

Supporting Statement for
FERC-725A, Mandatory Reliability Standards for the Bulk-Power System
As Proposed in Docket No. RM08-7-000
(A Final Rule Issued July 17, 2008)

The Federal Energy Regulatory Commission (Commission) (FERC) is submitting a Final Rule (Final Rule) that affects the requirements under the following information collection: **FERC-725A, Mandatory Reliability Standards for the Bulk Power System**. FERC-725A (Control No. 1902-0244) is a Commission data collection, (filing requirements), as contained in 18 Code of Federal Regulations, Part 40.

In 2007 the Commission created a new information collection FERC-725A, implementing mandatory reliability standards that were previously part of a voluntary program. The Commission is informing OMB that while there are changes to several of the Mandatory Reliability Standards, the proposed changes in this Final Rule will not make substantive changes to the information collection requirements and therefore the estimates reported last year remain unchanged in this submission. As the Commission noted last year, it will revise these estimates as the mandatory standards are updated and enforced.

Background

In the aftermath of the 1965 Blackout in the northeast United States, the electric industry established the North American Electric Reliability Council (NERC), a voluntary reliability organization. Since its inception, NERC has developed Operating Policies and Planning Standards that provided voluntary guidelines for operating and planning the North American bulk-power system. In April 2005, NERC adopted “Version O” reliability standards that translated the NERC Operating Policies, Planning Standards and compliance requirements into a comprehensible set of measurable standards. While NERC developed a compliance enforcement program to ensure compliance with the reliability standards it developed, industry compliance was voluntary and not subject to mandatory enforcement penalties. Although NERC’s efforts have been important in maintaining the reliability of the nation’s bulk-power system, NERC itself recognized the need for mandatory, enforceable reliability standards and was a proponent of legislation to establish a FERC-jurisdictional ERO that would propose and enforce mandatory reliability standards. (A reliability standard defines obligations or requirements of utilities and other entities that operate, plan and use the bulk power system in North America. Meeting these requirements helps ensure the reliable planning and operation of the bulk power system. Each NERC Reliability Standard details the purpose of the standard, the entities that must comply, and the specific actions that constitute compliance and how the standard will be measured).

On August 8, 2005, The Electricity Modernization Act of 2005, which is Title XII of the Energy Policy Act of 2005 (EPAAct 2005), was enacted into law.¹ EPAAct 2005 added a new

¹ The Energy Policy Act of 2005, Pub. L. No 109-58, Title XII, Subtitle A, 119 Stat. 594, 941 (2005), [codified at 16](#)

section 215 to the FPA and requires a Commission-certified ERO to develop mandatory and enforceable Reliability Standards, which are subject to Commission review and approval. Once approved, the Reliability Standards may be enforced by the ERO, subject to Commission oversight.

RM06-16-000 Final Rule

On March 16, 2007, the Commission issued Order No. 693, a Final Rule that added part 40, a new part to the Commission's regulations. The Final Rule stated that this part applies to all users, owners and operators of the Bulk-Power System within the United States (other than Alaska or Hawaii). It also requires that each Reliability Standard identify the subset of users, owners and operators to which that particular Reliability Standard applies. Order No. 693 also requires that each Reliability Standard that is approved by the Commission will be maintained on the ERO's Internet website for public inspection. (The bulk power system consists of the power plants, transmission lines and substations, and related equipment and controls, that generate and move electricity in bulk to points from which local electric companies distribute the electricity to customers.)

The Commission approved 83 of 107 proposed Reliability Standards, six of the eight proposed regional differences, and the Glossary of Terms used in Reliability Standards as developed by the North American Electric Reliability Corporation (NERC). NERC was certified by the Commission as the Electric Reliability Organization (ERO) responsible for developing and enforcing mandatory Reliability Standards. Those Reliability Standards meet the requirements of section 215 of the FPA and Part 39 of the Commission's regulations. However, although the Commission believed that it is in the public interest to make these Reliability Standards mandatory and enforceable, the Commission also found that much work remained to be done. Specifically, the Commission believes that many of these Reliability Standards require significant improvement to address, among other things, the recommendations of the Blackout Report. Therefore, pursuant to section 215(d)(5), the Commission required the ERO to submit significant improvements to 56 of the 83 Reliability Standards that are being approved as mandatory and enforceable. The remaining 24 Reliability Standards remain pending at the Commission until further information is provided.

RM08-7-000 NOPR

On April 21, 2008 the Commission issued a NOPR proposing to approve six modified Reliability Standards submitted to it for approval by NERC. Five modified Reliability Standards pertain to interchange scheduling and coordination and one pertains to transmission loading relief procedures (TLR). In addition, the Commission proposed to approve NERC's proposed interpretation of five specific Requirements of Commission-approved Reliability Standards.

This proposed rulemaking proceeding consolidated and addressed three NERC filings:

a) interpretations of requirements in four Commission-approved Reliability Standards: BAL-001-0 (Real Power Balancing Control Performance), Requirement R1; BAL-003-0 (Frequency Response and Bias), Requirement R3; BAL-005-0 (Automatic Generation Control), Requirement R17; and Requirement VAR-002-1 (Generator Operation for Maintaining Network Voltage Schedules), Requirements R1 and R2.²

b) modification to Reliability Standard IRO-006-4 (Reliability Coordination – Transmission Loading Relief) that applies to balancing authorities, reliability coordinators, and transmission operators. NERC stated that the modifications “extract” from the Reliability Standard the business practices and commercial requirements from the current IRO-006-3 Reliability Standard.

c) modifications to five Reliability Standards from the “Interchange Scheduling” group of Reliability Standards: INT-001-3 (Interchange Information); INT-004-2 (Dynamic Interchange Transaction Modifications); INT-005-2 (Interchange Authority Distributes Arranged Interchange); INT-006-2 (Response to Interchange Authority); and INT-008-2 (Interchange Authority Distributes Status). (NERC stated that the modifications to INT-001-3 and INT-004-2 eliminate waivers granted in 2007 under the voluntary Reliability Standards regime for entities in the WECC region. According to NERC, modifications to INT-005-2, INT-006-2, and INT-008-2 adjust reliability assessment time frames for proposed transactions within WECC.)

Each Reliability Standard that the ERO proposed to interpret or modify in the proposed rule was approved by the Commission in Order No. 693. In the NOPR, several standards were being updated but revisions to the standards and corresponding burden estimates are not applicable and the Commission submitted the proposed rule to OMB with no changes to the reporting burden.

