UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

TIME ERROR CORRECTION RELIABILITY STANDARD	))	**Docket No. RM09-13-000**

COMMENTS OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION IN RESPONSE TO NOTICE OF PROPOSED RULEMAKING

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TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. NOTICES AND COMMUNICATIONS	2
III. BACKGROUND	2
a. Regulatory Framework	2
b. Basis for Approval of Additional Proposed Reliability Standards	3
c. Overview of Time Error and Time Error Correction	3
d. How Time Error Correction is Handled Today	7
IV. DISCUSSION	8
a. Summary	8
b. Concerns with Time Error Correction In General	9
c. Purpose of the Proposed Reliability Standard	14
d. The Commission's Proposed Standards Language for Requirement R2 Goes Beyond That Which is Required for Reliability	16
e. NERC and NAESB Are Coordinated in their Standards Development Efforts	19
V. CONCLUSION	20

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I. INTRODUCTION

The North American Electric Reliability Corporation ("NERC")[1] hereby provides these comments in response to the Federal Energy Regulatory Commission's ("FERC" or "the Commission") Notice of Proposed Rulemaking for the Time Error Correction Reliability Standard ("NOPR").[2] In this filing, NERC discusses Time Error and how Time Error Correction came into existence. Because of reliability concerns discussed in more detail below, NERC poses questions that need to be addressed by the Commission and the industry as a whole regarding the continued need for Time Error Correction. To that end, NERC proposes that the Commission convene a technical workshop to discuss the matter. Finally, NERC disagrees that the BAL-004-1 Reliability Standard should be more specific as to when Time Error Corrections should start and stop, and requests that FERC not direct that additional detail be included in the standard.

[1] The Federal Energy Regulatory Commission ("FERC" or "Commission") certified NERC as the electric reliability organization ("ERO") in its order issued on July 20, 2006 in Docket No. RR06-1-000. *North American Electric Reliability Corporation*, "Order Certifying North American Electric Reliability Corporation as the Electric Reliability Organization and Ordering Compliance Filing," 116 FERC ¶ 61,062 (July 20, 2006).
[2] *Time Error Correction Reliability Standard Notice of Proposed Rulemaking*, 130 FERC ¶61,201 (March 18, 2010).

II. NOTICES AND COMMUNICATIONS

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III. BACKGROUND

A. Regulatory Framework

Through its enactment of the Energy Policy Act of 2005 ("the Act"), Congress entrusted FERC with the duties of approving and enforcing rules to ensure the reliability of the Nation's bulk power system, and with the duties of certifying an electric reliability organization ("ERO") that would be charged with developing and enforcing mandatory Reliability Standards, subject to FERC approval.[3] Section 215 of the Act provides that all users, owners and operators of the bulk power system in the United States will be subject to FERC approved Reliability Standards.

[3] 16 U.S.C. § 824o (2006).

On July 20, 2006, FERC certified NERC as the ERO.[4] Pursuant to Section 215 of the Act, the ERO is charged with developing mandatory and enforceable Reliability Standards, which are subject to FERC review and approval.[5] Upon approval by FERC, the Reliability Standards may be enforced by the ERO, subject to FERC oversight, or FERC can independently enforce these Reliability Standards.[6]

B. Basis for Approval of Proposed Reliability Standards

Under Section 215(d) of the Act, FERC is authorized to approve proposed Reliability Standards if FERC determines that the proposed standards are "just, reasonable, not unduly discriminatory or preferential, and in the public interest."[7] When evaluating proposed Reliability Standards, FERC is expected to give "due weight" to the technical expertise of the ERO, but is not to defer to the ERO on matters affecting competition.[8] Order No. 672 provides guidance on the factors FERC will consider when determining whether proposed reliability standards meet the statutory criteria.[9]

C. Overview of Time Error and Time Error Correction

In order to understand the BAL-004-1 Reliability Standard in its appropriate context, it is important to fully understand the concepts of Time Error and Time Error Correction. As stated in the NOPR, "Time Error occurs when a synchronous Interconnection operates at a frequency (number of cycles per second) that is different from the Interconnection's Scheduled Frequency."

