an increase in efficiency in the NERC compliance program. The NERC Board of Trustees approved the proposal to retire Reliability Standard BAL-004-0 on November 2, 2016.

¹ *North American Electric Reliability Corporation*, 138 FERC ¶ 61,193, at P 81 (“March 2012 Order”), *order on reh’g and clarification*, 139 FERC ¶ 61,168 (2012); and *Notice of Filing of the North American Electric Reliability Corporation of Retirement of Requirements in Reliability Standards*, , at Exhibit A (“Paragraph 81 Criteria”) (filed March 19, 2013), attached hereto as Exhibit A.

² *Standards Independent Experts Review Project, An Independent Review by Industry Experts*, at p. 26, Appendix E (“Independent Expert Review Report”) (June 2013), *available at*, http://www.nerc.com/pa/Stand/Standards%20Development%20Plan%20Library/Standards_Independent_Experts_Review_Report.pdf.

This filing presents the technical basis for retirement of Reliability Standard BAL-004-0. Technical documentation includes (i) the Standard Drafting Team (“SDT”) White Paper for Project No. 2010-14.2.2 *Phase 2 of Balancing Authority Reliability-based Controls* (Exhibit C-1); (ii) the PRT Recommendations for Project 2010-14.2 *Periodic Review of BAL Standards* (Exhibit C-2); (iii) the NERC Operating Committee (“OC”) approved *Manual Time Error Correction Reference Document* intended to support retirement of BAL-004-0 (Exhibit C-3); and (iv) a summary of the development history (Exhibit D). The retirement of Reliability Standard BAL-004-0 is just, reasonable, not unduly discriminatory or preferential, and in the public interest, for the reasons discussed herein.

I. EXECUTIVE SUMMARY

Reliability Standard BAL-004-0 is intended to ensure that manual Time Error Correction (“TEC”) helps manually maintain frequency at approximately 60 Hertz in a manner that does not adversely affect reliability. However, the SDT determined that manual TEC does not materially support reliability of the BPS and that conducting manual TEC is inconsistent with NERC Reliability Principle 2 as most recently articulated in the Independent Expert Review Report.³ The SDT’s conclusions align with the 2013 PRT’s recommendations regarding BAL-004-0 and the 2013 Independent Expert Review Report examining the standard as part of the Independent Experts Review Project. In addition, since Reliability Standard BAL-004-0 became effective, improvements have been made to mandatory Reliability Standards (such as the development of Reliability Standards BAL-003-1.1 and BAL-001-2 and the Interconnection Reliability Operations and Coordination (“IRO”) Standards) that help ensure continued adherence to

³ See, Independent Expert Review Report, at Appendix B (providing the updated list of Reliability Principles). NERC Reliability Principle 2, states that “frequency and voltage of interconnected bulk power systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.”

frequency approximating 60 Hertz over long-term averages and make BAL-004-0 redundant.⁴

Retiring Reliability Standard BAL-004-0 would, therefore, be “consistent with the Commission’s policy promoting increased efficiencies in Reliability Standards and reducing requirements that are either redundant with other currently-effective requirements or have little reliability benefit.”⁵

Where approval by an applicable governmental authority is required, Reliability Standard BAL-004-0 shall be retired effective on the later of (i) the first day of the first calendar quarter after the effective date of the applicable governmental authority’s order approving retirement, (ii) the effective date of retirement/reservation of North American Energy Standard Board (“NAESB”) WEQ-006 Manual Time Error Correction Business Practice Standard (“NAESB WEQ-006”)⁶, or (iii) or as otherwise provided for by the applicable governmental authority.

Where approval by an applicable governmental authority is not required, the standard shall be retired effective the later of (i) the first day of the first calendar quarter after the date retirement of the standard is adopted by the NERC Board of Trustees, (ii) the effective date of NAESB standard WEQ-006 retirement, or (iii) as otherwise provided for in that jurisdiction. NERC’s proposal is conditioned upon retirement of NAESB WEQ-006 to avoid uncoordinated manual TEC. NERC understands that NAESB’s effort regarding proposed retirement of NAESB WEQ-006 is underway and NAESB will make an informational filing to FERC following the completion of its standards development process. The OC approved reference document (Exhibit C-3) will further help ensure smooth retirement of BAL-004-0 and avoid uncoordinated manual TEC. Therefore, the retiring Reliability Standard BAL-004-0 and the related