RM08-7-000 Final Rule

On July 21, 2008 the Commission issued a Final Rule approving five of six modified Reliability Standards submitted to the Commission for approval by the North American Electric Reliability Corporation (NERC). The Commission directs NERC to submit a filing that provides an explanation regarding one aspect of the sixth modified Reliability Standard submitted by NERC. The Commission also approves NERC’s proposed interpretations of five specific requirements of Commission-approved Reliability Standards.

The Commission previously approved, in Order No. 693, each of the Reliability Standards that are the subject of the Final Rule. In the NOPR, the Commission explained that

² In its filing, NERC identified the Reliability Standards along with NERC’s proposed interpretations as BAL-001-0a, BAL-003-0a, BAL-005-0a, and VAR-002-1a.

the modifications to the Reliability Standards are minor and the interpretations relate to existing Reliability Standards; therefore, they do not add to or increase entities' reporting burden. As the Commission stated in the NOPR, the modified Reliability Standards and interpretations of Reliability Standards do not materially affect the burden estimates relating to the earlier version of the Reliability Standards presented in Order No. 693.³

A. **Justification**

1. **CIRCUMSTANCES THAT MAKE THE COLLECTION OF INFORMATION NECESSARY**

EPAAct 2005 added a new section 215 to the FPA, which provides for a system of mandatory and enforceable Reliability Standards. Section 215(d)(1) of the FPA provides that the ERO must file each Reliability Standard or modification to a Reliability Standard that it proposes to be made effective, *i.e.*, mandatory and enforceable, with the Commission. As mentioned above, on April 4, 2006, and as later modified and supplemented, the ERO submitted 107 Reliability Standards for Commission approval pursuant to section 215(d) of the FPA.

Section 215(d)(2) of the FPA provides that the Commission may approve, by rule or order, a proposed Reliability Standard or modification to a proposed Reliability Standard if it meets the statutory standard for approval, giving due weight to the technical expertise of the ERO. Alternatively, the Commission may remand a Reliability Standard pursuant to section 215(d)(4) of the FPA. Further, the Commission may order the ERO to submit to the Commission a proposed Reliability Standard or a modification to a Reliability Standard that addresses a specific matter if the Commission considers such a new or modified Reliability Standard appropriate to "carry out" section 215 of the FPA.⁴ The Commission's action in this Final Rule is based on its authority pursuant to section 215 of the FPA.

Recent Events

A common cause of the past major regional blackouts was violation of NERC's then Operating Policies and Planning Standards. During July and August 1996, the west coast of the United States experienced two cascading blackouts caused by violations of voluntary Operating Policies.⁵ In response to the outages, the Secretary of Energy convened a task force to advise the Department of Energy (DOE) on issues needed to be addressed to maintain the reliability of the bulk-power system. In a September 1998 report, the task force recommended, among other

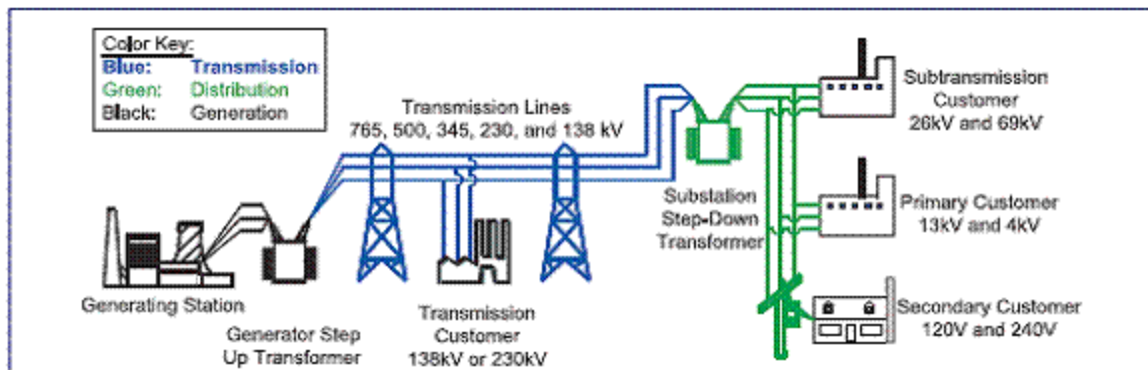
³ See Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 1905-07. The NOPR, FERC Stats. & Regs. ¶ 32,632 at P 76-78, provided a detailed explanation why each modification and interpretation has a negligible, if any, affect on the reporting burden.

⁴ See 16 U.S.C. 824o(d)(5) (2006).

⁵ The Electric Power Outages in the Western United States, July 2-3, 1996, at 76 (ftp://www.nerc.com/pub/sys/all_updl/docs/pubs/doerept.pdf) and WSCC Disturbance Report, For the Power System outage that Occurred on the Western Interconnection August 10, 1996, at 4 (ftp://www.nerc.com/pub/sys/all_updl/docs/pubs/AUG10FIN.pdf).

things, that federal legislation should grant more explicit authority for FERC to approve and oversee an organization having responsibility for bulk-power reliability standards.⁶ Further, the task force recommended that such legislation provide for Commission jurisdiction for reliability of the bulk-power system and FERC implementation of mandatory, enforceable reliability standards.

The Generation and Transmission components make up the “bulk power system”.



Source of graph: [US-Canada Power System Outage Task Force](#)

Electric reliability legislation was first proposed after issuance of the September 1998 task force report and was a common feature of comprehensive electricity bills since that time. A stand-alone electric reliability bill was passed by the Senate unanimously in 2000. In 2001, President Bush proposed making electric Reliability Standards mandatory and enforceable as part of the National Energy Policy.⁷

Under the new electric power reliability system enacted by the Congress, the United States will no longer rely on voluntary compliance by participants in the electric industry with industry reliability requirements for operating and planning the Bulk-Power System. Congress directed the development of mandatory, Commission-approved, enforceable electricity Reliability Standards. The Commission believes that, to achieve this goal, it is necessary to have a strong ERO that promotes excellence in the development and enforcement of Reliability Standards.

A mandatory Reliability Standard should not reflect the “lowest common denominator” in order to achieve a consensus among participants in the ERO’s Reliability Standard development process. Therefore, the Commission will carefully review each Reliability Standard submitted and, where appropriate, later remand if necessary, an inadequate Reliability Standard to ensure that it protects reliability, has no undue adverse effect on competition, and can be enforced in a clear and even-handed manner. Standards address aspects of the operation and planning of the bulk power system such as: real-time transmission operations, balancing load and generation, emergency operations, system restoration and blackstart, voltage control, cyber security, vegetation management, facility ratings, disturbance reporting, connecting

⁶ [Maintaining Reliability in a Competitive U.S. Electricity Industry. Final report of the Task Force on Electric System Reliability.](#) Secretary of Energy Advisory Board, U.S. Department of Energy (September 1998), at 25-27, 65-67.

