

**NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION**

**ATTACHMENT 1**

**TO**

**THREE-YEAR ERO PERFORMANCE ASSESSMENT**

**I. DISCUSSION OF HOW NERC MEETS  
THE ERO CERTIFICATION CRITERIA OF 18 C.F.R. §39.3(b)**

**II. NERC PROGRAM AREA  
STATEMENTS OF ACTIVITIES AND ACHIEVEMENTS**

**JULY 1, 2009**

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**I. DISCUSSION OF HOW NERC MEETS  
THE ERO CERTIFICATION CRITERIA OF 18 C.F.R. §39.3(b)**

- 1. The ERO has the ability to develop and enforce, pursuant to 18 C.F.R. §39.7, reliability standards that provide for an adequate level of reliability of the bulk power system**

This criterion encompasses two distinct functions of the ERO: (i) the ability to develop reliability standards that provide for an adequate level of reliability of the bulk power system, and (ii) the ability to enforce those reliability standards.

**Development of Reliability Standards**

NERC develops reliability standards pursuant to Section 300 of its Rules of Procedure (ROP) and its Reliability Standards Development Procedure (RDSP), Appendix 3A to the ROP, both of which have been approved by the Commission as ERO Rules.<sup>1</sup> In addition to having been approved by the Commission, the RSDP has been accredited by the American National Standards Institute (ANSI) as meeting ANSI's essential requirements for standards development.

The overall purpose of NERC's reliability standards development process, as stated in Section 301 of the NERC ROP, is to develop and maintain reliability standards that apply to bulk power system owners, operators and users and that enable NERC and the Regional Entities to measure the reliability performance of the owners, operators and users and to hold them accountable for the reliable operation of the bulk power system. Section 301 of the ROP requires that reliability standards developed by NERC must be technically excellent, timely, just, reasonable, not unduly discriminatory or preferential, in the public interest, and consistent with other applicable standards of governmental authorities.<sup>2</sup>

In Order No. 672 and the *ERO Certification Order*, the Commission stated that the ERO's reliability standards development process must ensure that each reliability standard is technically sound; that its operational specifications are designed to achieve a valuable reliability goal; that the standard is clear and unambiguous regarding what is required and who is required to comply; and that there be clear criteria to measure whether an entity is in compliance with the reliability standard, so that enforcement can be applied in a consistent and non-preferential manner.<sup>3</sup> Consistent with these requirements, Section 302 of the ROP specifies the essential

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<sup>1</sup> Sections 304 and 308.1 of the NERC ROP specify that "NERC shall develop reliability standards in accordance with the NERC *Reliability Standards Development Procedure*, which is incorporated into these rules as Appendix 3A." The current version of the RSDP is Version 6.1 which became effective June 7, 2007.

<sup>2</sup> Section 304 of the ROP sets forth NERC's "Essential Principles for the Development of Reliability Standards." These principles, which include openness, transparency, consensus building, fair balance of interests and due process, are discussed under criterion 5, below.

<sup>3</sup> *Rules Concerning Certification of the Electric Reliability Organization; Procedures for the Establishment, Approval and Enforcement of Electric Reliability Standards*, Order No. 672,

attributes of technically excellent reliability standards to be developed by NERC.<sup>4</sup> These essential attributes include<sup>5</sup>:

**Applicability:** Each reliability standard shall clearly identify the functional classes of entities responsible for complying with the reliability standard, with any specific additions or exceptions noted; and shall identify the geographic applicability of the standard.<sup>6</sup>

**Reliability Objectives:** Each reliability standard must have a clear statement of purpose that describes how the standard contributes to the reliability of the bulk power system. Section 302.2 of the ROP lists the general objectives for the bulk power system that provide a foundation for determining the specific objective(s) of each reliability standard.<sup>7</sup>

1. *Reliability Planning and Operating Performance:* Bulk power systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions.

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FERC Stats. & Regs. ¶31,204 (2006), at P 258, 262, 325, 327; *Order Certifying North American Electric Reliability Corporation as the Electric Reliability Organization and Ordering Compliance Filing*, 116 FERC P 61,062 (*ERO Certification Order*), at PP 239, 241.

<sup>4</sup> In the *ERO Certification Order*, the Commission recognized that NERC's proposed ROP provided that the ten characteristics for technical excellence of a reliability standards must be met for a proposed reliability standard to be approved. *ERO Certification Order*, 116 FERC P 61,062, at P 235.

<sup>5</sup> The descriptions of the essential attributes that follow are summaries, not direct quotes from Section 302.

<sup>6</sup> The functional classes of entities, or reliability functions, have been developed through NERC's functional model of the bulk power system, and are defined in NERC's *Glossary of Terms Used in Reliability Standards* and *Statement of Compliance Registry Criteria*. Currently, the functional classes of entities are: Balancing Authorities, Distribution Providers, Generator Operators, Generator Owners, Interchange Authorities, Load-Serving Entities, Planning Authorities, Purchasing-Selling Entities, Reliability Coordinators, Resource Planners, Reserve Sharing Groups, Transmission Operators, Transmission Owners, Transmission Planners, and Transmission Service Providers.

<sup>7</sup> In the *ERO Certification Order*, the Commission recognized that NERC's proposed rules provided that the purpose of a reliability standard, or its reliability objective, should derive from one or more of these eight general objectives. *ERO Certification Order*, 116 FERC P 61,062, at P 236.

2. *Frequency and Voltage Performance:* The frequency and voltage of bulk power systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.
3. *Reliability Information:* Information necessary for the planning and operation of reliable bulk power systems shall be made available to those entities responsible for planning and operating bulk power systems.
4. *Emergency Preparation:* Plans for emergency operation and system restoration of bulk power systems shall be developed, coordinated, maintained and implemented.
5. *Communications and Control:* Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of bulk power systems.
6. *Personnel:* Personnel responsible for planning and operating bulk power systems shall be trained and qualified, and shall have responsibility and authority to implement actions.
7. *Wide-Area View:* The reliability of the bulk power systems shall be assessed, monitored, and maintained on a wide-area basis.
8. *Security:* Bulk power systems shall be protected from malicious physical or cyber attacks.

**Performance Requirement or Outcome:** Each reliability standard must state one or more performance requirements, which if achieved by the applicable entities will provide for a reliable bulk power system, consistent with good utility practices and the public interest. The performance requirement(s) shall not be a “lowest common denominator” compromise, but instead shall achieve an objective that is the best approach for bulk power system reliability taking account of the costs and benefits of implementing the proposed standard.

**Measurability:** Each performance requirement (i) shall be stated so as to be objectively measurable by a third party with knowledge or expertise in the area addressed by the requirement; and (ii) shall have one or more associated measures used to objectively evaluate compliance with the requirement. Further, if performance can be practically measured quantitatively, metrics shall be provided to determine satisfactory performance.

**Technical Basis in Engineering and Operations:** Each reliability standard shall be based on sound engineering and operating judgment, analysis, or experience, as determined by expert practitioners in that field.

**Completeness:** Reliability standards shall be complete and self-contained, and shall not depend on external information to determine the required level of performance.

**Consequences for Noncompliance:** In combination with guidelines for penalties and sanctions and other ERO and Regional Entity compliance documents, the consequences of violating a standard are clearly presented to the entities responsible for compliance.

**Clear Language:** Each reliability standard shall be stated using clear and unambiguous language, such that responsible entities, using reasonable judgment and in keeping with good utility practices, are able to arrive at a consistent interpretation of required performance.

**Practicality:** Each reliability standard shall establish requirements that can be practically implemented by the responsible entities within the specified effective date and thereafter.

**Consistent Terminology:** To the extent possible, reliability standards shall use a set of standard terms and definitions that are approved through the reliability standards development process.<sup>8</sup>

In the *ERO Certification Order*, the Commission concluded that by specifying the eight general objectives for which a reliability standard must be intended, and by incorporating other requirements for reliability standards development into the essential attributes of technically excellent reliability standards, NERC's ROP satisfied the requirements of Order No. 672 for the ERO's reliability standards development process.<sup>9</sup>

The NERC RSDP also provides a template for, and specifies the performance elements of, a reliability standard.<sup>10</sup> The requirement that each standard contain these elements applies a systematic discipline in the development and revision of standards, in order to produce standards that are measurable, enforceable and consistent. Use of the template specified in the RSDP allows for a clear statement of the purpose, requirements, measures and compliance elements associated with each standard. The performance elements of a reliability standard, as specified in the RSDP, are as follows:

**Identification Number:** A unique identification number assigned in accordance with a published classification system to facilitate tracking and reference to the standards.

**Title:** A brief descriptive phrase identifying the topic of the standard.

**Applicability:** A clear identification of the functional classes of entities responsible for complying with the standard, noting any specific additions or exceptions.

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<sup>8</sup> In furtherance of the essential attribute of "Consistent Terminology," NERC has developed and maintains the *Glossary of Terms Used in Reliability Standards*, containing definitions of terms that are used in one or more reliability standards.

<sup>9</sup> *ERO Certification Order*, 116 FERC P 61,062 at PP 239, 241.

<sup>10</sup> NERC RSDP at 6-8.

**Effective date and status:** The effective date of the standard.

**Purpose:** The purpose of the standard, explicitly stating what outcome will be achieved by the standard.

**Requirement(s):** Explicitly stated technical, performance, preparedness or certification requirements, with each requirement identifying who is responsible and what action is to be performed or outcome is to be achieved. Each statement in the requirements section is to be a statement for which compliance is mandatory.

**Risk Factors:** The potential reliability significance of each requirement of the standard, designated as a High, Medium or Lower Risk Factor in accordance with criteria specified in the RSDP.

**Measure(s):** Each requirement of the standard is to be addressed by one or more measures, which are used to assess performance and outcomes for purposes of determining compliance with the requirements. Each measure is to identify to whom the measure applies and the expected level of performance or outcomes required to demonstrate compliance; and shall be tangible, practical and as objective as is practical. Achieving the measure shall be a necessary and sufficient indicator that the associated requirement was met.

The NERC RSDP sets forth the detailed process steps for, and the detailed roles of the different persons and groups in, the development and approval of a new reliability standard or a revision to an existing standard. Under the ROP and the RSDP, the key groups involved in development of a proposed new reliability standard or revision to an existing standard are the Standards Committee, the Standards Authorization Request (SAR) Drafting Team, the Standard Drafting Team and the Registered Ballot Body (RBB).

The Standards Committee is an elected body comprised of two members from each segment of the RBB.<sup>11</sup> The Standards Committee, with the assistance and facilitation of the professional staff of the NERC Reliability Standards Development Program, oversees the overall standards development process. The Standards Committee ensures that Standard Development Teams have the technical resources and capabilities required to develop technically sound standards that will gain industry support. Among other things, the Standards Committee determines whether SARs submitted by interested persons and entities should be pursued for development, and appoints members to SAR Drafting Teams and Standard Drafting Teams.<sup>12</sup> A SAR Drafting Team is a team of technical experts that, among other responsibilities, assists in

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<sup>11</sup> The segment organization of the RBB is set forth in detail in the NERC RSDP, and is described below in the discussion of criterion 5, “The ERO has established rules that provide reasonable notice and opportunity for public comment, due process, openness and balance of interests in developing reliability standards, and otherwise exercising its duties.”

<sup>12</sup> NERC ROP §306.

refining a SAR and considers and responds to comments.<sup>13</sup> The Standard Drafting Team is a team of technical experts that develops the details of the proposed new or revised reliability standard, analyzes results of field tests of the standard (if any), and considers and responds to comments.<sup>14</sup> The RBB, which is open to any person or entity and is organized by industry segments, votes on the adoption or rejection of proposed reliability standards or revisions to existing standards.<sup>15</sup>

The RSDP also specifies roles in the standards development process for a NERC Standards Process Manager and the NERC Standards Process Staff.<sup>16</sup> The Standards Process Manager administers the reliability standards development process, is responsible for ensuring that development and revision of standards is in accordance with the RSDP, works to ensure the integrity of the reliability standards development process and the consistency of quality and completeness of NERC reliability standards, and facilitates all steps in the standards development process. The NERC Standards Process Staff assists the SAR Drafting Teams and the Standard Drafting Teams in carrying out the steps of the standards development process.

Through the technical expertise provided by the industry experts comprising the SAR Drafting Teams and Standard Drafting Teams, and the technical and administrative assistance provided by the NERC Standards Process Managers and the NERC Standards Process staff, and with the overall oversight and direction of the Standards Committee, the NERC standards development process ensures that the essential attributes of technically excellent reliability standard, including the accomplishment of one of the eight general reliability objectives specified in Section 302 of the ROP, are represented in each reliability standard that is developed or revised through the process and submitted to the NERC Board of Trustees and, ultimately, to the Commission for approval.

Although a substantial part of the work of reliability standards development under the NERC rules is performed by industry technical experts and other industry volunteers, the NERC Reliability Standards Development Program Staff plays a significant role in reliability standards development. NERC has developed and maintained a professional and technical staff in its Reliability Standards Development Program and has provided for substantial resources for the Reliability Standards Development Program in its annual ERO Business Plans and Budgets that have been submitted to and approved by the Commission pursuant to 18 C.F.R. §39.4(b) and (c). NERC's 2007 Business Plan and Budget, as approved by the Commission, provided for a staff of

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<sup>13</sup> NERC RSDP at 13.

<sup>14</sup> NERC RSDP at 13.

<sup>15</sup> NERC ROP §305; NERC RSDP at 11-12, 14, 21-24. Following successful balloting by the ballot pool, a proposed standard is submitted to the NERC Board of Trustees for approval, and if approved by the Board, is filed with the Commission for approval in accordance with §215(d) of the FPA and 18 C.F.R. §39.5. NERC Bylaws, Article IX, Section 1; NERC ROP §§ 308.2, 308.3 and 309; NERC RSDP at 14 and 24.

<sup>16</sup> NERC RSDP at 12; see also NERC ROP §307.



12 full-time equivalent employees (FTE) in the Reliability Standards Development Program.<sup>17</sup> Staffing for the Reliability Standards Development Program was increased to 15 FTE in the 2008 Business Plan and Budget.<sup>18</sup> In its 2009 Business Plan and Budget as originally submitted to the Commission, NERC budgeted for 14 FTE in the Reliability Standards Development Program for 2009<sup>19</sup>; however, in a revised Business Plan and Budget submitted to the Commission on December 15, 2008, NERC proposed to increase staffing for this program in 2009 to 14.5 FTE, and also to use significant additional consultant resources in this program during 2009, including to provide additional subject matter expertise for certain standards development projects to supplement the subject matter expertise available in the Reliability Standards Development Program staff.<sup>20</sup> NERC's budgeted direct expenses for the Reliability Standards Development Program in its approved 2007 and 2008 Business Plans and Budgets and its revised 2009 Business Plan and Budget (presently pending Commission approval) have been as follows<sup>21</sup>:

<u>Year</u>	<u>Amount</u>	<u>Increase over 2007</u>
2007:	\$2,258,433	--
2008:	\$3,118,592	38.1%
2009:	\$3,599,454	59.4%

Thus, NERC has increased its budgeted resources (direct expenses) for the Reliability Standards program by 59% from 2007 to 2009.

Using the reliability standards development process, and with the resources described above, NERC has developed and submitted to the Commission a total of 95 continent-wide reliability standards that, as of May 31, 2009, have been approved by the Commission pursuant to §215(d) of the FPA and 18 C.F.R. §39.5 as mandatory and enforceable. NERC has also approved and submitted to the Commission, and the Commission has approved, a total of 9 Regional reliability standards as of May 31, 2009. The continent-wide reliability standards that

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<sup>17</sup> See NERC 2007 Business Plan and Budget at 5 and 35.

<sup>18</sup> See NERC 2008 Business Plan and Budget at 6.

<sup>19</sup> See NERC 2009 Business Plan and Budget at 8 and 75.

<sup>20</sup> See *Compliance Filing of the North American Electric Reliability Corporation in Response to October 16, 2008 Order on 2009 Business Plans and Budgets*, filed December 15, 2008 in Docket Nos. RR08-6 and RR07-14 (*December 2008 Budget Compliance Filing*), at 7-12 and Attachment 1.

<sup>21</sup> See 2007 Business Plan and Budget at 5 and Appendix A at 1; 2008 Business Plan and Budget at 6; *December 2008 Budget Compliance Filing*, Attachment 1. The amounts cited are direct expenses only and do not include NERC indirect expenses (General and Administrative, Information Technology, Legal and Regulatory, Human Resources and Finance and Accounting) allocated to the Reliability Standards Development Program.

have been developed by NERC and approved by the Commission cover the full range of reliability objectives specified in Section 302 of the NERC ROP:

- Resource and Demand Balancing (6 approved standards)
- Communications (2 approved standards)
- Critical Infrastructure Protection (9 approved standards)
- Emergency Preparedness and Operations (8 approved standards)
- Facilities Design, Connections and Maintenance (9 approved standards)
- Interchange Scheduling and Coordination (9 approved standards)
- Interconnection Reliability Operations and Coordination (9 approved standards)
- Modeling, Data, and Analysis (10 approved standards)
- Nuclear (1 approved standard)<sup>22</sup>
- Personnel Performance, Training and Qualifications (4 approved standards)
- Protection and Control (14 approved standards)
- Transmission Operations (8 approved standards)
- Transmission Planning (4 approved standards)
- Voltage and Reactive Power (2 approved standards)

NERC's success to date in developing reliability standards that the Commission has approved as mandatory and enforceable demonstrates NERC has, and has exercised, the ability to develop reliability standards that provide for an adequate level of reliability of the bulk power system.

The approved reliability standards are structured in accordance with the template and performance elements specified in the RSDP. Each approved reliability standard contains the following clearly identified sections and subsections:

- **Applicability** – stating the title of the standard, its identification number, its purpose, the reliability functional entities to which it is applicable, and its effective date.
- **Requirements**
- **Measures**
- **Compliance** – stating the entity responsible for monitoring compliance; the compliance monitoring period and reset timeframe; data retention requirements for the registered entities; the levels of noncompliance for specified types of violations of the standard.

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<sup>22</sup> The one Nuclear Plant Interface standard that has been approved by the Commission becomes mandatory and effective on April 1, 2010.

- **Regional Differences**, if any.

NERC systematically manages the development of new standards and revisions to standards, in areas of highest need and importance, through its rolling three-year Reliability Standards Development Plans. The Standards Development Plan identifies and prioritizes the reliability standards development projects in the immediate three-year time horizon. The three-year Standards Development Plan is revised annually, based on input from NERC staff, the Standard Drafting Teams, the NERC technical committees and subgroups, other industry participants, and government authorities, to look ahead an additional year. The annual Standards Development Plan revision considers perceived gaps in NERC's reliability standards and proposals for closing those gaps; timing priorities of the projects in the Standards Development Plan and recommendations for adjusting the timing of individual projects; and potential new projects for development of new standards or revisions to existing standards. The three-year rolling Reliability Standards Development Plan, as revised each year, is submitted to the NERC Board for approval and then filed with the Commission for information.

NERC's three-year Reliability Standards Development Work Plan for 2008-2010 contemplated 35 standards development projects during this period. The 2009-2011 Reliability Standards Development Work Plan includes 39 standards development projects.

### **Enforcement of Reliability Standards**

NERC's program for monitoring and enforcing compliance with Commission-approved reliability standards is implemented through its Compliance Registry, Section 400 of its ROP, its Compliance Monitoring and Enforcement Program (CMEP), which is Appendix 4C to the ROP, its *Sanction Guidelines*, which is Appendix 4B to the ROP, and its delegation agreements with the eight Regional Entities.<sup>23</sup>

Section 6(a) of the NERC's delegation agreements with the Regional Entities specifies that the Regional Entity shall enforce reliability standards within its geographic boundaries through the compliance enforcement program set forth in Exhibit D to the Agreement, and that the Regional Entity's compliance enforcement program meets all applicable requirements of the FPA, Commission Order No. 672 and the Commission's regulations, including, *inter alia*, the requirement for an audit program pursuant to 18 C.F.R. §39.7(a), the assessment of penalties pursuant to 18 C.F.R. §39.7(c) through 39.7(g), and the requirements for due process. Additionally, Section 6(d) of the delegation agreements requires the Regional Entity to maintain the capability to conduct investigations of potential violations of reliability standards and to conduct such investigations in a confidential manner, and Section 6(e) requires the Regional Entity to maintain a program of proactive enforcement audits including procedures for spot-checks of self-reported compliance and periodic audits of all Registered Entities.

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<sup>23</sup> The delegation agreements were originally approved by the Commission in an order issued April 19, 2007 (*Order Accepting ERO Compliance Filing, Accepting ERO/Regional Entity Delegation Agreements, and Accepting Regional Entity 2007 Business Plans*, 119 FERC ¶61,060 (2007)), subject to various compliance requirements, which have been addressed in subsequent compliance filings and Commission orders.

Through the NERC Organization Registration process, NERC and the Regional Entities have identified users, owners, and operators of the bulk power system that are obligated to comply with Commission-approved NERC reliability standards.<sup>24</sup> Sections 501 and 507 of the NERC ROP govern the registration of users, owners and operators of the bulk power system as responsible for compliance with the requirements of reliability standards that are applicable to the reliability function for which the entity is registered. The purpose of the NERC Compliance Registry, established pursuant to Section 501 of the ROP, is to clearly identify those entities that are responsible for compliance with reliability standards. The Compliance Registry identifies, and sets forth the reliability functions to be performed by, each organization responsible for meeting the requirements of reliability standards. Organizations listed in the Compliance Registry are responsible for knowing the contents of, and complying, with standards applicable to the reliability function(s) for which the entity is registered.<sup>25</sup> The criteria upon which users, owners and operators of the bulk power system will be registered for one or more reliability functions are specified in Section 501 of the ROP and in NERC's Commission-approved *Statement of Compliance Registry Criteria*.

Typically, a user, owner or operator of the bulk power system is identified, in the first instance, for placement on the Compliance Registry by the Regional Entity in whose territory the user, owner or operator is located. Upon the entity being notified by NERC that it is being placed on the Compliance Registry, the entity may challenge its inclusion on the Compliance Registry by filing a written objection with NERC.<sup>26</sup> Challenges to inclusion on the Compliance Registry are heard and decided by the NERC Board of Trustees Compliance Committee (BOTCC). If the entity is not satisfied with the decision of the BOTCC, the entity may appeal the registration determination to the Commission.<sup>27</sup> NERC may remove a registered entity from the Compliance Registry for one or more of the reliability functions for which the entity is listed, based on changed circumstances. The grounds for de-listing may be identified by NERC or may be brought to NERC's attention by the Registered Entity or by the applicable Regional Entity.<sup>28</sup>

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<sup>24</sup> Section 215(b)(2) of the FPA requires all users, owners and operators of the bulk power system to comply with reliability standards approved by the Commission. Similarly, the Commission's regulations at 18 C.F.R. §39.2 and §40.2 require all users, owners and operators of the bulk power system to comply with applicable reliability standards and applicable rules of the ERO and Regional Entities approved by the Commission.

<sup>25</sup> NERC ROP §501. The current categories of reliability functional entities are listed in footnote 6 above and in the NERC *Statement of Compliance Registry Criteria*.

<sup>26</sup> A user, owner or operator of the bulk power system may be listed on the Compliance Registry for several reliability functions. A registered entity may challenge its listing for one or more of the reliability functions for which it has been registered while accepting its listing for other reliability function(s).

<sup>27</sup> The registration, challenge and appeal process described in this paragraph is set forth in Section 501.1.3 of the NERC ROP.

<sup>28</sup> NERC ROP §501.1.3.6.

As of June 22, 2009, there were 1,839 organizations listed on the NERC Compliance Registry, registered for 4,487 reliability functions.

Monitoring and enforcement of compliance with reliability standards is primarily conducted by the eight NERC Regional Entities, pursuant to Section 401.4 of the NERC ROP and the delegation agreements between NERC and the Regional Entities. Each Regional Entity is responsible for compliance monitoring and enforcement activities within its regional footprint.<sup>29</sup> The NERC ROP provide for NERC to take responsibility for CMEP activities where a Regional Entity is unable to perform those functions, as well as to be responsible for overseeing the CMEP activities of the Regional Entities.<sup>30</sup> Section 403 of the NERC ROP prescribes in detail the required attributes of Regional Entity compliance programs, covering compliance program structure, compliance program resources and compliance program design. Section 403 emphasizes the requirement that the Regional Entity's governance of its compliance program, and its compliance program staff, be independent.<sup>31</sup> Each Regional Entity must annually develop, and submit to NERC for approval, a Regional Entity Compliance Enforcement Implementation Plan that identifies the reliability standards to be actively monitored by the Regional Entity (both those required by NERC and any additional standards the Regional Entity proposes to monitor), and how the identified standards will be monitored, evaluated, reported, sanctioned and appealed.<sup>32</sup> In its annual Implementation Plan, each Regional Entity must also report to NERC how the Regional Entity carried out its delegated compliance enforcement authority in the previous year, the effectiveness of its CMEP, and changes expected to corrected any identified deficiencies.<sup>33</sup>

NERC is required to conduct an audit, at least once every three years, to evaluate how each Regional Entity implements the NERC CMEP. The evaluation is to be based on the NERC ROP including the NERC CMEP, the delegation agreement with the Regional Entity, the approved Regional Entity annual Compliance Enforcement Program Implementation Plans, and the required CMEP attributes. NERC must provide its evaluations to the Commission and other appropriate ERO governmental authorities, to demonstrate the effectiveness of each Regional Entity in compliance monitoring and enforcement.<sup>34</sup> With the Regional Entity delegation agreements having been approved by the Commission in April 2007, NERC is commencing its initial round of triennial audits of Regional Entity CMEPs in 2009.

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<sup>29</sup> NERC ROP §401.4.

<sup>30</sup> NERC ROP §§401.5, 402 and 404.

<sup>31</sup> NERC ROP §§403.1 and 403.6.

<sup>32</sup> NERC ROP §403.21.

<sup>33</sup> NERC ROP §403.21.1.

<sup>34</sup> NERC ROP §402.1.3. The audit procedure for NERC's audits of the Regional Entity CMEPs is contained in *Audit of Regional Entity Compliance Programs*, Appendix 4A to the NERC ROP.

The controlling document for NERC's compliance monitoring and enforcement activities is the NERC uniform CMEP, Appendix 4C to the ROP. Pursuant to Exhibit D to its delegation agreement with NERC, each Regional Entity has adopted the uniform CMEP or a modified version of the CMEP; in the latter cases the modified CMEP, or an enumeration of any deviations in the Regional Entity's CMEP from the uniform CMEP, is included in Exhibit D to the Regional Entity's delegation agreement. The uniform CMEP and the modified CMEPs used by certain Regional Entities have all been approved by the Commission.<sup>35</sup> The uniform CMEP and Regional Entity CMEPs provide for compliance monitoring and enforcement activities to be carried out through eight processes: (i) audits of Registered Entities for compliance with reliability standards,<sup>36</sup> (ii) self certifications by Registered Entities of their compliance with standards,<sup>37</sup> (iii) spot checking of Registered Entities' compliance with standards,<sup>38</sup> (iv) compliance violation investigations, which may be conducted and led by the Regional Entity or by NERC,<sup>39</sup> (v) self-reporting by Registered Entities of violations of standards,<sup>40</sup> (vi) periodic data submittals by Registered Entities as requested by the Compliance Enforcement Authority (CEA),<sup>41</sup> (vii) exception reporting by Registered Entities,<sup>42</sup> and (viii) investigation of complaints.<sup>43</sup> The uniform CMEP and the Regional Entity CMEPs set forth detailed process steps for each of the eight compliance monitoring and enforcement processes, including requirements for the results of the processes to be reported by the Regional Entity (CEA) to NERC and ultimately to the Commission. The process steps as detailed in the uniform CMEP

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<sup>35</sup> The Commission initially approved the uniform CMEP and modified CMEPs adopted by certain Regional Entities in their respective delegation agreements, subject to various compliance requirements, in its Order issued April 19, 2007. *Order Accepting ERO Compliance Filing, Accepting ERO/Regional Entity Delegation Agreements, and Accepting Regional Entity 2007 Business Plans*, 119 FERC ¶61,060 (2007). Subsequent Commission orders have approved modifications to the uniform CMEP and Regional Entity CMEPs (both modifications in response to Commission directives and modifications initiated by NERC and/or Regional Entities). *Order Addressing Revised Delegation Agreements*, 122 FERC ¶61,245 (2008); *Order Accepting Compliance Filings, Subject to Conditions*, 125 FERC ¶61,330 (2008).

<sup>36</sup> NERC uniform CMEP §3.1.

<sup>37</sup> NERC uniform CMEP §3.2.

<sup>38</sup> NERC uniform CMEP §3.3.

<sup>39</sup> NERC uniform CMEP §3.4.

<sup>40</sup> NERC uniform CMEP §3.5.

<sup>41</sup> NERC uniform CMEP §3.6. The CEA is the entity (either NERC or the Regional Entity, as applicable) responsible for monitoring and enforcing the registered entity's compliance with reliability standards. Uniform CMEP §1.1.7.

<sup>42</sup> NERC uniform CMEP §3.7.

<sup>43</sup> NERC uniform CMEP §3.8.

and Regional Entity CMEPs include appropriate steps for avoidance of conflicts of interest,<sup>44</sup> preservation of confidentiality,<sup>45</sup> and provision of notice, opportunity to respond and other due process for the Registered Entity.<sup>46</sup>

As specified by Section 4.1 of the uniform CMEP, NERC develops and posts an annual CMEP Implementation Plan by October 1 of each year. The annual NERC CMEP Implementation Plan specifies, among other information, the reliability standards to be actively monitored during the upcoming year and the compliance process(es) to be used by the CEAs to monitor each reliability standard. The annual NERC CMEP Implementation Plan is used by the Regional Entities in developing their individual annual regional Compliance Enforcement Program Implementation Plans.

The uniform CMEP also specifies the processes to be followed when an alleged violation of a reliability standard by a Registered Entity is identified,<sup>47</sup> including notification to the Registered Entity of an alleged violation and the required contents of the notice;<sup>48</sup> the Registered Entity's response to the notice of alleged violation;<sup>49</sup> the opportunity for the Registered Entity to

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<sup>44</sup> For example, the Registered Entity is notified in advance of a compliance audit as to the members of the audit team (who are required to be free of conflicts of interest) and their backgrounds and is given the opportunity to object to individual members of the audit team on grounds of a conflict of interest or other circumstance that could interfere with the team member's impartial performance of his or her duties. NERC uniform CMEP, §3.1.5. Similar notice and opportunity to object is provided with respect to spot checking teams (*id.* §3.3.1) and compliance violation investigation teams (*id.* §3.4.1). In addition, Section 6(g) of the NERC-Regional Entity delegation agreements requires the Regional Entity to maintain a conflict of interest policy that assures the integrity of its compliance enforcement program and the independence of the compliance program staff from those subject to enforcement actions.

<sup>45</sup> NERC uniform CMEP §§2.0 and 9.3. In addition, Section 6(c) of the NERC-Regional Entity delegation agreements specifies that each violation or alleged violation of a reliability standard shall be treated as nonpublic until the matter is filed with the Commission as a notice of penalty or resolved by an admission that the owner, operator, or user of the bulk power system violated a reliability standard or by a settlement or other negotiated disposition.

<sup>46</sup> For example, the CEA must notify the Registered Entity in advance of a compliance audit as to the reliability standards to be covered by the audit, and must provide a pre-audit questionnaire to the Registered Entity at least two months before commencement of the audit. NERC uniform CMEP §3.1.1. At the conclusion of the audit, the compliance audit team is required to provide a draft audit report to the Registered Entity for comment. *Id.* §3.1.6. Similarly, in the spot check and periodic data submittal processes, the CEA is required to provide its draft assessment of compliance to the Registered Entity for comment. *Id.* §3.3.1 and §3.6.1.

<sup>47</sup> NERC uniform CMEP §5.0.

<sup>48</sup> NERC uniform CMEP §5.1.

<sup>49</sup> NERC uniform CMEP §5.2.

obtain a hearing on the alleged violation and/or proposed penalty or sanction before the CEA hearing body;<sup>50</sup> the process the Registered Entity may engage in to negotiate a settlement with the CEA;<sup>51</sup> the Registered Entity’s right to appeal a hearing body decision to NERC;<sup>52</sup> and the process for reporting a penalty or sanction to the Commission for confirmation.<sup>53</sup>

The uniform CMEP requires that a Registered Entity found to be in violation of a reliability standard must file with the CEA a Mitigation Plan to correct the violation, or a description of how the violation has been mitigated.<sup>54</sup> The uniform CMEP describes the required contents of the Registered Entity’s proposed Mitigation Plan,<sup>55</sup> the processes for submittal of the proposed Mitigation Plan by the Regional Entity<sup>56</sup> and for review and acceptance or rejection of the proposed Mitigation Plan by the Regional Entity and review and approval or disapproval by NERC (and, in the latter event, modification of the Mitigation Plan by the Registered Entity),<sup>57</sup> the timetable for completion of an accepted Mitigation Plan,<sup>58</sup> and the process for completion and confirmation by the CEA of implementation of the Registered Entity’s Mitigation Plan.<sup>59</sup> Key components required by the uniform CMEP to be in any Mitigation Plan are the Registered Entity’s action plans to correct the violation(s) and to prevent recurrence.<sup>60</sup>

Additionally, the uniform CMEP provides the procedure for the CEA to issue a Remedial Action Directive to a Registered Entity.<sup>61</sup> A Remedial Action Directive may be issued, when

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<sup>50</sup> NERC uniform CMEP §5.3 and Attachment 2, Hearing Procedures. Attachment 2 sets forth the detailed procedures for the hearing to be conducted before the CEA hearing body should a Registered Entity dispute a notice of alleged violation, proposed penalty or sanction, proposed Mitigation Plan, or a Remedial Action Directive.

<sup>51</sup> NERC uniform CMEP §5.4.

<sup>52</sup> Uniform CMEP §5.5. The NERC appeal process is addressed in §407.3 and §410 of the NERC ROP.

<sup>53</sup> NERC uniform CMEP §5.6.

<sup>54</sup> NERC uniform CMEP §6.1.

<sup>55</sup> NERC uniform CMEP §6.2.