⁴ Time Error is created when an Interconnection operates on the aggregate at a frequency different than the intended 60 Hertz or cycles. Manual TEC manually places the Interconnection closer to the appropriate frequency through an offset to the frequency schedule as requested by an Interconnection Time Monitor

⁵ *Transmission Operations Reliability Standards and Interconnection Reliability Operations and Coordination Reliability Standards*, Order No. 817, 153 FERC ¶ 61,178, at P 2 (2015). *See also, id.* at PP 13-14.

⁶ The NAESB process uses the term reservation, in lieu of retirement.

Implementation Plan are just, reasonable, not unduly discriminatory or preferential, and in the public interest.

II. NOTICES AND COMMUNICATIONS

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III. BACKGROUND

A. Paragraph 81 Criteria

In March of 2012, FERC stated that, “[i]f NERC believes that specific Reliability Standards or specific requirements within certain Standards should be revised or removed, we invite NERC to make specific proposals to the Commission identifying the Standards or requirements and setting forth in detail the technical basis for its belief.”⁷ Consistent with the March 2012 Order, NERC provided notice of retirement of 34 requirements within 19 Reliability Standards (the “P 81 Project”).⁸ The P 81 Project developed three criteria (comprised of several questions and subcriteria shown in Exhibit A) to help identify candidates for retirement. The Paragraph 81 Criteria are as follows:

(1) Criterion A: an overarching criteria designed to determine that there is no reliability gap created by the proposed retirement; (2) Criterion B: consists of

⁷ March 2012 Order, at P 81.

⁸ *Notice of Filing of the North American Electric Reliability Corporation of Retirement of Requirements in Reliability Standards*, (filed March 19, 2013).

seven separate identifying criteria designed to recognize requirements appropriate for retirement (administrative; data collection/data retention; documentation; reporting; periodic updates; commercial or business practice; and redundant); and (3) Criterion C: consists of seven separate questions designed to assist...an informed decision whether requirements are appropriate to propose for retirement.⁹

In Order No. 788, approving the retirements proposed under the P 81 Project, FERC, “concluded that the requirements identified by NERC for retirement satisfy[ied] the expectations set forth in the March 2012 Order; namely, the requirements proposed for retirement either: (1) provide little protection for Bulk-Power System reliability or (2) are redundant with other aspects of the Reliability Standards.”¹⁰ FERC added:

We agree with commenters that NERC should continue the process of identifying additional Reliability Standards and requirements as candidates for retirement or streamlining. We support NERC’s continuing efforts in this regard. Efficiencies can be gained from further consolidation or retirement of some requirements or components of requirements that are justified based on technical analysis of either existing requirements, new proposed requirements or modifications. Such analyses would take into account the interrelationship between standards and among categories of standards, in order to determine that when retirements or consolidations are made the reliability benefits of the currently effective requirements would be preserved.¹¹

As a result, NERC continues to consider the Paragraph 81 Criteria during periodic reviews and standard development projects.

B. NERC Reliability Standards Development Procedure

The proposal to retire BAL-004-0 was developed in an open and fair manner and in accordance with the Reliability Standard development process. NERC develops Reliability

⁹ *Notice of Proposed Rulemaking Electric Reliability Organization Proposal to Retire Requirements in Reliability Standards*, 143 FERC ¶ 61,251, at P 8 (2013); *and id.* at P 9 (highlighting the seven questions, including Question C5: “Is there a possible negative impact on NERC’s published and posted reliability principles?”). *See also*, *Electric Reliability Organization Proposal to Retire Requirements in Reliability Standards*, Order No. 788, 145 FERC ¶ 61,147, at PP 7 and 21 (2013); *and* Paragraph 81 Criteria, attached hereto as Exhibit A.

¹⁰ Order No. 788, at P 18. *See also*, *Transmission Operations Reliability Standards and Interconnection Reliability Operations and Coordination Reliability Standards*, Order No. 817, 153 FERC ¶ 61,178, at P 2 (2015).

¹¹ Order No. 788, at P 20.