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[4] *Rules Concerning Certification of the Electric Reliability Organization: Procedures for the Establishment, Approval and Enforcement of Electric Reliability Standards*, Order No. 672, 71 FR 8662 (February 17, 2006), FERC Stats. & Regs. ¶ 31,204 (2006), *order on reh'g*, Order No. 672-A, 71 FR 19814 (April 18, 2006), FERC Stats. & Regs. ¶ 31,212 (2006). (Hereinafter Order 672).
[5] 16 U.S.C. § 824o
[6] *Id.*
[7] 16 U.S.C. § 824o(d)(2)
[8] *Mandatory Reliability Standards for the Bulk-Power System*, 18 C.F.R. pt. 40, Docket No. RM06-16-000 at P 8(March 16, 2007) ("Order No. 693") (citing to 18 CFR 39.5(c)(1), (3)).
[9] *See*, Order No. 672 at PP 320-338.

The reason for Time Error and Time Error Correction dates far back into the history of the Bulk Power System. Henry E. Warren, inventor of the utility-synchronized "Telechron" electric motor clock, summarized this topic in a speech[10] given to the Clock Club held at the Old State House in Boston on February 6, 1937. While quite lengthy, his speech provides valuable insight into the genesis of Time Error and its associated correction. Excerpts from his speech (emphasis added) are provided below:

> "Prior to 1916 when the work which I will describe to you began, **the only timekeepers which were used on a very extensive scale consisted of separate clocks, each one of which was constructed to measure time independently.** Mr. Brown's clock had no connection with Mr. Jones' clock and either one of them had only that degree of accuracy which was imparted by the design and construction of the movement, aided or hindered by skill or lack of skill in regulating by Mr. Brown or Mr. Jones."
>
> "In 1916 the inadequacy of the battery clocks which I had been able to design and build impressed me so forcibly that I began exploring other possibilities in the art of telling time. **The need of some simple mechanism which would have universal application made me think**, as a few people had done in the preceding decades, **of the possibility of utilizing the existing communication systems for the distribution of time.**
>
> The two great networks which were then available were the telephone system ... and the **electric light and power lines** which covered a still more extensive territory ... the one which appealed to me more strongly was the electric light system, because this carried abundant power for the purpose of driving clocks and, far more important, it **contained the germ of a system for measuring time.** In 1916 more than 90% of all electric light, heat and power was distributed in the form of so called alternating current. **The alternations of this current might conceivably be used to measure time intervals provided they could be properly controlled.**"
>
> "…**the number of these cycles every second is not exactly sixty but only approximately that value** and that was the situation in 1916 when I dreamed of utilizing this alternating current for time-telling purposes. **It seemed to me possible that the number of these cycles or pairs of alternations per second could be made equal to *exactly 60 on the average,*** if I could only persuade the operators of the power stations to adopt a different method of regulating the speed of the generators, which alone determined the rate of alternations. Before this could be done **it was necessary to provide some means whereby the time characteristics of these alternations could be used to drive the hands of a clock.**"

[10] Warren, Henry E. Modern Electric Clocks. February 6, 1937. Retrieved April 14, 2010 from http://clockhistory.com/telechron/company/documents/warren_1937/index.html.

> "**In order to use the alternating current for accurate time-telling purpose I was compelled to devise a small reliable alternating current motor in which the rotor would follow the alternations of the current with extreme accuracy**. There could be no slip between the rotor and the rotating field, otherwise my clocks would be unreliable. A motor having these characteristics was long ago designated as 'synchronous' from two Greek words meaning 'equal time'.
>
> "In the modern electric clocks… the function of measuring time is separate from the function of telling time. **Two devices are necessary, first a single very reliable and accurate master clock located at some central point on a power system, and second an unlimited number of synchronous motor clocks located wherever convenient on the distribution system of the power company.** The same generators, wires, and transformers which carry light, heat and power to all the company's customers also carry without any extra charge accurate time impulses to those modern electric clocks. **The only thing that is necessary for the electric clock to do is to translate the alternating current impulses into time indications.** Therefore, they serve to tell the time which is accurately measured by another device."