<sup>56</sup> NERC uniform CMEP §6.4.

<sup>57</sup> NERC uniform CMEP §6.5.

<sup>58</sup> NERC uniform CMEP §6.3.

<sup>59</sup> NERC uniform CMEP §6.6.

<sup>60</sup> NERC uniform CMEP §6.2.

<sup>61</sup> NERC uniform CMEP §7.0. A Remedial Action Directive is “an action (other than a penalty or sanction) required by a Compliance Enforcement Authority that (1) is to bring a Registered



immediately necessary to protect the reliability of the bulk power system from an imminent threat, to a Registered Entity the CEA believes is committing or has committed a violation of a reliability standard. The Remedial Action Directive may include, but is not limited to, specifying operating or planning criteria, limits or limitations; requiring specific system studies; defining operating practices or guidelines; requiring confirmation of data, practices or procedures through inspection, testing or other methods; requiring specific training for personnel; requiring development of specific operating plans; directing a Registered Entity to develop and comply with a plan to remediate a violation; imposing increased auditing or additional training requirements; and requiring the Registered Entity to cease an activity that may constitute a violation of a reliability standard.<sup>62</sup>

As a key component of the enforcement of compliance with mandatory reliability standards, a violation of a standard can result in the imposition of a financial penalty or other penalty or sanction on the Registered Entity. NERC has established, and is applying, rules and procedures for determining the amount of financial penalties or other penalties or sanctions to be imposed on Registered Entities for violations of standards. These rules and procedures are embodied in the NERC *Sanction Guidelines*, which is Appendix 4B to the NERC ROP. The *Sanction Guidelines* must be followed by the Regional Entities in the implementation of their CMEPs.<sup>63</sup> Penalties and sanctions must bear a reasonable relation to the seriousness of the violation and take into consideration timely remedial efforts by the Registered Entity.<sup>64</sup> NERC's rules and procedures for determining appropriate penalties and sanctions for violations of reliability standards are discussed in greater detail below under criterion 4, "The ERO has established rules that provide fair and impartial procedures for enforcement of reliability standards through the imposition of penalties in accordance with 18 C.F.R. §39.7, including limitations on activities, operations, or other appropriate sanctions or penalties."

In order to carry out their responsibilities to monitor and enforce compliance with reliability standards, NERC and the Regional Entities, over the period from 2007 to date, have developed substantial professional staffs for, and are devoting substantial resources to, their CMEP and Organization Registration Programs. The following table shows the direct expenses and the numbers of FTE staff budgeted by NERC and each Regional Entity for 2008 and 2009.<sup>65</sup>

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Entity into compliance with a Reliability Standard or to avoid a Reliability Standard violation, and (2) is immediately necessary to protect the reliability of the bulk power system from an imminent threat." NERC uniform CMEP §1.1.18.

<sup>62</sup> NERC uniform CMEP §7.0.

<sup>63</sup> NERC ROP §§403.17 and 407.

<sup>64</sup> NERC ROP §401.7.

<sup>65</sup> Except as noted, data in this table is taken from the NERC and Regional Entity 2009 Business Plans and Budgets filed with the Commission on August 22, 2008, and conditionally accepted by the Commission in its Order issued October 16, 2008. *North American Electric Reliability Corp., Order Conditionally Accepting 2009 Business Plan and Budget of the North American Electric Reliability Corporation and Ordering Compliance Filings*, 125 FERC ¶61,056 (2008).

<b>Entity</b>	<b>2008 Budgeted FTEs</b>	<b>2008 Budgeted Direct Expense</b>	<b>2009 Budgeted FTEs</b>	<b>2009 Budgeted Direct Expense</b>
<b>NERC</b>	26.0	\$4,669,493	35.5*	\$7,358,536*
<b>FRCC</b>	7.20	\$1,218,578	9.10	\$1,991,643
<b>MRO</b>	9.65	\$1,453,770	10.0	\$2,071,510
<b>NPCC</b>	7.50	\$1,727,832	9.0	\$2,095,204
<b>ReliabilityFirst</b>	12.0	\$3,374,181	23.0	\$5,099,328
<b>SERC</b>	14.2	\$3,393,665	21.5	\$4,805,617
<b>SPP RE</b>	3.50	\$807,884	6.0	\$1,283,653
<b>Texas RE</b>	6.40	\$892,898	14.15	\$1,628,935
<b>WECC</b>	20.0	\$4,568,116	30.0	\$6,165,303
<b>Totals</b>	106.45	\$22,106,417	158.25	\$32,499,729

\*Revised budget submitted to the Commission on December 15, 2008.

NERC and the Regional Entities have increased their CMEP and Organization Registration Program staffs and budgets from 2007 to 2009 as the needs and complexities of operating the compliance programs have been realized through experience. In fact, from 2008 to 2009, NERC and the Regional Entities increased their aggregate budgeted Compliance Program staffing by 49% and their aggregate budgeted Compliance Program direct expenditures by 47%. In addition to their compliance program staffs, NERC and a number of the Regional Entities have also made use of consultants and contractors to assist in compliance audits, compliance violation investigations and other compliance monitoring and enforcement activities, and to provide subject matter expertise as needed to supplement the expertise of their staffs. For example, NERC's revised 2009 budget for its CMEP and Organization Registration Program includes \$1,100,000 for consultants to supplement NERC Compliance Program staff resources.

The Statements of Activities and Achievements of the individual Regional Entities, included in **Attachment 4** of this three-year assessment report, detail the cumulative numbers of possible violations of reliability standards reviewed, notices of alleged violations and notices of confirmed violations filed, and numbers of Mitigation Plans received, accepted, approved, and verified as complete, by each Regional Entity through May 31, 2009, as well as other quantitative data on their CMEP and Organization Registration Programs during this period. As of June 2009, the Regional Entities have conducted or planned 444 compliance audits in 2009:

FRCC:	20	<i>ReliabilityFirst</i> :	66	Texas RE:	45
MRO:	34	SERC:	61	WECC:	107
NPCC:	76	SPP RE	35		

The direct expenses shown in the table are the budgeted direct expenses of each entity for personnel costs (salary and benefits), meeting expenses (including travel costs), and operating expenses (including expenses for consultants, contracts, professional services, office rent and office and related costs) for its CMEP and Organization Registration Program, but do not include allocations of the entity's indirect costs (general & administrative, legal and regulatory, human resources, information technology and finance and accounting) to the program.

NERC has participated in some Regional Entity compliance audits and will continue to do so as an observer to observe the performance of audits by the Regional Entities and to help ensure consistent implementation and application of the CMEP and consistent application of the requirements of standards across the Regional Entities.

The foregoing discussion amply demonstrates that NERC has developed and is implementing the ability to develop and enforce reliability standards that provide for an adequate level of reliability of the bulk power system.

**2. The ERO has established rules that assure its independence of users, owners and operators of the bulk power system while assuring fair stakeholder representation in the selection of its directors and balanced decision-making in any ERO committee or subordinate organizational structure.**

This criterion encompasses three distinct considerations: (1) independence of NERC from users, owners and operators of the bulk power system, (2) fair stakeholder representation in the selection of NERC’s directors (trustees), and (3) provision for balanced decision-making in any NERC committee or subordinate organizational structure.

**Independence of users, owners and operators of the bulk power system**

NERC’s Bylaws provide that NERC’s business and affairs shall be managed by a Board of Trustees.<sup>66</sup> The Bylaws provide that the Board of Trustees shall consist of ten independent trustees plus the President of NERC.<sup>67</sup> The Bylaws define “independent trustee” as follows:

An independent trustee is a person (i) who is not an officer or employee of the Corporation [*i.e.*, NERC], a member or an officer, director, or employee of a member of the Corporation, or an officer, director, or employee of any entity that would reasonably be perceived as having a direct financial interest in the outcome of board decisions and (ii) who does not have any other relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a trustee. Provided, that upon initial election to the board, an independent trustee shall within ten (10) days terminate any employee, officer, or director position that conflicts with this subparagraph and shall within sixty (60) days terminate any financial interest or other relationship that conflicts with this subparagraph, and prior to such termination shall not participate in discussion of or voting on any matter involving the entity of which the trustee is an employee, officer or director or in which the trustee has the financial interest or other relationship giving rise to the conflict.<sup>68</sup>

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<sup>66</sup> NERC Bylaws Article III, §1.

<sup>67</sup> NERC Bylaws Article III, §1.

<sup>68</sup> NERC Bylaws Article III, §3a. The last sentence of §3a, providing for brief time periods for a newly-elected trustee to terminate any employment, officer or director position or financial

In the *ERO Certification Order*, the Commission found that the NERC Bylaws definition of “independent trustee” was sufficient to provide for independence from users, owners and operators of the bulk power system, subject to one clarification.<sup>69</sup>

Thus, a NERC trustee cannot be an officer, director or employee of a member of NERC nor of any other entity that would be perceived as having a direct financial interest in the outcome of Board decisions, and may not have any other relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a trustee. The “responsibilities of a trustee” include, among other things, voting on (i) Board approval of proposed reliability standards,<sup>70</sup> (ii) Board approval of the NERC ROP and amendments to the ROP,<sup>71</sup> and (iii) Board approval of NERC and Regional Entity Budgets.<sup>72</sup> Committees of the NERC Board, such as the Board of Trustees Compliance Committee, are responsible for decisions such as hearing and deciding challenges by a user, owner or operator of the bulk power system to placement of the entity on the Compliance Registry,<sup>73</sup> hearing and deciding appeals from a Regional Entity Hearing Body decision on a Registered Entity’s challenge to a notice of alleged violation of a reliability standard and/or proposed penalty or sanction,<sup>74</sup> and approving the imposition of penalties or other sanctions for violations of reliability standards on Registered Entities, including by settlements.

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interest or other relationship that would prevent the trustee from being independent, is a 2008 amendment to the Bylaws that was approved by the Commission by a letter order issued October 7, 2008 in Docket No. RR08-5-000.

<sup>69</sup> *ERO Certification Order*, 116 FERC ¶61,062, at P 42. The clarification is that the definition prohibits an independent trustee from having a relationship that would interfere with his or her exercise of independent judgment in carrying out the responsibilities of a trustee, regardless of whether he or she is an officer, director or employee of an entity with an interest in the outcome of NERC Board decisions. *Id.* NERC confirmed this clarification in a compliance filing dated September 18, 2006, and made a modification, consistent with the clarification, to the definition of “independent trustee” in its Bylaws. *Compliance Filing of the North American Electric Reliability Council and the North American Electric Reliability Corporation Addressing Governance Issues and Request for Expedited Treatment*, Docket No. RR06-1, filed September 18, 2006 (*NERC ERO Governance Compliance Filing*) at 3-4.

<sup>70</sup> NERC Bylaws Article IX, §1; NERC ROP §308.2.

<sup>71</sup> NERC Bylaws Article XI, §2; NERC ROP §1402.

<sup>72</sup> NERC Bylaws Article XIII, §§ 2, 3, 4 and 5; NERC ROP §1101. Each of the matters just listed, upon being approved by the NERC Board of Trustees, must then be submitted to the Commission for approval or confirmation. Sections 215(d) and (f) of the FPA and 18 C.F.R. §§39.4(b), (c) and (d) and 39.5.

<sup>73</sup> NERC ROP §501.1.3.

<sup>74</sup> NERC ROP §410.

In addition, the NERC Code of Conduct for Trustees, Officers and Employees (NERC Representatives) specifies that NERC Representatives “shall avoid or refrain from involvement in or situations where there is actually a conflict of interest (“Conflict”). A Conflict arises where the NERC Representative’s personal financial interest is significantly affected by or may reasonably appear to be significantly affected by his or her actions or decisions in his or her capacity at NERC.”

### **Fair stakeholder representation in the selection of NERC’s trustees**

NERC’s Bylaws provide for fair stakeholder representation in the selection of NERC’s trustees. Candidates for election as a trustee are selected by a nominating committee. The nominating committee is appointed annually (or more frequently if needed in the event of a special election to fill a Board vacancy) by the Board. The nominating committee is to consist of those independent trustees whose terms do not expire during the current year and such number of other persons with such qualifications as the Board shall specify, including at least three members of the NERC Member Representatives Committee (MRC).<sup>75</sup> The procedures to be followed by the nominating committee must include a means of permitting members of NERC to recommend to the nominating committee candidates for consideration as nominees for independent trustees.<sup>76</sup> NERC’s Bylaws specify that the nominating committee “shall endeavor to nominate candidates for election to the board consistent with the objectives that the board as an entity reflects expertise in the areas of technical electric operations and reliability, legal, market, financial, and regulatory matters, and familiarity with regional system operations issues; and reflects geographic diversity.”<sup>77</sup>

NERC’s Bylaws provide that the independent trustees shall be elected by the NERC MRC, from nominees proposed by the nominating committee. To be elected an independent trustee, a nominee must receive the affirmative vote of two-thirds of the members of the MRC.<sup>78</sup> The MRC is comprised of representatives from the various sectors of the NERC membership.<sup>79</sup>

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<sup>75</sup> NERC Bylaws Article III, §5.

<sup>76</sup> NERC Bylaws Article III, §5.

<sup>77</sup> NERC Bylaws Article III, §5.

<sup>78</sup> NERC Bylaws Article III, §6. The NERC Bylaws also require that the number of trustees from Canada shall not be less than the percentage of the net energy for load (NEL) of Canada to the total NEL of the United States and Canada, times eleven, rounded up to the nearest whole number, with the management trustee (*i.e.*, the president of NERC) counted as a trustee from Canada if he or she is a Canadian citizen. NERC Bylaws Article III, §2a. In the *ERO Certification Order*, the Commission approved this provision as “adequately providing for an international ERO,” stating that “appropriate country representation helps to ensure that the ERO is truly international in addressing Bulk Power System reliability and considering the concerns of stakeholders in each of these countries.” *ERO Certification Order*, 116 FERC ¶61,062, at P 47.

<sup>79</sup> Membership in NERC is voluntary and is open to any person or entity that has an interest in the reliable operation of the North American bulk power system, registers as a member, and

As specified by Article II, §4 of the NERC Bylaws, the sectors of the NERC membership are (i) investor-owned utilities, (ii) state/municipal utilities, (iii) cooperative utilities, (iv) federal or provincial utilities/power marketing administrations, (v) transmission-dependent utilities, (vi) merchant electricity generators, (vii) electricity marketers, (viii) large end-use electricity customers, (ix) small end-use electricity customers, (x) independent system operators/regional transmission organizations, (xi) regional entities, and (xii) government representatives.<sup>80</sup> The composition of the MRC, as specified in Article VIII, §2 of the NERC Bylaws, is as follows:

- (i) two representatives from each sector except the government representatives sector and the regional entity sector;
- (ii) two voting representatives from the regional entity sector, with the remaining members of that sector being non-voting members of the MRC;<sup>81</sup>
- (iii) the chairman and vice-chairman of the MRC;<sup>82</sup>
- (iv) any additional Canadian representatives as are selected pursuant to Article VIII, §4 of the Bylaws;<sup>83</sup> and

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complies with the other conditions of membership specified in the NERC Bylaws (which do not include payment of any membership or initiation dues or fees). NERC Bylaws Article II, §1. In the *ERO Certification Order*, the Commission stated that the availability of membership to any person or entity with an interest in the reliable operation of the North American bulk power system created an open membership structure that is consistent with the statutory requirement that the ERO establish rules that assure fair stakeholder representation. *ERO Certification Order*, 116 FERC ¶61,062, at P 54. Each member is assigned to one of the twelve membership sectors of NERC. NERC Bylaws Article II, §4.

<sup>80</sup> Article III, §6 of the NERC Bylaws specifies the types of persons or organizations that would be included in each of the membership sectors.

<sup>81</sup> The representation of Regional Entities in the MRC reflects changes made by NERC to the originally-proposed composition of the MRC in response to concerns expressed by the Commission in P 75 of the *ERO Certification Order*. See *NERC ERO Governance Compliance Filing* at 6-9. The Commission accepted these changes in an Order issued October 30, 2006. The Commission also accepted the overall structure and composition of the MRC in that Order. *North American Electric Reliability Corporation, Order on Petitions for Rehearing and Clarification; Order on Compliance Filing*, 117 FERC ¶61,126 (2006), at PP 30 and 44.

<sup>82</sup> The chairman and vice-chairman of the MRC are selected annually by majority vote of the members of the MRC, and may not be from the same membership sector. Upon being selected as chairman and vice-chairman, these individuals cease to be representatives of the MRC sectors to which they were originally elected, and are thereafter responsible to act in the best interests of the members of NERC as a whole. NERC Bylaws Article VIII, §5.

<sup>83</sup> Article VIII, §4 of the Bylaws contains provisions for the election of additional Canadian members to the MRC as and when necessary to ensure that the percentage of Canadian members

(v) the following representatives of the government representatives sector: two representatives of the U.S. federal government, one representative of the Canadian federal government, two representatives of state governments, and one representative of a provincial government, all of whom shall be non-voting members of the MRC except the two representatives of state government.

The MRC is therefore comprised of 26 voting members when at full complement (or more if the election of additional Canadian members has been necessary in accordance with Article VIII, §4 of the Bylaws). The members of the MRC from each sector are nominated from, and elected by, the NERC members in that sector pursuant to the processes specified in Article VIII, §3 of the NERC Bylaws, which generally call for election of the two candidates from each sector receiving the highest numbers of votes in the sector. The members of the MRC are elected annually (or between annual elections if needed to fill a vacancy).<sup>84</sup>

In summary, NERC's trustees are nominated by a nominating committee comprised of independent trustees whose terms are not expiring, members of the MRC, and possibly others, and elected by two-thirds vote of the MRC, which is a committee established pursuant to the Bylaws to fairly represent the sectors of NERC's membership, which is open to any person or entity with an interest in reliable operation of the North American bulk power system. Thus, the NERC Bylaws provide for fair stakeholder representation in the selection of NERC's trustees.

**Balanced decision-making in any NERC committee or subordinate organizational structure**

NERC's Bylaws authorize the Board of Trustees to create standing committees of NERC and such other committees as the Board deems necessary to carry out the purposes of NERC:

*In addition to those committees specified by these Bylaws, to which the board shall appoint members in accordance with the requirements of these Bylaws, the board may by resolution create standing committees of the Corporation; and may in addition by resolution appoint such other committees as the board deems necessary to carry out the purposes of the Corporation. The board shall appoint standing committees and other committees of the Corporation that are representative of members, other interested parties and the public, that provide for balanced decision making, and that include persons with outstanding technical knowledge and experience. All appointments of committees of the Corporation shall provide the opportunity for an equitable number of members from the United States and Canada (and from Mexico after the Corporation receives recognition by appropriate governmental authorities in Mexico as its electric reliability organization) to be appointed to each committee in approximate proportion to each country's percentage of the total NEL. All*

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on the MRC is approximately equal to the percentage the NEL of Canada is of the total NEL of the United States and Canada.

<sup>84</sup> NERC Bylaws Article VIII, §3.

committees shall have such scope and duties, not inconsistent with law, as are specified in these Bylaws and the Rules of Procedure of the Corporation or otherwise determined by the board. (Emphasis added.)<sup>85</sup>

Section 1300 of the NERC ROP provides additional criteria for the creation and appointment of NERC standing committees. In creating a standing committee, the NERC Board must approve the charter of the committee and assign specific authority to each committee necessary to conduct business within its charter.<sup>86</sup> Each committee shall have a defined membership composition that is explained in its charter. The specified committee membership composition can provide for balanced decision-making (i) by providing for representatives from each sector of the NERC membership, or (ii) where sector-based membership will not bring together the necessary diversity of opinions, technical knowledge and expertise in a particular subject area, by bringing together a wide diversity of opinions from industry experts with outstanding technical knowledge and experience in a particular subject area.<sup>87</sup> Committee membership shall also provide the opportunity for an equitable number of members from the U.S. and Canada, based approximately on proportionate NEL.<sup>88</sup>

The NERC ROP require that committee members shall be selected in a manner that is open, inclusive and fair.<sup>89</sup> Unless otherwise stated in the ROP or approved by the NERC Board, all committee member appointments are to be approved by the Board, and committee officers are to be appointed by the Chairman of the Board.<sup>90</sup>

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<sup>85</sup> NERC Bylaws Article VII, §1. “Committees specified by these Bylaws” include the nominating committee for the NERC Board and the MRC (discussed above under “fair stakeholder representation in the selection of NERC’s trustees”), and the Personnel Certification Governance Committee (PGCC) provided for in Article XII of the Bylaws. The purpose of the PGCC is to provide oversight to the policies and processes used to implement and maintain the integrity and independence of the NERC System Operator Certification Program. NERC Bylaws Article XII, §1. The members of the PGCC are appointed by the Board from candidates nominated by a nominating task force; nominations and appointments are to take into account the need to include representatives of all geographic regions of North America on the PGCC. *Id.*, Article XII, §2. In addition to the aforementioned committees, NERC standing committees include the Standards Committee, Compliance and Certification Committee, Critical Infrastructure Protection Committee, and Operating and Planning Committees and subgroups.

<sup>86</sup> NERC ROP §1301.

<sup>87</sup> NERC ROP §1302.

<sup>88</sup> NERC ROP §1302.

<sup>89</sup> NERC ROP §1303.

<sup>90</sup> NERC ROP §1303.



Further, the NERC ROP require that all NERC committees and other subgroups (except for those organized on other than a sector basis because sector representation will not bring together the necessary diversity of opinions, technical knowledge and experience in a particular subject area) must ensure that no two stakeholder sectors are able to control the vote on any matter, and no single sector is able to defeat a matter.<sup>91</sup> Any committees and subgroups organized on other than a membership-sector basis must be reported to the NERC Board and the MRC, along with the reason for constituting the committee or subgroup in the manner chosen. The ROP provide that for any committee or subgroup organized on other than a membership-sector basis, a reasonable opportunity for additional participation (as members or observers) shall be provided for sectors not represented on the committee or subgroup (subject to any reasonable restrictions as may be necessary to accomplish the mission of the committee or subgroup).<sup>92</sup> Additionally, a reasonable opportunity must be provided for membership from sectors desiring to participate in any committees and subgroups pertaining to development of, interpretation of, or compliance with reliability standards.<sup>93</sup>

The NERC ROP provide that NERC standing committees may appoint subgroups using the same principles as specified in Section 1302 of the ROP (summarized in the immediately preceding paragraph).<sup>94</sup>

The provisions of Sections 1301 and 1302 of the NERC ROP regarding committee composition reflect revisions to these provisions that were approved or directed by the Commission in its October 30, 2006 Order on the *NERC ERO Governance Compliance Filing*.<sup>95</sup>

The requirement for balanced decision-making is also applicable to the reliability standards development process, and is discussed below under criterion 5, “The ERO has established rules that provide reasonable notice and opportunity for public comment, due process, openness and balance of interests in developing reliability standards, and otherwise exercising its duties.”

**3. The ERO has established rules that allocate equitably reasonable dues, fees and charges among end users for all statutory activities.**

NERC’s Bylaws require that the funding mechanism used to recover its net annual budget requirement (*i.e.*, net of fees and other revenues received by NERC from users and purchasers of NERC products and services, and net of prior period funding surplus or deficiency)

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<sup>91</sup> NERC ROP §1302.

<sup>92</sup> NERC ROP §1302.

<sup>93</sup> NERC ROP §1302.

<sup>94</sup> NERC ROP §1305.

<sup>95</sup> See *North American Electric Reliability Corporation, Order on Petitions for Rehearing and Clarification; Order on Compliance Filing*, 117 FERC ¶61,126 (2006), at PP 75-87.

“shall consist of such assessments as determined by the [NERC Board] that result in an equitable allocation of the Corporation’s funding requirement among end users of the North American electric utility system as established in the Corporation’s Rules of Procedure.”<sup>96</sup> Section 1102 of the NERC ROP prescribes the allocation methods to be used to recover NERC’s funding requirements among regions of the U.S. and among countries in the North American bulk power system. Section 1102 specifies that net energy for load shall be used to allocate funding requirements among interconnections and Regional Entities except in those instances in which direct assignment of costs to a particular interconnection, Regional Entity, or group of entities is appropriate; however, in the case of direct assignment, NEL must be used to allocate the directly-assigned costs within the interconnection, Regional Entity or group of entities:

**1101. NERC Funding and Cost Allocation**

1. In order that NERC’s costs shall be fairly allocated among interconnections and among regional entities, the NERC funding mechanism for all statutory functions shall be based on net energy for load (NEL).
2. NERC’s costs shall be allocated so that all load (or, in the case of costs for an interconnection or regional entity, all load within that interconnection or regional entity) bears an equitable share of such costs based on NEL.
3. Costs shall be equitably allocated between countries or regional entities thereof for which NERC has been designated or recognized as the electric reliability authority.
4. Costs incurred to accomplish the statutory functions for one interconnection, regional entity, or group of entities will be directly assigned to that interconnection, regional entity, or group of entities provided that such costs are allocated equitably to end-users based on net energy for load.<sup>[97]</sup>

The NERC ROP define “Net Energy for Load” as:

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<sup>96</sup> NERC Bylaws Article XIII, §3. NERC charges users/purchasers of some of its products and services directly for the products and services, at prices that cover some or all of the cost of providing the product or service. Examples include charges to purchasers of data sets from the Generating Availability Data System, charges to candidates for certification as NERC-certified operators for examinations and for renewal of credentials, and charges to continuing education providers for certification of their education programs.

<sup>97</sup> For example, NERC’s costs for the interchange distribution calculator, which is used only within the Eastern Interconnection, have been allocated only to the six Regional Entities within the Eastern Interconnection, on the basis of NEL.

[N]et generation of an electric system plus energy received from others less energy delivered to others through interchange. It includes system losses but excludes energy required for the storage of energy at energy storage facilities.<sup>98</sup>

In its Business Plan and Budget filings with the Commission for 2007, 2008 and 2009, NERC has, with one exception (discussed below) used NEL to allocate its net funding requirements among Regional Entities, between or among countries, and to the individual load-serving entities (LSE) or their designees or other entities (as applicable within the particular Regional Entity<sup>99</sup>). *See, e.g.*, the NERC 2009 Business Plan and Budget at 79 (Table 6) and Appendix C. The one exception is that NERC has negotiated memoranda of understanding (MOU) with the Ontario Energy Board and with La Régie de l'énergie du Québec pursuant to which certain NERC CMEP costs are not allocated to Ontario and Québec, in recognition that other entities perform compliance monitoring and enforcement functions within those Canadian provinces. The excluded NERC costs are allocated to all remaining entities on the basis of NEL. NERC's MOU with the Ontario Energy Board and resulting adjustment to the allocation of NERC CMEP costs to Ontario were accepted by the Commission in its Order on NERC's 2008 Business Plan and Budget.<sup>100</sup> The additional adjustment to the allocation of NERC CMEP costs to Québec was first presented in NERC's 2009 Business Plan and Budget filing.

**4. The ERO has established rules that provide fair and impartial procedures for enforcement of reliability standards through the imposition of penalties in accordance with 18 C.F.R. §39.7, including limitations on activities, operations, or other appropriate sanctions or penalties.**

NERC has established rules that provide fair and impartial procedures for monitoring and enforcement of compliance with reliability standards. These rules and procedures are embodied primarily in Section 400 of the NERC ROP, the NERC uniform CMEP (Appendix 4C to the ROP) and individual Regional Entity CMEPs (which conform generally to the uniform CMEP), all of which have been approved by the Commission. These rules and procedures were discussed in detail above under criterion 1, relating to the ERO's ability to develop and enforce reliability standards that provide for an adequate level of reliability of the bulk power system. As discussed above under criterion 1, Section 400 of the NERC ROP, and the NERC uniform CMEP, include provisions for avoidance of conflicts of interest on the part of the CEA personnel conducting compliance monitoring processes, provisions for notice to Registered Entities and opportunity to respond to compliance monitoring processes, and provisions allowing Registered Entities to

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<sup>98</sup> NERC ROP §202.

<sup>99</sup> For example, within NPCC, NERC allocates its funding requirement to the Balancing Authority for each of six Balancing Authority Areas within NPCC, and does not calculate assessments to individual LSEs.

<sup>100</sup> *North American Electric Reliability Corporation, Order Conditionally Accepting 2008 Business Plan and Budget of the North American Electric Reliability Corporation and Ordering Compliance Filings*, 121 FERC ¶ 61,057 (2007).

engage in settlement discussions with the CEA concerning notices of alleged violations, proposed penalties or sanctions, and mitigation plans.

In addition, Attachment 2, Hearing Procedures, to the uniform CMEP contains detailed due process procedures for the conduct of hearings before the CEA hearing body, when requested by the Registered Entity, concerning a disputed notice of alleged violation and/or proposed penalty or sanction, disputed Mitigation Plan provisions, or disputed Remedial Action Directive. The Hearing Procedures, which have been approved by the Commission in two orders, subject to various specific compliance requirements,<sup>101</sup> are based on and in most respects are quite similar to the Commission's Rules of Practice and Procedure<sup>102</sup> and to the rules of practice and procedure used by many state public utility commissions.

The remainder of this discussion of NERC's compliance with criterion 4 addresses NERC's rules and procedures for the determination and imposition of penalties for violations of reliability standards.

Section 215(e)(6) of the FPA, and §39.7(g) of the Commission's regulations,<sup>103</sup> requires that any penalty imposed for violation of a reliability standard shall (A) bear a reasonable relation to the seriousness of the violation; and (B) take into consideration the efforts of the user, owner or operator to remedy the violation in a timely manner.<sup>104</sup> This fundamental requirement is embodied in Section 401.7 of the NERC ROP and in §3.8 of the NERC *Sanction Guidelines*, Appendix 4B to the ROP. Section 39.7(c) of the Commission's regulations<sup>105</sup> requires that NERC or a Regional Entity may, after notice and opportunity for hearing, impose a penalty on a user, owner or operator the bulk power system for violation of a reliability standard if NERC files a notice of penalty and record of the proceedings with the Commission and serves a copy on the user, owner or operator. The notice of penalty must contain (1) the name of the entity on whom the penalty is imposed, (2) identification of each reliability standard violated, (3) findings of fact with respect to any act or practice resulting in violation of the standard, (4) a description of the penalty imposed, (5) the record of the proceeding, (6) a form of notice suitable for publication, and (7) any other matters NERC or the Regional Entity may find relevant.<sup>106</sup> The penalty may not take effect earlier than the 31st day after NERC files the notice of penalty and

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<sup>101</sup> *Order Addressing Revised Delegation Agreements*, 122 FERC ¶61,245 (2008); *Order Accepting Compliance Filings, Subject to Conditions*, 125 FERC ¶61,330 (2008).

<sup>102</sup> 18 C.F.R. Part 385.

<sup>103</sup> 18 C.F.R. §39.7(g).

<sup>104</sup> 18 C.F.R. §39.7(g)(1) also specifies that a penalty may be a monetary or non-monetary penalty and may include, but is not limited to, a limitation on an activity, function, operation, or other appropriate sanction, including being added to a reliability watch list composed of major violators that is established by the ERO, a Regional Entity or the Commission.

<sup>105</sup> 18 C.F.R. §39.7(c).

<sup>106</sup> 18 C.F.R. §39.7(d).

record of proceeding with the Commission,<sup>107</sup> and is subject to review by the Commission on its own motion or on application of the user, owner or operator.<sup>108</sup> Section 5.6 of the uniform CMEP provides for the filing of a notice of penalty with the Commission, and for a thirty-day period to run before the penalty becomes effective, in accordance with 18 C.F.R. §39.7(d)-(e).

Section 39.7(g) of the Commission's regulations<sup>109</sup> requires the ERO to submit for Commission approval penalty guidelines that set forth a range of penalties for violations of reliability standards, and specifies that a penalty imposed by the ERO or a Regional Entity must be within the range set forth in the penalty guidelines. The NERC *Sanction Guidelines* comprise the penalty guidelines established by NERC, which the Commission has approved pursuant to Section 39.7(g). The current version of the *Sanction Guidelines* became effective January 15, 2008, and was approved by the Commission in an Order issued October 18, 2007 (subject to compliance filing) and a letter order issued January 15, 2008, approving the compliance filing.<sup>110</sup>

The basic approach to determination of financial penalties set forth in the *Sanction Guidelines* is to determine the base penalty amount range for a violation of a reliability standard requirement, and then establish the specific penalty amount within the base penalty range based on aggravating or mitigating factors, if any, that may be present in the circumstances. Additionally, the violator's ability to pay may be considered. Section 4 of the *Sanction Guidelines* sets forth a three-step process for the determination of monetary penalties:

Step 1: The Base Penalty Amount for the violation will be set.

Step 2: The Base Penalty Amount set in Step 1 will be reviewed, resulting in the Adjusted Penalty Amount.

Step 3: The Adjusted Penalty Amount determined in Step 2 may be reviewed and revised in light of the violator's financial ability to pay the penalty. Also, where applicable NERC or the Regional Entity will reconfirm that the penalty will disgorge unjust profits or economic benefits associated with an economic choice to violate by the violator.

Penalties are assessed on a per violation per day basis unless NERC or the Regional Entity determines alternative frequency or duration is warranted. The *Sanction Guidelines* recognize that in the United States, the maximum penalty allowed pursuant to the FPA, on which the authority of NERC and the Regional Entities is based, is \$1,000,000 per day per violation.<sup>111</sup>

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<sup>107</sup> 18 C.F.R. §39.7(e).

<sup>108</sup> 18 C.F.R. §39.7(e).

<sup>109</sup> 18 C.F.R. §39.7(g)(2).

<sup>110</sup> The October 18, 2007 Order is *North American Electric Reliability Corporation.*, 121 FERC ¶61,033 (2007).

<sup>111</sup> *Sanction Guidelines* §3.20.