Standards (including modification or retirement of standards) in accordance with Section 300 (Reliability Standards Development) of its Rules of Procedure and the NERC Standard Processes Manual.¹² Retirement also considers the Paragraph 81 Criteria discussed above in Section III.B.

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 BPS. NERC considers the comments of all stakeholders. Pursuant to these procedures, stakeholders and the NERC Board of Trustees must approve retirement of a Reliability Standard before that retirement is submitted to applicable governmental authorities.¹³

IV. JUSTIFICATION FOR PROPOSED RETIREMENT

Below is (a) the text of the Requirements in Reliability Standard BAL-004-0 proposed for retirement, (b) the procedural history associated with NERC's proposal to retire the Reliability Standard, and (c) the technical justification to support retirement of Reliability Standard BAL-004-0.

A. Reliability Standard BAL-004-0, Proposed For Retirement

R1. Only a Reliability Coordinator shall be eligible to act as Interconnection Time Monitor. A single Reliability Coordinator in each Interconnection shall be designated by the NERC Operating Committee to serve as Interconnection Time Monitor.

R2. The Interconnection Time Monitor shall monitor Time Error and shall initiate or terminate corrective action orders in accordance with the NAESB Time Error Correction Procedure.

R3. Each Balancing Authority, when requested, shall participate in a Time Error

¹² 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.

¹³ See e.g., the NERC *Standards Processes Manual*, at Section 4.19.

Correction by one of the following methods:

R3.1. The Balancing Authority shall offset its frequency schedule by 0.02 Hertz, leaving the Frequency Bias Setting normal; or

R3.2. The Balancing Authority shall offset its Net Interchange Schedule (MW) by an amount equal to the computed bias contribution during a 0.02 Hertz Frequency Deviation (i.e. 20% of the Frequency Bias Setting).

R4. Any Reliability Coordinator in an Interconnection shall have the authority to request the Interconnection Time Monitor to terminate a Time Error Correction in progress, or a scheduled Time Error Correction that has not begun, for reliability considerations.

R4.1. Balancing Authorities that have reliability concerns with the execution of a Time Error Correction shall notify their Reliability Coordinator and request the termination of a Time Error Correction in progress.

B. Procedural History

This section summarizes the history of (1) Reliability Standard BAL-004-0 and (2) projects resulting in NERC's proposal to retire Reliability Standard BAL-004-0.

1. History of Reliability Standard BAL-004-0

Time Error is created when an Interconnection operates on the aggregate at a frequency different than the intended 60 Hertz or cycles.¹⁴ Manual TEC manually places the Interconnection closer to 60 Hertz and to settings for automatic underfrequency load shedding or generator tripping intended to address frequency deviations (such as declining frequency).¹⁵ As noted above, NAESB developed a business practice standard to correct for Time Error, and Interconnection Time Monitors are currently responsible for monitoring Time Error in accordance with NAESB standards and initiating corrective procedures. Reliability Standard

¹⁴ The NERC Glossary defines Time Error as, "The difference between the Interconnection time measured at the Balancing Authority(ies) and the time specified by the National Institute of Standards and Technology. Time error is caused by the accumulation of Frequency Error over a given period."

¹⁵ An interconnected electric power system balances load and generation in order to maintain frequency within a reliable range.

BAL-004-0 was created to help ensure coordinated manual TEC. At that time, the Reliability Standards discussed in Section IV.C that manage adherence to frequency at approximately 60 Hertz were not in effect.¹⁶

As excerpted in Section IV.A above, Reliability Standard BAL-004-0 states that Balancing Authorities (“BAs”) must offset their frequency schedule, when requested by an Interconnection Time Monitor. The Reliability Standard provides that only Reliability Coordinators (“RCs”) may act as Interconnection Time Monitors and that any RC may request termination of a TEC in progress or scheduled. In Order No. 693, FERC approved Reliability Standard BAL-004-0.¹⁷ FERC also directed NERC to (i) develop additional Measures and add Levels of Non-Compliance; and (ii) consider alternatives to manual TEC.¹⁸ As discussed in Section IV.C, retiring BAL-004-0 would address these directives, through elimination of redundant and inefficient requirements in favor of newer standards.