⁷ [Report of the National Energy Policy Development Group, May 2001.](#) at p. 7-6.

facilities to the grid, certifying system operators, and personnel training. Standards detail how the system should perform, but not how the system should be designed. Individual owners, operators and users of the bulk power system determine if the system should be expanded or changed, and how, in order to achieve the standards.

Reliability Standard BAL-001-0

The purpose of Reliability Standard BAL-001-0 is to maintain interconnection steady-state frequency within defined limits by balancing real power demand and supply in real-time.⁸ Requirement R1 of BAL-001-0 defines the limits on area control error (ACE), which essentially is the mismatch between generation and load (*i.e.*, the mismatch between supply and demand) within the footprint of a balancing authority, measured by the difference between the balancing authority's net actual interchange and scheduled interchange with neighboring balancing authorities, after taking into account effects of deviations in interconnection frequency.⁹ The ability to constantly match load and generation within a certain tolerance directly affects the electrical state and control of the Bulk-Power System.¹⁰ Each balancing authority thus monitors the extent of its ACE in real-time and takes appropriate action also in real-time to rebalance supply and demand.¹¹ Requirement R1 obliges each balancing authority, on a rolling twelve-month basis, to maintain its clock-minute averages of ACE within a specific limit.

A supply/demand imbalance between the interconnection's generation output (including net imports) and load on a real-time basis will result in a deviation from the desired 60 Hz optimum operating frequency of the interconnection. All of the balancing authorities within an interconnection must work together to correct a deviation.¹² They do this by including a frequency bias component in their ACE calculation which indicates how many more or fewer megawatts a balancing authority would have interchanged with neighboring balancing authorities if the actual frequency had been exactly maintained so as to equal to the scheduled frequency. Thus, balancing authorities calculate what their total interchange would have been if the actual frequency had been exactly maintained so as to equal to the scheduled frequency.

⁸ See Reliability Standard BAL-001-0. Each Reliability Standard developed by the ERO includes a "Purpose" statement.

⁹ Generally, a balancing authority within an interconnection has an obligation to do its part to maintain the desired 60 Hertz (Hz) frequency. To achieve this, each balancing authority must keep its generation output (including net imports from neighboring balancing authorities) and load in balance within its footprint. A deviation from the 60 Hz baseline system frequency signals an imbalance in supply and demand. To prevent this imbalance from propagating throughout the interconnection, steps are taken to adjust regulating reserves (generation output and demand-side management) in response to deviations from the 60 Hz optimum. See North American Electric Reliability Corp., 121 FERC ¶ 61,179, at P 17 (2007) (November 16, 2007 Order).

¹⁰ If generation and load is not matched within a balancing authority's area, the resulting imbalance could result in an undue burden on adjacent balancing authorities and, if additional contingencies from disturbances are experienced, may compromise the ability of the Bulk-Power System to recover from those disturbances. See November 16, 2007 Order, 121 FERC ¶ 61,179 at P 28.

¹¹ See November 16, 2007 Order, 121 FERC ¶ 61,179 at P 20.

¹² See *id.* P 31.

With this information, the balancing authority¹³ can increase or decrease generation within the balancing authority's area to maintain the correct scheduled interchange. The total supply and the demand within an interconnection are balanced by the collective effort of all the balancing authorities in that interconnection to maintain the correct scheduled interchange. In this manner, frequency deviations are minimized, thereby protecting reliability without causing undue burden on any balancing authorities.

Reliability Standard BAL-003-0

The purpose of Reliability Standard BAL-003-0 is to provide a consistent method for calculating the frequency bias component of ACE. To accomplish this purpose, it is necessary to rely on historic data from a balancing authority's automatic generation control.¹⁴ Automatic generation control is the equipment that calculates ACE on an ongoing basis and serves as a "governor" that adjusts a balancing authority's generation, and demand-side resources where available, from a central location to minimize unscheduled interchange with its neighboring balancing authorities in order to balance ACE. There are several ways that automatic generation control could be set to balance the supply and demand within the balancing authority area. One method is called the "tie-line frequency bias" mode of operation. Collective operation in this mode allows balancing authorities' automatic generation control to calculate ACE and adjust the generation in the balancing authority area in a manner that maintains the interconnection frequency and does not result in an undue burden for any balancing authority. In addition, operation in this mode allows a balancing authority to continuously collect its tie-line and frequency data that must be used when the balancing authority annually reviews the frequency bias component of its ACE calculation as specified by BAL-003-0. Requirement R3 of BAL-003-0 requires the use of the tie-line frequency bias mode of operation of automatic generation control, unless such operation is adverse to system interconnection reliability.

BAL-005-0 – Automatic Generation Control

Requirement R17 of Reliability Standard BAL-005-0 (Automatic Generation Control) is intended to annually check and calibrate the time error and frequency devices under the control of the balancing authority that feed data into the automatic generation control necessary to calculate ACE. Requirement R17 mandates that the balancing authority must adhere to an annual calibration program for time error and frequency devices. The Requirement states that a balancing authority must adhere to minimum accuracies in terms of ranges specified in Hertz, volts, amps, etc., for various listed devices, such as digital frequency transducers, voltage transducers, remote terminal unit, potential transformers, and current transformers.

¹³ Balancing authority is the responsible entity that integrates resource plans ahead of time, maintains load-interchange-generation balance within a Balancing Authority Area, and supports Interconnection frequency in real time.

¹⁴ Automatic generation control refers to an automatic process whereby a balancing authority's mix and output of its generation and demand-side management is varied to offset the extent of supply and demand imbalances reflected in its ACE. November 16, 2007 Order, 121 FERC ¶ 61,179 at P 19 n.14.

On December 21, 2006, NERC received a request to provide a formal interpretation of Requirement R17 asking whether the only devices that need to be annually calibrated under this requirement are time error and frequency devices, and whether the list of device accuracy is simply the design accuracy of the devices listed and that those devices do not need to be calibrated on an annual basis (except the digital frequency transducer which is covered as a “frequency device”). NERC provided an interpretation clarifying that the intent of BAL-005-0, Requirement R17 is to annually check and calibrate a balancing authority’s time error and frequency devices located in the control room against the common reference, and this requirement does not apply to any such devices located outside of the operations control center.