The initial Base Penalty Amount range for a violation is determined using the Base Penalty Amount Table, Appendix A to the *Sanction Guidelines*, by finding the intersection of the Violation Risk Factor (VRF) of the requirement violated and the Violation Severity Level (VSL) assessed for the violation.<sup>112</sup> Each requirement in the NERC reliability standards has been assigned a VRF through the standards development process. The VRFs are assigned to reliability standard requirements to provide clear, concise and comparative association between the violation of a requirement and the expected or potential impact of a violation of that requirement on the reliability of the bulk power system. One of three defined levels of risk (VRF) is assigned to each reliability standard requirement: Lower Risk Factor, Medium Risk Factor or High Risk Factor.<sup>113</sup> The VSLs are defined measurements of the degree to which a violator violated a requirement of a standard. The VSL is assessed post-violation and is an indicator of how severely the violator actually violated the requirement or requirements in question. Up to four levels of VSL can be defined for each reliability standard requirement: Lower, Moderate, High, and Severe.<sup>114</sup>

NERC or the Regional Entity may set the initial Base Penalty Amount for the violation at the highest value in the Base Penalty Amount range as determined from the Base Penalty Amount Table.<sup>115</sup> However, NERC or the Regional Entity may set the Base Penalty Amount at a lower value in the initial Base Penalty Amount range based on two specific circumstances regarding the violation and the violator, specifically: (a) the applicability of the VRF for the violation to the specific circumstances of the violator (including, but not limited to, the violator's aggregate and net load, and interconnection characteristics such as voltage class and transfer ratings); and (b) whether the violation is an inconsequential first violation by the violator of the particular reliability standard(s).<sup>116</sup> NERC or the Regional Entity may consider the specific circumstances of the violator to determine if the violation of the requirement in question actually produced the degree of risk or harm to the bulk power system anticipated by the VRF assigned to the requirement; if that degree of risk or harm was not or would not have been produced, the Base Penalty Amount may be set to a lower amount within the initial range determined from the Base Penalty Amount Table.<sup>117</sup> Further, if the actual or foreseen impact of the violation is judged to be inconsequential and the violation is the violator's first violation of the requirement, NERC or the Regional Entity may set the Base Penalty Amount at a lower value within the initial Base Penalty Amount range determined from the Base Penalty Amount Table, or excuse

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<sup>112</sup> *Sanction Guidelines* §4.1.

<sup>113</sup> *Sanction Guidelines* §4.1.1.

<sup>114</sup> *Sanction Guidelines* §4.1.2.

<sup>115</sup> *Sanction Guidelines* §4.2.

<sup>116</sup> *Sanction Guidelines* §4.2.

<sup>117</sup> *Sanction Guidelines* §4.2.1.

the penalty for the violation. However, such reduction or elimination of the penalty generally will not be applied if the violator has a poor compliance record.<sup>118</sup>

In setting the Base Penalty Amount, NERC and the Regional Entity will also consider the time horizon involved in the violation.<sup>119</sup> Reliability standards involving longer and broader time horizons, such as long-term planning activities, may have lesser immediate impact and pose less immediate risk to reliability of the bulk power system than standards addressing shorter and narrower time frames, such as the Registered Entity's conduct in real time. Similarly, standards involving longer and broader time horizons typically will provide a longer time period over which to discover and remedy a violation as compared to standards involving more immediate activities such as next-day planning or same-day or real-time operations. Therefore, violations of standards involving more immediate or real-time activities will generally incur larger penalties than violations of standards with longer or broader time horizons. The time horizon considered and its impact on the Base Penalty Amount for the violation will be determined by NERC or the Regional Entity based on judgment and the facts of the violation. The rationale for and impact of the time horizon used will be documented in the Notice of Penalty.<sup>120</sup>

The Base Penalty Amount, determined as described above, may be adjusted upward or downward based on the application of adjustment factors, to reflect specific facts and circumstances material to each violation and violator. At a minimum, NERC or the Regional Entity will consider the possible adjustment factors listed below.<sup>121</sup>

- a. Repetitive violations and the violator's (negative) compliance history.<sup>122</sup>
- b. Failure of the violator to comply with compliance directives.<sup>123</sup>
- c. Self-disclosure and voluntary corrective action by the violator.<sup>124</sup>
- d. Degree and quality of cooperation by the violator in the violation investigation and in any remedial action directed for the violator.<sup>125</sup>

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<sup>118</sup> *Sanction Guidelines* §4.2.2.

<sup>119</sup> *Sanction Guidelines* §4.2.

<sup>120</sup> *Sanction Guidelines* §3.12.

<sup>121</sup> *Sanction Guidelines* §4.3. A number of these adjustment factors are identified in the Commission's *Policy Statement on Enforcement* issued October 20, 2005 under Docket No. PL06-00.

<sup>122</sup> *Sanction Guidelines* §4.3.1. A violation history of no violations will not produce any mitigation of the penalty otherwise determined.

<sup>123</sup> *Sanction Guidelines* §4.3.2.

<sup>124</sup> *Sanction Guidelines* §4.3.3.

- e. The presence (or absence) and quality of the violator’s compliance program.<sup>126</sup>
- f. Any attempt by the violator to conceal the violation or information needed to investigate the violation.<sup>127</sup>
- g. Intentional violation, *i.e.*, the violator violated the standard for a purpose other than a demonstrably good faith effort to avoid a significant, greater threat to the immediate reliability of the bulk power system, including an economic choice to violate the standard.<sup>128</sup>
- h. Extenuating circumstances.<sup>129</sup>

NERC or the Regional Entity may also consider additional factors it deems appropriate under the circumstances so long as their use and effect are clearly identified and adequately justified.<sup>130</sup>

In setting the Final Penalty Amount, NERC or the Regional Entity may, at the written request of the violator, review the Adjusted Penalty Amount, based on relevant, verifiable information on the violator’s ability to pay. (This step is the primary vehicle for addressing the ability to pay of “not for profit” and other similar organizations.) As a result of this review, NERC or the Regional Entity may reduce the penalty payable to an amount that the violator is deemed to have the ability to pay, or excuse the penalty amount payable, or sustain the Adjusted Penalty Amount. If the penalty amount is reduced or excused, NERC or the Regional Entity will consider the assessment of an appropriate non-monetary sanction(s) as a substitute or alternative for the penalty amount that has been excused or by which it has been reduced.<sup>131</sup>

Finally, notwithstanding the application of any other consideration or factor in determining the final penalty amount, if the violation involved an economic choice to violate the

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<sup>125</sup> *Sanction Guidelines* §4.3.4.

<sup>126</sup> *Sanction Guidelines* §4.3.5.

<sup>127</sup> *Sanction Guidelines* §4.3.6. Doubling of the penalty for the first incident of concealment by the violator, and an even larger increase for subsequent incidents of concealment, are suggested by the *Sanctions Guidelines*.

<sup>128</sup> *Sanction Guidelines* §4.3.7. Doubling of the penalty for the first intentional violation by the violator, and an even larger increase for subsequent intentional violations, are suggested by the *Sanctions Guidelines*. In addition, any penalty issued for a violation that resulted from an economic choice to violate should at a minimum disgorge any profits or economic benefits acquired as a consequence of this behavior. *Id.*

<sup>129</sup> *Sanction Guidelines* §4.3.8.

<sup>130</sup> *Sanction Guidelines* §4.3.

<sup>131</sup> *Sanction Guidelines* §4.4.1.



standards, NERC or the Regional Entity will reconfirm that the penalty amount set results in disgorgement of any profit or other economic benefit obtained by the violator from the violation, to the extent ascertainable.<sup>132</sup>

Under the *Sanction Guidelines*, NERC or the Regional Entity may impose non-monetary sanctions for violations of reliability standards. Non-monetary sanctions must be applied with the objective of promoting reliability and compliance with the reliability standards. Consistent with 18 C.F.R. §39.7(g)(1), non-monetary standards may include, but are not limited to (i) limitations on the violator’s activities, functions or operations, or (ii) placing the violator on a reliability watch list of major violators.<sup>133</sup>

In instances of multiple violations of standards by a Registered Entity related to a single act or common incidence of noncompliance, NERC or the Regional Entity will generally determine and issue a single aggregate penalty or sanction (or remedial action directive) bearing a reasonable relationship to the aggregate of the related violations. The penalty or sanction (or remedial action directive) will generally be at least as large or expansive as what would be called for individually for the most serious of the violations.<sup>134</sup>

Where a penalty or sanction has been determined by a Regional Entity and accepted by the Registered Entity (including following a hearing before the Regional Entity hearing body where the Registered Entity does not appeal the hearing body decision), prior to filing a Notice of Penalty with the Commission, NERC will review the penalty or sanction for consistency with the *Sanction Guidelines* and consistency with penalty determinations in other Regions for the same or similar violations in the same or similar circumstances. NERC may direct the Regional Entity to revise a penalty determination that clearly conflicts with the goal of consistent national reliability enforcement, in which case the Registered Entity may reopen the proceedings on any issue, irrespective of whether the issue was previously litigated, settled or unopposed.<sup>135</sup>

**5. The ERO has established rules that provide reasonable notice and opportunity for public comment, due process, openness and balance of interests in developing reliability standards, and otherwise exercising its duties.**

NERC has established rules that provide for reasonable notice and opportunity for public comment, due process, openness and balance of interests in developing reliability standards, and otherwise exercising its duties. With respect to the development of reliability standards, NERC’s Bylaws require that:

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<sup>132</sup> *Sanction Guidelines* §4.4.2.

<sup>133</sup> NERC uniform CMEP §5.

<sup>134</sup> *Sanction Guidelines* §3.10.

<sup>135</sup> *Sanction Guidelines* §5.6

The Corporation shall develop reliability standards pursuant to procedures and processes that shall be specified in the Rules of Procedure of the Corporation. The Rules of Procedure shall provide for the development of reliability standards through an open, transparent, and public process that provides for reasonable notice and opportunity for public comment, due process, and balancing of interests and is designed to result in reliability standards that are technically sound. Participation in the process for developing reliability standards shall not be limited to members of the Corporation but rather shall be open to all persons and entities with an interest in the reliable operation of the bulk power system.<sup>136</sup>

NERC's process for developing and modifying reliability standards, which the Commission accepted as meeting the criteria for certifying NERC as the ERO pursuant to §215 of the FPA and §39.3(b) of the Commission's regulations,<sup>137</sup> is embodied in Section 300 of the NERC ROP and the NERC RSDP, Appendix 3A to the NERC ROP. Section 304 of the NERC ROP states that NERC shall develop reliability standards in accordance with the NERC RSDP, Appendix 3A to the ROP. The RSDP sets forth the detailed process steps for development and approval of a new reliability standards or revision to a reliability standard.

Section 304 of the NERC ROP sets forth NERC's "Essential Principles for the Development of Reliability Standards," which include openness, transparency, consensus building, fair balance of interests, due process and timeliness:

1. **Openness** – Participation shall be open to all persons who are directly and materially affected by the reliability of the North American bulk power system. There shall be no undue financial barriers to participation. Participation shall not be conditional upon membership in NERC or any other organization, and shall not be unreasonably restricted on the basis of technical qualifications or other such requirements.
2. **Transparency** – The process shall be transparent to the public.
3. **Consensus-building** – The process shall build and document consensus for each standard, both with regard to the need and justification for the standard and the content of the standard.
4. **Fair Balance of Interests** – The process shall fairly balance interests of all stakeholders and shall not be dominated by a single interest category.
5. **Due Process** – Development of standards shall provide reasonable notice and opportunity for any person with a direct and material interest to express views on a proposed standard and the basis for those views, and to have that position considered in the development of the standards.

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<sup>136</sup> NERC Bylaws Article IX, §2.

<sup>137</sup> *ERO Certification Order*, 116 FERC ¶61,062, at PP 239, 241, 250.

6. **Timeliness** – Development of standards shall be timely and responsive to new and changing priorities for reliability of the bulk power system.

Section 305 of the NERC ROP specifies that “NERC reliability standards shall be approved by a registered ballot body prior to submittal to the [NERC] board and then to the ERO governmental authorities for their approval . . .”, and that “Any person or entity may join the registered ballot body to vote on standards.” The RBB is organized on an industry segment basis, and persons or organizations joining the RBB must select membership in the appropriate segment (subject to periodic review by NERC).<sup>138</sup> The RBB segments and the criteria for membership in each segment are set forth in the RSDP.<sup>139</sup>

- Segment 1: Transmission Owners
- Segment 2: Regional Transmission Organizations and Independent System Operators
- Segment 3: Load-Serving Entities
- Segment 4: Transmission Dependent Utilities
- Segment 5: Electric Generators
- Segment 6: Electricity Brokers, Aggregators, and Marketers
- Segment 7: Large Electricity End Users
- Segment 8: Small Electricity Users
- Segment 9: Federal, State, and Provincial Regulatory or other Government Entities
- Segment 10: Regional Reliability Organizations and Regional Entities

Section 306 of the ROP provides for the standards development process to be overseen by a Standards Committee, which is an elected body comprised of two members of each segment of the RBB.<sup>140</sup> The Standards Committee is to ensure stakeholder interests are fairly represented in the reliability standards development process. Section 308.2 of the NERC ROP specifies that proposed reliability standards or revisions to reliability standards shall be submitted to the NERC Board of Trustees for approval after being approved by the RBB pool voting on the standard.

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<sup>138</sup> NERC ROP §305.

<sup>139</sup> NERC RSDP at 40-41. The segments of the RBB are different from the NERC membership segments established by Article II, §4 of the NERC Bylaws (discussed above under criterion 2). The Commission approved the use of segments for the RBB that are different from the NERC membership segments. *North American Electric Reliability Corporation, Order on Petitions for Rehearing and Clarification, Order on Compliance Filing*, 117 FERC ¶61,126 (2006), at P 30.

<sup>140</sup> Election of the members of the Standards Committee is governed by the *Election Procedure for Members of NERC Standards Committee*, Appendix 3B to the NERC ROP.

The NERC RSDP sets out the detailed steps in the process for developing and approving reliability standards or revisions to standards. The process is based on the procedures of the ANSI and other standards-setting organizations in the U.S. and Canada.<sup>141</sup> The standards development process is intended to develop consensus on both the need for and content of a proposed standard.<sup>142</sup> As detailed in the RSDP, the process includes the following key elements:

**Nomination of a proposed standard, revision to a standard, or withdrawal of a standard**, using a Standard Authorization Request (SAR), which may entail appointing a SAR drafting team.<sup>143</sup>

**Public posting of the SAR** to allow interested persons and entities to review and comment on the need for the proposed standard and the expected outcomes and impacts from implementing it, and to identify if there is stakeholder consensus on the need, scope and applicability of the standard proposed by the SAR.<sup>144</sup>

**Review of the public comments** in response to the SAR and prioritization of proposed standards, leading to **authorization to develop standards** for which there is a stakeholder consensus-based need.<sup>145</sup>

**Appointment of a Standard Drafting Team** to draft the new or revised standard. The appointed Standard Drafting Team is to have the expertise, competencies and diversity of views needed to develop the standard. The appointment process includes a public solicitation for nominees.<sup>146</sup>

**Drafting the new or revised standard.** The standard will be drafted by the Standard Drafting Team with the assistance and administrative support of the NERC Standards Process Manager (a NERC professional staff member), who will review the draft standard for consistency of quality and completeness and to ensure the standard is within the scope and purpose identified in the SAR.<sup>147</sup>

**Public posting of the draft standard** to allow interested parties to review and comment on it, to receive specific comments from interested parties on the text of

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<sup>141</sup> NERC RSDP at 14. ANSI accredited NERC's reliability standards development process in 2003.

<sup>142</sup> NERC RSDP at 14.

<sup>143</sup> NERC RSDP at 14 and 15-16.

<sup>144</sup> NERC RSDP at 14 and 16.

<sup>145</sup> NERC RSDP at 14 and 17.

<sup>146</sup> NERC RSDP at 14 and 17-18.

<sup>147</sup> NERC RSDP at 14 and 18-19.

the standard, to assess stakeholder consensus on the draft standard, and to determine if the draft standard should be modified to increase consensus.<sup>148</sup>

**Field testing** (if any) of the draft standard and its measures.<sup>149</sup>

**Analysis of public comments and field test results** by the Standard Drafting Team, giving consideration to the written views and objections of all participants, to determine if there is consensus the proposed standard should go to ballot, or requires further work.<sup>150</sup>

**Balloting of the standard** by the industry stakeholder ballot pool formed from the RBB for purposes of balloting the new or revised standard.<sup>151</sup> (The voting process is described below.)

**Re-balloting of the standard to consider specific comments** by those submitting negative votes with comments.<sup>152</sup>

**Vote by the NERC Board to approve or reject the standard that has been approved by the ballot pool.** The Board may adopt or reject a reliability standard that has been approved by the ballot pool, but may not modify the standard; however, if the Board chooses not to adopt a proposed standard, the Board shall provide its reasons.<sup>153</sup>

**Submission of the RBB- and Board-approved reliability standard to the Commission** and other applicable governmental authorities for approval.<sup>154</sup>

As provided in the RSDP, voting on a proposed reliability standard or revision to a standard is done by the RBB ballot pool formed for that standard, and is tallied on a weighted segment basis. At least 30 days prior to the start of a ballot, the NERC Standards Process Manager issues a notice to the entities in the RBB advising them of the upcoming ballot on the new or revised standard, so that entities may elect to join the ballot pool for balloting the standard. Any member of the RBB may join (or leave) the ballot pool for the standard until the

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<sup>148</sup> NERC RSDP at 14 and 19-20.

<sup>149</sup> NERC RSDP at 14 and 20.

<sup>150</sup> NERC RSDP at 20-21.

<sup>151</sup> NERC RSDP at 14 and 21-22.

<sup>152</sup> NERC RSDP at 14, 23-24. Voters on the first ballot are allowed to submit comments with affirmative ballots and reasons for their votes with negative ballots (although inclusion of a statement of reasons with a negative ballot is not required). If one or more negative ballots are submitted with statements of reasons, a second ballot must be conducted. *Id.* at 23.

<sup>153</sup> NERC RSDP at 14 and 24.

<sup>154</sup> NERC RSDP at 24.

ballot period begins.<sup>155</sup> The balloting is conducted electronically with voting allowed during a specified ballot period, typically 10 days.<sup>156</sup> Approval of a proposed standard or revision to a standard requires both (i) a quorum, which is established by at least 75% of the members of the ballot pool submitting a response with an affirmative vote, a negative vote, or an abstention,<sup>157</sup> and (ii) affirmative votes by a two-thirds majority of the weighted segment votes.<sup>158</sup> The calculation of the weighted segment voting results is described in detail in the RSDP.<sup>159</sup>

The foregoing demonstrates that NERC's rules provide reasonable notice and opportunity for public comment, due process, openness, and balance of interests in the development of reliability standards. In finding that NERC met the statutory and regulatory criteria to be certified as the ERO, the Commission found NERC's reliability standards development process met the ERO certification requirement that the ERO candidate have rules providing for reasonable notice and opportunity for public comment, due process, openness, and balancing of interests in developing reliability standards.<sup>160</sup>

Other NERC rules provide for reasonable notice and opportunity for public comment, due process, openness, and balance of interests in the exercise of NERC's duties other than developing reliability standards. As discussed under criterion 2 above, NERC's Bylaws provide for its trustees to be elected by the MRC, which (again per the NERC Bylaws) is comprised of representatives of the segments of the NERC membership as defined in the Bylaws. The Bylaws also provides that amendments to the Bylaws must be adopted by majority vote of both the Board of Trustees and the MRC, conducted after at least 10 days and no more than 60 days notice of the vote on the proposed amendment. Additionally, the NERC membership may adopt new Bylaws, or alter, amend or repeal amendments adopted by vote of the Board and the MRC, by vote of two-thirds of the sectors voting on the alteration, amendment, repeal or adoption.<sup>161</sup>

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<sup>155</sup> NERC RSDP at 21-22.

<sup>156</sup> NERC RSDP at 22.

<sup>157</sup> NERC RSDP at 22. If a quorum of the ballot pool is not established, the standard is balloted a second time, allowing a 15-day period for the ballot. If a quorum is not established on the second ballot, the Standards Process Manager will re-survey the RBB to establish interest in participating in a ballot on the standard, and then a re-ballot will occur with the resulting revised ballot pool. *Id.*

<sup>158</sup> NERC RSDP at 22. For this purpose the number of votes cast is the sum of the affirmative and negative votes cast by the ballot pool, excluding abstentions and non-responses.

<sup>159</sup> NERC RSDP at 21-22 and 42-43 (Appendix C - Examples of Weighted Segment Voting Calculation).

<sup>160</sup> *ERO Certification Order* at P 250.

<sup>161</sup> NERC Bylaws Article XIV, §1.

The Bylaws further provide that revisions to the NERC ROP may be proposed by (i) any 50 members of NERC, which must include members from at least three membership segments, (ii) the MRC, (iii) a standing committee of NERC to whose function and purpose the ROP to be amended pertains, or (iv) an officer of NERC. A proposed revision to the NERC ROP must be posted on the NERC website for public comment for a minimum of 45 days prior to the Board vote on the proposed revision.<sup>162</sup>

The NERC Bylaws require that notice of meetings of the NERC Board and of the MRC, and of calls for action without a meeting by the Board or the MRC, along with all nonconfidential materials to be considered by the Board or MRC at a meeting or in an action without a meeting, shall be posted on the NERC website at least 24 hours prior to the meeting or within 24 hours after the call for action without a meeting.<sup>163</sup> The ROP provide that notice of meetings of NERC committees, and all nonconfidential materials relating to the meeting, shall be posted on the NERC website at approximately the same time(s) that the notice and materials are provided to the committee members.<sup>164</sup> Additionally, the Bylaws require that, except for discussions of certain specified non-public topics, meetings of the Board and of the MRC shall be open to the public (subject to reasonable space limitations).<sup>165</sup> Similarly, the NERC ROP require that, except for discussions of certain specified non-public topics, meetings of NERC standing committees shall be open to the public (subject to reasonable space limitations).<sup>166</sup>

With respect to the preparation of NERC's annual business plan and budget, the NERC Bylaws provide that NERC shall post a draft business plan and budget for comment by the NERC membership, the MRC and the NERC standing committees for at least 30 days prior to the Board meeting at which the annual business plan, budget and funding requirement is to be approved for submission to the Commission. The Board shall also consult with the members of the MRC on the proposed business plan and budget before it is adopted.<sup>167</sup> Should a supplemental or modified budget or assessment be considered for adoption during the course of the year, the Bylaws require that the procedures for posting, receipt of comments and consultation with the MRC shall be followed to the extent possible in the Board's judgment in light of the exigency of the circumstances necessitating preparation and approval of the supplemental or modified budget, funding and assessment.<sup>168</sup>

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<sup>162</sup> NERC Bylaws Article XI, §2.

<sup>163</sup> NERC Bylaws Article V, §§4 and 6; Article VIII, §§10 and 12.

<sup>164</sup> NERC ROP §1304.1.

<sup>165</sup> NERC Bylaws Article V, §4; Article VIII, §10.

<sup>166</sup> NERC ROP §1304.1.

<sup>167</sup> NERC Bylaws Article XIII, §4; *see also* NERC ROP §1103.1.

<sup>168</sup> NERC Bylaws Article XIII, §5. To date, as the ERO, NERC has not requested a supplemental or modified budget requiring increased funding and assessments from LSEs.

With respect to compliance monitoring and enforcement, as discussed above under criteria 1 and 4, the NERC uniform CMEP and Regional Entity CMEPs, the NERC Hearing Procedures (Attachment 2 to the uniform CMEP), and the NERC *Sanction Guidelines*, provide for reasonable notice to and due process for users, owners and operators of the bulk power system in the conduct of NERC's and the Regional Entities' compliance monitoring and enforcement activities, including the implementation of the compliance monitoring processes, the conduct of hearings on disputed notices of alleged violations, proposed penalties, disputed Mitigation Plan components and disputed Remedial Action Directives, and the imposition of penalties and sanctions for violations of reliability standards.

Finally, as discussed above under criterion 2, the NERC Bylaws and ROP require members to be selected for NERC standing committees and other committees and subgroups so as to (subject to specified exceptions) provide for balanced decision making, such that no two stakeholder sectors can control the voting on the committee and no single stakeholder sector is able to defeat a matter; and to provide the opportunity for an equitable number of members from the U.S. and Canada.

**6. The ERO has established rules that provide appropriate steps to gain recognition in Canada and Mexico.**

As stated in its Certificate of Incorporation, one of the corporate purposes of NERC is “to act as the electric reliability organization for the United States as certified by the Federal Energy Regulatory Commission and for Canada and Mexico as recognized by applicable government and regulatory authorities in such countries, all pursuant to law.”

**a. Canada.** Under the Canadian Constitution, regulation of electricity is primarily within the jurisdiction of each province. Canada does not have a “FERC-equivalent” with plenary jurisdiction over electricity matters, although the National Energy Board (NEB) does have jurisdiction over international power lines (IPLs). Accordingly, beginning before its certification as the ERO for the U.S. and continuing to the present time, NERC has devoted significant efforts to developing relationships with, and where possible attempting to obtain recognition as the electric reliability organization within, each of the relevant provincial authorities, as well as the NEB, as described below.

**Alberta:** On December 28, 2007, the Alberta Minister of Energy issued an order recognizing NERC as the ERO for purposes of the *Electric Utilities Act* and the *Transmission Regulation* of Alberta.<sup>169</sup> The accompanying letter directed the Alberta Electric System Operator (AESO) and Alberta Utilities Commission (AUC) to work cooperatively with NERC and the Regional Entities to implement mandatory reliability standards in Alberta. The amendment to the *Transmission Regulation* establishes a mechanism for reliability standards to become mandatory. That mechanism is for the AESO to submit standards to the AUC for approval. The expectation is that the reliability standards in force will be the NERC standards, to the extent the AESO adopts them, recommends them to the AUC for approval, and the AUC approves them.

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<sup>169</sup> Government of Alberta Department of Energy Ministerial Order 79/2007 (Dec. 28, 2007).



The AESO may also adopt and recommend for AUC approval other reliability standards to take the place of one or more NERC standards. Under that mechanism, the AUC has approved three NERC reliability standards, and is considering additional standards recommended for approval by the AESO. Under an agreement between WECC and AESO, WECC will monitor AESO for compliance with reliability standards. The AESO will monitor the remaining entities in Alberta for compliance with reliability standards. Potential violations of reliability standards are referred by both WECC and the AESO to the Alberta Market Surveillance Administrator for prosecution. The AUC holds the authority to sanction or impose penalties.

**British Columbia:** A mechanism is in place for standards to become mandatory, but none are yet mandatory. The British Columbia Utilities Commission (BCUC) would set and enforce mandatory reliability standards. The expectation is that British Columbia Transmission Corporation (BCTC) will file standards for approval with the BCUC. The BCTC is a signatory to the WECC Reliability Management System agreement.

**Manitoba:** In April 2009, legislation was introduced that would give Manitoba the authority to make reliability standards developed by NERC mandatory and enforceable in the Province.<sup>170</sup> As an interim measure, in May 2008 NERC, MRO and Manitoba Hydro signed an agreement by which reliability standards are binding and enforceable on Manitoba Hydro until such time as broader legislative authority is adopted. The Manitoba government has designated the Manitoba Public Utilities Board to hear any disputed matters regarding compliance with reliability standards by Manitoba Hydro.

**New Brunswick:** NERC reliability standards are mandatory in New Brunswick by operation of law as a part of the New Brunswick market rules. On October 3, 2008, NERC, the Minister of Energy of the Province of New Brunswick, and the New Brunswick System Operator (NBSO) signed a MOU that recognizes NERC's role as the ERO and finds that NERC is a "standards authority" within the meaning of the New Brunswick *Electricity Act*. NERC, NPCC and NBSO have signed a MOU under which NERC and NPCC would monitor compliance and carry out enforcement as to the NBSO. The NBSO would monitor and enforce compliance with reliability standards by those entities within New Brunswick as a part of its market rules.

**Nova Scotia:** The Nova Scotia Utilities and Review Board (NSUARB) has legislative authority to adopt and enforce mandatory reliability standards. No standards are yet in force. The NSUARB retains the authority to make findings of violation and impose sanctions within Nova Scotia. NERC and NPCC could make recommendations to the NSUARB regarding compliance matters. NERC and the NSUARB have signed an MOU regarding their respective roles. NERC, NPCC, Nova Scotia Power and the NSUARB are negotiating a further MOU to implement the first MOU. Nova Scotia Power is currently reviewing NERC standards and will be formally proposing them for adoption by the NSUARB during 2009.

**Ontario:** The Ontario Minister of Energy has recognized NERC as the ERO within Ontario. NERC reliability standards are mandatory in Ontario by operation of law as a part of the market rules of the Ontario Independent Electric System Operator (Ontario IESO). Under recent

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<sup>170</sup> Bill 20, the Manitoba Hydro Amendment and Public Utilities Board Amendment Act.

changes to Ontario law, proposed reliability standards are formally noticed to the Ontario Energy Board (OEB) by the Ontario IESO. The standards become legally enforceable, unless within a prescribed time, the OEB takes action to the contrary. The OEB now also has the power to remand reliability standards. Pursuant to an MOU between NERC and the OEB and an MOU between NERC, NPCC, and the Ontario IESO, NERC and NPCC monitor compliance and carry out enforcement as to the Ontario IESO. The Market Surveillance unit of the Ontario IESO monitors and enforces compliance with reliability standards by those entities within Ontario as a part of its market rules. Modifications to the two MOUs are under consideration to reflect the change in Ontario law that gives the OEB remand authority.

**Québec:** The Québec Régie de l'énergie has statutory authority to set and enforce reliability standards. Standards are to be proposed by the Québec reliability coordinator to the Régie for adoption. Standards are not yet in force in Québec. NERC and the Régie have signed a MOU describing their respective roles in reliability. NERC, NPCC, and the Régie have negotiated a services agreement under which NERC and NPCC would provide compliance and enforcement monitoring services to the Régie. The Régie has the authority to make the decision on enforcement matters and impose penalties. NERC and NPCC would make recommendations to the Régie on compliance and enforcement matters as well as provide reports and advice on other matters related to reliability. The agreement will be done in two phases. NERC, NPCC, and the Régie signed the Phase I agreement on May 8, 2009. Phase II is being posted for comment within Québec, with signing expected in the third or fourth quarter 2009. On a parallel path, TransEnergie, the entity designated by the Régie as "reliability coordinator" within Québec, will be proposing reliability standards for adoption by the Régie on a similar time schedule.

**Saskatchewan:** The Province of Saskatchewan does not have a separate regulatory authority. Under provincial law, Saskatchewan Power Corporation (SPC) has the authority to set, monitor, and enforce reliability standards within Saskatchewan. NERC, MRO and SPC have negotiated and signed a MOU, effective February 3, 2009, covering the respective roles of the parties regarding reliability and monitoring compliance with reliability standards. SPC has established a "Saskatchewan Authority" within SPC to serve as the oversight function for reliability within the province. The MOU recognizes NERC and MRO as Electric Reliability Standards Setting Bodies for Saskatchewan. The Saskatchewan Authority may, on recommendation of NERC and MRO, make a finding of non-compliance and may order a mitigation plan. This approach is viewed as an interim step pending possible future changes in legislation.

**National Energy Board:** The NEB has jurisdiction only with respect to IPLs. The NEB has announced an intention to require owners of IPLs to follow NERC reliability standards and is considering the steps necessary to achieve that goal. NERC and the NEB have signed a MOU describing their respective roles in reliability. Until such time as reliability standards are made mandatory with respect to IPLs, NERC, working with NPCC, MRO, and WECC, has implemented a procedure to report system events and potential compliance matters involving IPLs to the NEB.

**b. Mexico.** No legislative authority currently exists in Mexico for a regulatory authority to recognize NERC as the “electric reliability organization” or exercise regulatory authority over reliability matters. NERC shares significant developments with representatives of the Comisión Reguladora de Energía (CRE), and the CRE participates in the quarterly Trilateral meetings among regulators on reliability matters. The Comisión Federal de Electricidad (CFE) has responsibility for the reliable operation of the electric system in Mexico, and CFE is a signatory to the WECC Reliability Management System with respect to the portion of the grid in Baja California Norte that is part of the Western Interconnection.

## II. NERC PROGRAM AREA STATEMENTS OF ACTIVITIES AND ACHIEVEMENTS

Each NERC statutory direct program area, plus Members' Forums, prepared a description of its activities and achievements since NERC was certified as the ERO in 2006. These descriptions are based on a set of purposes and objectives for each program area. In this section, for each NERC program area, its purposes and objectives are stated followed by a description of the program's activities and achievements with respect to each purpose and objective.

### A. Reliability Standards Development Program

1. **NERC shall develop and maintain reliability standards applicable to bulk power system owners, operators and users that enable NERC and Regional Entities:**
  - a. **to measure the reliability performance of bulk power system owners, operators and users; and**
  - b. **to hold bulk power system owners, operators and users accountable for reliable operation of the bulk power system.**

NERC has developed reliability standards during the certification period using the ANSI-accredited development process originally established in 2003. These process requirements are embodied in the NERC RSDP that governs the development process. In April 2005, the former planning standards and operating policies were transformed into what was termed the "Version 0" reliability standards, and have served as the general template that is utilized for the current set of reliability standards. NERC submitted a total of 107 Reliability Standards to the Commission between April, 2006, when NERC applied to be the ERO, and November, 2006, the latest date on which the Commission acted on proposed Reliability Standards in its March, 2007, Order No. 693. In Order No. 693, the Commission approved 83 of these standards and held 24 pending further information. Subsequent to this action, the Commission approved 12 additional reliability standards, CIP-002-1 through CIP-009-1, FAC-010-2, FAC-011-2, and FAC-014-2, and NUC-001-1. In the United States, there are 94 Commission-approved continent-wide Reliability Standards now in effect with one more to be effective April 1, 2010.<sup>171</sup> In addition, the Commission has also approved nine WECC reliability standards, which are all in effect as of July 1, 2009.

Since NERC was certified as the ERO in July, 2006, the Reliability Standards Development Program, utilizing the RDSP and working with volunteer industry stakeholder-comprised drafting teams, developed and approved the following NERC continent-wide Reliability Standards that permit NERC and the Regional Entities to measure the reliability performance of and hold owners, operators, and users accountable for, the reliable operation of the bulk power system:

- 50 revised standards with new or revised requirements;

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<sup>171</sup> The effective date for Standard NUC-001-1 is April 1, 2010.

- 20 versions that added additional compliance measures to then-existing reliability standards;
- 13 formal interpretations to requirements in NERC reliability standards; and
- 21 versions that correct various errata changes.