In summary, prior to the invention of the Telechron clock, there was no need to maintain average frequency at any specified level, only instantaneous frequency. The use of system frequency as a time-measurement mechanism, through which clocks in customers' offices and homes were synchronized with a "master" clock run by the utility, is what necessitated the establishing of a target for average frequency. To the extent the average frequency was different from 60 Hertz, the customer's clocks would run "fast" or "slow." The measurement of this difference is referred to as "Time Error," and a "Time Error Correction" is initiated to correct that error.

For example, if today we were to connect a synchronous motor clock to the Bulk Power System (by plugging it into a wall outlet) and then setting that clock based on a signal from the National Institute of Standards and Technology ("NIST"), we would then be able to observe average frequency performance. If average frequency performance was less than 60 Hertz, the motor in the clock would run slower than desired, moving the hands of the clock slower than they should. When compared with the NIST cesium fountain atomic clock in Colorado, the

synchronous motor clock would show a time that was "behind" that of the atomic reference, indicating a certain amount of "Time Error." To correct that error, one of two things can occur: either the owner of the clock can reset the clock to match the reference, or the operators of the Bulk Power System can temporarily generate at a frequency higher than the normal 60 Hertz, speeding up the clock motor until it "catches up" with the reference. When all generators intentionally over-generate (or under-generate) in a coordinated fashion in order to correct Time Error, it is referred to as a "Time Error Correction."

From a Bulk Power System real-time operations standpoint, there is no value in improving *average* frequency; operating at 65 Hertz for one hour and 55 Hertz the next is *not* the same as operating at 60 Hertz for both hours. From a Time Error perspective, the net result of such action is good, as the total number of cycles at the end of the two hour period will be correct. However, the actual consequences of operating at these frequencies cannot simply be "netted out" the way that accumulated Time Error can. If the reliability goal is to maintain frequency within predefined limits to preserve the integrity of the Interconnection (*e.g.*, avoid frequency-related instability; unplanned tripping of load or generation; and uncontrolled separation or cascading outages), then the practice of offsetting scheduled frequency away from the specific target frequency around which the Bulk Power System has been planned must be questioned; in this case, two "wrongs" truly do not make a "right." While it is expected that actual frequency will deviate to a certain extent from scheduled frequency (and indeed the Bulk Power System has been designed to allow for such variability), intentionally moving away from a scheduled frequency target of 60 Hertz serves no reliability purpose and effectively "wastes" the safety margins designed into the system by the engineers who planned it.

D. How Time Error Correction is Handled Today

In general, time error correction is handled much in the same fashion as it was in the early twentieth century. Because of the synchronously interconnected nature of the Bulk Power System, it is no longer required that each utility keep track of reference time as was described earlier. Instead, a single entity in each Interconnection is designated to serve as the Interconnection Time Monitor. In the Western Interconnection, the WECC serves as Interconnection Time Monitor; in the Texas Interconnection, ERCOT; in the Quebec Interconnection, Hydro Quebec. In the Eastern Interconnection, where there are several entities that could potentially act as the Interconnection Time Monitor, the Midwest ISO has volunteered to perform this function.

The Time Monitor is charged with tracking accumulated Time Error and, when a certain amount of Time Error is reached, directing the implementation of a Time Error Correction. The current Time Error limits that dictate when to implement a Time Error Correction are defined in WEQ-006, one of the Business Practices of the North American Energy Standards Board (NAESB).