VAR-002-1 Generator Operation for Maintaining Network Voltage Schedules

The stated purpose of Reliability Standard VAR-002-1 is to ensure that generators provide reactive and voltage control necessary to ensure that voltage levels, reactive flows, and reactive resources are maintained within applicable facility ratings to protect equipment and the reliable operation of the interconnection.¹⁵

Modification of TLR Procedure

In Order No. 693, the Commission approved the current version of this Reliability Standard, IRO-006-3. This Reliability Standard ensures that a reliability coordinator has a coordinated transmission service curtailment and reconfiguration method that can be used along with other alternatives, such as redispatch or demand-side management, to avoid transmission limit violations when the transmission system is congested. Reliability Standard IRO-006-3 establishes a detailed TLR process for use in the Eastern Interconnection to alleviate loadings

¹⁵ Most bulk electric power is generated, transported, and consumed in alternating current (AC) networks. AC systems supply (or produce) and consume (or absorb or lose) two kinds of power: real power and reactive power. Real power accomplishes useful work (e.g., runs motors and lights lamps). Reactive power supports the voltages that must be controlled for system reliability. FERC, Principles for Efficient and Reliable Reactive Power Supply and Consumption, Docket No. AD05-1-000, at 17 (2005), available at <http://www.ferc.gov/legal/staff-reports.asp> (Reactive Power Principles).

on the system by curtailing or changing transactions based on their priorities and the severity of the transmission congestion.¹⁶

In addition to approving IRO-006-3, the Commission in Order No. 693 directed the ERO to modify the Reliability Standard to: (1) include a clear warning that the TLR procedure is an inappropriate and ineffective tool to mitigate actual IROL violations;¹⁷ and (2) identify in a requirement the available alternatives to mitigate an IROL violation other than use of the TLR procedure.¹⁸ These directives reflect an observation from the U.S.-Canada Power System Outage Task Force in the August 14, 2003 Blackout Report, which identified that the TLR procedure is often too slow for use in situations where the system has already violated IROLs.¹⁹ In setting forth these directives, the Commission stated that it did not have concerns with the use of the TLR procedure to avoid *potential* IROL violations.²⁰

Violation Risk Factors

Violation risk factors delineate the relative risk to the Bulk-Power System associated with the violation of each Requirement and are used by NERC and the Regional Entities to determine financial penalties for violating a Reliability Standard. NERC assigns a lower, medium, or high violation risk factor for each mandatory Reliability Standard Requirement.²¹ The Commission also established guidelines for evaluating the validity of each Violation Risk Factor assignment.²²

16 The equivalent interconnection-wide TLR procedures for use in WECC and Electric Reliability Council of Texas (ERCOT) are known as “WSCC Unscheduled Flow Mitigation Plan” and section 7 of the “ERCOT Protocols,” respectively.

17 An IROL is a system operating limit that, if violated, could lead to instability, uncontrolled separation, or cascading outages that adversely impact the reliability of the Bulk-Power System.

18 Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 964.

19 U.S.-Canada Power System Outage Task Force, Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations, at 163 (April 2004) (Final Blackout Report), available at <https://reports.energy.gov/>.

20 Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 962.

21 The definitions of “high,” “medium,” and “lower” are provided in North American Electric Reliability Corp., 119 FERC ¶ 61,145, at P 9 (Violation Risk Factor Order), order on reh’g, 120 FERC ¶ 61,145 (2007) (Violation Risk Factor Rehearing).

22 The guidelines are: (1) consistency with the conclusions of the Blackout Report; (2) consistency within a Reliability Standard; (3) consistency among Reliability Standards; (4) consistency with NERC’s definition of the violation risk factor level; and (5) treatment of requirements that co-mingle more than one obligation. The Commission also explained that this list was not necessarily all-inclusive and that it retains the flexibility to consider additional guidelines in the future. A detailed explanation is provided in Violation Risk Factor Rehearing, 120 FERC ¶ 61,145 at P 8-13.

2. **HOW, BY WHOM, AND FOR WHAT PURPOSE THE INFORMATION IS TO BE USED AND THE CONSEQUENCES OF NOT COLLECTING THE INFORMATION**

Prior to enactment of section 215, FERC had acted primarily as an economic regulator of wholesale power markets and the interstate transmission grid. In this regard, the Commission acted to promote a more reliable electric system by promoting regional coordination and planning of the interstate grid through regional independent system operators (ISOs) and regional transmission organizations (RTOs), adopting transmission pricing policies that provide price signals for the most reliable and efficient operation and expansion of the grid, and providing pricing incentives at the wholesale level for investment in grid improvements and assuring recovery of costs in wholesale transmission rates.

As part of FERC's efforts to promote grid reliability, the Commission created a new Division of Reliability within the Office of Markets, Tariffs and Rates. One task of this office has been to participate in North American Reliability Council's (NERC's) Reliability readiness reviews of balancing authorities, transmission operators and reliability coordinators in North America to determine their readiness to maintain safe and reliable operations. FERC also directed transmission owners to report by June 2004, on the vegetation management practices they use for transmission and rights of way.²³ FERC's Reliability Division has also been engaged in studies and other activities to assess the longer-term and strategic needs and issues related to power grid reliability. (On September 20, 2007, the Division of Reliability became the Office of Electric Reliability, a separate office within the Commission.)

Sufficient supplies of energy and a reliable way to transport those supplies to customers are necessary to assure reliable energy availability and to enable competitive markets. Reasonable supply relative to demand is essential for competitive markets to work. Without sufficient delivery infrastructure, some suppliers will not be able to enter the market, customer choices will be limited, and prices will be needlessly volatile. The Commission assists in creating a more reliable electric system by:

- Fostering regional coordination and planning of the interstate grid through independent system operators and regional transmission organizations;
- Adopting transmission policies that provide price signals for the most reliable and efficient operation and expansion of the grid; and
- Providing pricing incentives at the wholesale level for investment in grid improvements and ensuring opportunities for cost recovery in wholesale transmission rates.

²³ 1902-0207, FERC-723 "Vegetation Report" in Docket No. EL04-52-000. EL04-52-000. This was a one-time information collection that expired 10/31/04. FERC submitted a report to Congress in September 2004 that set forth the Commission's findings and recommendations, including the need for mandatory, enforceable reliability rules.

The passage of the Electricity Modernization Act of 2005 added to the Commission's efforts identified above, by giving it the authority to strengthen the reliability of the interstate grid through the grant of new authority pursuant to section 215 of the FPA which provides for a system of mandatory Reliability Standards developed by the ERO, established by FERC, and enforced by the ERO and Regional Entities.