In addition, in February and March, 2007, NERC filed with the Commission an entire body of Violation Risk Factors for the then-existing set of NERC Reliability Standards. In similar fashion, NERC filed an entire set of Violation Severity Levels for the 83 Commission-approved Reliability Standards and proposed NUC-001-1 – Nuclear Plant Interface Coordination Reliability Standard.

Since ERO certification, NERC evaluated 21 proposed Regional Entity reliability standards or revisions to Regional Entity standards. To date, nine original standards and seven updated versions to the original nine have been approved by the NERC Board. The remaining five are being reviewed by the Regional Entities following NERC's evaluation.

**2. NERC shall develop reliability standards that have the following attributes:**

- a. Technically excellent (statement of applicability; clear statement of purpose describing how the standard contributes to the reliability of the bulk power system; statement of performance requirement or outcome that will provide for a reliable bulk power system consistent with good utility practices and the public interest; performance requirements to evaluate compliance that are objectively measurable by third parties with relevant knowledge or expertise; sound technical basis in engineering and operations; complete and self-contained; consequences for non-compliance are clearly presented; clear and unambiguous language; requirements can be practically implemented; consistent terminology is used);**
- b. Timely;**
- c. Just, reasonable, not unduly discriminatory or preferential;**
- d. In the public interest; and**
- e. Consistent with other applicable standards of governmental authorities.**

The Commission provided in Order No. 672 general guidance in the form of 15 criteria regarding how the Commission will evaluate a proposed Reliability Standard to determine whether it meets the legal standard of review. These criteria directly support the stated objective and its subparts outlined above. Therefore, by satisfying the Commission's criteria for approval of proposed standards, NERC demonstrates its success in meeting the stated objective. On this basis, NERC has created a regulatory filing template for new and significantly revised reliability standards that directly address each of the criteria. The Commission has affirmatively acted on each NERC Reliability Standard request for approval since July, 2006 (exclusive of

interpretations, violation risk factors, and violation severity levels) which demonstrates that the standards NERC has developed and submitted to the Commission satisfactorily meet the Commission's criteria for approval.<sup>172</sup>

More specifically, NERC's ROP describe ten characteristics for technical excellence that each proposed Reliability Standard must meet to be approved. A Reliability Standard must:

1. Identify the types of entities and geographic scope to which it applies;
2. State its purpose and describe how it contributes to the reliability of the Bulk-Power System;
3. Describe a specific performance requirement not resulting from lowest-common-denominator compromise, yet taking into account costs and benefits;
4. Be measurable, so as to facilitate objective evaluation of compliance;
5. Be based on engineering and operating judgment, analysis, or experience;
6. Be complete and self-contained, independent of external information;
7. Be clear as to the consequences for violation (when viewed in concert with the penalty guidelines);
8. Use clear and unambiguous language;
9. Consist of requirements that can be practically implemented; and
10. Use consistent terminology.

Further, a NERC Reliability Standard must achieve a reliability objective in one or more of eight main categories:

1. The Bulk-Power System should be planned and operated to perform reliably under normal and abnormal conditions;
2. The frequency and voltage of the Bulk-Power System should be controlled within defined limits by balancing real and reactive power supply and demand;
3. Information necessary for the planning and operation of the Bulk-Power System should be made available to those who need it;
4. Emergency operations plans should be developed and implemented;
5. Facilities for communication, monitoring, and control should be provided, used and maintained;
6. Personnel must be trained, qualified and must have the authority to implement actions;
7. The reliability of the Bulk-Power System should be monitored on a wide-area basis; and
8. The Bulk-Power System must be protected from malicious physical or cyber attacks.

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<sup>172</sup> In its orders approving proposed Reliability Standards, the Commission has directed that NERC develop revisions to a number of the standards the Commission has approved.

NERC’s rolling three-year reliability standard development plan contains a listing of projects whose scope includes a significant focus on improving the quality of existing reliability standards. This “clean-up” of primarily Version 0 reliability standards addresses many of the attributes listed in developing technically excellent standards. In this regard, NERC’s reliability standard development effort is clearly focused on achieving the stated objective. NERC provides guidance to its drafting teams in the form of drafting team guidelines that provide further detail using examples on how to achieve the quality objectives required to satisfy criteria for “technically excellent” reliability standards.

Consistently since NERC was certified as the ERO in July, 2006, each proposed reliability standard has been developed in conformance with the Commission-approved and ANSI-accredited reliability standards development process contained in Appendix 3A to the NERC ROP. NERC’s template for submitting a SAR requires the submitter to document explicitly which of the eight noted objectives are being addressed by the SAR and proposed standard.

- 3. NERC shall develop reliability standards and revise existing standards through a process that is consistent with the following principles:**
  - a. Openness – Participation in standards development shall be open to all persons directly and materially affected by the reliability of the bulk power system, with no undue financial barriers to participation and participation not unreasonably restricted on the basis of technical qualifications or other such requirements;**
  - b. Transparency – The standards development process shall be transparent to the public;**
  - c. Consensus-building – The standards development process shall build and document consensus with regard to the need for, justification for, and content of the standard;**
  - d. Fair balance of interests – The standards development process shall fairly balance the interests of all stakeholders and not be dominated by any single interest category;**
  - e. Due process – The standards development process shall provide reasonable notice and opportunity for persons with a direct and material interest to express views on a proposed standard and to have their positions considered in the development of the standard; and**
  - f. Timeliness – Development of standards shall be timely and responsive to new and changing priorities for and threats to the reliable operation of the bulk power system.**

In P 250 of the *ERO Certification Order*, the Commission concluded NERC has established rules that provide for reasonable notice and opportunity for public comment, due

process, openness, and a balance of interests in developing Reliability Standards. The Commission concluded that by using the ANSI-accredited process as presented, NERC satisfies the essential requirements for openness, transparency, consensus-building, due process, and balance of interests. Through the efforts of the Standards Committee, industry stakeholders, and NERC staff, NERC has faithfully implemented Section 300 of its ROP since its ERO certification and has not materially changed these rules since being certified.

The Standards Committee is responsible for ensuring that the integrity of the Reliability Standards Development Procedure is maintained, including adherence to the process steps. Additionally, by design, any change to the RSDP must be affirmatively supported by the stakeholders.

Since receiving ERO certification in 2006, NERC has actively engaged in 48 standards development projects and 26 interpretations, each one requiring the procession of steps identified in the RSDP. Thus, there are literally hundreds of process steps that were taken in support of this body of work. In all but five instances (discussed below), the steps were implemented in complete accord with the development procedure.

In all cases where a deviation occurred, the timelines driving the need to shorten the steps in the standards process were established in directives by the Commission. As a result, the Standards Program was faced with two conflicting choices:

- Follow the standards process exactly as written in the NERC ROP (including the RSDP) or miss the deadline and thereby violate the Commission's directive, or
- Deviate from the established standards process and meet the Commission's deadline.

For each noted deviation from the established process, the Standards Committee authorized the action in a public meeting that was properly noticed and documented. These approved deviations consisted of:

Deviation to Approving Changes to the RSDP to Address Commission Directive in the *ERO Certification Order*

The first instance of deviating from the process occurred when the Commission directed NERC to file a revised RSDP. In its July 20, 2006 *ERO Certification Order*, the Commission directed NERC to make certain changes to its governance and rules of procedure within 90 days, and some of those changes required modifications to the RSDP. At its August 2006 meeting, the Standards Committee authorized submitting the proposed revisions to the procedure to the NERC Board of Trustees without a stakeholder comment period as is required in the RSDP.

Deviation to Address Commission Directive in January 2007 Non-Governance Compliance Order

The second instance where NERC deviated from its standards development process occurred to comply with the Commission's January 18, 2007 Order on NERC's Non-



Governance Compliance Filing.<sup>173</sup> As an ongoing activity initiated by the *ERO Certification Order*, the January 18, 2007 Order included several directives for NERC to modify the RSDP within 60 days, which did not permit sufficient opportunity for NERC to employ its documented review and approval processes. As a result, at its February 2007 meeting, the Standards Committee authorized shorter posting periods than required in the RSDP to meet the Commission’s deadline.

Deviation to Address Commission Directive in June 2007 Commission Order for Violation Severity Levels

The third instance where NERC deviated from its standards development process occurred when the Commission directed NERC to replace “Levels of Non-compliance” (in the 83 standards the Commission had approved in Order No. 693) with “Violation Severity Levels” by March 1, 2008. In the fall of 2007, the drafting team assigned the development of VSLs realized it could not meet the Commission deadline if it conducted an additional industry comment period after it substantively revised the assignments in response to comments from the previous industry comment period. At its December 2007 meeting, the Standards Committee authorized the drafting team to deviate from the RSDP, if necessary, by making significant revisions to the VSL assignments following the last comment period and between the initial and recirculation ballots without an industry comment opportunity in order to meet the Commission’s deadline.

Deviation to Address Commission Directives in Order Nos. 693 and 890 — Available Transfer Capability

The fourth and fifth instances where NERC deviated from its standard development process occurred in response to Commission directives with specific due dates for filing Available Transfer Capability (ATC)-related standards. At its February 2008 meeting, the Standards Committee’s Executive Committee authorized the ATC standard drafting team to make modifications to the set of ATC-related standards, if needed, between the initial and recirculation ballots in order to ballot the standards and file them by the Commission-specified May 9, 2008 deadline. Under the RSDP, standard drafting teams are not permitted to make modifications to proposed standards between the initial and recirculation ballots per the current process. This action was ratified by the full Standards Committee at its February 2008 meeting. The team modified the standards as requested but the ballot pool did not approve them. NERC subsequently requested and was granted an extension to the due dates for filing these standards with the Commission. The drafting team then processed the proposed standards in accord with the development process steps, except as noted below.

At its October 2008 meeting, the Standards Committee’s Executive Committee authorized the ATC standard drafting team to make clarifying modifications to the set of

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<sup>173</sup> *North American Electric Reliability Corporation, Order on Compliance Filing*, Docket No. RR06-1-003 (2007) (January 18, 2007 Order).

ATC-related standards, if needed, between the initial and recirculation ballots. This action was ratified by the full Standards Committee at its November 2008 meeting.

### Additional Project Planning Activities

The Standards Program established the Manager of Standards Development position in 2006. The Manager of Standards Development is responsible for updating the RSDP, and modified the input process to the plan so that it provides the opportunity to collect information from a wider constituency. In updating the standards development plan for 2009, the Standards Program sought input from each program area, each of NERC's technical committees, and trade and professional organizations. While fewer ideas were generated than hoped for, the standards program sees the progress made as the "first step" in moving forward to transform the plan from one that necessarily "cleaned up" existing standards to one that identifies requirements which may be needed to fill new or emerging reliability-related areas and provides the sound technical foundation for doing so.

Some of the further improvements implemented to improve project management and communication of project schedules include:

- Reporting individual project status to the Standards Committee at every monthly meeting,
- Communicating vacant drafting team positions in the NERC News,
- Posting vacant drafting team positions on the Standards Under Development Web page,
- Posting individual project schedules on the "related files" page for each drafting team, and
- Updating project schedules to provide a three month "look ahead" in order to coordinate project schedules such that the number of documents posted for stakeholder review is manageable.

Since certification as the ERO in 2006, NERC has undertaken a number of activities that demonstrate its commitment to improve the overall effectiveness of the reliability standard development processes. These activities were manifested in the 2006-2008 Standards Program goals. A listing of the specific improvements beyond those identified in those goals is presented in summary fashion below.

### Staffing

The NERC Standards Program staff has grown since 2006 from a staff of seven to a complement of fourteen. There are sufficient coordinators to manage the number of projects included in the three-year Reliability Standards Development Plan on a forward-looking basis, although in its revised budget for 2009, NERC has provided for additional consulting resources to support expedited completion of certain standards projects, including projects involving revisions to Critical Infrastructure Protection Standards. Two additional coordinators are

required to manage in a timely manner the significant number of interpretation requests NERC has received and expects to continue to receive for the foreseeable future. These two positions are tentatively included in the 2010 Business Plan and Budget. Additionally, one vacant position was transformed into a regulatory filing support position to ensure more timely filings of new or revised reliability standards.

### Standards Process Revisions

2007 Goal — Shorten average development time to 12 months through stakeholder ballot for high priority standards. Limited progress was made. The Standards Program took an aggressive stance with projects that had a regulatory-issued deadline and timelines were achieved. However, this was not a favorable approach due to the tendency to truncate development discussions. Generally, reaching consensus on complex reliability-related issues is not always achievable in a short time frame; this effort benefits from the full opportunity for industry stakeholders to consider and opine.

2008 Goal — Integrate the definition of “adequate level of reliability” into the standards development process. The Standards Committee directed that the revisions to the RSDP include the definition of “adequate level of reliability” and the proposed modifications to the procedure do include this.

2008 Goal — Track adherence to the standards process. The Standards Program has tracked its adherence to the process and filed reports of identified deviations with the NERC Compliance and Certification Committee.

2008 Goal — Evaluate and improve ballot performance. The Standards Program made good use of the balloting software to remind balloters to cast their ballots before the end of the ballot window. All but one standard being balloted achieved a quorum in 2008. Several standards did not receive a sufficiently high approval vote to “pass” but these standards had undergone an expedited process to achieve a specific deadline and the drafting team had moved the standards to ballot before there was sufficient industry consensus on them.

2008 Goal — Flatten the standards process by increasing the number of conference calls, web casts, and e-mail actions to greater than 50 percent for all committee and drafting team meetings. The Standards Committee and most drafting teams achieved this goal.

2008 Goal — Implement a strategy for shortening standard development time. The Standards Program has identified ways of shortening the development time by revising some steps in the standards process, by improving the planning done by drafting teams in developing and adhering to project schedules, and by appointment of a single drafting team to address both the SAR and standard. The strategies have not been implemented yet but are being considered by the Process Subcommittee of the Standards Committee.

### IT Tools

2006 Goal — Use an automated electronic tool to manage stakeholder comments on standards and SARs. In 2006 and through part of 2007, stakeholders submitted comments using MS Word documents via e-mail.

2008 Goal — Develop a relational database for standards management. The only portions of the relational database that have been completed are associated with registration and balloting. Additional work is needed but was stopped due to the pending availability of the standards database in support of the compliance data management system, thereby avoiding the duplication of effort and resources.

2008 Goal — Implement new application for comment handling and nomination processing. The “Checkbox” survey software has been installed and is in use for handling comment forms and has reduced cycle time for providing comments to the drafting teams following the close of a comment period.

### Communication - Workshops

2006-2008 Goal — Hold two workshops. The Standards Program held two workshops in each of 2006, 2007, and 2008, the last of which was a joint workshop with the Compliance Program.

### Communication – Website

2006 Goal — Standards users are able to seamlessly access NERC Reliability Standards and related NAESB business practices. NERC provided a link to the NAESB site, but did not develop any method of “seamlessly” accessing related business practices. Cost considerations associated with use of NAESB business practices prohibit the seamless access originally envisioned.

2006 Goal — Standards Web pages are redesigned to facilitate easier user access to approved standards (both those in effect and those with future effective dates), standards under development and pending requests for standards. Improvements through reorganization of the standards content were made in 2006.

2007 Goal — Post standards under development, standards pending board approval, and pending requests for standards. In 2007 the standards under development Web page was redesigned to meet this goal.

2007 Goal — Conduct pre-ballot WebEx meetings for each drafted standard. This goal was met. Some projects included changes that did not warrant a pre-ballot WebEx meeting.

2008 Goal — Formalize a feedback loop for continuous improvement. The Standards Program implemented a “standards suggestions and comments” form accessible from the standards web site for use in submitting suggestions for new or revised standards. The Standards

Program actively sought input from other program areas and from the technical committees and trade organizations when developing its update of the development plan. The form remains available as an ongoing vehicle for identifying issues to be addressed in reliability standards.

2008 Goal — Survey stakeholders and drafting team chairs for input into the process with a goal of indentifying opportunities for improvement. The Standards Program conducted an electronic survey and a conference call with drafting team chairs to solicit ideas for improvements to the standards process.

#### Communications with Regulators

2006 Goal — Conduct an informal conference with U.S. and Canadian regulators to review 2006 results of the Standards Program and to receive concurrence on the 2007 standards development plan. The Standards Program held an informal WebEx conference with regulators in 2006.

2007 Goal — Conduct an informational exchange meeting or conference with North American regulators. The Standards Program director met with all North American regulators in 2007 through the trilateral regulator meetings held quarterly.

2008 Goal — Meet with all North American regulators individually to discuss standards development strategy and issues. The Standards Program has weekly calls with FERC staff on standards development, meets on an as needed basis for specific standards projects, and conducts pre-filing briefings prior to submitting proposed standards for approval. In addition, Standards Program staff, and on occasion, members of the Regional Entities and the Standards Committee members, have met with each individual Canadian provincial regulatory body with oversight of ERO activities in 2008.

#### **4. NERC will develop and revise reliability standards through the activities of volunteer technical experts and stakeholders under the facilitation of NERC's professional staff, ensuring that standards development teams have the technical resources and capabilities required to develop technically sound standards.**

NERC continues to employ the standards development process that was contained in its ERO certification application. This process requires reliability standards to be developed utilizing volunteer industry experts with the support of NERC Standards Program staff. NERC, including its staff and the Board, cannot unilaterally develop reliability standards that were not developed using the industry based development process contained in the RSDP. NERC has faithfully implemented this model by implementing the ANSI-accredited development process since 2003 and continues to faithfully execute the process as it continues to initiate and complete projects in its three-year development plan. For each of the 48 development projects and 26 interpretations undertaken since July, 2006, under the control of its Standards Committee, a drafting team has been appointed consisting of industry stakeholders with subject matter expertise on the standards or interpretations to be addressed by the drafting team. These teams generally consist of 12-15 representatives with sufficient geographic diversity from a broad spectrum of the ten industry segments that comprise the registered ballot body. An industry team

leader is selected to chair the team and the project activities, working with the support of a NERC standards staff coordinator specifically, and the standards program staff in general, including significant efforts by the Standards Process Manager to ensure the quality assurance of the presented standards and associated documents.

In addition to the standards drafting teams, NERC, through its Standards Committee, also appoints a SAR drafting team that is assigned to refine the scope of a SAR based on industry feedback collected during industry postings associated with the SAR. SAR drafting teams are not required by the RSDP, but they have provided great benefit in effectively processing a proposed standard request and formulating a framework for the standard drafting team to use in drafting the requisite standard. SAR drafting teams are not assigned for processing interpretations and urgent action SARs, since the latter requires the submitter to propose the SAR and standard concurrently. If accepted by the Standards Committee, the urgent action standard proceeds to the ballot process without an industry comment opportunity. An approved urgent action standard must proceed through the regular standards development process within a limited timeframe following initial approval.

To assist the standard drafting teams in the effective completion of its objectives, the Standards Program has implemented the following goals and additional activities since ERO certification in July, 2006. Also identified are several opportunities for improvement to enhance the effectiveness of the industry-based standard drafting teams.

- Documents to Support Drafting Teams
  - 2006 Goal — Develop a guide for drafting teams to improve consistency and efficiency of the drafting teams. The Standards Program developed a “Drafting Team Guidelines” document and distributed the document to all teams for use.
  - 2007 Goal — Publish revised drafting team guidelines to improve consistency and efficiency of the drafting teams. A revised set of Drafting Team Guidelines was developed and distributed to drafting teams in 2007.
  - 2008 Goal — Improve the training of drafting teams and drafting team guidelines. The Standards Program worked with the Compliance Program to develop a set of guidelines for developing measures and compliance elements and worked with the Standards Committee to issue a set of guidelines on good “requirements”.
  - 2008 Goal — Clarify roles and responsibilities of participants in the standards development process. The roles and responsibilities have been undergoing iterative clarifications since mid 2007. In March 2009, the Standards Committee approved a document entitled *Roles and Responsibilities: Standards Drafting Team Activities*.
- Documents to Support the Standards Process:
  - 2008 Goal — Develop detailed procedures for standard drafting teams, coordinators, and NERC support staff activities. The Standards Program worked with the Standards Committee to develop formal procedures for handling errata, for authorizing the posting of supporting documents and for authorizing field tests.

5. **NERC will develop, maintain, revise annually and implement a forward-looking work plan for standards development and revisions to ensure that new standards are considered for development, and existing, approved standards are considered for revisions, as warranted by changing needs and conditions, including new and changing priorities for and threats to the reliable operation of the bulk power system.**

The Standards Program develops and annually updates a three-year development plan with goals and associated timelines for the development of specific standards projects. The first version of the three-year development plan was prepared in December 2006, and addressed the 2007-2009 timeframe. This three-year plan has been updated annually and filed with U.S. and Canadian regulators. The timelines contained in the development plan were developed not as “hard” deliverable dates, but rather were intended to be flexible with recognition of the many variables that could impact the development timelines once the drafting teams began deliberating on the issues. In general, the Standards Program has missed most of those goals by an average of six months from the published timelines.

Because the Standards Program relies upon industry volunteers to staff drafting teams and leverages the expertise of those teams to develop standards, as well as the Standards Committee, itself an industry based committee, to support the execution of the Standards Program’s work plans, NERC and its Standards Program staff must collaborate with these groups to achieve its objectives. In short, each annual work plan and the specific projects therein include a set of assumptions, and some of those assumptions were more accurate than others on specific projects. The major factors that impacted the delivery schedules of these projects are discussed below.

The earliest versions of the RSDP did not allow the Standards Committee the flexibility to delay action in developing properly submitted SARs. Although changes made to the standards process now give greater flexibility to the Standards Committee in accepting and processing new SARs, it has been reluctant to do so. Thus, there was no instance from 2006 through 2008 where the Standards Committee delayed posting a SAR that it accepted, thus initiating the standard development process. Several of the SARs the Standards Committee accepted were not originally identified in the Standards Program’s three-year development plans and once accepted for development, required the support of resources that had been designated for use with other projects. This has caused delays in initiating some planned projects that were contemplated by the development plan.

In 2006, there were two unanticipated SARs for projects that were submitted to the Standards Committee that had not been included in the 2006 development plan. In 2007, there were four new SARs for unanticipated projects, and in 2008 there were five unanticipated project requests. In addition, there were two requests for formal interpretations in 2006, eight in 2007, and seven in 2008. In January through May, 2009, there were five unanticipated new projects, and fourteen requests for interpretations were received.

Beyond these projects that were proposed by stakeholders, the Standard Program responded to several Commission Orders by initiating projects to make modifications to approved standards.

Three of the most resource-intensive standards development efforts undertaken by the Standards Program in the first three years as the ERO were aimed at improving the initial set of standards submitted and approved by the Commission (referred to as Version 0 standards). Some of the improvements to the Version 0 standards were self-directed, and others were undertaken as a result of a Commission directive, but each was aimed at either developing or improving the compliance elements of the standards, and not on improving the requirements. Because the scope of these projects involved many if not all standard content areas, each project required the commitment of resources from every content area and therefore limited the availability of resources to develop new or improve existing standard requirements. These three projects were:

- Missing Measures and Compliance Elements — (project needed to support initial sanctions table) added measures and compliance elements to 20 standards — started in 2005 and approved by its ballot pool in October 2006.
- Violation Risk Factors — (project needed to support new *Sanction Guidelines*) added VRFs to every Version 0 standard that had been submitted to the Commission — started in December 2005 and approved by ballot pools in early 2007.
- Violation Severity Levels — (project required to address Commission directive) replaced levels of noncompliance with VSLs in 83 standards — started in July 2007 and completed in February 2008.

In 2006, the Standards Program worked with the Standards Committee to develop a multi-year development plan to improve the overall quality of the Version 0 standards, to continue work on Version 1 standards that were already under development, and to initiate new projects to support improvements to reliability, particularly in areas identified as causal or contributing to blackouts. The 2006–2008 standards development plan was very ambitious, and assumed that most Version 0 standards could be revised with no more than two industry comment periods. There were three significant reasons why the original project schedules were understated:

- Clarifying Vague Requirements — In developing the schedule for Version 0 “clean up,” there was an assumption that the focus of the work would be on “refinement” of existing requirements, and most of the work would be aimed at wording changes that would clarify, but would not change the intent of the requirements. As work progressed in this area, the Standards Program discovered that the language in the NERC voluntary Operating Policies and Planning Standards was deliberately vague in many areas, reflecting the best consensus that could be achieved at the time the former policies and standards were developed. As drafting teams attempted to add clarity to Version 0 standard requirements, the teams were obligated to clarify these ambiguities and obtain stakeholder consensus, which resulted in the need for more industry comment periods, and many more meetings than originally anticipated.



Thus, the original Version 0 project development schedules (timelines) were understated.

- Revisions Midstream to Address Commission Orders — When the Commission issued Order No. 693 and Order No. 890 that directed numerous changes to the 107 standards then proposed by NERC for approval, drafting teams were already working on refinements to Version 0 standards, and the scope of those projects did not include addressing the directives from these two Orders. The many drafting teams supporting these projects had to stop their work, study the Orders and associated directives, and expand the project scopes to incorporate the directives. In some cases, the teams had to change requirements already drafted. This activity caused many delays with negative impacts on projected development timelines. Drafting teams also experienced further delays in situations where a team needed clarification on a directive and sought informal advice from Commission staff before proceeding. These issues occurred primarily in 2007 during which the roles and responsibilities and relationships between Commission staff, NERC staff, and drafting teams were initially being implemented.
- Start-up Processes — As expected in a start-up environment, the commencement of NERC’s activities as the ERO in July, 2006, required a focused effort to “start-up” the processes outlined in the NERC ROP. One of the significant undertakings for the Standards Program was the development of its three-year standard development plan, with the first version published in late 2006 covering the 2007-2009 period. To support the implementation of the plan, NERC needed to double its Standards Program staffing to ensure sufficient facilitators were available for each identified project. There were delays in finding and then hiring the needed staff that resulted in delays in the project schedules. These individuals then required training on the standards development process. New, and in some cases, existing drafting teams were organized with new facilitators, resulting in slower progress than expected.

In its Order issued January 18, 2007 in Docket RR06-1-003, the Commission directed that NERC’s three-year performance assessment report should identify how long each new reliability standard or modification under development has taken up to that point, provide an analysis of the reasons for delay in developing timely reliability standards or modifications to existing standards, address the Commission’s concerns and specific orders for new or modified reliability standards and compare progress with NERC’s Standards Development Plan, and discuss the effectiveness of the RSDP with respect to timely development of standards, including possible changes to the RSDP or other resolutions to improve timeliness of standards development.<sup>174</sup> NERC has prepared an analysis of the duration of each standard development projects initiated since January 1, 2002 (including projects currently in progress). The results of that analysis are separately provided in **Appendix A** at the conclusion of this **Attachment 1**. As shown by that analysis, the average duration for completed standards projects from the initial SAR to approval of the new or modified standard by the NERC Board has been 21.7 months, with a median duration of 17.7 months, a minimum duration of 1.6 months and a maximum duration of 80.5 months. The discussion in **Appendix A** identifies factors that have resulted in

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<sup>174</sup> January 18 2007 Order at P 31.

extended project durations for individual standards projects. Additionally, timeliness of the standards development process is an issue raised by a number of stakeholders in their responses to the stakeholder survey and other outreach conducted for purposes of preparing this three-year assessment report. The stakeholders' comments on this issue, and NERC's responses and planned actions to attempt to expedite the standards development process where possible, are discussed in detail in **Attachment 2** of this report.

In the January 18, 2007 Order, the Commission also directed NERC to closely monitor the voting results for balloted reliability standards and to file quarterly reports with the Commission on voting results.<sup>175</sup> The Commission expressed some concern as to whether the super-majority 67% weighted segment vote required to approve a standard under the NERC RSDP could pose an obstacle to adopting improved reliability standards.<sup>176</sup> For purposes of this three-year assessment report, NERC has prepared an analysis of the ballot results for the standards projects that were balloted between July 20, 2006 and May 31, 2009. This analysis is also provided separately, in **Appendix B** to this **Attachment 1**. As the analysis shows, there were a total of 51 final ballot events conducted between July 20, 2006 and May 31, 2009, of which 48 were approved by the ballot pool and three were rejected. The average weighted segment approval for the 48 standards that were successfully balloted was 82.26%, with a minimum of 67.79%. The weighted segment approvals for the three unsuccessful final ballot events were 57.30%, 57.37% and 59.95%. As detailed in **Appendix B**, there were numerous technical issues raised with each of the three standards that did not receive the required weighted segment vote for approval, as shown by comments received with negative ballots. NERC's conclusion based on this analysis is that the 67% weighted segment approval requirement has not proved an obstacle to adopting new and revised reliability standards, because (i) 94% of the final ballot events over an approximate three-year period resulted in adoption of the proposed new or revised standard; and (ii) although the three standards that were not approved received weighted segment approval votes between 57.30% and 59.95% (*i.e.*, greater than a simple majority), there were sufficient technical issues raised with each of these proposals to warrant its non-adoption.

**6. NERC will coordinate its reliability standards development and revision activities with the development of business practices by the North American Energy Standards Board (NAESB).**

NERC's Manager of Business Practice Coordination is a voting representative on the NAESB Executive Committee, and participates regularly (often twice a month) in coordination conference calls with NAESB staff to discuss issues of common importance to each organization. NAESB and NERC's Standards Committee Process Subcommittee are investigating ways in which to continue to strengthen the relationship between NERC and NAESB, such as through high-level coordination of annual plans and standards project reviews. In addition, NERC's Manager of Business Practice Coordination participates with other senior

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<sup>175</sup> January 18 2007 Order at P 18. NERC filed the initial quarterly report on May 3, 2007, covering January through March, 2007, and has filed a report for each quarter thereafter.

<sup>176</sup> January 18 2007 Order at PP 17-18.

NERC and NAESB staff to review strategic objectives and future year business plans to ensure further alignment.

The following annual program goals and additional coordination activities exemplify the focus the NERC Standards Program has placed on this key interface.

- 2006 Goal — Establish a new procedure for joint development of standards with NAESB. Accomplished in 2006
- 2007 Goal — Establish deadlines with NAESB for joint NERC/NAESB standards and business practices and complete standards work by the specified dates. The Standards Program worked closely with NAESB throughout 2007 but did not establish a set of “firm” deadlines for joint work as the scope of work in the joint projects continued to change shape throughout the year. Instead, the Standards Program worked closely with NAESB to ensure close coordination of changing project schedules and this alternative met the needs of both organizations.
- 2008 Goal — Update strategy and deadlines with NAESB for joint NERC/NAESB standards and business practices and complete standards work by the specified dates. The Standards Program worked closely with NAESB throughout 2008 but did not establish a set of “firm” deadlines for joint work as the scope of work in the joint projects continued to change shape throughout the year. Instead, the Standards Program worked closely with NAESB to ensure close coordination of changing project schedules and this alternative met the needs of both organizations. By example, NERC and NAESB held over 20 joint meetings in the course of developing the final set of ATC-related reliability standards that were submitted in the second half of 2008.
- Since 2006, NERC and NAESB have jointly developed a coordinated set of standards and business practices for the coordination of interchange.
- NERC developed a set of six ATC-related reliability standards driven by FERC Orders No. 693 and No. 890 and worked cooperatively with NAESB in developing companion business practices.
- NERC worked with NAESB to split the responsibilities for the Transmission Loading Relief standards into business practices and reliability standards, and jointly developed and published a reference document to support these congestion management standards and business practices.
- NERC is working closely with NAESB to ensure coordination between the ongoing efforts at both organizations to modify Inadvertent Accounting and Time Error Correction.
- NERC is currently starting its next major revisions to the Interchange standards, which will also be closely coordinated with NAESB.
- NERC has jointly discussed with NAESB the future strategy of ownership of reliability and business practice tools.

The NERC-NAESB relationship is strong and well coordinated. In April, 2007, NERC staffed a newly-created position, Manager of Business Practice Coordination, whose primary role is to coordinate the NERC-NAESB relationship that includes, importantly, the development of related NERC reliability standards and NAESB business practice standards. This approach has been highly effective in completing several standard projects that include reliability standards and related business practices as well as a number of additional ongoing efforts as contained in the three-year development plan.

**7. NERC shall publicly notice and request comment on proposed regional reliability standards, and shall evaluate and recommend whether a proposed regional reliability standard has been developed in accordance with all applicable procedural requirements and whether the regional entity has considered and resolved stakeholder objections.**

NERC is responsible for processing and approving Regional Entity reliability standards development procedures and the standards that result from the implementation of those procedures. In 2006, NERC hired a full time manager to support the Regional Entities in this activity. At first, this effort was focused on ensuring that proposed Regional Entity standards development procedures were appropriate for NERC approval. In addition, NERC staff and Regional Entity representatives created a Regional Reliability Standards Working Group (RRSWG) to develop a work plan for addressing the “fill-in-the-blank” reliability standards that were cited in Commission Orders approving reliability standards. Upon completion of these initial activities, in 2007, the focus of the group then shifted to developing consistent methods to evaluate Regional Entity reliability standards submitted to NERC for evaluation and approval. Currently, the RRSWG is focused on developing Regional Entity reliability standards consistently throughout the United States. In addition to these activities, NERC Standards Program staff has evaluated a total of 21 Regional Entity reliability standards submitted for NERC Board approval, and the NERC Board has approved 16 of them. Upon consideration of NERC’s evaluation, five Regional Entity reliability standards were withdrawn from NERC consideration for further refinement.

The following activities and goals provide a listing of specific achievements in the NERC regional reliability standards development area:

- 2006 Goal — Four regional standards procedures were approved by NERC in 2006. Eight regional standards procedures were drafted and approved in 2006.
- 2006 Goal — Work plan to address fill-in-the-blank regional standards was approved by applicable regulators and was on schedule at end of 2006. Plans to address the fill-in-the-blank standards were incorporated into the overall Standards Program development plan completed in 2006.
- 2007 Goal — Develop the remaining regional “fill-in-the-blank” standards. This goal was not met. All but one of the subject standards was under revision at the end of 2007, but none were complete.