Reliability Standard BAL-004-0 has been implemented since 2007.¹⁹ After Order No. 693, NERC proposed revisions to Reliability Standard BAL-004-0 but withdrew this proposal after FERC’s 2010 NOPR, as further examination determined that the proposed revisions were unnecessary.²⁰ Therefore, since 2007, BAL-004-0 continued in effect, subject to ongoing review

¹⁶ The NERC Glossary defines Time Error Corrections as, “An offset to the Interconnection’s scheduled frequency to return the Interconnection’s Time Error to a predetermined value.”

¹⁷ *Mandatory Reliability Standards for the Bulk-Power System*, Order No. 693, 72 Fed. Reg. 16416, FERC Stats. & Regs. ¶ 31,242, PP 382-386, *order on reh’g*, Order No. 693-A, 120 FERC ¶ 61,053 (2007).

¹⁸ *See* Order No. 693, at PP 382-385.

¹⁹ There is also one Regional Reliability Standard BAL-004-WECC-1 (*Automatic Time Error Correction*). This filing does not propose any change to Regional Reliability Standard BAL-004-WECC 1.

²⁰ *See, Notice of Withdrawal of the North American Electric Reliability Corporation of BAL-004-1 - Time Error Correction*, at p. 2 (filed March 19, 2013) (stating, “NERC has determined that these proposed changes to BAL-004-1 are unnecessary and therefore, NERC is providing notice of its withdrawal of the Petition for approval of BAL-004-1.”) (withdrawing the earlier filing that had led to the *Notice of Proposed Rulemaking re Time Error Correction Reliability Standard*, 130 FERC ¶ 61,201 (2010) (“2010 NOPR”)). Non-utility industry stakeholders also expressed confusion regarding the proposed revisions.

under the P 81 Project, Independent Expert Review Project, PRT review in Project No. 2010-14.2, and Project No. 2010-14.2.2 described immediately below.

2. Projects Resulting in the Proposal to Retire Reliability Standard BAL-004-0

a) Project No. 2010-14.2 – Periodic Review of BAL Standards

Upon NERC’s periodic review of BAL-004-0 under Project 2010-14.2 – *Periodic Review of BAL Standards*, the PRT recommended retirement of the standard based on its determination that manual TEC does not materially support reliability. The PRT explained that during the P 81 Project, the review team received three sets of comments suggesting retirement of Reliability Standard BAL-004-0. Further, the PRT highlighted that the 2013 Independent Expert Review Report found that Reliability Standard BAL-004-0 did not support reliability. The PRT determined that, “[t]he PRT agrees with the Independent Experts and many stakeholders that BAL-004-0 should be retired under Paragraph 81 criteria.”²¹

The PRT Recommendations determined that Reliability Standard BAL-004-0 satisfied Criteria A of the Paragraph 81 Criteria, “because it does not support reliable operation of the BES” and that it satisfied Criteria B as manual “TEC is a commercial practice that relates to the quality of power delivered, not a practice that supports reliability.”²² The PRT also concluded that Reliability Standard BAL-004-0 satisfied Criteria C of the Paragraph 81 Criteria, on the basis that the Reliability Standard (i) was not included in the 2014 Actively Monitored List for

²¹ *Project 2010-14.2 – Balancing Authority Reliability-based Controls 2 Periodic Review Template: BAL-004-0-Time Error Correction* (updated Apr. 28, 2014) (“PRT Recommendations”), attached hereto at Exhibit C-2, at p. 5 (summarizing, “The Independent Expert Review Report recommended retiring BAL-004-0 R1, R2, R3, and R4, primarily under Paragraph 81 principles.”). *See also, Notice of Filing of the North American Electric Reliability Corporation of Retirement of Requirements in Reliability Standards*, at Exhibit D (filed March 19, 2013); and Independent Expert Review Report, at p. 26, Appendix E (recommending the Reliability Standard BAL-004-0 Requirements for Retirement on the basis that each of these Requirements “does not support a reliability objective as defined by the Reliability Principles.”).