When a Time Error Correction is initiated, NERC Reliability Standard BAL-004 specifies that Balancing Authorities may either offset their scheduled frequency by 0.02 Hertz in the direction indicated by the Interconnection Time Monitor, or include an offset to their Scheduled Interchange based on their Bias Setting that will produce the same result. All Balancing Authorities within the Interconnection are required to participate in the Time Error Correction, and must do so in a coordinated fashion based on the start and stop times specified by the Interconnection Time Monitor. The Time Error Correction is halted when specific targets specified in WEQ-006 are achieved. Should reliability concerns necessitate the premature

halting of (or proactive cancellation of) a Time Error Correction, NERC BAL-004 provides for this.

In the Western Electricity Coordinating Council (WECC), an additional procedure is utilized, referred to as Automatic Time Error Correction (ATEC). This process was filed with the Commission as BAL-004-WECC-01, and was approved by the Commission on May 21, 2009.[11] In general, WECC ATEC has helped minimize the need for WECC to initiate periodic Time Error Corrections. However, it is NERC's understanding that WECC continues to perform manual Time Error Corrections as described above.

IV. DISCUSSION

A. Summary

NERC has concerns regarding Time Error Correction in general, and proposes that further discussion on the topic should be considered. NERC specifically requests that the Commission give due weight to NERC's technical expertise on this matter. Based on that technical expertise, NERC recommends that FERC convene a technical conference to engage in a policy discussion among all stakeholders that considers the benefit of Time Error Corrections versus the potential adverse reliability impacts of the practice.

NERC has additional concerns that the remanding of BAL-004-1, and the direction of further modifications to the standard, would distract from the larger policy discussion that is needed and that NERC is requesting. Prior to expending industry resources developing a standard which may ultimately be determined to not be in the best interests of reliability or the public, NERC would prefer to engage in the proposed technical conference and determine the best course forward for all parties involved.

[11] Order No. 723, Western Electricity Coordinating Council Regional Reliability Standard Regarding Automatic Time Error Correction, 127 FERC ¶ 61,176.

Should the Commission not follow NERC's recommendation and instead choose to remand BAL-004-1 and direct modifications to the standard, NERC objects to the Commission's proposal to direct that specific elements be included in the Requirement R2 of the standard related to the starting and stopping of Time Error Corrections. NERC is concerned that the proposed requirement is not necessary for bulk power system reliability.

Finally, FERC implies in the NOPR that NERC and NAESB have not coordinated their standards development with regard to Time Error Correction. NERC disagrees with this statement, as discussed below.

B. Concerns With Time Error Correction In General

As discussed above in Section III.C, Time Error and Time Error Correction were developed for a specific purpose: to ensure that the utility customers had access to a standardized frequency signal service that could be used to accurately and consistently measure time. NERC's general assumption has been that while Time Error Correction is not required for reliability, it can be undertaken with minimal impact to the reliability of the Bulk Power System.

However, recent analysis of frequency data has caused NERC to question this assumption. NERC's Reliability Based Control Standards Drafting Team, which is currently performing a field trial of the proposed Balancing Authority ACE Limits metric as a part of NERC Project 2007-18, has also been collecting data regarding Interconnection frequency performance, including the number of clock-minutes during which actual frequency dropped below the low Frequency Trigger Limit (FTL)[12] of 59.95 Hertz. During the period of July 2005 through March 2010, approximately 44% of the minutes during which clock-minute actual

[12] "Frequency Trigger Limit" is a frequency limit defined in the draft standard currently under development by the Reliability Based Control Standard Drafting Team. The calculation of the draft Balancing Authority ACE Limit for each Balancing Authority is dependent upon the selection of the low and high Frequency Trigger Limits for each Interconnection.

frequency dropped below the low Frequency Trigger Limit occurred during Time Error Corrections when scheduled frequency was 59.98 Hertz (1,875 of the 4,234 total minutes observed below 59.95 Hertz). Upon further investigation, it was found that almost all of those minutes (1,819 of the 1,875 total) represented frequency deviations that would likely not have dropped frequency below 59.95 Hertz if the scheduled frequency had been 60 Hertz. In other words, it was estimated that approximately 97% were of such a magnitude that if the Time Error Correction had not been in effect, the exceedance of the low FTL would not have occurred.