- 2007 Goal — Process regional standards submitted for approval and make recommendations to the Board. The standards program processed eight WECC regional standards submitted in 2007.
- 2008 Goal — Process regional standards submitted for approval in accord with the NERC ROP. The Standards Program processed 13 regional standards (8 WECC, 4 MRO, 1 Reliability *First*) submitted in 2008 in accord with the ROP.
- Formed the RRSWG to coordinate on issues of regional standards consistency.
- Developed a pro forma standards development procedure template for Regions to use as a base for their regional standards development procedures.
- Developed and refined a set of Web pages to make it easier for stakeholders to locate regional standards development procedures and regional standards under development.
- Developed a template for use in assessing whether a regional standard submitted to the Standards Program has been developed in accordance with the associated regional standards development procedure.

**B. Organization Registration and Compliance Monitoring and Enforcement Program**

1. **NERC will establish and implement (through its own activities and those of the Regional Entities) a program for identifying and registering those owners, operators and users of the bulk power system that perform functions affecting the reliability of the bulk power system and therefore must comply with applicable requirements of regulator-approved reliability standards. This program will include:**
  - a. **Establishing clear, specific criteria for determining that an owner, operator or user of the bulk power system performs a particular reliability function(s) and therefore should be registered as responsible for complying with the requirements of reliability standards that are applicable to that reliability function(s).**
  - b. **Identifying those owners, operators and users of the bulk power system that perform reliability function(s) and therefore should be registered as responsible for complying with the requirements of reliability standards that are applicable to that reliability function(s).**
  - c. **Establishing and maintaining (including periodically reviewing and updating) a registry of owners, operators and users of the bulk power system that are responsible for performing particular reliability function(s) and for complying with the requirements of reliability standards that are applicable to that reliability function(s).**
  - d. **Establishing and implementing a process for joint registrations by which an entity may be registered for, and responsible for performance of, reliability**

**functions and requirements of reliability standards that would otherwise be the responsibility of other related entities, while ensuring that the joint registration and resulting allocation of responsibility does not result in a reduced level of reliability of the bulk power system.**

**e. Establishing and implementing a process by which entities may appeal registration for a particular reliability function(s).**

Following is a list of the principal activities and achievements of the Organization Registration and Certification Program since NERC was certified as the ERO.

1. Developed a Statement of Compliance Registry Criteria document to delineate the criteria for registration of the functional entities defined in the NERC Glossary of Terms.
2. Worked with the Regional Entities to identify the organizations that should be registered for the specific functions identified in the Statement of Compliance Registry Criteria.
3. Developed a database for registered entity data.
4. Implemented a revision to the NERC ROP to allow two types of Joint Registration Organization (JRO) registrations.
5. Implemented a process whereby a Registered Entity could appeal its registration in the NERC Compliance Registry.
6. Updated the Statement of Compliance Registry Criteria document to include clarifications and additional criteria as necessary in order to ensure an accurate listing of registered entities. The current version of the document is Revision 5.0.
7. As of June 22, 2009, NERC and the Regional Entities identified and registered 1,839 organizations for 4,487 functions. A summary by function and Region is posted on the NERC Compliance Registry website.
8. Along with the Regional Entities, continuously worked to identify new organizations, verify current registered entity status, and revise the NERC Compliance Registry as appropriate. The NERC Compliance Registry is updated continuously and an updated listing is posted on the NERC web site at least monthly.
9. The NERC compliance registry includes, as of May 31, 2009, 31 JROs comprised of 60 registered entities.
10. As of May 31, 2009, 20 registered entity appeals were ruled on by the BOTCC and 3 appeals are still pending.

In addition, the following activities are in progress:

1. A revision to Section 500 and Appendix 5 of the ROP is currently in progress. This revision will:

- a. Replace the “transitional certification” process with the provisional certification process which will increase reliability of the bulk power system.
  - b. Clarify the JRO process and provide greater explanation of the requirements for the two types of JROs.
  - c. Clarify additional paragraphs of Section 500 and implement re-worded processes and procedures for mandated requirements based on experience gained implementing the existing ROP over the course of the referenced period.
2. The NERC Compliance Registry will be integrated into the NERC Guidance System during 2009 which should improve the ability to revise and update the NERC Compliance Registry.
  3. A process is being developed as a joint effort between the Standards and Compliance Programs to allow notification to be sent to all registered entities when new or revised NERC standards are approved by regulatory bodies.
  4. A Multi-Regional Registered Entity (MRRE) process is being developed that will allow more consistent and accurate audits of entities that are registered in more than one Region for the same function or functions. This effort is a step toward an ultimate solution in which a registered entity with operations in multiple Regions would be assigned to a single Regional Entity for the purposes of compliance monitoring.

The NERC Compliance Registry has been continuously refined and updated throughout the period since ERO certification, which has increased Registry accuracy over the period. Additional reports have been generated that allow other departments in NERC the ability to utilize the Compliance Registry information in carrying out their responsibilities. The addition of the JRO capabilities in the Compliance Registry has increased reliability for those entities involved in the JROs. Use of the JRO process has resulted in resolution of several appeals of organization registrations. Finally, the Compliance Registry has also been updated to include NERC Alerts notification capabilities.

2. **NERC shall develop and implement a program for monitoring and enforcing compliance with regulator-approved reliability standards by owners, operators and users of the bulk power system (CMEP) that will promote and ensure reliable operation of the bulk power system and will have the following essential attributes:**
  - a. **Is independent from owners, operators and users of the bulk power system responsible for complying with reliability standards.**
  - b. **Holds owners, operators and users of the bulk power system responsible and accountable for performance of specific actions and activities to maintain reliable operation of the bulk power system.**
  - c. **Utilizes a variety of compliance monitoring processes focused on compliance audits of responsible entities but also using other processes such as self-certification, spot-checking and self-reports.**

- d. Establishes and disseminates clear, understandable requirements as to what responsible entities must do, provide or demonstrate in response to compliance audits and other compliance monitoring processes, including documentation requirements, in order to demonstrate the entity’s compliance with reliability standards.**
- e. Provides prompt and timely feedback and reports to responsible entities from compliance monitoring processes, including prompt and timely identification of violations of reliability standards.**
- f. Requires a responsible entity that has violated a reliability standard to develop and execute a mitigation plan that will (i) remedy the cause of the violation and (ii) prevent its recurrence.**
- g. Imposes penalties and sanctions on, and directs remedial actions to be undertaken by, responsible entities for violations of reliability standards, with penalties and sanctions bearing a reasonable relation to the seriousness of the violation and the potential consequences to the reliable operation of the bulk power system, taking into account the entity’s timely remedial efforts (or lack thereof) and the quality of the entity’s overall compliance efforts.**

NERC has delegated compliance responsibilities to eight independent Regional Entities to implement the NERC Compliance Monitoring and Enforcement Program. These Regional Entities carry out their delegated responsibilities under delegation agreements with NERC that have been approved by the Commission. The Regional Entity’s governance structure is described in each delegation agreement to provide clarity regarding the Regional Entity’s independence and compliance decision making processes. At a staff level, a conflict of interest and work history are recorded for compliance staff personnel to ensure independence.

Some Regional Entities also perform functions as a registered entity responsible for compliance with certain reliability standards (WECC, FRCC, SPP RTO and ERCOT). Such a dual role creates a potential conflict of interest for those specific functions and NERC has implemented processes to either lead or conduct the compliance monitoring activities for the functions where such a conflict may exist.

Within the NERC CMEP, eight monitoring methods are defined for identifying alleged violations of approved reliability standards. These methods are self reporting, self certification, periodic data submittals, exception reporting, compliance violation investigations (CVI), complaints, spot checks and compliance audits. The Regional Entities hold periodic workshops and provide registrants with notifications regarding specific reporting criteria and processes. NERC actively reviews, approves and monitors the activities of each Regional Entity. Violation findings from the Regions are tabulated and reported to the NERC Board of Trustees. Violation trends and anomalies are identified by NERC staff and investigated accordingly by NERC.



Self reporting has been, and still is, the most common method by which alleged violations are identified. Self reports have trended downward from the inception of the program as registered entities develop more rigor within their companies and compliance programs are further developed. Compliance violations found via compliance audits and CVIs are trending upward as Regional Entity compliance programs mature and more staff is engaged in the process.

Where a violation of a reliability standard is suspected, the relevant facts and circumstances are reviewed, and where they support a finding of violation by the CEA, the CEA processes an enforcement action against the registered entity for the violation pursuant to the uniform CMEP. The registered entity is required to remedy the situation and prevent reoccurrence of the violation via a NERC-approved mitigation plan proposed by the entity. The registered entity may be required to accept revisions proposed by the Regional Entity or NERC to the registered entity's proposed mitigation plan in order for the mitigation plan to be accepted and approved.

Steps are currently being implemented by NERC and the Regional Entities to provide for more expeditious processing and closure of notices of alleged violations, notices of penalty and mitigation plan and to reduce the numbers of outstanding notices of alleged violations. These actions are discussed in greater detail elsewhere in this report.

The NERC Annual CMEP Implementation Plan outlines the processes to be used by the Regional Entity for monitoring registered entity compliance for a set of actively monitored reliability standards during the upcoming year. The NERC Compliance Audit Group provides feedback to the Regional Entities' audit staffs regarding their performance on compliance audits and final audit reports.

In general, Regional Entity compliance audit performance has improved throughout 2008, although inconsistencies remain with audit processes among the Regions. These inconsistencies have been noted by NERC and it is a goal for 2009 to drive audit performance uniformity between the Regions. Currently the Regional Entities maintain their own processes for self certification and spot checking. It is NERC and the Regions' goal to drive uniformity for the above mentioned processes. This uniformity will help all industry participants, and in particular registered entities that operate in more than one Region.

The results of all compliance audits are posted on the NERC website pending completion of due process activities for the registered entity. Notice of Penalties (NOPs) are approved by NERC BOTCC, filed with the Commission and posted on the NERC website.

NERC compliance staff developed Reliability Standard Audit Worksheets (RSAW) to clearly identify what evidence is needed by a registered entity to show compliance with a reliability standard requirement. These RSAWs are publically posted on the NERC website and are updated as changes are made to approved reliability standards. Applicable RSAWs are sent to a registered entity at least 60 days prior to an audit as part of the pre-audit questionnaire, as required by the NERC CMEP. For 2009, the RSAW, Pre-Audit Questionnaire and excerpts from relevant Commission orders have been combined into one document for each approved

reliability standard, creating one reference document for the registered entity and Regional auditors to work from in an audit of the standard. The revised RSAWs state what evidence is needed for compliance and give the registered entity the ability to provide additional pertinent information in the questionnaire portion. The Commission order language provides the Commission's perspective on the intent of the standard or requirement.

NERC is working on developing an online portal and interface to make available current compliance documents. NERC developed and implemented a Compliance Tracking and Reporting Tool with the Regional Entities that utilizes Excel reporting workbooks and an Access database. This system, while useful, is not production grade software and requires a good deal of staff interaction by the Regional Entities and NERC to produce reports. A more robust system, utilizing server to server communication, web service and XML protocol, is currently undergoing initial testing.

On a daily basis, NERC reviews incoming submittals from Regional Entities to NERC via the workbook tool for updates on new or outstanding alleged and confirmed compliance violations, including various documents and records. NERC develops appropriate notices and transmits the reports to the Commission using the portals established by the Commission for ERO/Regional Entity Filings/Submittals/Notifications. Weekly internal outstanding issues summary reports are prepared and issued to NERC compliance management for review and action. Bi-weekly Regional Outstanding Issues Reports, including an overall summary report, are developed and issued to the Regional Entities for action.

Monthly reports are developed that provide trending and tracking for Regional Entity and NERC program metrics including identification of trends related to specific Reliability Standards and development of violation and mitigation process states. These reports are presented to the NERC BOTCC at each monthly meeting. Confidential quarterly reports are developed and distributed to the Commission in a timely manner that summarize information surrounding violations that have occurred; including the status of mitigation plans. Vegetation-related transmission outage quarterly reports are developed and publicly posted.

NERC is required to provide notice of each allegation of a violation to the Commission within two business days. NERC has met that requirement for all violations where additional information is not required from the Regional Entity. Each subsequent step requires reporting to the Commission. NERC has consistently provided the necessary information to the appropriate Commission portals. To improve the efficiency of this process, NERC is working with the staffs of the ERO governmental authorities to replace the portals system currently in place with a component of the updated data management system previously noted.

All violations of reliability standards must be mitigated by the registered entity. Mitigation plans are correcting, have already corrected and/or are preventing reoccurrence of, many hundreds of violations of reliability standards and thereby promoting and ensuring reliable operation of the bulk power system. Where a violation of a reliability standard is determined by the CEA, the registered entity responsible for the violation is required to remedy the situation and take action to prevent reoccurrence of the violation via implementation of a CEA-accepted and NERC-approved mitigation plan developed and proposed by the registered entity. If the

mitigation plan submitted by the registered entity is not satisfactory, the CEA or NERC will direct changes to the mitigation plan.

A mitigation plan is required from the registered entity upon the alleged violation becoming a confirmed violation. However, registered entities can and are being encouraged by the Regional Entities and NERC to establish and begin implementation of their mitigation plans earlier in the enforcement process, and many are doing so. Under the uniform CMEP, and pursuant to Commission orders, NERC is required to complete its review and approval or rejection of a mitigation plan that has been accepted by the Regional Entity within 30 days after NERC receives the plan from the Regional Entity. NERC has been meeting this timing requirement.

Full completion of a given mitigation plan, including certification of completion – with appropriate evidence - issued by the registered entity and CEA verification of that certification, is commonly occurring well in advance of completion of enforcement proceedings regarding the associated violation(s). Also, many violations being self-reported by registered entities are being reported concurrent with certification and evidence that the reported violations have already been mitigated.

A short-form pro-forma settlement agreement has been developed that can be used for self-reported or self-certified violations of a minor or administrative nature. This approach will allow the Regional Entity to provide the registered entity with an option of either promptly settling the alleged violation or proceeding through the full enforcement action process.

Prior to June 18, 2007, the effective date of Commission-approved mandatory reliability standards, NERC allowed registered entities to self-report violations of the standards and submit mitigation plans, with the understanding that if the mitigation plan was completed on schedule, the entity would not be found in violation of the reliability standard (for the same noncompliance) when it became mandatory and enforceable. There was an unexpectedly large response to this opportunity, with over 5,100 separate violations of reliability standards being self-reported. Of these, over 1,800 were determined by the Regional Entities not to be violations. Registered entities completed mitigation of the remaining 3,300 violations generally before the end of 2007. While this unexpected volume of self-reported reliability standards violations created a very large amount of work for the Regional Entities prior to and after the reliability standards became mandatory, and helped contribute a backlog in processing violations, nonetheless, it also resulted in early mitigation of a significant number of violations of standards by the industry. Regional entities and NERC successfully processed these self-reported violations and associated mitigation plans. Each report of violation and the associated mitigation plan in the United States was provided to FERC. The Regional Entities and NERC cataloged, provided, and tracked each violation and its associated mitigation plan to completion.

For the period June 2007 to May 31, 2009, NERC as the ERO filed 62 NOPs with the Commission regarding and proposing enforcement disposition for 175 alleged violations of reliability standards.<sup>177</sup> With the exception of one NOP (NP09-21-000), all of the NOPs and the

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<sup>177</sup> Additional NOPs have been filed with the Commission in June 2009.

dispositions proposed therein were allowed by the Commission to become effective after expiration of the required 30-day period after the filing with the Commission.

Remedial Action Directives can be issued by NERC or the Regional Entity if the alleged violation and surrounding circumstances warrant such action. Remedial Action Directives have been issued directing specific thorough and timely action to address significant situations related to the reliability of the bulk-power system.

- 3. NERC shall enter into and administer delegation agreements with Regional Entities that provide for establishment and implementation of, and will monitor and direct the Regional Entities in accordance with the regulator-approved delegation agreements in the implementation of, regional CMEPs having the essential attributes listed in Objective 2 and that have appropriate (i) technical and professional staffing, (ii) procedures, and (iii) internal oversight. NERC's oversight of Regional Entity CMEPs shall include periodic audits of their CMEPs.**

The discussion under purpose and objective 2 above describes NERC's entry into delegation agreements with the Regional Entities to implement the CMEP, and NERC's activities in administering Regional Entity activities and working with them to implement the CMEP.

As required by Section 400 of the NERC ROP, NERC is developing the Regional Entity audit program to meet the objective of determining the Regional Entities' compliance with the delegation agreements and the NERC ROP including the CMEP. Concurrent with the development of the Regional Entity audit program, NERC and an independent auditing firm retained by NERC will make recommendations which will improve NERC's CMEP processes and implementation efficiencies. These recommendations will be communicated to the NERC CEO and Compliance Vice President and Director via a management letter.

The planning of the Regional Entity audit program began in July of 2008, with the actual development of the program commencing in October, 2008. Listed are the major accomplishments and milestones of this project to date.

Mid-July 2008

- Soliciting project bids from four independent auditing firms

August 2008

- Received proposals
- Auditing firms presented proposals to NERC executive management
- NERC selected audit product
- NERC communicated audit scope to the Regional Entities and the Commission

September 2008

- NERC selected audit firm for project
- Contract negotiations began

October 2008

- Contract finalized
- Development of Regional Entity audit program began
- NERC communicated projected timelines and status to the Commission

December 2008

- 100% criteria developed
- 88% reviewed by NERC process owners
- 26% reviewed by auditing firm's technical review team
- Draft sampling methodology developed
- 25% sent to Commission for review and comment
- Reliability*First* audit scheduled

January 2009

- Sampling methodology finalized
- Questionnaire developed
- Request for information (pre-audit documentation) determined
- 100% reviewed by NERC process owners

The Regional Entity audit program criteria contain all auditable compliance related requirements as specified in the Regional Entity delegation agreements and the NERC ROP including Appendices 4B, 4C and 5. As such, the specifications for determination of the Regional Entity's (i) staff's technical and profession qualification, (ii) procedures and (iii) internal oversight are contained within the developed criteria. The first Regional Entity audit (Reliability*First*) was conducted in March 2009. Following the implementation of the first Regional Entity audit, the audit team, consisting of an independent auditing firm and NERC, will perform a lessons learned analysis with the objective of determining recommendations for any audit process improvement items. Thereafter, NERC will schedule and perform four additional Regional Entity audits during 2009.

Concurrent with the implementation of the Regional Entity audit program, NERC and the independent auditing firm will identify improvement items associated with the audited Regional Entity's processes and procedures associated with its implementation of the CMEP. These recommendations will be communicated via a management letter to the NERC and the CEO of the audited Regional Entity.

Beginning in 2009, NERC has hired a Director of Regional Operations responsible for developing and executing infrastructure to support successful Regional Entity operations; developing and reviewing operational reports and metrics and monitoring productivity of the Regional Entities for all areas of delegated responsibility; monitoring and communicating performance issues to ensure needed improvements are implemented; developing and maintaining standard operating procedures, program implementation tools, and reporting procedures to support the NERC ROP.

4. **NERC shall develop and implement, and require the Regional Entities to implement, hearing and appeal procedures that:**
  - a. **Will be available to owners, operators and users of the bulk power system to dispute alleged violations of reliability standards, proposed penalties and sanctions, proposed components of mitigation plans, and remedial action directives.**
  - b. **Provide due process; and**
  - c. **Provide for efficient and expeditious resolution of disputes.**

The Regional Entity Hearing Procedures are included in the NERC uniform CMEP (Attachment 2) and, where there are deviations, in Exhibit D to the Regional Entity's Delegation Agreement. The Hearing Procedures were developed through a collaborative process by the Regional Entities and NERC, and have been approved by the Commission in a series of orders.<sup>178</sup> The Hearing Procedures provide the opportunity for a registered entity disputing a notice of alleged violation, proposed penalty or sanction, mitigation plan provision or remedial action directive to have a due process hearing on the matter before the Regional Entity hearing body. If the registered entity receives an adverse ruling from the Regional Entity hearing body, Section 5.5 of the uniform CMEP and Section 1.7.10 of the Hearing Procedures provides that the registered entity may appeal the decision to NERC pursuant to Section 410 of the ROP. The appeal will be heard and decided by the NERC BOTCC.

To date, no disputes over notices of alleged violations, proposed penalties, mitigation plans or other matters of enforcement in any of the Regions have gone to hearing, and no Regional Entity hearing body has had occasion to render a decision on a disputed compliance matter. Therefore, while as noted NERC and the Commission have approved the Regional Entities' Hearing Procedures, NERC has no basis in experience to assess the effectiveness and fairness of these hearing procedures as applied in actual cases, nor the manner in which the Regional Entities have implemented the Hearing Procedures.

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<sup>178</sup> The Hearing Procedures in essentially their current form were conditionally approved by the Commission in *Order Addressing Revised Delegation Agreements*, 122 FERC ¶ 61,245 (March 21, 2008), subject to compliance with a number of directives requiring revisions to the Hearing Procedures. In an order issued June 1, 2009, the Commission approved the final round of revisions to the Hearing Procedures in response to previous directives. *Order on Compliance Filing*, 127 FERC ¶61,209 (2009).

- 5. NERC shall establish and implement, and cause the Regional Entities to establish and implement, appropriate procedures to maintain the confidentiality of information obtained and shared during compliance audits and other CMEP processes, including dispute hearings and appeals.**

The NERC uniform CMEP, which the Regional Entities are required to follow in conducting compliance monitoring and enforcement activities, require NERC and the Regional Entity to maintain information obtained during the compliance processes as confidential, in accordance with Section 1500 of the NERC ROP, until a notice of confirmed violation and penalty or sanction is filed with the Commission.<sup>179</sup> In addition, hearings before a Regional Entity hearing body are non-public proceedings, and the proceedings and all written testimony, exhibits, transcripts, briefs, rulings and other documents in the hearing process are non-public and are to be maintained as confidential by the participants, including the Regional Entity.<sup>180</sup>

The Regional Entity compliance audit program will audit and evaluate the Regional Entity's confidentiality and non-disclosure processes.

- 6. NERC shall monitor and ensure consistency among the Regional Entity CMEPs with respect to:**
- a. Organization registration determinations.**
  - b. Determinations of violations of reliability standards.**
  - c. Impositions of penalties and sanctions for violations of reliability standards.**
  - d. Development and oversight of mitigation plans by registered entities in response to violations of reliability standards (*i.e.*, comparable mitigation plan elements shall be required across Regional Entities in response to comparable violations of a reliability standard).**

The NERC Organization Registration group has used feedback from industry groups, stakeholders, and other NERC departments to cross-reference the current NERC Compliance Registry data with registration data submitted by the Regional Entities. In 2009, NERC is initiating a project to identify all registered entities in the bulk power system by function inter-relationships, which will verify the current registry and identify any missing registrants and any possible undesirable reliability-associated overlaps of functional footprints.

As called for in the CMEP and by explicit direction in Commission Orders, NERC undertakes substantive review of all of the enforcement findings of its Regional Entities and the associated enforcement dispositions proposed by the Regional Entities wherever violations are

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<sup>179</sup> See Sections 8.0 and 9.3 of the uniform CMEP.

<sup>180</sup> See Sections 1.2.13 and 1.5.10 of the Hearing Procedures (Attachment 2 to the uniform CMEP).

determined. The purpose of the reviews includes NERC meeting its ERO obligation of ensuring consistency in the determination of violations of the reliability standards. Regional Entities, with limited exceptions, perform the bulk of the work regarding determination of whether a violation of a reliability standard has occurred. NERC conducts audits of the Regional Entity programs and field work, as previously described.

NERC reports monthly to the BOTCC all violations of reliability standards, statistics highlighting the most frequently violated reliability standards, the sources of discovery of the violations, and the status of each violation in the enforcement process, among other things. In each case processed, NERC staff and the BOTCC have taken into consideration the consistency of the enforcement actions with others completed or in process.

As called for in the CMEP and by explicit direction in Commission Orders, NERC approves, after appropriate review, mitigation plans that have been proposed by registered entities and accepted by the Regional Entity. The purpose of the reviews includes NERC meeting its ERO obligation of ensuring comparable elements and timeliness within mitigation plans proposed to address comparable violations of reliability standards. NERC reviews each mitigation plan accepted by a Regional Entity against the criteria established in the CMEP. Any mitigation plans not meeting these criteria are returned to the Regional Entity for additional work by the registered entity.

**7. NERC shall establish and maintain a program for providing appropriate and timely training to NERC and Regional Entity compliance auditors and other NERC and Regional Entity CMEP personnel and for verifying and maintaining their qualifications to conduct compliance audits and other compliance monitoring and enforcement activities.**

NERC developed a Compliance Auditor Manual and implemented lead auditor training in 2007 in accordance with the General Accounting Office auditing standards. Auditor training was held periodically throughout 2007 and 2008 to ensure all Regional Entity audit staff was trained prior to performing an audit. In 2008 additional training was developed for volunteers that were being used as supplemental staff in some Regions. Also in 2008 an Evidence Gathering module was developed to focusing on what constitutes sufficient evidence and evidence stacking. The NERC CMEP requires that all auditors take NERC auditor training and applicable modules prior to participating on an audit team.

NERC maintains a master list of auditors who have completed training. In addition NERC Compliance staff reviews and approves those individuals requesting training to assure appropriateness. NERC grants access to the online auditor training for 30 days and then removes the individual's access.

NERC monitors the Regional Entity audit teams to ensure all participants have taken the required training. In 2008 two instances were found where the Regional audit team members did not complete the required training. For 2009, NERC will continue to focus on this requirement by having the Regional Entities self certify that their audit team members have taken the appropriate training. Also for 2009, the NERC compliance auditor training will be reviewed and



updated to include any changes that have occurred with the program. For 2009, NERC is adding additional training for the CIP standards to which some registered entities must be auditably compliant as of July 1, 2009. CVI training may be added in the second half of 2009.

- 8. NERC shall develop and implement, directly through its own personnel and through the Regional Entities, training and education programs on the requirements of reliability standards and the actions and documentation needed to demonstrate compliance; such programs will be directed to and available to owners, operators and users of the bulk power system, through means such as seminars, workshops, printed materials and website materials.**

NERC recognized the need to effectively and thoroughly communicate its compliance program requirements and processes to stakeholders. NERC developed RSAWs and Question & Answer resource document to aid the registered entities. These documents are updated as needed and posted on the NERC website. Also, to effectively communicate the CMEP processes, NERC and the Regional Entities post guidance documents on their websites that provide additional information for the registered entities as to their responsibilities. The Regional Entities, supported by NERC, perform periodic compliance workshops to alert the registered entities on process changes, requirements and industry trends.

NERC is working with the Compliance and Certification Committee to receive collective industry feedback regarding NERC and the Regional Entities' communications. To date, the tone of the feedback has been positive. The industry is very receptive toward communication efforts and continues to ask for more transparency. As a result, NERC has stepped up this effort, developing a cross-functional team between the NERC Compliance Program and the NERC Standards Program to answer questions regarding reliability standards that the registered entities are asking.

For 2009, NERC is developing a database to systematically collect industry feedback and communicate NERC determinations to relevant parties in a user friendly reporting manner. This is a major NERC initiative as it will include resources, at a minimum, from IT, Compliance, and Standards.

**C. Reliability Readiness Evaluation and Improvement Program**

- 1. NERC shall establish and implement a program for conducting evaluations of operators of the bulk power system that perform reliability functions (including in particular balancing authorities, transmission operators and reliability coordinators), to provide guidance and feedback to these entities to:**
  - a. Ensure they have the facilities, tools, processes and procedures in place to carry out their reliability functions appropriately under future conditions.**
  - b. Enable these entities to achieve operational excellence in the performance of their reliability functions.**

NERC initiated the Readiness Evaluation Program (originally called the Reliability Readiness Audit Program) in response to evaluations of the causes of the August 14, 2003 Northeast blackout. On February 10, 2004, the NERC Board approved a recommendation of the NERC Steering Group for the August 2003 Blackout Investigation to initiate a Readiness Audit Program to assess the readiness of bulk power system operations in North America. NERC conducted its first Readiness Audit on March 8, 2004. The initial three-year cycle of readiness audits took place in 2004 through 2006.<sup>181</sup> The goal was to increase transparency on operating practices and to assess the industry's overall preparedness to minimize the likelihood of another major blackout. When the Commission approved NERC as the ERO and began adopting NERC Reliability Standards as mandatory in the United States, NERC created a compliance audit program. The readiness program, which had been asking compliance-type questions, shifted its full effort to encouraging entities to improve reliability performance and achieve excellence in their assigned functions and responsibilities.

The readiness program worked with industry experts to conduct on-site evaluations of all balancing authorities (BAs), transmission operators (TOPs), reliability coordinators (RCs), and other entities that support the reliable operation of the bulk power system in North America to determine their readiness to maintain safe and reliable operations. Operating under the principles of being open, fair, transparent, and inclusive, the evaluations identified strengths and areas for improvement in an effort to promote excellence in operations among these organizations. The evaluation process was based on the following six fundamental aspects of reliability:

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<sup>181</sup> In their analyses of the causes of the August 2003 Northeast blackout, NERC and the U.S.-Canada Power System Outage Task Force both recognized a need to assess the vulnerability of the bulk power system in North America to similar events. *See, e.g., Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations*, U.S.-Canada Power System Outage Task Force, April 5, 2004, at 156 (Recommendation 18), noting that NERC and the regional reliability councils were jointly establishing a program to audit the reliability readiness of all reliability coordinators and control areas within three years and continuing thereafter on a three-year cycle, with 20 audits of high priority areas to be conducted by June 30, 2004.

1. Culture – The corporate organization provides the necessary leadership and management for system operations to sustain high levels of safe, reliable operation.
2. Operations – Operations personnel monitor and control the system in a manner that ensures safe, reliable operation.
3. Maintenance - Maintenance is conducted by skilled personnel to achieve safe, reliable control center equipment and system performance.
4. Operational planning – Operational planning provides the technical information and support necessary for safe, reliable system operation.
5. Training – Training in both specific job-related skills and broader technical fundamentals is used to provide highly skilled, knowledgeable personnel for safe, reliable operations, and to achieve performance improvement.
6. Infrastructure – System operators must be provided with effective, reliable computer facilities for data and status monitoring and communication facilities for voice communication at both the primary and the backup control facilities. Access to control rooms and critical computer facilities must be controlled for physical and cyber security reasons.

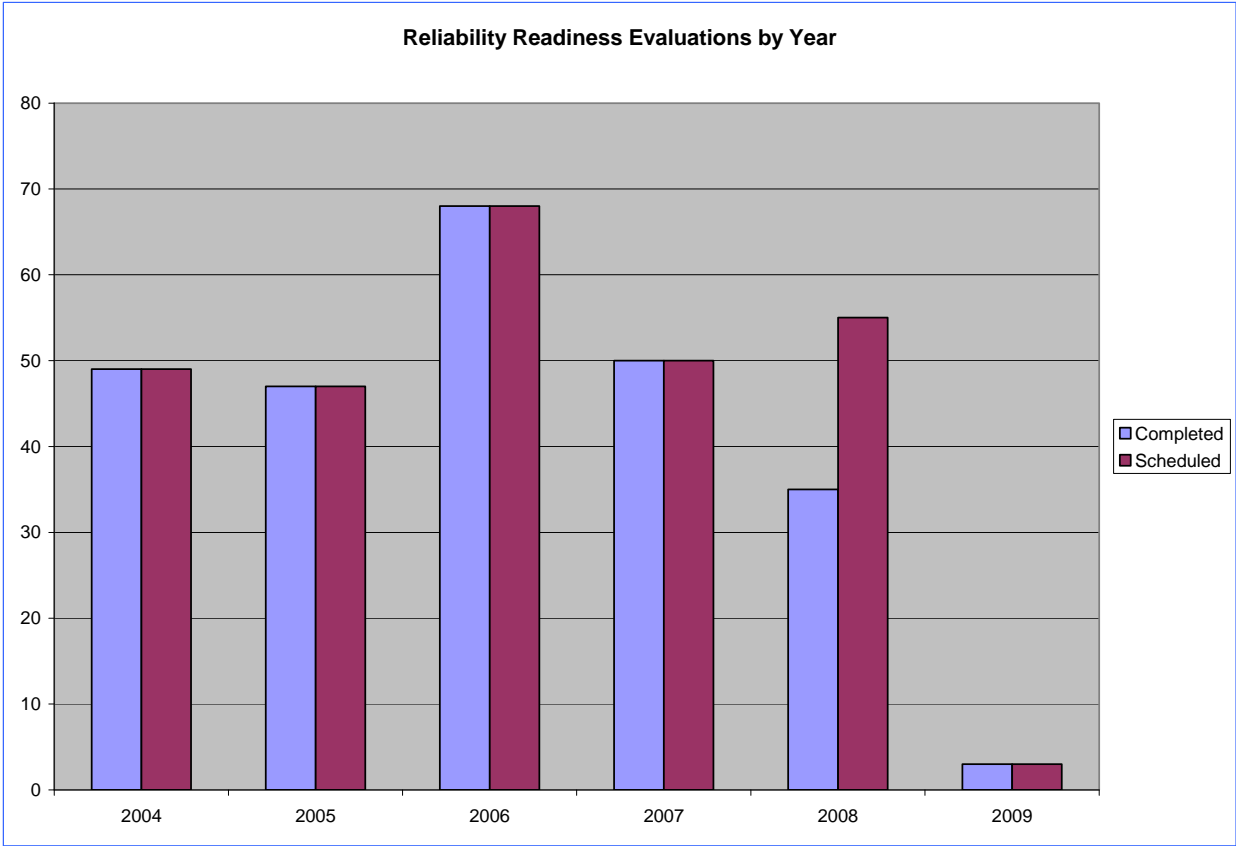
The readiness evaluation teams, each led by a NERC staff member and a senior Regional representative, included industry volunteers with considerable expertise selected to provide representation from other interconnections, other Regions, and neighboring operating entities. The teams also typically included representatives from the Commission staff.

The readiness evaluation teams independently reviewed the operations of reliability entities, noted positive observations and made recommendations for improvement. Final evaluation reports were posted on NERC's Web site, with any infrastructure discussion redacted from the public report. The recommendations, if implemented, would enhance the entity's readiness to operate reliably and maintain the reliability of the bulk power system.

Readiness evaluations were conducted on a three-year cycle with approximately 50 to 60 evaluations completed per year. As noted above, NERC conducted its first Readiness Audit on March 8, 2004. The initial three-year cycle of readiness audits took place in 2004 through 2006. In February 2007, NERC began a second three-year cycle of reliability readiness evaluations.