This Final Rule approves six modified Reliability Standards, five of which pertain to interchange scheduling and coordination and one that pertains to transmission loading relief procedures. In addition, this Final Rule approves interpretations of five specific requirements of Commission-approved Reliability Standards. The Final Rule finds the Reliability Standards and interpretations just, reasonable, not unduly discriminatory or preferential, and in the public interest.

3. DESCRIBE ANY CONSIDERATION OF THE USE OF IMPROVED TECHNOLOGY TO REDUCE BURDEN AND TECHNICAL OR LEGAL OBSTACLES TO REDUCING BURDEN.

The Commission has developed the capability for electronic filing of all major submissions to the Commission. In Order No. 619, the Commission established an electronic filing initiative that permits over 40 qualified types of documents to be filed over the Internet to its website. This includes the ability to submit standard forms using software that is readily available and easy to use. Electronic filing, combined with electronic posting and service over the web site, permits staff and the public to obtain filings in a faster and more efficient manner. The Commission is working to expand the qualified types of documents that can be filed over the Internet.

In order that the Commission is able to perform its oversight function with regard to Reliability Standards that are proposed by the ERO and established by the Commission, it is essential that the Commission receive timely information regarding all or potential violations of Reliability Standards. While section 215 of the FPA contemplates the filing of the record of an ERO or Regional Entity enforcement action, FERC needs information regarding violations and potential violations at or near the time of occurrence. Therefore, it will work with the ERO and regional reliability organizations to be able to use the electronic filing of information so the Commission receives timely information.

The regulations established in Order No. 693 also require that each Reliability Standard that is approved by the Commission will be maintained on the ERO's Internet website for public inspection.

4. DESCRIBE EFFORTS TO IDENTIFY DUPLICATION AND SHOW SPECIFICALLY WHY ANY SIMILAR INFORMATION ALREADY

AVAILABLE CANNOT BE USED OR MODIFIED FOR USE FOR THE PURPOSE(S) DESCRIBED IN INSTRUCTION NO. 2

Filing requirements are periodically reviewed as OMB review dates arise or as the Commission may deem necessary in carrying out its responsibilities under the FPA in order to eliminate duplication and ensure that filing burden is minimized. There are no similar sources of information available that can be used or modified for these reporting purposes. The filing requirements contained in FERC-725A will incorporate NERC's requirements. However, all reliability requirements will be subject to FERC approval along with the requirements developed by Regional Entities and Regional Advisory Bodies and the ERO.

5. METHODS USED TO MINIMIZE BURDEN IN COLLECTION OF INFORMATION INVOLVING SMALL ENTITIES

FERC-725A is a filing requirement concerning the implementation of reliability standards by the Electric Reliability Organization and its responsibilities as well as those of Regional Entities and Regional Advisory Bodies in the development of Reliability Standards. The Electricity Modernization Act specifies that the ERO and Regional Entities are not departments, agencies or instrumentalities of the United States government and will not be like most other businesses, profit or not-for-profit. Congress created the concept of the ERO and Regional Entities as select, special purpose entities that will transition the oversight of the Bulk-Power System reliability from voluntary, industry organizations to independent organizations subject to Commission jurisdiction.

Section 215(b) of the FPA requires all users, owners and operators of the Bulk-Power System to comply with Commission-approved Reliability Standards. Each proposed Reliability Standard submitted for approval by NERC applies to some subset of users, owners and operators. However, the Commission believes that in achieving compliance with the Reliability Standards, the burden could be minimized for smaller entities by having them join a joint action agency or a generation or transmission cooperative or similar organization that would assume responsibility for compliance on behalf of its members. In addition, the Commission is relying on the registry established by NERC that spells out the criteria of who will be subject to the Reliability Standards. Some of the criteria included in the registry process are: (1) transmission owners and operators with an integrated element associated with the Bulk Power System of 100kV or above; distribution providers or Load Serving entities that have a peak load of 25 MW or greater and are directly connected to bulk service system; for generators, individual units of 20MVA or greater that are directly connected to the bulk electric system, generating plants with an aggregate rating of 75 MVA or greater or any generator regardless of size that is material to the reliability of Bulk Power System. In essence, the burden can be reduced as result of either eligibility or collaborative efforts.

With respect to the requirements in this Final Rule, the Commission does not anticipate any additional impact on the reporting burden for small businesses, because the proposed

modifications in this Final Rule are minor and the interpretations do not increase the existing burden.

6. CONSEQUENCE TO FEDERAL PROGRAM IF COLLECTION WERE CONDUCTED LESS FREQUENTLY

The Electric Reliability Organization will conduct periodic assessments of the reliability and adequacy of the Bulk-Power System in North America and report its findings to the Commission, the Secretary of Energy, Regional Entities, and Regional Advisory Bodies annually or more frequently if so ordered by the Commission. The ERO and Regional Entities will report to FERC on their enforcement actions and associated penalties and to the Secretary of Energy, relevant Regional entities and relevant Regional Advisory Bodies annually or quarterly in a manner to be prescribed by the Commission. If the information were conducted less frequently or discontinued, the Commission would be placed at a disadvantage in not having the data necessary for monitoring its mandated obligations.

7. EXPLAIN ANY SPECIAL CIRCUMSTANCES RELATING TO THE INFORMATION COLLECTION

FERC-725A is a filing requirement necessary to comply with the applicable provisions of the Electricity Modernization Act of 2005 and section 215 of the Federal Power Act.

In accordance with section 39.5 of the Commission's regulations, the ERO must file each Reliability Standard or a modification to a Reliability Standard with the Commission. The filing is to include a concise statement of the basis and purpose of the proposed Reliability Standard, either a summary of the Reliability development proceedings conducted by the ERO or a summary of the Reliability Standard development proceedings conducted by a Regional Entity together with a summary of the Reliability Standard review proceedings of the ERO and a demonstration that the proposed Reliability Standard is "just, reasonable, not unduly discriminatory or preferential, and in the public interest.

The ERO must make each effective Reliability Standard available on its Internet website. Copies of the effective Reliability Standards will be available from the Commission's Public Reference Room.