These Frequency Trigger Limits in and of themselves are only indicators of system behavior, but the nature of their relationship to Time Error Corrections calls into question the potential impact that Time Error Corrections can have on frequency behavior overall. While it is intuitively obvious that any frequency offset that moves target frequency away from the reference point to which all other frequency sensitive devices (such as relays) have been indexed will have a potential impact on those devices' performance, the industry has by and large regarded Time Error Corrections as harmless and necessary as part of the service it provides to its customers. However, in light of this data, NERC's stakeholders are now questioning whether or not the intentional movement closer to (or in some cases, further away from) the trigger settings of frequency-based protection devices as is evidenced during Time Error Correction events is appropriate.

Additionally, NERC's stakeholders have been challenged to question whether or not the benefits customers receive from Time Error Corrections are of a value that exceed the costs of the correction. The costs of implementing Time Error Corrections can be seen as potential additional fuel costs, as well as "wear and tear" on machines that are asked to over- and under-generate from their frequency set points on a regular basis.

NERC also notes that circumstances have changed from when time error correction was first thought necessary. The two "networks" considered by Henry Warren when developing his approach for time-keeping have been largely supplanted by other communication channels, including:

- Shortwave and low-frequency radio transmissions from NIST[13] that provide time signals (in both audio and coded formats) from their reference cesium fountain atomic clock and which are used by numerous radio-controlled watches and clocks;
- Telephone access to NIST time information in audio format via toll numbers;
- Internet access to NIST time information via the Internet Time Service, which can be used to set time for TCP/IP enabled devices (such as personal computers) via the NTP, DAYTIME, and TIME protocols;
- Satellite networks, through which GPS signals can easily disseminate accurate time signals traceable to NIST;
- Cellular networks, through which CDMA signals can easily disseminate accurate time signals traceable to NIST;
- Cable and Satellite television providers, some of which send time signals traceable to NIST directly to set top boxes, others of which display time traceable to NIST on one or more of their channels; and
- Broadcast television providers, which routinely display time traceable to NIST on one or more of their programs.

[13] NIST and the U.S. Naval Observatory (UNSO) collaborate to provide reference time through the use of the NIST cesium fountain atomic clock and the USNO Master Clock atomic clock. Each organization provides various time keeping services to the public. For convenience, this filing generically refers to the joint efforts of the two organizations together as those of NIST.

Additionally, technology used in time-keeping has changed. The majority of newly produced non-networked time-keeping devices that require time accuracy utilize quartz crystal oscillators, which can produce a constant time signal based on direct current input. This includes most watches, clocks in automobiles, and travel clocks. Newly produced time keeping devices that depend on an average 60 Hertz signal service are generally limited to those which have limited need for fine accuracy (such as bedside alarm clocks and appliance clocks such as those found on ovens or stoves). It should also be noted that many devices employ these new technologies in concert with one of the communication channels described previously (for example, a personal computer has an internal clock based on a quartz crystal oscillator, but can also "check" its time regularly based on an NTP request via the Internet).

These technologies are mature and pervasive throughout the United States. Accordingly, NERC must ask the question: is Time Error Correction still a needed and valuable service, particularly in light of the data showing that Time Error Corrections appear to be placing the reliability of the Bulk Power System at greater risk?

NERC's Balancing Authority Controls Standard Drafting Team, which is responsible for the redrafting of BAL-004, believes it is not. While proceeding cautiously, that team is tentatively recommending that the practice of Time Error Corrections be halted. NERC has discussed this concept with NAESB, and NAESB does not believe any conflict with its standards would exist if NERC chose to halt the practice of Time Error Corrections. To the extent any such conflicts were identified, NERC and NAESB would work together to ensure consistency between the NERC and NAESB standards.