From March 2004 to March 2009, NERC completed a total of 252 on-site evaluations (*see* Figure 1 below). A total of registered 17 Reliability Coordinators (RC), 126 Balancing Authorities (BAL) and 150 Transmission Operators (TOP) underwent at least one NERC readiness evaluation.

Figure 1 – Readiness Evaluations by Year

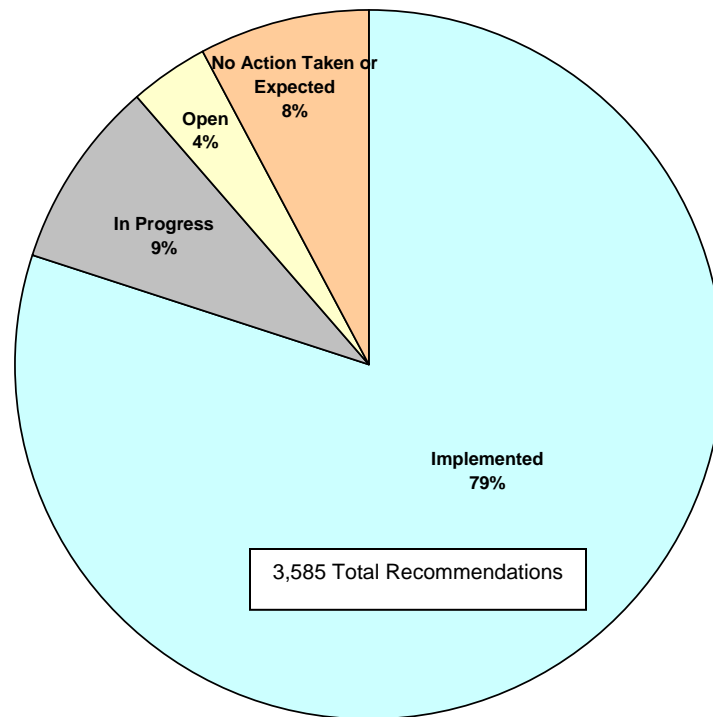


Additionally, 14 Transmission Owners (TOs) that can significantly affect neighboring reliability entities, reliability regions or load centers of a national interest also completed readiness evaluations, as listed in Table 1.

**Table 1 – Readiness Evaluation Conducted for 14 TOs**

<b>Entity Name</b>	<b>Region</b>	<b>Evaluation Date</b>
CenterPoint Energy	ERCOT	11/01/2006
Commonwealth Edison	RFC	11/09/2006
PPL Electric Utilities Corp.	RFC	02/08/2006
PSE&G	RFC	01/25/2006
TXU Electric Delivery	ERCOT	12/13/2006
Baltimore Gas and Electric	RFC	03/28/2007
Dominion Virginia Power	SERC	09/20/2007
Long Island Power Authority	NPCC	05/03/2007
New York Power Authority	NPCC	12/06/2007
PECO Energy	RFC	09/27/2007
ATS – First Energy	RFC	05/22/2008
Rochester Gas and Electric	NPCC	06/19/2008
Potomac Electric Power Co.	RFC	10/06/2008
Consolidated Edison Company	NPCC	12/9/2008

These readiness evaluations resulted in 3,585 recommendations that have been or currently are being implemented by the evaluated entities. Figures 2 and 3 below summarize the status of all recommendations tracked over the course of the program.

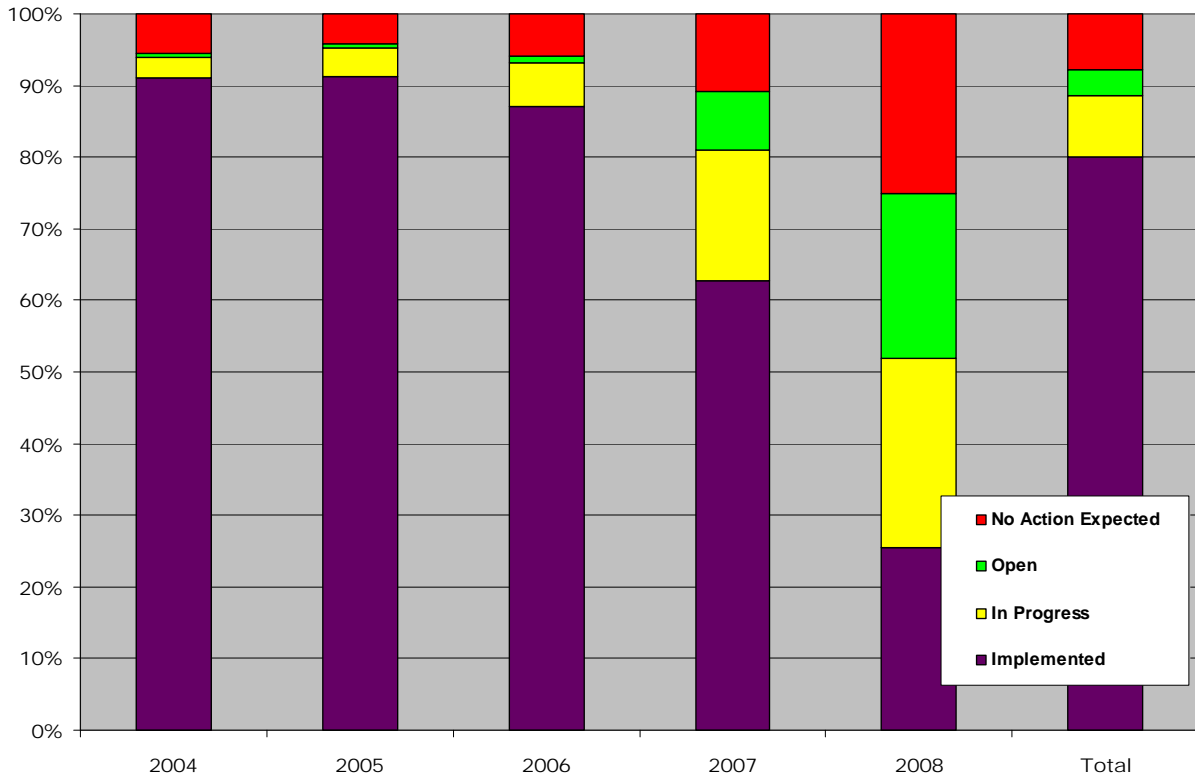
**Figure 2: Recommendations Tracking Status**

The recommendations are not mandatory. However, entities have either implemented or started work on 88 percent (79 percent implemented and 9 percent in progress) of 3,585 recommendations through December 2008.

As of the end of 2008, over 650 industry volunteers had participated in evaluations to fill approximately 1600 positions. Of these volunteers, about 240 participated in multiple evaluations.

NERC has continued the program with provisionally certified RCs, BAs, and/or TOPs that have not been through readiness evaluations since the 2003 blackout. By the end of March 2009, all provisionally certified RCs, BAs and/or TOPs had completed at least one readiness evaluation.

Figure 3: Annual Recommendations Tracking Status



Prior to enforceable and mandatory NERC standards, the goal of the Readiness Evaluation Program was to increase transparency on operating practices and assess the industry's overall preparedness to minimize the likelihood of another major blackout. By leveraging publicly posted and balanced reports, NERC encouraged adoption of examples of excellence, identified industry trends, and became a proactive force in encouraging continent-wide reliability practices. The program served as one of the many driving factors aimed at increasing reliability of the bulk power system. Review of the history of the Readiness Evaluation Program shows the Readiness Evaluation Program was one of NERC's strongest responses to the August 2003 Northeast blackout and served an important purpose while it was being conducted, particularly prior to the implementation of mandatory and enforceable reliability standards pursuant to Section 215 of the FPA.

**2. NERC shall utilize the results of reliability readiness evaluations to identify and promote examples of excellence to owners, operators and users of the bulk power system.**

Examples of excellence are practices that NERC has identified as being exceptionally effective in ensuring and protecting the reliability of the interconnected bulk power system. NERC highlights these practices as examples for the electric industry to use in achieving excellence in system operations. While these examples are not intended to serve as requirements or standards, NERC recommends that organizations review and consider them where appropriate for their own operations.

Examples of excellence have been derived from the information and insight NERC has gained from its Readiness Evaluation Program. Readiness evaluation teams independently reviewed the operations of reliability entities and not only made recommendations for improvement, but also identified practices that could serve as examples of excellence for the industry. Team leaders and members of the Operating Reliability Subcommittee (a subcommittee of the NERC Operating Committee) then jointly reviewed newly discovered findings and carefully considered each practice. Practices determined to be notable, effective, and feasible became examples of excellence and were described in a one- to two-page description posted on NERC's Web site.

Not every example of excellence identified will be appropriate for every organization and in every circumstance. But more widespread implementation of these practices was intended to help sustain and continuously improve interconnected network reliability. Each organization makes its own decisions on whether or not to implement an example of excellence.

To increase exposure, NERC moved from using a quarterly examples of excellence bulletin to announcing examples in the widely read monthly NERC News. NERC also sponsored a webinar to share examples of excellence focusing on the important issue of attracting and retaining talent in the electric industry. As stated in NERC's *2007 Long-Term Reliability Assessment*, "The loss of industry workers and their years of accumulated expertise due to retirements is a serious threat to bulk power system reliability, exacerbated by the lack of new recruits entering the field." Representatives from Wisconsin Electric Corporation, the Tennessee Valley Authority, and Western Area Power Administration-Upper Great Plains Region presented practices they use effectively to address workforce planning, recruitment, development, and relations.

By December 2008, over 100 examples of excellence had been identified and posted to NERC's Web site. These examples covered a wide range of operational areas, including culture, reliability tools, system restoration, and vegetation management.

#### **D. Training, Education and Operator Certification Program**

##### **1. NERC shall establish and implement a program for issuing certification credentials to, and maintenance of the certification credentials by, operating personnel of owners, operators and users of the bulk power system.**

In 1998, NERC established a program to address system operator minimum required knowledge based on a formal job analysis of system operator activities. A certificate is awarded to those individuals who demonstrate the required knowledge related to NERC Standards and the basic principles of bulk-power system operations by passing an examination in one of four functional areas: Transmission Operator, Balancing and Interchange Operator, Balancing/Interchange and Transmission Operator, and Reliability Coordinator. The program contracts with a federally recognized psychometric consultant to provide advice on all matters of exam development. The exams are designed to measure the candidate's knowledge concerning job tasks identified (in job analysis surveys by persons working as system operators) as being important to their job.



The NERC ROP covering operator certification and the System Operator Certification Program Manual have been crafted from certification criteria endorsed by the National Organization for Competency Assurance (NOCA). The NERC Personnel Certification Governance Committee (PCGC) is responsible for governing the program. The program charter requires at least one Canadian representative to serve on the PCGC. The PCGC is composed of system operators or those who are directly involved with operators. All members of the PCGC must have a valid NERC certification. The PCGC makes every attempt to have each specialty represented. The PCGC seeks input and assistance from other NERC and industry groups for proposed changes and initiatives, and the PCGC is the final decision-making body for the certification program.

The program has an open policy towards its examinations in that there are no prerequisites. Anyone and everyone may pay the fee and take the exam without regard to factors such as age, gender, religion, national origin, or disability. A statement to this effect is in all announcements of the program. NERC maintains multiple exams for each credential to ensure fair results. To maintain examination form equivalence, Applied Measurement Professionals (AMP) is contracted to work with the Examination Working Group (EWG) to ensure that each form of a credential's exam is weighted such that no person taking any of the different forms will be penalized. Each form assesses the equivalent level of knowledge and skill of system operators. Efforts are made by AMP and the EWG to minimize the scoring differences between exam forms to an insignificant level. AMP also compares the cut score on each exam with the actual performance of the exam as another form of validation. This is a continuous process to ensure that the program accounts for any variables or anomalies. The program develops exams that are translated for the operators in Quebec.

NERC has a contract with Prometric (formerly Sylvan Learning Centers) to administer the computer-based examinations throughout North America (except Mexico). The convenience of Prometric's numerous test centers, and the level of security employed at the test centers, are very high.

A credential is maintained in one of two ways: earning the necessary amount of qualified continuing education hours in a three-year period, or retesting when the credential is close to expiring. The retesting option is being phased out and will no longer be available after October 1, 2009.

The program budget is included in the annual NERC Business Plan and Budget. However, it is completely funded through user fees. NERC acts as a contracted administrator for the program. In addition, the certification program is operated and funded separately from NERC's Continuing Education Program and the Education program. The Certification program shares a database with the Continuing Education program, with each program sharing the cost of operating and updating the database. The NERC Continuing Education program uses the criteria established by the PCGC as the baseline to judge the quality of a learning activity. The Continuing Education program is not dependent on the Certification program as the Continuing Education program focuses on improving skills, not testing current knowledge.

Since the program's inception in 1998, over 12,000 credentials have been issued. As of May 31, 2009, there are over 5,870 active system operator credentials. As seen in the chart below, since 1998 the average passing rate is 79% with some variations from year to year. This passing rate is within the standard accepted normal range in the testing industry. Most of the variations have been due to the level of experience of the people taking the exam. In recent years, as experienced operators have increased the use of continuing education hours to renew their credentials, new operators with less knowledge have comprised an increasing percentage of test-takers, resulting in lower passing rates that are still within acceptable testing industry bounds.

<b>NERC System Operator Examination Statistics</b>				
<b>Year</b>	<b>Number of Exams Taken</b>	<b>Number Passed</b>	<b>Number Failed</b>	<b>Percent Pass</b>
1998	997	920	77	92
1999	1620	1420	200	88
2000	1422	1089	333	76
2001	777	593	184	76
2002	993	760	233	77
2003	1868	1555	313	83
2004	1690	1412	278	84
2005	2170	1731	439	80
2006	1262	943	319	75
2007	1030	729	301	71
2008	1059	693	366	65
2009 thru 5/31	441	288	153	65
<b>Totals</b>	<b>15329</b>	<b>12133</b>	<b>3196</b>	<b>79%</b>

The most significant change to the program in the past three years was the change from retesting to maintain certification to the use of continuing education hours to maintain a credential. After two years of preparation, the three-year transition to the exclusive use of continuing education hours began in October 2006. The use of continuing education hours has had the result of expanding the training and education available to system operators to improve their knowledge and skills. This is addressed in more depth below in the discussion of the continuing education program.

As seen in the table below, the use of continuing education hours to maintain a credential has increased dramatically since first implemented in 2006. The database is not yet capable of determining the annual number of operators who are required to maintain or renew their credential within a given year, so the table below is limited to those who used continuing education hours for renewal. The smaller number of experienced operators taking the exam to maintain their credential contributed to the lower passing rate for the exam for 2008 into 2009 compared to previous years.

<b>Use of Continuing Education Hours for Credential Maintenance</b>	
<b>Year</b>	<b>Credentials Maintained</b>
2006	35
2007	109
2008	833
2009 thru 5/31	379
<b>Total</b>	<b>1356</b>

In 2007 the program implemented a new System Operator Certification and Continuing Education Database (SOCCED) in conjunction with the continuing education program to allow input and tracking of an individual's credential maintenance. The SOCCED allows operators to register for the exam and track the status of the activities needed to renew their credential.

The program conducts a job analysis for system operators at least once every five years. NERC last conducted a job analysis in 2006 and is preparing to conduct another in 2009 to capture the recent changes in system operations attributed to enforceable standards.

New exams have been released twice in the past three years: January 2006 and July 2008. Two exams are developed and released for each of the four credentials, each exam requiring a large amount of effort from volunteers, NERC staff, and contractors.

With almost 12,000 credentials awarded in the ten years of the Personnel Certification program, there is a positive impact on the industry with this demonstrated knowledge. The overall passing rate of 79% shows that the credential is not just another simple step to becoming an effective operator; real knowledge is required. This knowledge is defined by certified operators who participate in the job analysis, write exam items, and construct the exams. This is a practice of true certification programs. Preparing for the exam and maintaining the credential through the use of continuing education has improved the knowledge base of system operators. This is vitally important as the workforce loses its most experienced operators and new operators take their place.

Comparison of the content of the current exams to the initial exams in 1998 reflects an increasing sophistication within the operator population. It is the operators who write the questions for the exams. Early questions focused on memorizing the content of the NERC Operating Policies. Today there is a greater emphasis on situational problem solving and analysis with much less memorization of reliability standards. This shift is attributable to the improved knowledge from the increased training and education operators receive today compared to ten years ago.

The Personnel Certification program follows NOCA accreditation criteria to maintain independence. Decisions made for the program by the PCGC are meant to protect the integrity of the credential and the program. The PCGC seeks input from affected industry sectors when deciding on changes to the program. However, official accreditation has not been sought for the program since the cost of achieving and maintaining accreditation was not perceived to benefit the program or operators.

2. **NERC shall monitor, review and revise the components and topics of its operator certification, continuing education and training programs on an ongoing basis to ensure that the components and topics are timely and reflect matters of current importance to the reliable operation of the bulk power system.**

The NERC system operator certification program conducts a job analysis at least once every five years. NERC last conducted a job analysis in 2006 and is preparing to conduct another in 2009 (*i.e.*, 2-1/2 years after the last analysis) to capture the recent changes in system operations attributed to enforceable standards. The job analysis determines the content outline for each of the four credentials. The content outline for each of the four credentials accurately reflects the tasks performed by system operators performing that function. A PCGC subgroup working with AMP recently created a survey instrument that will be used in the mid-2009 job analysis. The results of this analysis will be a content outline for each of the four job functions. The content outlines form the basis for each exam.

The NERC Examination Working Group (EWG) introduces new examinations every 18 months to keep items from becoming too well known and to address changing industry operations while still focusing on the content outline. New examinations were released in January 2006 and July 2008. The July 2008 release was originally scheduled for July 2007. The delay was due to a breach of exam development security protocol, possibly exposing an exam to the world. The PCGC stopped development of that nearly completed exam and instructed the EWG to begin development of a new exam. The use of the exams for an extra year was not a problem since all items on the exam were current and performing well with the test-takers.

No real changes or improvements have been required to the monitoring and review processes since 2006. The response to the possible exam security development breach demonstrates that the procedures the PCGC has in place work well.

Monitoring, reviewing, and revising the basis for the operator certification exams is a routine activity that is fundamental to the success of the program. It is performed to keep the exam items timely. Performing the job analysis one and one-half years early in 2009 is designed to capture the changes in operations that have occurred since NERC became the ERO. It also includes the additional entities that are now required to have certified operators on shift. This type of response has become expected of the certification program to maintain the integrity of the credentials. The practices used to maintain the integrity of the credentials and keep the examination content current have been adopted from the testing and certification industry. These have proven quite successful. The NERC ROP and the Certification Program Manual have been written using these principles. Putting them into action is labor intensive but protects the integrity of the program. No changes are foreseen for the program in this area.

3. **NERC shall establish and implement education programs for NERC and Regional Entity staff and for personnel of owners, operators and users of the bulk power system, including learning materials and training activities.**

The NERC Training and Education program strongly differentiates between training and education. Education is the dissemination of information to increase a person's knowledge.

Education can be delivered through documents, coursework, or workshops. The mediums can be a formal classroom setting, electronic, or via internet. Training is performed to improve a person's skills and performance. Training likely includes some form of education, but applies this knowledge into higher level uses so a person can successfully perform a job task.

The NERC ROP define a large audience for the education program with an emphasis on system operations personnel, but also includes other industry personnel, Regional Entity staff, regulators, and NERC staff. NERC delivers educational materials to the industry and provides training to NERC and Regional Entity staff.

The program provides educational materials to the industry as resources allow. Industry education has been limited but includes workshops and webinars. Educational materials are developed from the NERC perspective. They form the basis for others to use and incorporate into more detailed education and training activities. Generally, however, NERC has not provided training to the industry. Skill requirements differ throughout the industry even within similar jobs. There are a number of excellent vendors that provide these services and NERC has not wanted to compete with them.

NERC has the primary responsibility for providing training for NERC internal staff, NERC and Regional Entity compliance auditors (including CIP auditing), NERC and Regional Entity compliance investigators, and NERC Standards staff. It is this audience on which NERC focuses its limited training and education resources.

Since 2006 NERC has provided many educational activities to improve the knowledge of industry personnel and training activities to improve NERC and Regional Entity staff performance. Listed below are the training activities presented since 2006.

- NERC and Regional Entity Compliance Auditor Training - NERC conducted a job task analysis in early 2007 for NERC and Regional Entity compliance auditors. The job task analysis determined the tasks for lead auditors and audit team members. NERC will conduct another compliance auditor job task analysis in the fall of 2009 to determine how the role has changed, and what additional training needs to be developed in order to help the auditors improve their job performance. The curriculum NERC currently maintains for compliance lead auditors is listed below. All compliance auditors must complete this training before they participate in their first compliance audit. This curriculum was developed through the use of a job task analysis to identify auditor skills.
- Fundamentals of NERC Compliance Audits for Lead Auditors - An instructor-led compliance auditing fundamentals course is delivered quarterly to compliance auditor team leaders. It is required for all team leaders before they can lead an audit team. This course includes lead auditor tools, interview techniques, correct protocols, processes, evidence gathering techniques and other necessary skills. The course is facilitated by NERC subject matter experts. As of May 31, 2009 over 148 NERC, Regional Entity, and Commission personnel have attended this course.

- Fundamentals of NERC Compliance Audits for Audit Team Members - An online compliance auditing fundamentals course is available on demand (24/7) for compliance audit team members. It is required for all team participants before they perform as part of an audit team. This course is similar to the instructor-led compliance auditing fundamentals course. It is not as intensive as the instructor-led course because it does not include all of the instruction and tools for the lead auditors. It includes interview techniques, correct protocols, processes, techniques for gathering evidence, and other necessary skills. As of May 31, 2009 over 299 industry participants have taken this online course.
- Gathering Quality Evidence - An online Gathering Quality Evidence module for audit team leaders and audit team members launched in April 2008. This training module is required before anyone may participate on a compliance audit. This module is in addition to the compliance audit fundamentals online modules. This module is available on demand (24/7). As of May 31, 2009, 309 NERC, Regional Entity, and Commission personnel have taken this online course.
- Gathering Quality Evidence WebEx (optional) - WebEx module created to answer frequently asked questions that compliance audit team members have after completing the online Gathering Quality Evidence module. This WebEx is held when there are a minimum of 10 people requesting it. This WebEx is optional. As of May 31, 2009, 30 NERC and Regional Entity, personnel have attended this WebEx.
- Tracking Users in Design a Course - An online module “Tracking Users in DAC” was developed for NERC and Regional Entity staff. This module instructs lead auditors and compliance staff how to track in NERC’s Learning Management System if their audit team members have completed the necessary online training modules. There is also an instructor-led version of this course. As of May 31, 2009, 16 NERC and Regional Entity personnel have either attended the instructor-led course or taken the online course.
- NERC CIP Standards Training - An instructor-led course for the NERC CIP standards for compliance audit team leaders. This two-day course covers the basic concepts and topics that are the focus of the CIP standards with which some registered entities must be auditably compliant as of July 1, 2009. As of May 31, 2009, 92 NERC and Regional Entity staff have attended this course.
- CVI Training - An instructor-led CVI course for NERC and Regional Entity investigation and compliance staff was launched on January 28, 2009. This one day course focuses on the NERC CVI process, investigation methodology, and the use of NERC tools and techniques for investigating violations. The class includes a break-out exercise that simulates conducting a CVI on a small system event. The class was rolled out to the Regional Entities on June 9, 2009. As of May 31, 2009, 8 NERC compliance investigators and 18 Regional Entity staff attended this course. In addition, many WebEx’s have been conducted for Regional Entities to support CVIs and CIQs.

- Creating Compliance Elements for NERC Reliability Standards - An online course on how to develop compliance elements for reliability standards (partnering with the Standards Program) for compliance element development resource pool volunteers. This module is available on demand (24/7). As of May 31, 2009, 16 NERC and Regional Entity personnel have taken this course. In late 2009 NERC will perform a job task analysis for members of the standards drafting teams. The job task analysis will be used to develop training for the standards drafting team members and team leaders.
- The Fundamentals of NERC Readiness Evaluations - This course is an online readiness fundamentals course for readiness evaluators on the NERC evaluation process, interview techniques, observation techniques, and other necessary skills. This course is available on demand (24/7). Approximately 210 readiness evaluators have completed this course. This course is no longer available as the Readiness Program is closing.
- Continuing Education Providers - NERC also provides training for continuing education providers who use the System Operator Certification and Continuing Education Database. It is delivered via WebEx to answer the providers' questions as they learn about the use of the SOCCED. Over 250 people have received this training online via WebEx since 2007.

In late 2006 into 2007 a total of ten 1-1/2 day workshops addressing the content of the new CIP standards were held across North America. Approximately 870 people attended. Materials from the workshop are still available for download and are being used by the industry to prepare for compliance in July 2009. Participants reacted very favorably to the workshops. These workshops also provided a platform for NERC to encourage entities to use expert consultants to bring their programs into compliance.

In 2008 NERC began hosting Webinars for the industry to educate industry participants on NERC topics and pressing industry issues. In 2008, 10 Webinars were held drawing over 4000 industry participants. The series of Webinars was developed with the NERC Communications department. The Webinars and the slides are available to industry participants. The topics presented in 2008 were: NERC 101: Wind Integration and Transmission, Reliability Basics; NERC 102: Compliance and Enforcement Process, Lessons Learned from Event Analysis; NERC 102: Standards Process, Aging Workforce, Examples of Excellence: Retaining and Training Employees, Special Report: Industry Concerns on the Reliability Impacts of Climate Change Initiatives Briefing, Winter Reliability Assessment Briefing, Alerts Distribution (Reporting and FAQs). As of May 31, 2009, 9 more Webinars were hosted for the industry. Approximately 3600 participants attended. The topics were: Alerts Distribution, Reporting & FAQs; Demand Response, and NERC 101, Project 207-11: Disturbance Monitoring Draft Standard, Accommodating High Levels of Variable Generation into the Bulk Power System, Generator Frequency Response, Under-frequency Load Shedding – PRC-006-1 Standards Development, and 2009 Summer Reliability Assessment. This successful Webinar series is continuing in 2009.

Five job aids regarding Compliance Monitoring Enforcement Program Timelines were developed for the electric industry in 2008. These are available for download from the NERC website. Comments from users have been very favorable.

The last year NERC hosted a Train-the-Trainer workshop for those who train system operators was 2006. Approximately 45 people attended. Since this workshop was duplicating courses offered by training vendors, NERC stopped delivering this course. Several entities complained about the need to pay more for vendors, but overall entities have adapted well and training organizations have filled the need to offer this specialized training.

NERC encourages expert vendors in the industry to assist industry participants with their needs. There are also other resources available to the industry such as workshops offered by other NERC departments and the Regional Entities, and forums for industry participants.

In 2008 the Training and Education Program also commissioned a consultant to review and recommend options for delivering education and training online when appropriate. The recommendations note that NERC's migration to a Microsoft Sharepoint platform is ideal for developing and delivering future learning activities online. The program intends to take advantage of this platform for future activity development.

NERC has those participating in each course complete evaluations at the end, including for online courses. Courses are then changed based on the comments and potential improvement. Changes are made to the courses or materials almost immediately. Because these changes tend to be incremental, activities are constantly evolving and improving. The program also performs job task analyses to determine areas for further training development and to target changes and improvement.

The Training and Education Program focused on training NERC and Regional Entity personnel as the main priority when NERC became the ERO. Compliance personnel have been the main audience as their enforcement duties were new and carried high expectations. The Training and Education Program wanted to focus on qualifying personnel performing the authorized work of the ERO first, then provide industry with the knowledge it sought from the NERC perspective. With many expert consultants available to provide training and guidance on many operating and planning topics, the program did not want to duplicate or compete with what the market had to offer.

The biggest challenge to training Regional Entity compliance personnel has been delivering a single direction so that audits are conducted uniformly throughout North America. Participant surveys note that the program has been successful in delivering that message in the classroom setting. No follow-up surveys have been performed to determine if participants are using this knowledge in audits.

To date, creating education materials for industry participants has not been a priority for the NERC Training and Education department, due to resource limitations. Limited industry education has been developed and delivered based on needs, priorities, and available resources. Those that are developed focus on delivering the NERC perspective and were discussed



previously. The Webinars have been a large success, reaching many interested industry participants. However, going forward, in light of stakeholder demand, training and education programs and materials will be developed for industry participants on NERC reliability standards and compliance with standards.

NERC is also working with the standing committees to develop ways of sharing information among industry stakeholders. The Reliability Fundamentals Working Group of the Operating Committee is charged with using an “open source” concept to deliver and modify information relevant to the industry. NERC is working to provide the platform to accomplish and manage this charge in 2010. The result will be more timely and useful information on many topics.

- 4. NERC shall establish and implement a program to promote quality and foster improvement in continuing education and training programs offered by owners, operators and users of the bulk power system to their operating personnel, including developing and maintaining a process to approve continuing education and training providers by establishing requirements for, and conducting periodic audits of, such providers and activities.**

In October 2003, the NERC Board approved the Continuing Education program. The Personnel Subcommittee designed the Continuing Education program based on the International Association for Continuing Education and Training (IACET) criteria and guidelines by which hundreds of organizations measure their educational offerings. IACET’s criteria and guidelines address the processes for the design, development, and delivery of continuing education and training. The Personnel Subcommittee used industry comments to help develop the program. Initially system operators could earn continuing education hours, but not yet use those hours to maintain their system operator certification credentials. The NERC Board sought validation of the program’s ability to delivery quality training before approving its use in maintaining system operators’ credentials.

The Personnel Subcommittee is the stakeholder governing body for the program and sets the standards, criteria, and fees associated with the program. The program is 100% funded by user fees with no industry assessments needed.

The Continuing Education Program has processes and procedures to review and approve all continuing education activities. An independent panel of industry trainers assists NERC in the review of each activity submitted. Upon the completion of each review, NERC either approves or denies the provider’s application. There are over 12,000 activities that have been approved through the program with over 6,000 of those still active.

The Continuing Education Program has helped promote the growth of system operator training in North America. Since 2003 when continuing education activities were first approved, the industry has gone from providing a handful of training activities to over 6,000 offered for system operators in 2009. This dramatic increase can only result in increased knowledge and skills of system operators, which ultimately increases the reliability of the bulk power system. In 2006 about 152,000 hours of continuing education were earned by system operators, growing to

280,000 hours in 2007 and up to 399,000 hours in 2008. As of May 31, 2009, over 162,000 hours of continuing education were earned by over 4,600 individuals.

- Over 220 entities are now approved to deliver continuing education activities
- About 1,000 unique activities are delivered quarterly
- Training providers are reporting between 50,000 to 75,000 continuing education hours awarded each quarter. There have been over 980,000 continuing education hours earned by certified system operators since April 1, 2006

Changes to this program are continual and ongoing. The Continuing Education Program has processes and procedures to randomly audit continuing education courses to ensure providers are delivering what they submit on their applications. The program met its goal to audit 150 activities in 2008 with plans to audit more in 2009.

Since May 2007, continuing education providers maintain an account and course listing in the System Operator Certification and Continuing Education database. Training providers are required to apply for approval of all continuing education activities that they intend to deliver to system operators. In December 2008 the Personnel Subcommittee completed minor updates to the program manual clarifying what is expected in various activities to be approved.

In 2009, with additional tracking capabilities in the System Operator Certification and Continuing Education Database, NERC will be able to follow trends in the frequency and type of training that is being delivered to system personnel. This will tie into metrics of how the aging workforce issue is affecting the industry.

The Personnel Subcommittee has begun work on determining how to accredit training programs voluntarily to raise the bar in training quality beyond requirements found in PER-005 and the Continuing Education program. A plan is expected to be presented to the NERC Board in 2010.

The Continuing Education Program is aligned to meet the needs of the certification program continuing education requirements. The Continuing Education Program has dramatically increased the amount of training a certified system operator receives since 2006. This training, targeted to improve the skills and performance, improves the level of reliability of the bulk power system. The Personnel Subcommittee and the PCGC meet annually to ensure that the continuing education program will continue to improve on the quality of training being delivered to system personnel.

The certification program has met the defined needs of system operators and will seek to expand its usage among other professions in the industry. It will continue to address the quality of the activities that are acceptable to maintain a credential to honor the high integrity of the program and credential. The continuing education program has fulfilled its requirements and is moving forward to expand the reach of its positive impact on reliability. The program has continuously clarified its requirements to meet the needs of training providers and meet the needs of the certification program. Going forward NERC will play a large role in developing voluntary

training program accreditation criteria that will focus on the overall quality of a training program. Evaluated items that go beyond current NERC standards and training programs are performance of an operator, training program model, training effectiveness, and advanced training.

**E. Reliability Assessment and Performance Analysis Program**

- 1. NERC shall conduct periodic assessments of the reliability and adequacy of the bulk power system in North America and disseminate such assessments to the FERC, other governmental authorities, the electric utility industry and the public, in accordance with §215(g) of the Federal Power Act and 18 C.F.R. §39.11.**

Section 800 of NERC's ROP governs NERC's obligations to independently and comprehensively assess and report on the reliability and adequacy of the North America bulk power system. NERC prepares three reliability assessment reports each year: (1) a long-term reliability assessment report, (2) an annual seasonal (summer) report and (3) an annual seasonal (winter) report. These reports assess electricity demand and the adequacy of supply throughout the North America bulk power system.

Beginning with NERC's *2006 Long-Term Reliability Assessment*, NERC identified key findings and specific actions needed to be taken by bulk power system users, owners, and operators, governmental agencies and NERC itself to improve the reliability of the bulk power system. The actions identified do not represent mandatory requirements, but rather NERC's independent judgment of those steps that will help improve the reliability and adequacy of the North American bulk power systems. In its *2007 Long-Term Reliability Assessment* and reports for subsequent periods, NERC reported on the progress being made in achieving each of the actions identified in prior assessment reports.