The Commission requires an original and seven of the proposed Reliability Standard or to the modification to a proposed Reliability Standard to be filed. This exceeds the OMB guidelines in 5 CFR 1320.5(d) (2) (iii) because of the number of divisions within the Commission that must analyze the standard and corresponding reports in order to carry out the regulatory process. The original is docketed, imaged through e-Library and filed as a permanent

record for the Commission. The remaining copies are distributed to the necessary offices of the Commission with one being placed immediately in the Commission's Public Reference Room for public use. Since the time frame for responses to the request is very limited, the multiple hard copies are necessary for the various offices to review, analyze and prepare the final order at the same time. The electronic filing initiative at FERC, may in the near future, allow for relief of the number of copies, but at this time, the program turn around time for docketing, imaging and retrieval does not permit sufficient time to review the filings and to prepare the necessary documents for the processing of these filings.

In addition, individual reliability standards may have records retention schedules that exceed OMB guidelines in 5 CFR 1320.5(d)(2)(iv) of not retaining records for no longer than three years. The Commission is not prescribing a set data retention period to apply to all Reliability Standards.

**8. DESCRIBE EFFORTS TO CONSULT OUTSIDE THE AGENCY:
SUMMARIZE PUBLIC COMMENTS AND THE AGENCY'S RESPONSE
TO THESE COMMENTS**

Each Commission rulemaking (both NOPRs and Final Rules) are published in the Federal Register, thereby affording all public utilities and licensees, state commissions, Federal agencies, and other interested parties an opportunity to submit data, views, comments or suggestions concerning the proposed collection of data. The notice procedures also allow for public conferences to be held as required. The Commission has held several workshops and technical conferences to address reliability issues including transition to the NERC reliability standards, operator tools, and reactive power.

ERO TLR Filing, Reliability Standard IRO-006-4

As noted above, NERC submitted for Commission approval in its December 2007 filing, a modified TLR procedure, Reliability Standard IRO-006-4, which contains five requirements. Requirement R1 obligates a reliability coordinator experiencing a potential or actual system operating limit (SOL) or IROL violation within its reliability coordinator area to select one or more procedures to provide transmission loading relief. The requirement also identifies the regional TLR procedures in WECC and ERCOT.²⁴

In the NOPR, the Commission proposed to approve IRO-006-4 as just, reasonable, not unduly discriminatory or preferential, and in the public interest.²⁵ The Commission also proposed to approve the Reliability Standard based on the interpretation that using a TLR procedure to mitigate an IROL violation is a violation of the Reliability Standard. The Commission asked for comments on whether any compromise in the reliability of the Bulk-

²⁴ In open-access electricity markets the reservations of transmission services are based on data resulting from the off-line computation of Available Transfer Capability (ATC). When ATC data is inaccurate or misused, security violations can emerge and cause operators and operations planners to invoke Transmission Loading Relief (TLR) procedures.

²⁵ NOPR, FERC Stats. & Regs. ¶ 32,632 at P 48.

Power System may result from the removal and transfer to NAESB of the business-related issues formerly contained in Reliability Standard IRO-006-3. In addition, the Commission proposed to direct the ERO to modify the violation risk factors assigned to Requirements R1 through R4 by raising them to “high.”

The Commission received comments on the NOPR proposal. Because the Final Rule does not approve or remand the proposed Reliability Standard and, rather, directs the ERO to submit a filing that provides an explanation regarding specific language of one requirement of IRO-006-4, the Commission will address the comments in a future issuance in this rulemaking proceeding.

Commission Determination

Because the Commission has concern regarding the understanding of certain language of Requirements R1 and R1.1 of IRO-006-4, the Commission is not approving or remanding the proposed Reliability Standard at this time. Rather, the Commission directs that the ERO, within 15 days of the effective date of this Final Rule, submit a filing that provides an explanation regarding specific language of Requirements R1 and R1.1 of IRO-006-4. The Commission will then issue a notice allowing public comment on the ERO’s filing, and will act on the proposed Reliability Standard in a future issuance in this proceeding.

In the Final Blackout Report, an international team of experts studying the causes of the August 2003 blackout in North America recommended that NERC “[c]larify that the transmission loading relief (TLR) process should not be used in situations involving an actual violation of an Operation Security Limit.”²⁶ Based on the Final Blackout Report recommendation, the Commission, in Order No. 693, directed NERC to develop a modification to the TLR procedure (IRO-006-3) that “(1) includes a clear warning that the TLR procedure is an inappropriate and ineffective tool to mitigate actual IROL violations and (2) identifies in a Requirement the available alternatives to mitigate an IROL violation other than use of the TLR procedure.”²⁷

In response to this directive, NERC proposed in Requirement R1.1 of IRO-006-4 that “[t]he TLR procedure [for the Eastern Interconnection] alone is an inappropriate and ineffective tool to mitigate an IROL violation due to the time required to implement the procedure.” (Emphasis added.) The Commission is concerned whether this language is adequate to satisfy the concern of the Final Blackout Report and Order No. 693. Specifically, we note that the use of the term “alone” seems to imply that a TLR procedure could be used in response to an actual violation of an IROL whereas the Final Blackout Report recommendation would prevent the use of the TLR procedure in such situations. Moreover, Requirement R1 of IRO-006-4 further appears to contradict the Final Blackout Report recommendation by allowing a reliability

²⁶ See U.S.-Canada Power System Outage Task Force, Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations, at 163 (April 2004) (Final Blackout Report) (Recommendation 31).

²⁷ See Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 577, 964.

coordinator to implement transmission loading relief procedures to mitigate not only potential SOL or IROL violations but also actual SOL or IROL violations.”²⁸ The Commission is concerned that Recommendation 31 of the Final Blackout Report and the directive in Order No. 693, both of which state the TLR procedures should not be used in situations involving an actual violation of an IROL, may not be clearly addressed in the proposed Reliability Standard.

The Commission notes that an entity is not prevented from using the TLR procedure to avoid a potential IROL violation before a violation occurs. If, while a TLR procedure is in progress, an IROL violation occurs, it is not necessary for the entity to terminate the TLR procedure. However, the Commission believes that it is inappropriate and ineffective to rely on the TLR procedure, even in conjunction with another tool, to address an actual IROL violation.

Therefore, the Commission is not approving or remanding IRO-006-4. Rather, the Commission is directing the ERO to submit a filing, within 15 days of the effective date of the Final Rule, that provides an explanation regarding Requirements R1 and R1.1 of IRO-006-4. Specifically, in light of the above discussion, the Commission directs the ERO to provide an explanation regarding the phrase “[t]he TLR procedure alone is an inappropriate and ineffective tool to mitigate an IROL violation . . .” Further, the ERO should explain whether Requirements R1 and R1.1 only allow the TLR procedure to be continued when already deployed prior to an actual IROL violation or, alternatively, whether Requirements R1 and R1.1 allow use of the TLR procedure as a tool to address actual violations after they occur. If the latter, the ERO is directed to explain why this application is not contrary to both Blackout Report Recommendation 31 and the Commission’s determination in Order No. 693. The Commission also directs that the ERO’s filing should include an explanation of those actions that are acceptable, and those that are unacceptable, pursuant to Requirement R1 and R1.1.