This is not to imply that NERC believes that monitoring of Time Error as an indicator of system performance is invalid. Much like the accumulation of Inadvertent Interchange, Time

Error provides a valuable metric that can be used to identify abnormal system behavior. Unlike the accumulation of Inadvertent Interchange (which identifies when individual Balancing Authorities under- or over-generate), Time Error accumulation indicates the imbalance of the Interconnection (when, on a net basis, the entire Interconnection under- or over-generates). As such, NERC believes it is valid and proper to monitor Time Error accumulation and to use it as an overall indicator of Interconnection performance.

However, NERC does question the validity of Time Error Corrections. Intentionally over- or under-generating in order to offset a previous case of unintentional under- or over-generation does not improve reliability, and only makes sense in the context of achieving a non-instantaneous goal like average performance. Offsetting poor performance with equal but opposite poor performance may ensure that frequency-dependent clocks keep accurate time, but it can create just as much reliability risk as the original poor performance. Admittedly, the risk created by Time Error Corrections is likely minimal, but risk has cumulative properties in that several smaller risks can combine to create a large risk. To the extent this risk can be minimized, it reduces overall risk to the interconnection that would otherwise occur during the period of Time Error Correction. If Time Error Correction can be eliminated completely, that risk can also be eliminated.

To this end, NERC has discussed the possibility of halting the practice of Time Error Correction with its stakeholders, FERC Staff, and NIST. NERC conducted a survey of its members and the industry, and of those who responded, almost eighty percent indicated that Time Error Correction as a practice should be halted, as it creates reliability risk with no reliability benefit. FERC staff has expressed concern, as has NIST staff, regarding the overall impact of halting Time Error Corrections.

Accordingly, NERC requests that FERC, in cooperation with NIST and the Department of Energy, hold a technical conference to determine whether Time Error Correction is a practice that should continue into the future. NERC recommends that technical conference seek input from reliability entities (such as NERC and its stakeholders), commercial entities (such as NAESB and its stakeholders), technical bodies (such as NIST and the Institute of Electrical and Electronics Engineers), manufacturers (such as the National Electrical Manufacturers Association and the Association of Home Appliance Manufacturers), academia, and the general public. Following that event, NERC would work collaboratively with NAESB, based on the conclusions identified at the conference, to develop or modify their standards and business practices that address Time Error Correction. To the extent that the Commission or other agencies chose to offer policy guidance following the technical conference, that guidance would be considered by the Standard drafting Team in its review of the BAL-004 Reliability Standard.

C. Purpose of the Proposed Reliability Standard BAL-004-1, As Filed

Prior to advent of mandatory Reliability Standards, Time Error monitoring and Time Error Correction were done on a voluntary, coordinated basis. NERC did not observe problems, reliability or otherwise, with the manner in which Time Error Correction was handled. With Reliability Standards becoming mandatory and enforceable, those who had undertaken Time Error monitoring on a voluntary basis were no longer willing to perform those duties, as the mandatory regime now exposed them to the threat of significant financial penalties if they undertook their voluntary actions in a way that was perceived by an auditor as being inconsistent with the Reliability Standard.

The modifications contained in BAL-004-1 were designed to maintain the status quo, with voluntary Interconnection Time Monitors continuing to perform that function without the

risk of significant penalties. This would allow NERC, through the Standards Development Process and the efforts of the NERC Balancing Authority Controls Standards Drafting Team, to consider the broader policy issues presented by Time Error Correction. As discussed previously, this consideration has been ongoing, and is at a point where NERC believes that prior to taking action, further discussion is warranted between NERC and its stakeholders, NASEB and its stakeholders, the Commission, NIST, and other interested parties.

The specific directives proposed in the NOPR could, if imposed in the Final Rule, be a distraction from the important policy discussion of Time Error Correction that needs to occur. Additionally, it could have the unintended consequence of causing a voluntary Interconnection Time Monitor to withdraw from that activity, effectively halting Time Error Corrections without the benefit of needed policy considerations. No good purpose would be served by that, and society could actually be harmed if Time Error Corrections were eliminated prior to the scrutiny that an open, public discussion of the topic would provide.