²² Exhibit C-2, PRT Recommendations, at p. 5.

either self-certification or audits; (ii) is inconsistent with NERC’s published and posted reliability principles (such as Principle 2 that “[t]he frequency and voltage of interconnected bulk power systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand”); and (iii) does not promote results or performance-based Reliability Standards.²³ As a result of its findings in Project No. 2010-14.2, the PRT prepared a Standard Authorization Request (“SAR”) for retirement.²⁴

**b) Project No. 2010-14.2.2 Phase 2 of Balancing Authority
Reliability-based Controls for Retirement of Reliability Standard
BAL-004-0**

The PRT Recommendations and SAR led to Project No. 2010-14.2.2, resulting in this filing. The SAR explained that:

As explained in the Independent Expert Review Project report, the industry and FERC have expressed concern that a significant number of NERC requirements do not contribute materially to the reliability of the Bulk-Power System. When NERC maintains requirements that do not contribute materially to reliability, registered entities may lose focus on the most critical matters that can adversely impact reliability and resources are diverted from higher priority activities. Standards that do not contribute to reliability should be retired.²⁵

Therefore, the SAR proposed “to retire a standard that does not contribute materially to reliability.”

²³ *Id.* (explaining, “BAL-004-0 also satisfies Criteria C4, C5, and C7. With respect to C4, the 2014 Actively Monitored List does not include BAL-004-0 for either self-certification or audits. With respect to C5, there is a possible negative impact on NERC’s published and posted reliability principles. For instance, slowing the clock for a manual TEC in the Eastern Interconnection brings the Interconnection slightly closer to the first step of Underfrequency Load Shedding, which contradicts Principle 2, which states that ‘The frequency and voltage of interconnected bulk power systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.’ Finally, with respect to C7, BAL-004-0 does not promote results- or performance-based Reliability Standards.”).

²⁴ PRT Recommendations.

²⁵ *See*, SAR, at p.1-2, attached hereto within Exhibit D.

Comments on the SAR indicated industry support for retiring BAL-004-0, however it was unclear whether industry supported maintaining or eliminating manual TEC.²⁶ The SDT requested further comment on this issue, as FERC previously clarified that while TEC may not be necessary to ensure reliability, if TEC is performed, it is important to ensure that manual TEC is performed in a way that does not adversely affect reliability.²⁷ As a result, the SDT asked whether stakeholders supported either (i) maintaining the ability to implement manual TEC, or (ii) preferred to eliminate the Reliability Standard and ability to implement manual TEC. The majority of responses supported retirement of BAL-004-0 and manual TEC.

Through its review, the SDT also affirmed the PRT's findings that manual TEC would not support reliability of the BPS and that conducting manual TEC in any form operates in tension with NERC Reliability Principle 2.²⁸ Further, the SDT confirmed that current, or soon to be effective, Reliability Standards would manage continued adherence to a frequency approximating 60 Hertz over long-term averages. This technical justification is detailed in

²⁶ See, Unofficial Survey Form Project 2010-14.2.2 Phase 2 of Balancing Authority Reliability-based Controls: Time Error Correction (posted Aug. 12, 2015), *available at*, http://www.nerc.com/pa/Stand/Project%2020101422%20Phase%202%20of%20BARC%20%20BAL004%20DL/Unofficial_Survey_Form_2010-14_2_2_BAL-004-20150812.docx (“2015 Survey”); *and* Results, at http://www.nerc.com/pa/Stand/Project%2020101422%20Phase%202%20of%20BARC%20%20BAL004%20DL/Comments_Received_Report_08262015.pdf.

²⁷ Order No. 693, at P 383 (stating, “[m]any commenters aver that the time error correction procedure belongs within the realm of NAESB and is not a reliability issue. The Commission disagrees, as BAL-004-0 is intended to ensure that time error corrections are performed in a manner that does not adversely affect the reliability of the Interconnection...”); *and* 2010 NOPR, at PP 25 and 27 (stating, “[i]n Order No. 693, we disagreed with arguments that Time Error Correction is really more a NAESB business practice. Rather, we stated that the Time Error Correction Reliability Standard is intended to ensure that Time Error Corrections are performed in a manner that does not adversely affect reliability, and the technical details, including the means to carry out the procedure, are a reliability issue....”).