Commencing in 2008, and continuing into 2009, the Reliability Assessment and Performance Analysis Program is responsible for implementing the Reliability Assessment Improvement Plan, approved by the NERC Planning Committee in March 2008 to enhance NERC's seasonal (summer/winter) and long-term reliability assessments. The final report, which was approved by NERC's Planning Committee in September 2008, can be found at <http://www.nerc.com/files/Reliability%20Improvement%20Report%20RAITF%20100208.pdf>. This plan creates a platform from which NERC, in concert with Regional Entities and industry volunteers, can address reliability considerations and increase the level of independence, granularity, transparency, and comprehensiveness of its reliability assessments, including:

- Emerging Issues risk assessment and development of Scenarios for assessment
- Risk Assessment and probability analysis for the Long-Term Reliability Assessment
- Additional and improved metrics for long-term reliability assessment
- Development and maintenance of a NERC-wide reliability assessment handbook
- Addition of on-peak and off-peak transmission and capacity reliability assessment

- Risk & Probabilistic analysis to support reliability assessment
- Generation/fuel interdependency

Additionally, NERC's efforts to improve both its seasonal (summer/winter) and long-term reliability assessments consider the following areas of assessment:

- In-depth evaluation and risk assessment of industry emerging issues
- Scenario analysis, such as renewable portfolio standards, climate change initiatives, etc.
- Review of international best practices
- Open workshops to discuss emerging issues and review long-term reliability assessment data collection and self-assessments
- Evaluate load forecasting techniques and develop improved bandwidth calculations
- Measure load diversity changes and impacts on reliability and adequacy.

The following Seasonal and Long-Term Reliability Assessments were completed between July, 2006 and May 2009:

- Long Term Reliability Assessments
  - <http://www.nerc.com/files/LTRA2006.pdf> and addendum
  - [http://www.nerc.com/fileUploads/File/Assessments/LTRA2006\\_Planne\\_d\\_Transmission\\_Table\\_Update.pdf](http://www.nerc.com/fileUploads/File/Assessments/LTRA2006_Planne_d_Transmission_Table_Update.pdf), published October 16, 2006
  - <http://www.nerc.com/files/LTRA2007.pdf>, published October 2007
  - <http://www.nerc.com/files/LTRA2008.pdf>, published October 2008
- Summer Reliability Assessments
  - <http://www.nerc.com/files/summer2006.pdf> published May 2006
  - <http://www.nerc.com/files/summer2007.pdf> published May 2007
  - <http://www.nerc.com/files/summer2008.pdf> published May 2008
  - <http://www.nerc.com/files/summer2009.pdf> published May 2009
- Winter Reliability Assessments
  - <http://www.nerc.com/files/winter2006-07.pdf> published November 2006
  - <http://www.nerc.com/files/winter2007-08.pdf> published November 2007
  - <http://www.nerc.com/files/winter2008-09.pdf> published November 2008

As part of the process for the NERC long-term reliability assessments, the NERC Reliability Assessment Subcommittee (RAS) relies on input from the NERC Load Forecast Working Group (LFWG), which is responsible for assessing uncertainty inherent in the forecasts provided to the Regional Entities by their member systems. For this purpose, LFWG develops uncertainty bandwidths around aggregated Regional, United States, and Canadian annual forecasts of peak demand and energy. Each long-term reliability assessment report discusses the method and resulting bandwidths around the ten-year Regional forecasts as well as how the assessment results would vary if peak demands exceeded base forecasts. Load forecast

bandwidth calculations were completed and incorporated into NERC’s annual 2006 through 2008 Long-Term Reliability Assessments. The specifics of this analysis are documented in the following reports:

- [http://www.nerc.com/docs/docs/pubs/NERC\\_2006-2015\\_Regional\\_Bandwidth\\_Report.pdf](http://www.nerc.com/docs/docs/pubs/NERC_2006-2015_Regional_Bandwidth_Report.pdf)
- [http://www.nerc.com/docs/docs/pubs/NERC\\_2007-2016\\_Regional\\_Bandwidth\\_Report\\_080107.pdf](http://www.nerc.com/docs/docs/pubs/NERC_2007-2016_Regional_Bandwidth_Report_080107.pdf)
- [http://www.nerc.com/docs/pc/lfwg/NERC\\_2008-2017\\_Regional\\_Bandwidths.pdf](http://www.nerc.com/docs/pc/lfwg/NERC_2008-2017_Regional_Bandwidths.pdf)

Calculation of bandwidths of certainty based on historical projections and forecast demand improves NERC’s ability to measure overall bulk power system reliability. NERC evaluated load forecasting techniques used throughout the NERC regions and developed enhancements, (see *Load Forecasting Survey and Recommendations*, December 2007 at [http://www.nerc.com/docs/pc/lfwg/NERC\\_Load\\_Forecasting\\_Survey\\_LFWG\\_Report\\_111907.pdf](http://www.nerc.com/docs/pc/lfwg/NERC_Load_Forecasting_Survey_LFWG_Report_111907.pdf)). Further, NERC evaluated how to improve the accuracy of bandwidth calculations and documented the results in its report, entitled *Method for NERC’s 2008-2017 Regional and National Peak Demand and Energy Projection Bandwidths* ([http://www.nerc.com/docs/pc/lfwg/Method\\_for\\_2008-2017\\_Bandwidths.pdf](http://www.nerc.com/docs/pc/lfwg/Method_for_2008-2017_Bandwidths.pdf)).

In addition, in 2008, NERC requested a Special Reliability Assessment to measure the impacts of significant supply-side changes from the 2008 Long-Term Reliability Assessment reference case. For this *Scenario Case*, the regions were asked to assess accommodating a minimum of an additional 15% of total energy from new renewable resources, above the *Reference Case* values, with no more than 5% made up from energy efficiency, or to propose a another *Scenario Case* that significantly impacts supply mix, electricity purchases or sales in the studied region. The base year for calculating the energy was set as 2008 to provide a common reference value. The results of this scenario assessment will be completed in 2009 (see [http://www.nerc.com/docs/pc/ras/Scenario\\_Letter\\_122308.pdf](http://www.nerc.com/docs/pc/ras/Scenario_Letter_122308.pdf) for more background).

NERC also prepared special reliability assessment reports on regional, interregional or interconnection bases as conditions warrant or as requested by its Board. The following Special Assessments/Reports and Survey of Reliability Issues were completed:

- Results from the *2007 Survey of Reliability Issues*, published October 26, 2007: ([http://www.nerc.com/files/Reliability\\_Issue\\_Survey\\_Final\\_Report\\_Rev.1.pdf](http://www.nerc.com/files/Reliability_Issue_Survey_Final_Report_Rev.1.pdf)).
- *2008-2017 Impact on Capacity Margins from Retrofit of Once-Through Cooling Systems at Existing Generating Facilities*, published October 2008 ([http://www.nerc.com/files/NERC\\_SRA-Retrofit\\_of\\_Once-Through\\_Generation\\_090908.pdf](http://www.nerc.com/files/NERC_SRA-Retrofit_of_Once-Through_Generation_090908.pdf)).

- *Electric Industry Concerns on the Reliability Impacts of Climate Change Initiatives*, published November 12, 2008 (<http://www.nerc.com/files/2008-Climate-Initiatives-Report.pdf>).
- *Accommodating High Levels of Variable Generation*, published April 16, 2009: [http://www.nerc.com/files/VGTF\\_Report\\_041609.pdf](http://www.nerc.com/files/VGTF_Report_041609.pdf)

In 2009, NERC began an assessment of Reliability Impacts of Climate Change Initiatives (<http://www.nerc.com/filez/ricciftf.html>). A two-phase approach is being developed to first provide the current status of technical reliability considerations (Phase I), followed by more detailed scenario assessment (Phase II). Completion is targeted for July and December 2009.

NERC has sponsored/co-sponsored a number of workshops exploring key emerging issues, and supported the development of industry forums to support industry action:

- With the National Science Foundation (NSF), Power System Engineering Research Center (PSERC), and Institute of Electrical and Electronic Engineers - Power & Energy Society (IEEE-PES), NERC cosponsored the *Aging Workforce Workshop* in November 2007 (see report at [http://www.ieee.org/portal/cms\\_docs\\_pes/pes/subpages/pescareers-folder/workforce/2008-7-8-NSF\\_Workforce\\_Workshop\\_Report.pdf](http://www.ieee.org/portal/cms_docs_pes/pes/subpages/pescareers-folder/workforce/2008-7-8-NSF_Workforce_Workshop_Report.pdf)). As a result of this workshop, an industry-wide collaborative supported by the IEEE-PES has been formed to address industry workforce issues and provide a platform for industry action (<http://www.ieee-pes.org/workforce/workforce-collaborative>)
- Joining with the Electric Power Research Institute (EPRI) and the Power System Engineering Research Center (PSERC), NERC supported the *Technical Summit: Extreme Weather Impacts on Reliability*, held in October, 2008. (see [http://www.pserc.org/docsa/Reliability\\_Summit.pdf](http://www.pserc.org/docsa/Reliability_Summit.pdf)) The goal was to identify any reliability issues and support development of collaborative R&D to address bulk power system reliability concerns resulting from extreme weather. A final report documenting the results of this workshop identifying next steps is under preparation.

As variable resources (such as wind and solar plants) are projected to increase, NERC has initiated the Integration of Variable Generation Task Force concentrating on the reliable integration of large amounts of these resources (see <http://www.nerc.com/filez/ivgtf.html>). The final report from this task force was approved by NERC's Operating and Planning Committees in February 2009. Recommendations are being evaluated to address the impacts on bulk power system planning and operations, evaluation of any gaps in NERC Standards and a work plan developed for NERC and industry.

Finally, NERC developed its first version of the *Reliability Assessments Guidebook* to provide guidance on what the industry should do regarding data submissions to support NERC's requirement for more consistent reliability assessments. This document has undergone review by the Planning Committee and it has been posted as a committee guideline ([http://www.nerc.com/docs/pc/ragtf/Reliability\\_Assessment\\_%20Guidebook%20v1.2%20031909.pdf](http://www.nerc.com/docs/pc/ragtf/Reliability_Assessment_%20Guidebook%20v1.2%20031909.pdf)).

As demand-side management (DSM) becomes increasingly deployed by industry to meet resource obligations, NERC initiated the development of a categorization taxonomy along with recommendations on data collection for both DSM projections supporting NERC's seasonal and long-term reliability assessments, and data collection of demand response events (see NERC's report *Data Collection for Demand-Side Management for Quantifying its Influence on Reliability*) [http://www.nerc.com/docs/pc/drdtf/NERC\\_DSMTF\\_Report\\_040308.pdf](http://www.nerc.com/docs/pc/drdtf/NERC_DSMTF_Report_040308.pdf)). To ensure these resources are effective and reliable, NERC is developing a demand response event data collection system to assess realization rates and measure their dependability. See <http://www.nerc.com/filez/drdtf.html>.

Since being certified as the ERO in 2006, NERC has implemented a number of improvements in the Reliability Assessment Program and processes:

- A work plan has been developed with industry support to vastly improve the reliability assessments and this plan is now being executed
- Emerging Issues coupled with risk assessment has deepened the assessment impact by identifying high impact, high likelihood scenarios that affect bulk power system reliability
- Scenario analysis processes have been put in place which enable comparison to specific reference cases to test the robustness of the plan and identify potential reliability concerns and NERC standard requirements
- Emerging Issues are being investigated in detail, and actions taken to prepare for potential reliability issues, and develop requisite NERC standards of performance.
- Data checking and validation algorithms developed for the 2009 Summer Reliability Assessment (see the *Data Checking Algorithms Applied* Section of <http://www.nerc.com/files/Summer2009.pdf>).

NERC continues to advance the state-of-the-art reliability assessment methods to increase the granularity and clarity of its results and facilitate comprehensive and independent assessments.

**2. NERC shall review, analyze and report on regional self-assessments of the electric supply and bulk power transmission reliability, including reliability issues of specific regional concern.**

NERC Staff provides an independent and increasingly comprehensive view of reliability assessment. As both NERC Staff and NERC committees individually report to NERC's independent Board of Trustees, NERC Staff and the Planning Committee (with support from the Operating Committee) provide an industry balance to ensure the independence and comprehensiveness of the reliability assessment process.

**Assessment Approach**

NERC's unique, independent ability to validate the data on regional reliability gathered from industry in the preparation of its reliability assessment reports incorporates industry experts



and deploys processes NERC and the Regional Entities use to perform their respective portions of the reliability assessments. These processes constitute an independent, rigorous, transparent and time-tested method for validating the data and information provided and a vigorous and vibrant approach to assessing the reliability of bulk power systems. As stated in the Introduction section of each of NERC's reliability assessment reports, NERC prepares its reliability assessments with detailed data, information, and regional self assessments from the Regional Entities as well as active support from the RAS under the direction of NERC's Planning Committee with additional review from the NERC Operating Committee.

The data, information, and regional assessments submitted by each of the Regional Entities is periodically updated throughout the report drafting process to ensure that it is as current as possible. This data and information is first analyzed, vetted, and attested to by the Regional Entities as part of their own assessment process, which follows a detailed set of assessment criteria established by NERC. After it is received, it undergoes further review by NERC staff and the RAS to ensure accuracy and consistency.

NERC also uses an active peer review process in developing its reliability assessments. The peer review process takes full advantage of subject matter expertise from many sectors of the industry, which far exceeds any resources that could be assembled at the NERC staff level. This process also provides an essential and independent check and balance for ensuring the validity of the data and information provided by the Regional Entities. Each Region prepares its data and an assessment according to a set of instructions provided by NERC with support from the RAS and the Data Coordination Working Group (DCWG). The resulting Regional assessments and data are assigned to two to four RAS members from other regions for an in-depth and comprehensive peer review of the data and information. Reviewer comments are discussed at an open RAS meeting with the Regional Entity's representative(s) and refinements as well as adjustments made as necessary. Where necessary, NERC requests Regional Entities to provide additional data and supporting information to explain the basis of their reliability assessment conclusions. The Regional assessments and data are then subjected to scrutiny and review by the entire subcommittee to ensure that members of the subcommittee and NERC staff are fully convinced that each Regional assessment and the data supporting it are accurate, thorough, and complete.

The entire reliability assessment document, including the Regional assessments, is then reviewed in detail by the NERC Member Representatives Committee and NERC management. The report is endorsed by the Planning Committee before being submitted to NERC's Board of Trustees for final approval.

To further increase the robustness and transparency of the process and the conclusions in its annual ten-year reliability assessments, NERC sponsors public workshops to discuss preliminary findings of its assessment with industry experts and participants, identify industry concerns, explore emerging issues and solicit improvements ([http://www.nerc.com/filez/ltra\\_workshop.html](http://www.nerc.com/filez/ltra_workshop.html)). In addition, NERC staff has recently joined Regional Entity reliability assessment stakeholder groups to deepen the mutual understanding of their processes, supply input and peer review of the self-assessments and provide training for



regional staff. Key suggestions from these workshops and meetings are reflected in the final assessment report.

### **Regional Reliability Assessments**

NERC's assessment requests to the Regional Entities include the development of a self-narrative. Regional Entities are directed to respond to an agreed upon set of narrative questions focused on identifying potential regional reliability concerns. These are reviewed by NERC staff, along with peer reviews and the Planning Committee for thoroughness and accuracy. The results are documented in the seasonal and long-term reliability assessment reports.

Along with this review of the Regional assessments completed as part of the reliability assessments, NERC staff reviews confidential and non-confidential regional reliability assessment reports and provides comments on reliability and processes directly to Regional Entities. For example, assessment of gas transportation, storage and supply, drought assessments, regional/sub-regional reports, reliability assessment approaches/processes and annual ISO/RTO reliability assessments have all been completed as part of this Regional assessment.

To improve data validation, NERC began, in 2009, to review its internal data collection and validation processes to fortify its current data analysis system by designing, creating, testing and putting in place additional automated data checking systems to accommodate the increasing amount of data NERC collects for its reliability assessments. Data checking algorithms were developed for use in NERC's *2009 Summer Reliability Assessment* (see the *Data Checking Methods Applied* Section in <http://www.nerc.com/files/Summer2009.pdf>). These enhancements are an internally-developed system. In addition, further enhancements for NERC's *2009 Long Term Reliability Assessment* will compare demand and supply forecasts obtained from NERC's data request with other, publicly available forecasts for further validation and comparison. The aforementioned automated data checks with the *2009 Summer Reliability Assessment* and comparisons of demand/supply forecasts have and will complement the rigorous peer review performed by industry subject matter experts described above. Further, this process can and will expedite peer review and increase the productivity of NERC staff and industry experts who are tasked with developing independent and comprehensive reliability assessments of bulk power system reliability.

- 3. NERC shall analyze major events and other off-normal events on the bulk power system and shall gather and disseminate information on events, risks and uncertainties potentially affecting the reliable operation of the bulk power system, including:**
  - a. Assessing and reporting on significant issues, risks and uncertainties that affect or have the potential to affect the reliability of existing and future electric supply and transmission.**
  - b. Investigating, assessing and reporting on the potential impacts of new and evolving electricity market practices, new or proposed regulatory procedures,**

- and new or proposed legislation on the adequacy and reliable operation of the bulk power system.**
- c. Directing industry teams in the investigation and analysis of major events on the bulk power system.**
  - d. Maintaining a database of major events on the bulk power system.**
  - e. Communicating to the industry root causes of events that may be precursors of potentially more serious events, and other lessons learned from analyses, including issuing alerts (Advisories, Recommendations and Essential Actions) and collecting, summarizing and reporting information on the responses of owners, operators and users of the bulk power system to such alerts.**

The Event Analysis and Information Exchange program performs analysis of large-scale outages, disturbances, and near misses to determine root causes and lessons learned; identification and continuous monitoring of performance indices to detect emerging trends and signs of a decline in reliability performance; and communications of performance results, trends, recommendations, and initiatives to those responsible to take actions; followed with confirmation of actions to correct any deficiencies identified.

The following tools and processes have been developed during the period from ERO certification (July 2006) to the present:

- Developed process for triage of system events reported to the ES-ISAC to determine the level of analysis necessary.
- Developed the NERC Event Analysis Tool (NEAT) to aid in the event triage process and centrally gather preliminary information on system events.
- Developed the NERC Alerts process to notify the industry of potential problems found during event analyses.
- Developed an Event Analysis Tracking System to track the events being analyzed.
- Developed a Disturbance Element tracking system to provide metrics on problems that were initiating, causal, contributory, or incidental to system events. Tracked 23 Disturbance Elements from the events analyzed.
- NERC advocacy of improvements to system protection and modeling improvements based on findings from event analyses.

NERC Event Analysis staff have reviewed or participated in the analyses of over 100 system events since July 2006. That number includes participation in seven detailed event analyses of system disturbances that were led by Regional Entities and one detailed event analysis that was led by NERC. As part of the on-going communication and information exchange efforts, quarterly reports were prepared and presented to the NERC Planning and Operating Committees, the Members Representative Committee, and the NERC Board of Trustees. These reports include findings resulting from the analyses and on disturbance trends.

Similar presentations have also been made to the Transmission Owners and Operators Forum. This work has resulted in six Alerts issued to the industry. Improvements made to activities and operations since July 2006 include:

- Established the Event Analysis Coordinating Group to support the Event Analysis Program by providing coordination between the Regions and Interconnections to facilitate consistency in the event analysis processes to ensure that NERC and regional event analysis are complete and timely.
- Hired a Manager of Alerts to run the Alerts process.
- Hired a Manager of Event Analysis Information to shepherd lessons learned and Alerts based on event analyses.
- Developed cross-regional training of system protection subject matter expertise in forensic analysis.
- Improving NEAT system to improve usability and efficiency of NERC Event Analysis staff.

The Event Analysis Program has been effective in analyzing major events on the bulk power system. Each of the analysis efforts has uncovered important information on risks and uncertainties potentially affecting the reliable operation of the bulk power system. This information is being disseminated to the industry. Since ERO certification in July 2006, the Event Analysis Program has made numerous improvements, and has added capabilities to more quickly triage events, deploy resources to complete system studies, and issue industry Alerts. However, stakeholders have expressed concerns that event analyses are being conducted for too many bulk power system occurrences (*i.e.*, for occurrences that are not significant enough to warrant an event analysis); that event analyses are taking too long to complete, with the result that dissemination of root cause and lessons learned information from an event analysis is not timely; and that the speed of completion of and dissemination of information from event analyses is adversely impacted because a compliance violation investigation is often conducted in conjunction with or shortly after the event analysis. These concerns, along with analysis of them and possible actions in response, are discussed in detail in **Attachment 2** of this report.

**4. NERC shall establish and implement programs for recording, analyzing and publicizing performance metrics and benchmarks for the reliability performance of the bulk power system and of its owners, operators and users.**

NERC has established several programs for recording, analyzing and publicizing performance metrics and benchmarks for the reliability performance of the bulk power system and of its owners, operators and users, including the Generating Availability Data System (GADS), the Transmission Availability Data System (TADS), and specific metrics and benchmarking programs, as discussed below.

**Generating Availability Data System (GADS) Program**

The GADS Program comprises a unique series of databases used extensively throughout the industry to collect, record, and retrieve operating information for improving the performance

of electric generating equipment. GADS provides assistance to those researching information on power plant availability; supports equipment reliability and availability analyses and other decision-making processes; facilitates the use of GADS data in conducting assessments of generation resource adequacy; and reports on trends in generating equipment performance.

### 1. GADS Publications and Software

The annual [Generating Availability Report \(GAR\)](#) and its accompanying [Generating Unit Statistical Brochure](#) present data for five individual years and for a five-year average with generating unit availability statistics provided on both a capacity weighted and non-weighted basis. These reports are available for download at no cost.

The [Historical Availability Statistics \(HAS\)](#) report provides annual performance information starting from 1982 through the most current year for the same groups of units that appear in the traditional GAR reports. HAS includes annual, five-year, ten-year and multi-year interval reports for each of 63 generator unit groups. GAR and HAS are combined into one self-expanding program. These Windows-based programs are free to all interested parties and can be downloaded from the NERC website.

[pc-GAR](#) is a user-friendly information software package, designed for use on personal computers, for analyzing power plant performance data. pc-GAR provides users access to millions of event records collected by GADS Services since 1982. It is used by hundreds of utility analysts in 12 countries and is the model used by the World Energy Council (WEC) Performance of Generating Plant (PGP) Committee. The program enables analysts to evaluate generator equipment performance on generating units, equipment groups, and major components. Users can access more than 2,000 cause codes collected from outage records and multiple years of performance and statistical information. In 2005, GADS Services introduced a new software product using the GADS data called pc-GAR MT. The purpose of the software was to calculate the time between failure and the time to repair based on pc-GAR retrieval criteria, event types and cause codes.

### 2. GADS Workshops

The annual GADS Data Reporting Workshop is multi-day day meeting that focuses on data collection and reporting techniques. It emphasizes the importance of accurate data reporting and builds confidence in GADS data users who come away satisfied that GADS reports provide an accurate resource of generating unit performance information. The workshop is open to anyone interested in learning about the data gathering process. Special “in-house” workshops are available to those interested in training their complete staff at their home facility.

### 3. GADS Projects and Activities

GADS supports a number of projects and activities designed to help generating facility operators improve unit reliability and performance. These include:

Benchmarking Services – a unique service for locating peer units of similar design and operating characteristics that establishes performance benchmarks for improving individual unit reliability and availability. Both domestic- and foreign-based utilities have commissioned GADS Services to benchmark generating units.

Special Studies – special generating unit performance studies for entities whose requirements cannot be met by any of the GADS products or publications. Since 1982, GADS Services has conducted thousands of studies dealing with a variety of analyses relating to generating units and equipment/component failures.

Manufacturers Support Services – allows manufacturers to review their equipment failures and to increase the reliability of their equipment. Each year, GADS receives more than 100,000 outage events containing vital information on almost every major generating unit in the United States and Canada. GADS matches these data with the design information on the unit's major equipment, providing a history of equipment outages and repairs for use in increasing equipment reliability. Manufacturers benefit by having a low cost resource to access and analyze historical equipment problems; power generators benefit as manufacturers learn from equipment failure histories and improve their equipment.

High-Impact Low-Probability (HILP) Analyses – help warn power generators about infrequent forced outage events that could cripple generating plants for a long period of time. By reviewing the outage records collected by GADS, lessons are learned from the experiences of others in order to prevent the same problem from occurring again. The hundreds of thousands of historical equipment records at the heart of the HILP analysis contain the time and energy impacts of each unit outage. Previous HILP studies involved water induction, coal plants with shared equipment, and several types of equipment failures. Through this program, GADS is available to assist power generators to maintain or increase generating unit availability and reliability.

GADS has continued to improve its database by staying abreast of changing industry needs. For example, over the last several years, GADS has upgraded the pc-GAR by adding new combined cycle information for analyzing the individual gas turbines (GT), the steam turbine or the entire block (the combination of GT and steam turbine). GADS is also adding wind turbine, the first renewable generating source, to its database so that companies can benchmark wind turbine equipment.

GADS is an active member of the American Society of Mechanical Engineers (ASME) Power Division. Through its work with the ASME Reliability, Availability and Maintainability (RAM) Committee, GADS encourages top quality technical papers and panel discussions at the annual ASME Power Conferences. Each year papers are presented that demonstrate new ways to use GADS data to improve power plant performance.

GADS was an active member of the latest revision of the Institute of Electrical and Electronics Engineers (IEEE) Standard 762, “Definitions for Reporting Electric Generating Unit Reliability, Availability and Productivity.” As a result of NERC’s involvement with IEEE 762,

NERC now has the new modified standard for measuring the performance of cycling and peaking generating units (demand-related reliability) as part of its software and data calculations.

GADS collects event and performance data for GTs and jet engine units. Strategic Power Systems, Inc. (SPS) also collects these data for its Operational Reliability Analysis Program database. Because it was inefficient for power generators to report the same information in different formats to both databases, NERC and SPS created a common software program both organizations can use.

GADS is developing a working relationship with the Institute of Nuclear Power Operations (INPO) and the International Atomic Energy Agency (IAEA) Power Reactor Information System (PRIS) members. GADS hopes to cut the reporting requirements of U.S. nuclear operators by reporting once to GADS, INPO, and PRIS databases.

As a member of the United States Energy Association (USEA), NERC supports the generating availability improvement discussions within USEA, World Energy Congress and the WEC PGP Committee. GADS also supports the WEC in its analysis of electric power supplies. GADS staff participates in WEC committees and teaches workshops in developing countries. The WEC PGP Committee is developing a GADS-type program for collecting power plant outage data worldwide. GADS has worked with PGP members over the past years to provide WEC with GADS-type procedures for the uniform collection and reporting of plant outage data.

Starting in 2004, GADS Services opened its database to generating companies outside North America. A number of European, Asian, and South American companies wanted to report GADS data in GADS format to NERC in exchange for access to manufacturer-specific data, available to GADS members only. For a nominal annual fee, international affiliate GADS members can be part of GADS and receive discounts on the purchase of the pc-GAR software.

GADS has been coordinating with members of the Canadian Electricity Association (CEA) to convert CEA data into GADS format. For several years, CEA members wanted access to GADS but only wanted to collect and report data in one format. In 2009, the translation program will be in place to convert CEA data into GADS for use by all North American utilities.

In 2008, GADS met with members of Comision Federal de Electricidad (CFE) of Mexico regarding CFE reporting to GADS. Work is underway to convert CFE data to GADS format and report to GADS starting the second quarter of 2009.

### **Transmission Availability Data System (TADS)**

The Transmission Availability Data System (TADS) collects data from Transmission Owners that are on the NERC Compliance Registry to measure the historical performance of the four elements listed below. All cited reports are posted at <http://www.nerc.com/filez/tadstf.html>.

- AC Circuits  $\geq$  200 kV (Overhead and Underground Circuits). Radial circuits are included.
- DC Circuits with  $\geq$  +/-200 kV DC voltage

- Transformers with  $\geq 200$  kV low-side voltage
- AC/DC Back-to-Back Converters with  $\geq 200$  kV AC voltage, both sides
- Program Achievements and Measurables

The NERC Planning Committee formed a task force in October 2006 to develop a proposal for quantifying and measuring transmission system performance and reliability. This proposal was to identify the type of transmission availability data that transmission owners should report to NERC; a single process for collecting such data that avoids duplication of effort; the transmission availability statistics that could be calculated from the reported availability data; and guidelines for release of the data and statistics. The Planning Committee approved the final report of the task force in June 2007, and the NERC Board approved the Phase I data collection in October 2007. NERC contracted in 2008 for development of custom software for TADS and is conducting training for data reporters under the guidance of a contracted project manager. Based on these efforts and progress to date, NERC is working with the EIA to eliminate its requirement for transmission owners to report transmission availability data as part of Form EIA-411, Schedule 7.

TADS is being implemented in two phases. Phase I requires the submittal of Automatic Outage data as described in the TADS Revised Final Report dated September 27, 2008. Data collection was initiated in 2008 as authorized by NERC's Board. The TADS Task Force prepared a report on the first quarter's results (TADS 1st Quarter 2008 Phase I Metrics and Data Report dated October 30, 2008). Phase I is mandatory for all U.S. Transmission Owners and voluntary for non-U.S. Transmission Owners. Phase II was authorized by the NERC Board to require the submittal of Non-Automatic Outage data beginning in 2010. Phase II is described in the TADS Phase II Final Report dated September 11, 2008. Phase II is mandatory for all U.S. Transmission Owners and all non-U.S. Transmission Owner who are NERC members. Specific objectives for the TADS Program in 2009 include:

- Maintain and expand the Transmission Availability Data System (TADS) and report on trends in transmission equipment performance.
- Subject to board approval in 2008, expand the system to include historic Planned Outages and related metrics required by the TADS Task Force.
- Eliminate the need for duplicate Transmission Owner reporting via EIA-411.
- Export data from TADS to fulfill the EIA-411 Schedule 7 requirements.
- Evaluate the feasibility of expanding TADS to cross reference TADS and GADS automatic outage events. (Events which automatically cause outage events on both transmission circuits and generators should be integrated and such trends tracked via TADS.)

### **Metrics and Benchmarking**

The purpose of NERC's metrics and benchmarking activities is to identify, understand, and, whenever possible, facilitate adoption of best practices or techniques that help improve

reliability performance over time. NERC's approach follows a four-phase continuous process improvement cycle – plan, collect, analyze and adapt – aimed at long-term results. Through this cycle, NERC can track performance and progress towards sustained reliability improvement. The analysis results will be tied into standards refinement and development, be used in assessment and improvement activities, help identify training/education needs, and more. The metrics and benchmarking will also be used to measure effectiveness of reliability standards and NERC's Compliance Enforcement Program.

NERC has committed resources to metrics and benchmarking development since 2006. At that time, NERC launched its reliability indicator monitoring and tracking system. NERC formed an internal benchmarking team in 2007, bringing functional expertise and the perspectives from each NERC program together to help direct the effort. NERC's Planning Committee formed a Reliability Metrics Working Group (RMWG) in early 2008 to advise and support the needs of the metrics and benchmarking program, especially metrics development for assessing an Adequate Level of Reliability.

The RMWG has developed an open process for industry metrics vetting (see Metrics Templates at <http://www.nerc.com/filez/rmwg.html>). A draft report outlining this process and identifying the first set of metrics addressing the adequate level of reliability was sent to the NERC Planning Committee for review and endorsement ([http://www.nerc.com/docs/pc/rmwg/RMWG\\_Report\\_May%20-29-09\\_v2.pdf](http://www.nerc.com/docs/pc/rmwg/RMWG_Report_May%20-29-09_v2.pdf)).

As part of its continued efforts to enhance the Reliability Metrics and Benchmarking Program, NERC developed a draft plan<sup>182</sup> for an advanced system for establishing those metrics. The objectives of this plan are to develop guidelines for acceptable metrics, assess available metrics, maintain and monitor reliability indicators on NERC's Web site (see <http://www.nerc.com/page.php?cid=4/37>) and develop from analysis of these metrics appropriate reliability performance benchmarks. The plan calls for the development and use of three major indices as reliability performance metrics used to judge the relative performance of the bulk power system:

- **Reliability Performance Gap (RPG):** designed to measure how far the system is from expected performance under contingencies (dynamic conditions). Reliability Performance Gap Events are the disturbances that significantly affect the integrity of interconnected system operations. They are divided into five categories to take into account their different system impact.
- **Adequacy Gap (AG):** designed to measure the capacity and energy shortage from expected adequacy level under steady state conditions. Adequacy Gap Events are

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<sup>182</sup> [http://www.nerc.com/docs/pc/rmwg/Reliability\\_Metrics\\_white\\_paper\\_draft.pdf](http://www.nerc.com/docs/pc/rmwg/Reliability_Metrics_white_paper_draft.pdf)



divided into three main categories, exemplified in the three categories based on the Standard EOP-002-0 (Capacity and Energy Emergencies).

- **Violation Index (VI):** designed to measure the reliability improvement from compliance with NERC Reliability Standards. The Violation Index is designed to measure improvement in compliance with standards. The VI for each entity is weighted based on each violation's VRF and VSL. A VRF and VSL weighted-violation average can determine the change in reliability levels due to confirmed standard requirement violations. The weighting values can be derived by applying similar ratios developed in the NERC Sanction Guidelines to assess the potential consequences of a particular violation. Violations of a higher risk factor requirement have a higher weighting value in the index than violations of lower risk factor requirements. The index decreases if the compliance improvement is achieved over a trending period.