²⁸ Requirement R1 provides that “[a] reliability Coordinator experiencing a potential or actual SOL or IROL violation within its Reliability Coordinator Area shall, with its authority and at its discretion, select one or more procedures to provide transmission loading relief. This procedure can be a “local” . . . transmission loading relief procedure or one of the following Interconnection-wide procedures....” Sub-requirement R1.1 provides that “[t]he TLR procedure alone is an inappropriate and ineffective tool to mitigate an IROL violation due to the time required to implement the procedure. Other acceptable and more effective procedures to mitigate actual IROL violations include: reconfiguration, redispatch, or load shedding.”

BAL-001-0 – Real Power Balancing Control Performance and BAL-003-0 – Frequency Response and Bias

The purpose of Reliability Standard BAL-001-0 is to maintain interconnection steady-state frequency within defined limits by balancing real power demand and supply in real-time.²⁹ It uses two averages, covering the one-minute and ten-minute area control error (ACE) performance (CPS1 and CPS2, respectively), as measures for determining compliance with its four Requirements. Requirement R1 of BAL-001-0 obligates each balancing authority, on a rolling twelve-month basis, to maintain its clock-minute averages of ACE, modified by its frequency bias and the interconnection frequency, within a specific limit based on historic performance.³⁰

The purpose of Reliability Standard BAL-003-0 is to ensure that a balancing authority's frequency bias setting is accurately calculated to match its actual frequency response. Frequency bias may be calculated in a number of ways provided that the frequency bias is as close as practical to the frequency response. Requirement R3 of BAL-003-0 requires each balancing authority to operate its automatic generation control on "tie line frequency bias," unless such operation is adverse to system interconnection reliability.³¹

In its December 19, 2007 filing, NERC explained that WECC requested the ERO to provide a formal interpretation whether the use of WECC's existing automatic time error correction factor that is applied to the net interchange portion of the ACE equation violates Requirement R1 of BAL-001-0 or Requirement R3 of BAL-003-0.

In response, the ERO interpreted of BAL-001-0 Requirement R1 as follows:

- The [WECC automatic time error correction or WATEC] procedural documents ask Balancing Authorities to maintain raw ACE for [control performance

²⁹ See Reliability Standard BAL-001-0. Each Reliability Standard developed by the ERO includes a "Purpose" statement.

³⁰ Frequency bias is an approximation, expressed in megawatts per 0.1 Hertz, of the frequency response of a balancing authority area which estimates the net change in power from the generators that is expected to occur with a change in interconnection frequency from the scheduled frequency (which is normally 60 Hertz).

³¹ Automatic generation control refers to an automatic process whereby a balancing authority's mix and output of its generation and demand-side management is varied to offset the extent of supply and demand imbalances reflected in its ACE. North American Electric Reliability Corporation, 121 FERC ¶ 61,179, at P 19 n.14 (2007). "Tie line frequency bias" is defined in the NERC Glossary of Terms Used in Reliability Standards as "[a] mode of Automatic Generation Control that allows the Balancing Authority to 1.) maintain its Interchange Schedule and 2.) respond to Interconnection frequency error."

standard or CPS] reporting and to control via WATEC-adjusted ACE.

- As long as Balancing Authorities use raw (unadjusted for WATEC) ACE for CPS reporting purposes, the use of WATEC for control is not in violation of BAL-001 Requirement 1.

The ERO interpreted BAL-003-0 Requirement R3 as follows:

- Tie-Line Frequency Bias is one of the three foundational control modes available in a Balancing Authority's energy management system. (The other two are flat-tie and flat-frequency.) Many Balancing Authorities layer other control objectives on top of their basic control mode, such as automatic inadvertent payback, [control performance standard] optimization, [and] time control (in single [balancing authority] interconnections).^[32]
- As long as Tie-Line Frequency Bias is the underlying control mode and CPS1 is measured and reported on the associated ACE equation,^[33] there is no violation of BAL-003-0 Requirement 3:

$$ACE = (NI_A - NI_S) - 10B (F_A - F_S) - I_{ME}$$

(NERC December 19, 2007 Filing, Ex. A-3.)

In the NOPR, the Commission proposed to approve the ERO's formal interpretations of Requirement R1 of BAL-001-0 and Requirement R3 of BAL-003-0.

NERC and IESO support the Commission's proposal to approve these interpretations.

Commission Determination

The Commission is approving the ERO's formal interpretations of Requirement R1 of BAL-001-0 and Requirement R3 of BAL-003-0. The ERO's interpretation of BAL-001-0, Requirement R1, is reasonable in that it requires all balancing authorities in WECC to calculate CPS1 and CPS2 as defined in the Requirements. Thus, the interpretation upholds the reliability goal to minimize the frequency deviation of the interconnection by constantly balancing supply and demand.

The ERO's interpretation of BAL-003-0, Requirement R3 is appropriate because it maintains the goal of Requirement R3 by obligating a balancing authority to operate automatic generation control on tie-line frequency bias as its underlying control mode, unless to do so is adverse to system or interconnection reliability. Further, the interpretation fosters the purpose of Requirement R3 as it allows that a balancing authority may go beyond Requirement R3 and "layer other control objectives on top of their basic control modes, such as automatic inadvertent payback, [control performance standard] optimization, [and] time control (in single [balancing

³² The "flat frequency" control mode would increase or decrease generation solely based on the interconnection frequency. The "flat tie" mode would increase or decrease generation within a balancing authority area depending solely on that balancing authority's total interchange. The "tie-line frequency bias" mode combines the flat frequency and flat tie modes and adjusts generation based on the balancing authority's net interchange and the interconnection frequency.

³³ "CPS1" refers to Requirement R1 of BAL-001-0.

authority] interconnections),”³⁴ although such layering is not required by the Reliability Standard.

For these reasons, the Commission finds that the ERO’s interpretations of Requirement R1 of BAL-001-0 and Requirement R3 of BAL-003-0 are just, reasonable, not unduly discriminatory or preferential, and in the public interest. Accordingly, the Commission approves the ERO’s interpretations.

9. EXPLAIN ANY PAYMENT OR GIFTS TO RESPONDENTS

No payments or gifts have been made to respondents.