²⁸ See, PRT Recommendations, at p. 5; *Standards Announcement*, Project 2010-14.2.2 Phase 2 of Balancing Authority Reliability-based Controls Recommended Retirement of BAL-004-0, *available at*, http://www.nerc.com/pa/Stand/Project%2020101422%20Phase%202%20of%20BARC%20%20BAL004%20DL/2010-14.2.2_Phase_2_of_BARC_CP_BP_IB_Word_Announce_09242015.pdf; *and* Time Error Correction and Reliability White Paper, *Recommendation of the Balancing Authority Reliability-based Controls 2.2 Standard Drafting Team to Retire BAL-004-0 – Time Error Correction*, (Sept. 24, 2015) (“White Paper”), attached hereto, as Exhibit C-1.

Section IV.C below. As a result of its findings, the SDT proposed to retire Reliability Standard BAL-004-0, conditioned upon retirement of the NAESB WEQ-006. This proposal met with approximately 98% industry approval.²⁹

C. Justification for Retirement of Reliability Standard BAL-004-0

Retiring Reliability Standard BAL-004-0 is just, reasonable, not unduly discriminatory or preferential, and in the public interest. The purpose of Reliability Standard BAL-004-0 is “to ensure that Time Error Corrections are conducted in a manner that does not adversely affect the reliability of the Interconnection.” However, as discussed in in Section IV.B.2 above and detailed in this Section IV.C, the Independent Expert Review Report, the PRT, and the SDT each determined that manual TEC does not materially support reliability of the BPS, BAL-004-0 falls within Paragraph 81 Criteria, and BAL-004-0 has been superseded by newer standards. As a result, BAL-004-0 should be retired. Moreover, in September 2016, the OC approved a manual TEC reference document, to ensure that any manual TEC determined necessary is performed in a coordinated manner and thereby assuage any potential remaining concerns regarding retirement.

1. Reliability Standard BAL-004-0 and Manual TEC Do Not Materially Contribute to Reliability

Building on the Independent Expert and PRT analyses, the SDT determined that the practice of manual TEC does not significantly support or enhance reliability. The SDT instead, “maintain[ed] that elimination of manual TEC will allow each Interconnection to be operated closer to the design frequency of 60 Hertz more often, by avoiding the over-corrections that arise in manual TEC accomplished under BAL-004-0 and NAESB WEQ-006.”³⁰ Moreover, the SDT confirmed that conducting manual TEC in any form is inconsistent with NERC Reliability

²⁹ See, Exhibit D.

³⁰ Exhibit C-1, White Paper, at Section III.A; and *id.* at Section III.D.

Principle 2 that “[t]he frequency and voltage of interconnected bulk power systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.” As a result, while the SDT considered alternatives to retirement of BAL-004-0 and alternative methods of manual TEC, it ultimately found, “that [the alternatives] would not support reliability of the BPS. Conducting manual TEC in any form directly contradicts NERC Reliability Principle 2....”³¹

The SDT was also concerned that availability of manual TEC under BAL-004-0 and NAESB WEQ-006 might inadvertently contribute to the hazards of a free rider problem and excessive over-correction, where multiple BAs might collectively correct Time Error caused by a single entity. Thus, the SDT affirmed that Reliability Standard BAL-004-0 has a negative impact on published and posted reliability principles, contrary to Paragraph 81 Criteria.³²

2. Other Reliability Standards Established Since Order No. 693 Render Reliability Standard BAL-004-0 Redundant

In addition, the SDT confirmed that Reliability Standard developments since Order No. 693 render Reliability Standard BAL-004-0 redundant. In particular, upon retirement of BAL-004-0 and NAESB WEQ-006, compliance with the requirements in Reliability Standards BAL-003-1.1 and BAL-001-2 would result in continued adherence to a frequency approximating 60 Hertz over long-term averages.³³ This supports retirement and helps ensure that retirement does

³¹ Exhibit C-1, White Paper, at Section III.F. *See also, id.* at Appendix II (providing details regarding concerns that arose during the SDT’s review of alternative methods, such as how they could make performance measurements that rely on ACE unreliable and ineffectiveness).

³² *Supra*, n. 5.