Not every activity needs to be subject to the threat of financial penalties. The implementation of Time Error Correction has not been a significant compliance issue in the past, and NERC does not foresee it becoming an issue of such significance that it must be subjected to financial penalties going forward. Rather, as discussed above, it is Time Error Correction itself that may be posing a risk to the reliability of the Bulk Power System.

NERC strongly recommends that the Commission not proceed with the course of action described in the NOPR. Instead, NERC recommends that the Commission approve the modest changes included in proposed BAL-004-1 to maintain the status quo. In addition, NERC reiterates its recommendation that the Commission convene a technical conference so that the

broad policy issues of the value of Time Error Correction and the increased risk to reliability posed by Time Error Correction can be understood and appropriately evaluated.

D. **The Commission's Proposed Standards Language for Requirement R2 Goes Beyond That Which is Required for Reliability.**

To the extent the Commission chooses to remand BAL-004-1 and directs NERC to make changes to the standard, NERC believes the direction of the Commission regarding R2 is excessive. In Paragraph 24 of the NOPR regarding the removal of Requirement R2 from the BAL-004-0, the Commission states, in part:

> "Removing Requirement R2 makes the Reliability Standard incomplete and ambiguous, since it would not explain the circumstances under which a Time Error Correction needs to be initiated or ended, indicate that Time Error Correction must be performed, or identify the entity that has the obligation and authority to initiate a Time Error Correction."

FERC's statement that removal of Requirement R2 (which provides that the Interconnection Time Monitor will monitor Time Error and shall initiate or terminate corrective actions in accordance with the NAESB Time Error Correction Procedure) makes the standard incomplete or ambiguous will be considered by NERC as part of its overall effort to address Time Error Correction for bulk power system reliability. NERC currently has an active project (Project 2007-05) and a standard drafting team (the Balancing Authority Controls Standards Drafting Team) in place that is considering the best approach for addressing Time Error Correction in a clear and unambiguous fashion. At this time, that team is considering several approaches to addressing Time Error Correction, including its possible elimination. Accordingly, NERC requests that FERC allow that team to continue its work and that FERC support that team's efforts through the provision of a technical conference as described previously in this filing.

With regard to the specific actions proposed in the NOPR, NERC disagrees with certain items specified by the Commission as being necessary for the standard to be complete and unambiguous. In paragraph 25 of the NOPR, FERC further states:

> The Commission therefore proposes to remand the proposed Reliability Standard and, further proposes that, on remand, NERC should modify its proposed changes to Requirement R2 to (1) indicate that the Time Monitor, designated according to a process described in a Commission-approved document as discussed above, is responsible for initiating or terminating a Time Error Correction in a reliable manner; and (2) explain the circumstances under which the Time Monitor should start or end a Time Error Correction.

Based on the drafting team's work on the standard thus far, NERC believes the BAL-004-1 Reliability Standard as proposed in its March 11, 2009, filing is sufficiently clear regarding the circumstances under which the Time Monitor should start or end a Time Error Correction. As discussed in Section IV.B above, the primary reasons for starting and ending a Time Error Correction are commercial in nature to ensure that an "informal service contract" created in the early 20th century between utilities and their customers, is honored so that frequency-dependent time-keeping devices maintain relative accuracy.

NERC is unaware of any reason for starting a Time Error Correction that is related to ensuring Bulk Power System reliability. Rather, NERC believes that the sole reason to start a Time Error Correction is to ensure that the average frequency over a specified period of time is roughly equivalent to 60 Hertz and that frequency-dependent time-keeping devices that utilize that 60 Hertz signal service are kept accurate. The triggers that define the tolerances of acceptability for that service (*i.e.*, that identify when accumulated Time Error is significant enough to require the starting of a Time Error Correction) are currently defined within NAESB WEQ-006.