10. DESCRIBE ANY ASSURANCE OF CONFIDENTIALITY PROVIDED TO RESPONDENTS

The Commission generally does not consider the data filed to be confidential. However, certain standards may have confidentiality provisions in the standard.

Section 215(e) of the FPA as well as section 39.7(d) of the Commission’s regulations regarding enforcement of Reliability Standards provides for public notice and opportunity for a hearing with respect to both the ERO (or Regional Entity) enforcement proceedings and proceedings before the Commission involving review of a proposed penalty for violation of a reliability standard. Section 39.7(b)(4) provides a limited exception to this notice requirement and allow non-public proceedings for enforcement actions that involve a Cybersecurity Incident,³⁵ unless FERC determines on a case-by-case basis that such protection is not necessary. The Commission has in place procedures to prevent the disclosure of sensitive information, such as the use of protective orders and rules establishing critical energy infrastructure information (CEII). However, the Commission believes that the specific, limited area of Cybersecurity Incidents requires additional protections because it is possible that system security and reliability would be further jeopardized by the public dissemination of information involving incidents that compromised the cybersecurity system of a specific user, owner or operator of the Bulk-Power System. In addition, additional information provided with a filing may be submitted with a specific request for confidential treatment to the extent permitted by law and considered pursuant to 18 C.F.R. 388.112 of FERC's regulations.

11. PROVIDE ADDITIONAL JUSTIFICATION FOR ANY QUESTIONS OF A SENSITIVE NATURE THAT ARE CONSIDERED PRIVATE.

There are no questions of a sensitive nature that are considered private.

³⁴ NERC interpretation of BAL-003-0, Requirement R3.

³⁵ The term “Cybersecurity Incident” is defined as a malicious act or suspicious event that disrupts, or was an attempt to disrupt, the operation of those programmable electronic devices and communications networks including hardware, software and data that are essential to the Reliable Operation of the Bulk-Power System.

12. ESTIMATED BURDEN OF COLLECTION OF INFORMATION

As stated above, the Commission previously approved, in Order No. 693, each of the Reliability Standards that are the subject of the current rulemaking. The modifications to the Reliability Standards are minor and the proffered interpretations relate to existing Reliability Standards; therefore, they do not add to or increase entities' current reporting burden.

Therefore the reporting burdens as reported in Order No. 693 (see estimates below) remain unchanged.

Total Annual Hours for Collection:

Data Collection	No. of Respondents	No. of Responses	Hours Per Response	Total Annual Hours
FERC-725A				
Investor Owned Utilities	170	1	2,080	353,600
Municipals and Cooperatives (Large)	80	1	1,420	113,600
Municipals and Cooperatives (Small)	670	1	710	475,700
Generator Operators	360	1	500	180,000
Power Marketers	159	1	100	15,900
Recordkeeping	Investor Owned Utilities			35,360
	Munis/Coops (Large)			11,360
	Munis/Coops (Small)			47,570
	Generator Operators			18,000
	Power Marketers			1,590
Totals				1,252,680

(FTE=Full Time Equivalent or 2,080 hours)

Total Hours = 1,138,800 (reporting) + 113,880 (recordkeeping) = 1,252,680 hours. This estimated reporting burden will be significantly reduced once joint action agencies are established, which will reduce the number of small entities that will be responsible for compliance with Reliability Standards.

13. **ESTIMATE OF THE TOTAL ANNUAL COST BURDEN TO RESPONDENTS**

Information Collection Costs: As noted above, the modifications to the Reliability Standards are minor and the proffered interpretations relate to existing Reliability Standards; therefore, they do not add to or increase entities' current reporting burden. As a result, the Commission does not anticipate there will be associated costs to implement these revisions.

14. **ESTIMATED ANNUALIZED COST TO FEDERAL GOVERNMENT**

The estimate of the cost to the Federal Government is based on salaries for professional and clerical support, as well as direct and indirect overhead costs. Direct costs include all costs directly attributable to providing this information, such as administrative costs and the cost for information technology. Indirect or overhead costs are costs incurred by an organization in support of its mission. These costs apply to activities which benefit the whole organization rather than anyone particular function or activity. As the Commission has already adopted many of the Reliability Standards instituted in Order No. 693 (many of which have already been in place on a voluntary basis), it is difficult to provide an assessment at this stage of what the costs will be to the Commission in its review and of Reliability Standards submitted to it. These requirements are at the preliminary stages and the Regional Entities and Regional Advisory bodies have only just been created. Both organizations will play a role in standards development prior to their submission to the Commission.

Initial Estimates anticipate that 2.5 FTE's will review these revised Reliability standards at the Commission or a total cost of $2.5 \times \$126,384 = \$315,960$.³⁶

15. **REASONS FOR CHANGES IN BURDEN INCLUDING THE NEED FOR ANY INCREASE**

There are no changes to the reporting burden for the reasons stated above.

16. **TIME SCHEDULE FOR THE PUBLICATION OF DATA**

The filed proposed Reliability Standards are available on the Commission's eLibrary document retrieval system in Docket No. RM06-16-000 and the Commission required that all Commission-approved Reliability Standards be available on the ERO's website, with an

³⁶ An FTE = Full Time Employee. The \$126,384 "cost" consists of approximately \$102,028 in salaries and benefits and \$24,355 in overhead. The Cost estimate is based on the estimated annual allocated cost per Commission employee for Fiscal Year 2008.

effective date (http://www.nerc.com/~filez/nerc_filings_ferc.html).

Copies of the filings are made available to the public within two days of submission to FERC via the Commission's web site. There are no other publications or tabulations of the information.

17. DISPLAY OF THE EXPIRATION DATE

It is not appropriate to display the expiration date for OMB approval of the information collected. The information will not be collected on a standard, preprinted form which would avail itself to that display. Rather the Electric Reliability Organization must prepare and submit filings that reflect unique or specific circumstances related to the Reliability Standard. In addition, the information contains a mixture of narrative descriptions and empirical support that varies depending on the nature of the transaction.

18. EXCEPTIONS TO THE CERTIFICATION STATEMENT

Item No. 19(g) (vi) see Instruction No. 17 above for further elaboration. In addition, the data collected for this reporting requirement is not used for statistical purposes. Therefore, the Commission does not use as stated in item no. 19(i) "effective and efficient statistical survey methodology." The information collected is case specific to each Reliability Standard.

B. COLLECTION OF INFORMATION EMPLOYING STATISTICAL METHODS.

This is not a collection of information employing statistical methods.