³³ *See, Standards Announcement*, Project 2010-14.2.2 Phase 2 of Balancing Authority Reliability-based Controls Recommended Retirement of BAL-004-0, *available at*, http://www.nerc.com/pa/Stand/Project%2020101422%20Phase%20%20of%20BARC%20%20BAL004%20DL/2010-14.2.2_Phase_2_of_BARC_CP_BP_IB_Word_Announce_09242015.pdf; and Exhibit C-1, White Paper, at Section III.A. *See also*, Whitepaper, at Appendix I (demonstrating general decline in manual TECs, which the Standard Drafting Team interpreted as further demonstration that Reliability Standard BAL-004-0 was redundant).

not give rise to a gap in Reliability Standards. The SDT's consideration of alternatives and newer standards was also consistent with FERC's directive in Order No. 693 regarding consideration of alternatives to BAL-004-0's manual TEC.³⁴

As noted above, Reliability Standards BAL-003-1.1 and BAL-001-2 work together to help ensure that frequency approximates 60 Hertz, consistent with the design of the North American BPS. Reliability Standard BAL-003-1.1, for example, now requires sufficient Frequency Response from the BA to maintain Interconnection Frequency within predefined bounds by arresting frequency deviations and supporting frequency until frequency is restored to scheduled value. The White Paper explains that this ensures that each Interconnection has sufficient Frequency Response to guard against underfrequency load shedding due to a credible event.³⁵

Reliability Standard BAL-001-2, effective July 1, 2016, applies long-term and short-term Requirements to control Interconnection Frequency within defined limits. Reliability Standard BAL-001-2 requires BAs to (i) consistently, over time, adjust generation to improve frequency of an Interconnection, and (ii) operate so that the BA's clock-minute average of Reporting Area Control Error ("ACE") does not exceed its clock minute BA ACE limit for more than 30 consecutive clock-minutes. The White Paper explains that BAL-001-2 combines frequency and ACE information to provide operators immediate feedback to make corrections to return frequency within frequency trigger limits.³⁶ As a result, BAL-003-1.1 and BAL-001-2 would continue helping to maintain frequency on average at 60 Hertz and sufficient frequency response to guard against underfrequency load shedding, after retirement of BAL-004-0. This would

³⁴ Order No. 693, at PP 382 and 385.

³⁵ Exhibit C-1, White Paper, at Section III.E.

³⁶ *Id.*

prevent any gap in reliability arising from retirement of BAL-004-0 and present effective alternatives to manual TEC.

As other Reliability Standards modified since Order No. 693 further support frequency at 60 Hertz on average, BAL-004-0 is redundant and appropriate for retirement. For example, RCs monitor frequency as part of monitoring System Operating Limits (“SOLs”) and Interconnection Reliability Operating Limits (“IROLs”).³⁷ The IRO and Transmission Operations (“TOP”) Reliability Standards are also intended to ensure coordination among RCs.³⁸ Thus, consistent with Order No. 788, reliability benefits associated with adherence to frequency approximating 60 Hertz will continue upon retirement of BAL-004-0, when taking into account interrelationships between continuing Reliability Standards and categories of Reliability Standards.

3. Empirical Data Supports Determinations that Reliability Standard BAL-004-0 Has Little Effect on Reliability and Has Become Redundant

Data appended to the White Paper demonstrates that the level of manual TEC has fallen significantly over the past ten years. This may be additional evidence that BAL-004-0 is redundant and the little effect that BAL-004-0 has on reliability.³⁹ The SDT also identified that:

[D]ata shows that the one-minute frequency varies from a value of about 59.95 Hz to 60.05 Hz for the great majority of the time, over 99% of the one-minute

³⁷ See e.g. Reliability Standards IRO-005-3.1a (in effect) and IRO-002-4 (to become effective April 1, 2017), *Notice of Filing of the North American Electric Reliability Corporation of Proposed Transmission Operations and Interconnection Reliability Operations and Coordination Reliability Standards*, filed March 25, 2015; see also *Transmission Operations Reliability Standards and Interconnection Reliability Operations and Coordination Reliability Standards*, Order No. 817, 153 FERC ¶ 61,178 (2015).

³⁸ See, *Transmission Operations Reliability Standards and Interconnection Reliability Operations and Coordination Reliability Standards*, Order No. 817, 153 FERC ¶ 61,178, at P 7 (2015) (discussing NERC’s explanation of how the IRO and TOP Reliability Standards help ensure reliability coordinators and transmission operators work together and with other functional entities to operate the BES within SOLs and IROLs and summarizing that “[t]he proposed IRO Reliability Standards, which complement the proposed TOP Standards, are designed to ensure that the bulk electric system is planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions.”).