In general, a Time Error Correction is ended when the accumulated Time Error has been reduced in magnitude such that the 60 Hertz signal/service is within specified tolerances (*i.e.*, the average frequency over a specified period of time has been changed to be roughly equivalent to 60 Hertz, and frequency-dependent time-keeping devices that utilize that 60 Hertz signal service should be back within a specified range). Similar to the triggers that start a Time Error Correction, those that stop the correction are defined within NAESB WEQ-006.

While NERC acknowledges that there are numerous valid reasons for which a Time Error Correction should not be started, or for which a Time Error should be ended, NERC does not believe it is productive to include such a prescriptive list within the Reliability Standard. Requirement R3 of the proposed BAL-004-1 already provides the following:

> **R3.** 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.
>
> > **R3.1.** 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.

while Requirement R1 provides:

> **R1.** Only a Reliability Coordinator shall be eligible to act as Interconnection Time Monitor.

As such, any Reliability Coordinator (including the Interconnection Time Monitor) can request the cancellation of a Time Error Correction, either prior to or during its execution. Balancing Authorities are required to request termination of a Time Error Correction in progress if they have reliability concerns with its execution, but are also not prohibited from requesting the cancellation of a Time Error Correction that has not yet begun. NERC believes this allows for an appropriate level of flexibility, rather than attempting to limit the ending or cancellation of a Time Error Correction to a pre-defined set of conditions.

It should be noted that while the NERC Reliability Standards give the Reliability Coordinator and the Balancing Authority broad latitude in identifying reliability concerns, the associated NAESB Business Practice (WEQ-006) specifically prohibits fast Time Error Corrections from being initiated in the Eastern, Texas, and Quebec Interconnections between the hours of 04:00 and 11:00 Central Prevailing Time. The NERC responsibilities assigned to the Reliability Coordinator encompass this general practice, and both NERC and NAESB do not believe this to be in conflict.

E. NERC and NAESB Are Coordinated in their Standard Development Efforts.

In Paragraph 26 of the NOPR, FERC states, in part,

> "Additionally, when an issue has both reliability and business aspects, the Commission has directed NERC and NAESB to work together to coordinate their efforts in order to provide a workable Reliability Standard that addresses the reliability issue. The Commission expects that to occur here."

This statement seems to indicate that FERC does not believe that such coordination has occurred between NERC and NAESB in the case of BAL-004-1 and WEQ-006. While FERC may disagree with what NERC and NAESB have jointly determined to be the appropriate split between the reliability and commercial aspects of Time Error Correction, NERC does not believe that this indicates a lack of coordination between the two organizations. NERC and NAESB, through the expertise of their stakeholders, have developed the BAL-004-1 and WEQ-006 standards, respectively, to be complementary. While the two sets of standards were not submitted jointly to FERC, both organizations were aware of each other's work efforts and participated together in those efforts.

Additionally, NERC believes that its stakeholders are supportive of the NAESB WEQ-006 standard, and that NAESB's stakeholders are supportive of the BAL-004-1 standard. While NERC and NAESB do coordinate on a regular basis, it may simply be that record of

development provided with NERC's standards filings are not providing a clear enough indication of that coordination. NERC will work with NAESB to ensure that that such coordination is more appropriately highlighted in our future filings.

V. CONCLUSION

NERC respectfully requests that FERC issue an Order consistent with the comments set forth herein, and convene a technical conference related to Time Error Correction as recommended, before directing further changes in BAL-004-1.

Respectfully submitted,

/s/ Holly A. Hawkins

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CERTIFICATE OF SERVICE

I hereby certify that I have served a copy of the foregoing document upon all parties listed on the official service list compiled by the Secretary in this proceeding.

Dated at Washington, D.C. this 28th day of April, 2010.

/s/ Holly A Hawkins
Holly A. Hawkins

Attorney for North American Electric Reliability Corporation