³⁹ Exhibit C-1, White Paper, at Section III.B and Appendix I (including graphs that show the reduction in manual TEC). Other factors contributing to the downward trend could include the national economic environment and tools that better indicate performance.

intervals...the Frequency error that the interconnections experience is less than one tenth of one percent. The elimination of TEC will have no significant effect on these error distributions, although it will move them slightly right or left so that the average error is slightly above or below 60 Hz. Time error correction has historically been implemented by offsetting the scheduled frequency by 0.02 Hz above or below the normal frequency of 60 Hz. This scheduled offset moves the distribution closer to the relay limits for the interconnection, thus having a detrimental effect on reliability.⁴⁰

This supports determinations that BAL-004-0 has had little effect in ensuring reliability and that retirement should have little impact on (and could improve) reliability.

4. Retirement Should Not Impact Accumulation of Inadvertent Interchange

Further, the SDT determined that eliminating manual TEC is not expected to impact accumulation of Inadvertent Interchange, since the two issues are not necessarily linked and each is influenced by multiple factors.⁴¹ Inadvertent Interchange is an imbalance of scheduled and actual energy at a BA's boundary in an Interconnection with other BAs, whereas Time Error relates to accumulated frequency drift of an Interconnection (related to imbalance between load and generation). Frequency drift is a result of Inadvertent Interchange. Therefore, BAL-004-0 may be retired without adversely impacting accumulation of Inadvertent Interchange.

5. Proposed Retirement is Conditioned on Retirement of the NAESB WEQ-006 Business Practice Standard

NERC emphasizes, however, that both the justification for retirement in this Section IV and NERC's proposal to retire BAL-004-0 are conditioned upon simultaneous retirement of NAESB-WEQ-006. NERC and the SDT have been coordinating with NAESB on this issue and submitted a request for retirement/reservation of NAESB WEQ-006. Based on discussions with NAESB, NERC understands that the NAESB standards development process regarding this

⁴⁰ *Id.* at Appendix I.

⁴¹ This relates to FERC's directive regarding consideration of alternative practices by addressing its question regarding an alternative practice might impact inadvertent interchange. Order No. 693, at P 385.

request is underway and that the NAESB subcommittee working on the request issued a recommendation in support on November 9, 2016. Following the completion of NAESB's standards development process, NAESB will make an informational filing with FERC which will include any applicable modifications to the NAESB WEQ Business Practice Standards.

Simultaneous retirement of NERC and NAESB's standards as necessary to ensure clarity and to avoid inadvertent, uncoordinated, manual TEC. Such coordinated retirement of the NERC and NAESB standards would also thereby address FERC's concern in Order No. 693 regarding uncoordinated manual TEC.⁴² The NERC OC approved manual TEC reference document (Exhibit C-3) is also intended to help ease the transition upon retirement of BAL-004-0 and assure the applicable governmental authorities and potential non-utility industry that if TEC is determined necessary, it will be performed in a coordinated and reliable manner.⁴³

As a result, consistent with FERC's March 2012 Order and policy regarding redundant Reliability Standards,⁴⁴ BAL-004-0 should be retired as proposed herein with little to no effect on reliability. Retirement should increase efficiency within Reliability Standards and allow Interconnections to be operated more closely to 60 Hertz, by reducing the risk of frequency over-corrections and inconsistencies of BAL-004-0 with other Reliability Standards managing frequency at 60 Hertz over long-term averages. Therefore, the retirement of Reliability Standard BAL-004-0, as proposed herein, is just, reasonable, and in the public interest.

⁴² *Supra*, n. 42.

⁴³ The reference document was posted for a 45-day comment period and approved by the NERC OC.

⁴⁴ *Supra*, n. 5-6 and 9.

V. **EFFECTIVE DATE**

The effective date of the retirement of Reliability Standard BAL-004-0 is provided for in the] Implementation Plan in Exhibit B. This effective date recognizes that NERC's proposal to retire Reliability Standard BAL-004-0 is conditioned on simultaneous retirement of NAESB WEQ-006.

Respectfully submitted,

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EXHIBITS A – E