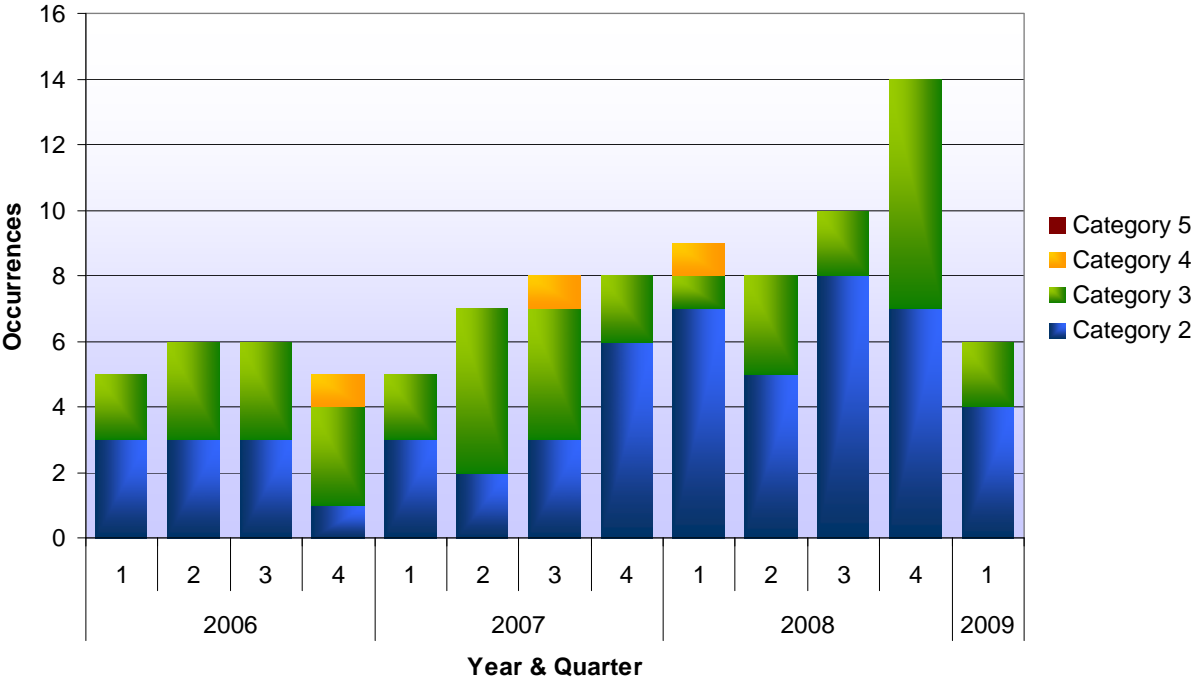
These three indices are intended to capture and represent many complex reliability parameters into easy to understand reliability performance metrics.

NERC performed its initial analysis of reliability metrics from the last six years and results of historical trends of reliability are provided for the first time in the *2008 Long-Term Reliability Assessment*. Understanding these trends can lead to improved bulk power system reliability. For example, indication of ongoing threats to reliability can stimulate pre-emptive action in future designs towards maintain bulk power system reliability.

Figure 1 below depicts all Category 2 through 5 system events for 2002-2008 and the first quarter of 2009.

**Figure 1 – Disturbance Event Trend**

**Number of Disturbance Events by Severity, Year & Quarter**



These data clearly indicate that gaps exist between actual performance and expected system behavior under actual operating conditions. Ultimately the most important measure of operating reliability is that the number of events declines towards zero.

Figure 2 below summarizes the contribution of leading causes to the total number of events in 2006, 2007, 2008 and the first quarter of 2009.

**Figure 2 – Reported Events by Cause Codes**

**Bulk Power Disturbances by Cause and Year (2006-2009)**



More work is required to examine the root causes of these events, including the significance of protection system misoperations, the effects of human activities (both by utility

workers and the public), and the influence of equipment failures on reliability performance. The objective is to recognize and eliminate unreliable actions and at-risk conditions.

The System Protection Initiative is a top priority for NERC along with its stakeholder committees and standard drafting teams. Protection system misoperations are a leading root cause of bulk power system disturbances, either causing or exacerbating a growing percentage of bulk power system outages over the past several years. For example, these misoperations contributed to over 50% of system disturbances (Categories 2-5) in 2008. In April 2009, NERC launched a comprehensive initiative ([http://www.nerc.com/fileUploads/File/News/spi-letter\\_24Apr09.pdf](http://www.nerc.com/fileUploads/File/News/spi-letter_24Apr09.pdf)), designed to coordinate ongoing activities and improve the performance of power system protection and control systems. The System Protection Initiative focuses on the following areas:

1. Relay Loadability
2. Protection System Redundancy
3. Protection System Coordination
4. Generator Frequency and Voltage Protective Relay Coordination
5. Transmission and Generation Protection System Misoperations
6. Protection System Maintenance

In 2008, NERC's reliability indicators were tracked and updated with revised performance indices and leading indicator trends.<sup>183</sup> These performance indices and trends will be monitored throughout 2009 and changes in reliability performance reported. With experience in 2009, benchmarks for each indicator may then be developed.

Since being certified as the ERO, NERC has taken on the role of being an independent source of reliability performance information, thereby fulfilling one of the recommendations in the April 2004 U.S.–Canada Power System Outage Task Force Report on the August 14, 2003 blackout. The GADS program, which NERC has operated for many years, provides an independent source of reliability performance information for the generation sector of the bulk power system. NERC is developing TADS to provide a comparable, independent source of reliability performance information for the transmission sector of the bulk power system. The greatest use of TADS data will be for outage cause analysis and outage event analysis. Event analysis will aid in the determination of credible contingencies and will result in better understanding. This understanding should be used to improve planning and operations. Ultimately, these improvements should result in improved transmission system performance. In addition, trending performance within each Region against its own history will show how that Region's performance is changing over time.

The analyses described above demonstrate that the metrics and benchmarking program is a performance-oriented, results-driven reliability enhancement program which prepares the industry to address new standards, emerging reliability issues, and may ultimately lead to new

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<sup>183</sup> <http://www.nerc.com/page.php?cid=4|37>

standard authorization requests. By defining various metrics and indices, it is possible to use amassed historical data to track the success of various initiatives and develop leading indicators and root causes of unreliable system performance based on past events. As indicated in the event tracking and root cause analysis described above, the advanced metrics system is used to (1) measure past and current reliability and progress in ensuring reliability, and (2) identify factors that positively or negatively impact reliability and reliability problems and solutions. Another critical role the metrics system plays is to measure effectiveness of reliability standards and enforcement programs. Reliability performance metrics and benchmarking activities are a key part of a continuous reliability improvement cycle.

**F. Situational Awareness and Infrastructure Security Program**

- 1. NERC shall monitor conditions on the bulk power system and provide leadership coordination, technical expertise, and assistance to the industry in responding to events, including by:**
  - a. Maintaining real-time situation awareness of conditions on the bulk power system.**
  - b. Serving as the coordinator of the Electric Sector Information Sharing and Analysis Center (ES-ISAC).**
  - c. Notifying the industry of major bulk power system events that have occurred in one area and have the potential to impact reliability in other areas.**
  - d. Maintaining and strengthening high-level communication, coordination and cooperation with governmental authorities regarding real-time conditions.**
  - e. Facilitating information exchange and coordination among reliability service organizations.**

NERC has been developing its ability to monitor reliability of the individual interconnects that comprise the North American bulk power system. NERC's Situational Awareness and Information Security (SAIS) program manages a NERC/ES-ISAC duty position that is responsible for receiving event and incident reporting from bulk power system entities, triage event information as appropriate, develop a summary of major events and share information with the appropriate authorities. NERC SAIS/ES-ISAC has monitored conditions on the BPS and conducted numerous information sharing calls with the electric sector, other infrastructures and government partners. The coordination calls have been conducted in response to hurricanes, wildfires, security concerns and frequency disturbances.

**Electric Sector-Information Sharing & Analysis Center (ES-ISAC)**

The ES-ISAC serves the Electricity Sector by facilitating communications between electricity sector participants, federal governments, and other critical infrastructures. NERC has overlapping responsibilities in the U.S. under section 215 of the FPA as the ERO to monitor

cyber security risks that can threaten the reliability of the bulk power system. The NERC Chief Security Officer (CSO) and SAIS Vice President is responsible for both objectives and has consolidated both functions under the ES-ISAC.

It is the job of the ES-ISAC to promptly disseminate threat indications, analyses, and warnings, together with interpretations, to assist Electricity Sector participants in taking protective actions. As the ES-ISAC, NERC gathers, disseminates and interprets security-related information for the entire electricity sector. The Commission has oversight of NERC's alerting process for bulk power system entities in the U.S. under section 215, and Canadian authorities provide guidance for alerting entities in Canada.

This arrangement serves two functions (voluntary CIP partnership function as the ES-ISAC and the ERO reliability monitoring function under section 215) with one organization working toward a common objective. The ES-ISAC is a U.S. construct developed under Presidential Decision Directive 63 and is meant to serve all entities in the U.S. electricity sector. The U.S. DOE designated NERC as the electricity sector coordinator for critical infrastructure protection. To fulfill this obligation, NERC operates the ES-ISAC and provides the framework for industry policy level engagement through the Electricity Sector Coordinating Council (ESCC). The ES-ISAC also works closely with the U.S. Department of Homeland Security and [Public Safety Canada](#) to ensure the critical infrastructure protection functions are coordinated with the governments of the United States and Canada.

### **Situational Awareness Tool Project for North American Authorities**

This project and ongoing function will allow NERC to assemble a North American-wide reliability picture. The project is working to develop an initial plan, based on Commission requests, to enable 100% of reliability coordinators in the United States to display bulk power system conditions to the Commission, NERC, and Regional Entities. This will be accomplished through an internet-based system that provides visual displays for the Commission, NERC, and the Regions while all the data resides at the reliability coordinators. Future stages will include discussions with Canadian stakeholders to investigate the benefit and desire to expand the approach to include Canadian information.

Several recent achievements include the hiring of a vice president to oversee NERC situational awareness functions, enhancements to the ES-ISAC, and successful collaborations to develop a uniform approach for the provisioning of information to monitor reliability conditions. The ES-ISAC has been maturing its analytical process and reporting capabilities, through the initiation of several improvement projects. This includes working with the compliance and event analysis programs to streamline and regularly test the notification lists used by NERC to improve the distribution of Alerts, educate recipients on all forms of Alerts, and demonstrate the ability to provide information and instructions in an efficient and effective manner. NERC has increased the development and dissemination of Critical Infrastructure Protection Alerts, with ten Alerts being issued in the last quarter of 2008.

The ES-ISAC's renewed focus on operational excellence has prompted significant process engineering and rigorous use of the NERC ROP §810 formal notification process

developed and approved in 2007. Recent enhancements and industry efforts have resulted in rapid improvements in the acknowledgement and response rate to Level-2 or higher Alerts. NERC has issued two, Level-2 CIP Industry Recommendation (Alerts), one in September and another in October. There has been significant improvement to NERC's alerts process and industry's performance from an Alert response rate of just over 58% for a pool of approximately 1,200 recipients in October to the most recent response rate from a pool of approximately 1,800 recipients of over 94%. NERC's steps to improve the process included a training "Webinar" with over 1,000 participants, provision of an "Alerts Frequently Asked Questions (FAQ)" document, and notable process improvements. The launch of a new online acknowledgement tool greatly improved NERC's ability to account for responses and follow up with non-respondent entities. This enhanced capability to identify, evaluate and provide notifications of CIP related reliability concerns will better position bulk power system entities to uniformly mitigate risks.

NERC's use of Alerts is applied across the North American bulk power system. NERC CIP leadership has traveled to Canada to coordinate with federal authorities and integrate work processes so that NERC can assist in achieving Canadian CIP goals. The Alert capability is seen as an important tool for communicating threat and vulnerability information. The threat and vulnerability evaluation and Alert generation process includes participation from Public Safety Canada and the Royal Canadian Mounted Police (RCMP).

NERC recognizes the need to mature the ES-ISAC, enhance its coordination and communication procedures and develop more effective ways to assemble knowledge pertaining to bulk power system operating conditions. NERC has been able to improve the effectiveness of these activities after a series of learning opportunities during 2007. NERC is improving its capability by re-organizing the SAIS program to provide a greater focus on situational awareness functions, established mechanisms for executive-level guidance and direction, reaching out to form effective industry and regional collaborations, and increasing the resources dedicated to the operation of the ES-ISAC.

Although the ES-ISAC has been operated by NERC since 2000, it has previously lacked a clear governance structure and guiding charter document. NERC's Board of Trustees has formed the Electricity Sector Steering Group (ESSG) to provide executive level guidance and strategic direction for the ES-ISAC. The ESSG provides strategic and policy guidance to the ESCC and to NERC in its role as the operator of the ES ISAC. The ESSG was formed in the second quarter of 2008 and has conducted two meetings. The ESSG is providing additional direction and is providing an excellent channel for senior executive's engagement with NERC staff and ESCC members. The ESSG conducted an open meeting on December 10, 2008 to discuss existing electric sector public and private partnership engagement activities. Discussion and direction was provided on topics such as the ESCC engagement with DHS on Tier-I and II critical asset list criteria, U.S. clearances for the sector, future classified briefings, and vulnerability management coordination.

2. **NERC shall provide tools and other support services for the benefit of reliability coordinators and other system operators, including:**
  - a. **Maintaining the reliability and effectiveness of all mission-critical operating reliability support systems and services.**
  - b. **Investigating, analyzing and, if deemed appropriate, supporting implementation of, high-speed real-time system measurements, including phasors, in predicting the behavior and performance of the Eastern Interconnection.**
  - c. **Facilitating real-time voice and data exchange services among reliability coordinators.**

NERC manages the provision of system reliability tools, such as the Interchange Distribution Calculator (IDC), facilitates reliability coordinator communications, and helps to incubate next generation reliability tools. Many of the NERC-provided reliability tools are essential to registered entities to enable them to effectively carry out reliability responsibilities. The industry has become dependent on the tools to implement processes required by both NERC Reliability Standards and NAESB Business Practices. The tools enable processes that would be difficult to implement manually with the current level of staffing. NERC has completed a review of all of the provided reliability tools and is in the process of developing life-cycle strategies to include turning the rights to the tools over to other entities or businesses where appropriate. Examples of NERC-managed tools and NERC-provided situational awareness functions include:

- **Interregional Security Network (ISN):** An information sharing network used by Reliability Coordinators to exchange data with each other and with NERC. ISN data is exchanged in real-time via the Inter Control Center Protocol (ICCP). The Data Exchange Working Group is responsible for decisions relating to the data that is exchanged over the ISN. The ISN travels atop NERCnet, a private frame relay communications network.
- **NERC Factor Viewer (NFV):** This tool allows transmission customers in the Eastern Interconnection to view various factors related to transmission congestion (generation shift factors, transmission distribution factors, load shift factors, and generation and load distribution factors). This information is especially important to transmission customers during Transmission Loading Relief (TLR) 3 events and above when transmission paths become constrained. It allows reliability coordinators to concentrate on managing congested flow gates uninterrupted by transmission customers' requests for information.
- **System Data Exchange (SDX):** This tool provides a central repository of all scheduled and ongoing generator and transformer outages throughout the Eastern Interconnection. The SDX was created in response to the increased need for accurate data exchange used to support reliability related applications, such as the IDC, and provides input to the IDC. This data is made available to NERC-approved operating reliability entities who have agreed to terms of the NERC Data Confidentiality Agreement. Data from the SDX is used within the IDC and information may be downloaded for use in updating calculations of available transfer capability. This tool is used by all Eastern Interconnection reliability

coordinators and by some balancing authorities and transmission operators. This tool provides input to the IDC.

- **Central Repository of Curtailment Events (CRC):** This tool is a limited-access Web site that allows transmission customers to view current and historical (TLR) activity, system flows, and energy emergency alerts. The NERC Factor Viewer is accessible from this website, and the Book of Flowgates and the IDC reference base case can be downloaded from the site. This website was created at the request of NERC’s Market Interface Committee in response to FERC Order No. 605, mandating public access to curtailment information. It provides ready access to historical curtailment information for events analysis purposes.
- **Book of Flowgates (BoF):** This dataset is a compendium of all flowgates in the Eastern Interconnection. It is an essential input to the IDC. The existing BoF is an Excel spreadsheet and is updated via e-mails to and among the NERC Distribution Factor Working Group (DFWG) each month. The original BoF contained 730 flowgates and 9 tables; it now contains more than 1,500 flowgates and 13 tables. NERC is currently in the process of developing a replacement tool for the current BoF. The future BoF Data Base project will provide a centralized online system for managing changes to the BoF, enable users to download customized flowgate reports, and serve as a tool for storing Eastern Interconnection model files.
- **Near-real-time monitoring of Area Control Error (ACE) and interconnection-wide frequency for the Reliability Coordinators:** This tool gives Reliability Coordinators time to work with Balancing Authorities to make corrections in resources and dispatch. It was developed in 2004 and has undergone several enhancements in 2006 through 2008. Application allows NERC RCs and BAs to be alerted when ACE is violated or frequency variations occur.
- **Frequency Monitoring and Analysis (FMA) Using Phasor Measurements:** This tool can be used to identify the cause of interconnection frequency fluctuation and frequency response deterioration. It can help guide actions to remedy the situation. The system will include data collection, analysis, and report capabilities.
- **Real-Time Resources Adequacy Intelligent Alarms:** Intelligent Alarms are providing RCs, BAs, and Resources Subcommittee key, timely information for critical Resource Inadequacies conditions such as major tie-errors, inaccurate load-forecast, inadequate frequency response. The system has been in production and broadcasting alarms since January 2007. The Intelligent Alarms include key performance information (intelligence) to quickly identify the alert’s root-causes and allow the RCs to determine possible corrective actions.
- **Inadvertent Interchange Application:** This tool facilitates the entering of monthly scheduling data, and then assists in the monitoring and resolution of reliability issues originated by Inadvertent Interchange imbalances with adjacent BAs. It also facilitates the submittal of monthly inadvertent performance standard reports to NERC. This



application is an adaptation of a tool developed by SPP and has been in production since January 2007. Inadvertent Interchange application measures the health of each interconnection by summarizing the inadvertent interchange balances, identifying which BAs are leaning on the interconnection, and which BAs are supporting frequency.

- **Wide-Area Real Time RBC Monitoring:** The Reliability Based Control (RBC) concept was developed by the Balance Resources and Demand standard drafting team, is currently being field tested for accuracy and operational benefits, and will continue to be developed through the standards process. This tool will monitor field trial performance for reliability based control Standards. RBC Standards are undergoing field trial. The RBC concept makes each BA accountable for its ACE on a real-time basis through a frequency-dependent compliance measure. This tool gives the BAs, the RCs, and the Resources Subcommittee visual and statistical methodologies to monitor the BAs' ACE against the real-time RBC values.
- **North American SynchroPhasor Initiative (NASPI):** This technology and associated interconnect-wide networks will improve the monitoring of the bulk power system in North America. It will provide the operators with greater situational awareness, allow for earlier detection of disturbances on the interconnections, and more rapid investigations of disturbances after they have occurred. SynchroPhasors will support reliability by increasing situational awareness and provide operators with tools to better control the interconnections. In early 2008, NERC decided that the promise of synchrophasors for grid event forensics investigations and improving future operational reliability was so great that it justified hiring a Project Manager to focus and accelerate the industry's adoption of PMUs and phasor data applications. In July 2008, NERC's Board approved the plan developed by the Project Managers and NERC management, which included hiring TVA under contract to continue operating the existing Eastern Interconnection phasor aggregator and to develop and operate the Generation 2 regional PDC, funding the Project Manager activities, and funding NASPI-related legal work to develop an information sharing framework. NERC will work with the NASPI leadership team to develop a roadmap and vision for integrating PMU, NASPInet, PDC and phasor data applications technologies.
- **Interchange Distribution Calculator (IDC):** This tool is used primarily to implement NERC's TLR Procedure. Each RC in the Eastern Interconnection has the option of invoking the NERC TLR or other a agreed-upon local procedures to relieve network congestion. In accordance with Requirement 2 of reliability standard IRO-006-3 (Reliability Coordination — Transmission Loading Relief), a RC experiencing a potential or actual system operating limit or interconnection reliability operating limit violation within its reliability area shall, at its discretion, select from either a "local" (Regional, Interregional, or sub-regional) transmission loading relief procedure or an Interconnection-wide procedure. The Interconnection-wide TLR procedure for use in the Eastern Interconnection is provided in Attachment 1 to Standard IRO-006-0, and is programmed in the IDC.

- **Reliability Coordinator Information System (RCIS):** This system provides the exchange of operational and security information in real time. It represents a uniform, easy-to-use mechanism for information exchange as well as a central, secure location for viewing information pertinent to all RCs. The RCIS has been in service since 1999. The application was rewritten and new functionality added in 2007. The RCIS provides the ability to rapidly share information directly related to operating conditions on the bulk electric system.
- **Spare Equipment Database (SED):** This dataset is an inventory of spare transformers that may be available to a utility in the event of an emergency. The SED application has two functions: the first allows owners to enter and update information about their spare transformers into the database; the second allows authorized NERC staff to search the database to locate equipment that meets specified criteria. Should a spare transformer be needed in an emergency situation, a utility may enter a request to NERC staff, documenting the type of equipment it requires. The dataset matches needs to resources and supplies contact information to the requester for follow up.
- **Transmission Availability Data System (TADS):** This database, which is described in greater detail in the discussion of the NERC Reliability Assessment and Performance Analysis Program, is being used to collect information from the industry about the availability of transmission lines operating above 220 KV. It will collect the causes for outages and be used to develop performance benchmarks. This system supports reliability by gathering information about critical components of the bulk power system and organizing the information for the industry to develop meaningful performance benchmarks.
- **Transmission System Information Network (TSIN):** This software tool enables industry participants to register for access to OASIS nodes, and to document information necessary to participate in the industry's electronic tagging process.

NERC has been supporting, enhancing and developing next generation bulk electric system reliability tools since 2006. In recognition of the importance of these tools, NERC has embarked on an effort to develop a framework to identify requirements that might lead to new reliability tools, plan for the best approach for the incubation and management of current and future tools and promote a future model for reliability tool development and sustainment. In 2007 NERC established guidelines for reliability tool development and operations. NERC continued to make progress in laying a foundation for this effort through the creation of a life-cycle evaluation process for future reliability tools in 2008. Since 2006, NERC has incubated three additional reliability tools and made several enhancements to existing tools.

NERC is committed to improving its ability to efficiently and effectively develop and manage existing and future reliability tools. The SAIS program will work closely with NERC's Chief Information Officer and the Technology Committee of the Board of Trustees to implement the new framework to better manage the portfolio of reliability tools. The new framework takes a "cradle to grave" approach and will require NERC to develop plans to sustain, enhance, and in some cases turn over existing tools to other organizations. NERC recognizes the importance of

today's tools and believes new technology will provide better ways to monitor and manage the bulk power system.

**3. Critical infrastructure protection – NERC shall:**

- a. Address critical infrastructure protection issues across NERC program areas consistent with each program's scope, authority, policies, procedures and protocols.**
- b. Take a leadership role in critical infrastructure protection of the electricity sector, and coordinate electric industry activities to promote critical infrastructure protection of the bulk power system in North America, so as to reduce vulnerability and improve mitigation and protection of the electricity sector's critical infrastructure.**

NERC's Critical Infrastructure Protection (CIP) activities include the development of CIP standards, CIP compliance and enforcement program, security guidelines, and coordination with federal authorities. In an August 2006 filing with the Commission, NERC requested approval of eight new cybersecurity standards (CIP-002-1 to CIP-009-1) to provide a comprehensive set of requirements to protect the bulk power system from malicious cyber attacks. On January 18, 2008, the Commission issued Order No. 706, approving as mandatory the eight Reliability Standards for Critical Infrastructure Protection submitted by NERC in August 2006.<sup>184</sup> Approval of the CIP Reliability Standards was a major step forward in ensuring the reliability of the electric grid because these standards set forth specific requirements that are binding on users, owners and operators of the bulk power system to safeguard critical cyber assets.

NERC has organized for, and began to resource, the CIP program as a core program. NERC has hired a recognized CIP expert as Chief Security Officer (CSO) to lead these efforts. NERC has enhanced the management and governance structure by making the CSO a direct report to the CEO and establishing the ESSG to provide program guidance. NERC has recognized the need to elevate the importance and urgency associated with cyber threats. Several new CIP initiatives were completed in the last quarter of 2008 to mobilize bulk power system protection efforts. These initiatives include enhanced industry executive awareness and participation through the establishment of the ESSG and holding a cyber summit in September of 2008. NERC has made significant organizational changes by consolidating responsibility for coordination of security matters across all NERC activities into a single responsible area and hiring a CSO to oversee the enhanced program.

NERC has already completed a review of its standards process to support the development of future CIP standards and respond to urgent security concerns. This review was conducted by NERC staff and the Board of Trustees in coordination with the Standards Committee. The review has identified changes that are in development to enhance formal notification mechanisms that rely upon existing authorities under NERC's ROP and to make

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<sup>184</sup> *Mandatory Reliability Standards for Critical Infrastructure Protection*, Order No. 706, 122 FERC ¶ 61,040, *reh'g denied*, Order No. 706-A, 123 FERC ¶ 61,174 (2008).

modifications for the development of emergency CIP standards. The recommended changes are designed to provide a level of due process and technical review, but also provide the necessary speed and confidentiality to address national security concerns.

CIP-focused risk monitoring and mitigation efforts have already resulted in improved ES-ISAC performance and more comprehensive vulnerability reporting. The CIP program has begun a pilot to better leverage industry expertise in the evaluation, validation and mitigation of security risks. The pilot began in October of 2008 and has already engaged industry technical experts in the evaluation of eight cyber vulnerabilities and drafting of the last five ES-ISAC issued Alerts. The pilot has provided valuable expertise and knowledge, directly increasing the quality of ES-ISAC notifications.

Since issuance of Order No. 706 in January 2008, NERC has been working to implement the compliance and enforcement program for the eight new CIP standards. NERC has been preparing to evaluate how these Reliability Standards will work in practice, monitor industry and technology developments, and determine on an ongoing basis whether these Standards should be improved, or new standards should be promulgated.

In response to Order No. 706, NERC formed a new Standard Drafting Team. The drafting team, with augmented NERC staff support, selected a multi-phase approach to enhance and revise the CIP standards. Phase I changes were posted for comment in December 2008, with responses due back early in 2009. These changes were balloted in March 2009 and will be reballoted after comments submitted in the first ballot round are addressed. Work on Phase II has already begun and will result in more significant revisions which may change some of the philosophical foundations of the standards. These efforts will include a more thorough evaluation of the National Institute of Standards and Technology standards and risk management framework and their applicability to the bulk power system, as specified in PP 232-233 of Order No. 706. The CIP program is providing technical expertise and will assist the drafting team chair and vice chair by being a steward of the requirements set forth in Order No. 706.

The CIP standards differ from traditional reliability standards due to the specific nature of the expertise necessary to align security practices with operational realities. The SAIS program is working with the Compliance Monitoring and Enforcement Program to train staff and develop an efficient capability to assess, investigate, evaluate, and audit compliance with the CIP standards. The first project has been to work with the Training and Education Program to develop an auditor training program for the CIP standards. The initial course pilot has been completed and SAIS is working to support the classes to be offered in November 2009.

As stated, NERC has embarked on a concerted effort to improve its ability to lead CIP efforts for the electric sector. New NERC efforts in 2009 include performing a cyber risk preparedness evaluation and conducting comprehensive and continuous risk assessments for the bulk power system. The cyber risk preparedness evaluation will focus on investigating the existing capabilities to prevent, detect, respond to, and limit the potential damage of existing/emerging attack techniques with the objective of understanding the preparedness of both individual entities and existing processes/mechanisms to ensure reliability of the bulk power system while under a cyber attack. The cyber risk preparedness evaluation will provide a

benchmark and identify valuable practices and gaps to be addressed. This foundation will be built upon by the introduction of formal and re-occurring assessments of threats facing the bulk power system. NERC, with the guidance of the ESSG, will establish a protocol with DHS, DOE, the Commission, and their Canadian counterparts to ensure comprehensive cyber security threat analysis and risk assessment is available to NERC from a consolidated government voice, with industry users, owners, operators able to participate directly.

To ensure NERC is making decisions and setting priorities on the most current information, NERC will, in consultation with the Commission, organize briefings for the ESSG, the NERC CEO, and senior level utility executives across all stakeholder groups on cyber security threats. The first of these briefings was held in January 2009 included U.S. and Canadian bulk power system top executives. The CSO has undertaken an effort to work with the NERC CIPC to create a program charter for the ES-ISAC, for the ESSG to review and consider for approval in the near future. The ESSG has completed its review and is actively engaging and expects to conduct a joint meeting with existing members of the ESCC. In setting a strategic course for the industry, the ESSG will seek guidance and may request input from any NERC committees, including the MRC, CIPC, OC, and PC, other industry groups such as trade associations, or other groups such as NIAC, the ISAC Council, the PCIS, or other groups as appropriate to the matter at hand. Additionally, the ES-ISAC is maturing its processes for engaging industry experts to assist in the evaluation of security threats and vulnerabilities. NERC is evaluating technologies to improve the quality, security and timeliness of ES-ISAC notifications.

The risk assessment program function provides a formal plan and engagement strategy to receive infrastructure protection concerns from government organizations and assemble a landscape of physical and cyber security risks to the bulk power system by assessing threats and hazards. This effort will include the development of a common language to be used by NERC to classify risks to draw the appropriate attention. It will also enhance NERC's ability to evaluate the electricity sector's existing risk management strategies and efforts to address agreed upon concerns, and add a level of discipline necessary to put specific concerns in context to enable a more strategic approach to managing infrastructure protection risks. The goal will be to have an ongoing process that provides the opportunity for emerging concerns to be evaluated and communicated to the appropriate parties. The process will include an executive-level briefing for the ESSG and other senior managers to outline the concerns, risks, and ongoing efforts.

NERC is developing two new systems that will improve the Cyber Security Alert process, the NERC Secure Alerting & Notification System (NSANS) and HYDRA. HYDRA is a program that identifies and manages security knowledge resources and weaves them into the fabric of the ES-ISAC's business processes and workflows. Together both the content and level of detail obtained via HYDRA, and the target audience delivery, executed via the NSANS application, will be substantially improve the overall Cyber Security Alert process. NSANS and HYDRA are described below.

**NSANS.** NERC has worked with industry stakeholders, the recipients of Alerts, to design and implement a NERC Secure Alert System. Leading up to this decision, NERC staff identified where it can address process weaknesses and better communicate and educate

registered entities on what formal notifications are used for, their obligations to acknowledge and respond, how the process works and how to resolve problems. NERC has conducted two Alert webinars that reached an audience of over 1,500 individuals, and the NERC Chief Security Officer has made Alerts a topic for all interactions with industry. The NSANS will give the ES-ISAC/NERC the power to alert and notify registered entities of the bulk power system, and other utilities of the electricity sector, of vulnerabilities, threats, and/or abnormal events/conditions, or other significant events that may impact the bulk power system. The new alerting platform enables rapid alert creation and dissemination to the electric industry, as well as, providing for flexible user controlled account management and permissions to facilitate, quick acknowledgement and response from the industry via the combination of a notification engine and a secure web browser portal.

**HYDRA.** The CIP program started a pilot to better leverage industry expertise in the evaluation, validation and mitigation of security risks. The pilot began in October of 2008 and has already engaged industry technical experts in the evaluation of eight cyber vulnerabilities and drafting of the last five ES-ISAC issued Alerts. The pilot, with an initial subject matter expert pool has provided valuable expertise and knowledge directly increasing the quality of ES-ISAC notifications. The ES-ISAC processes for engaging experts and evaluating technology vulnerabilities is being matured to achieve consistency and quality. This effort is being called “network HYDRA,” which is a program that identifies and manages security knowledge resources and weaves them into the fabric of the ES-ISAC’s business processes and workflows. The ES-ISAC as a hierarchical organization must develop focused bridges and touch points into the broad social network of security, technology and infrastructure experts that exist in our industry.

One of the initial priorities of the CIP program was to work with Event Analysis and NERC’s support organizations to enhance the NERC ROP §810 notification and response process, conduct exercises, provide training for recipients, and employ the process to address security risks. NERC has developed and executed an improvement program that has focused on standardizing, educating, enabling entities to develop processes to meet obligation and, most importantly, demonstrate the use of the process. NERC invested in a dedicated staff member to manage the Alert process and work with recipients to address issues and develop a planned approach for implementing improvements.

The Director of National Intelligence worked with NERC and industry to host a meeting on January 15, 2009 to share information and educate key decision makers on the cyber security challenge. The meeting, which was attended by industry chief executives, included briefings from national security officials and a round table discussion regarding the cyber threats facing North America. The U.S. Government conducted security vetting and provided special access to participants representing all types of electricity sector organizations from the U.S. and Canada. The meeting was successful in providing meaningful dialogue about threats we face, sharing our collective insights and perspectives, and started an ongoing discussion on how we improve our cyber security.

NERC was heavily criticized for its response to one specific cyber security vulnerability in 2007. The effectiveness of the CIP program was rightfully questioned by stakeholders, which

has prompted NERC to make a significant commitment to improve the program. NERC's commitment and initial plan were developed in July of 2008 and the plan is now in its execution phase. NERC has made progress and has already seen improvements in its performance. NERC is committed to actively managing this program area and recognizes, as the ERO, it must be at the forefront of CIP in North America.

**G. Members' Forums**

- 1. NERC will form, and facilitate the activities of, forums for NERC members that serve the interests of members within individual industry sectors and enable members to identify and exchange information on best practices for reliable operations and on performance evaluations, and to disseminate information on lessons learned from operating experience.**

NERC presently has one forum, the Transmission Owners and Operators Forum ("Transmission Forum") whose purpose is to improve the reliability and security of the bulk power system by facilitating the pursuit of operational excellence through a forum where transmission owners and operators can identify and exchange information on best practices for reliable operations, evaluate their own performances against those best practices, disseminate lessons learned from disturbances and near misses, and facilitate the utilization of such information in a timely manner, among other things.

NERC forums are financially self-sufficient and therefore do not rely on funds from NERC's assessments. However, the Transmission Forum's charter specifies that the NERC Board approve the Transmission Forum's budget. Membership dues received from Transmission Forum members are functionally separated from ERO assessments received from load-serving entities or their designees. To the extent membership dues exceed Transmission Forum expenses in any year, such excess will be held for Transmission Forum use and not used to support NERC activities. The Transmission Forum currently contracts with NERC to provide administrative services and employee benefits, for which the Transmission Forum reimburses NERC.

The Transmission Forum charter was first approved on November 1, 2006. It was revised to broaden opportunity for membership on July 30, 2008. The Transmission Forum's present membership eligibility requirements extend the opportunity to those organizations that own or operate at least 50 circuit miles of transmission lines at 100 kV or greater, or operate a "24/7" transmission control center with NERC-certified transmission or reliability operators, or have an open access transmission tariff or equivalent on file with a regulatory authority. The Transmission Forum presently has over 500 individual participants from among its approximately 50 members including investor-owned, state-authorized, municipal, cooperative, U.S. federal, and Canadian provincial utilities.

In the short time period since its formation, the Transmission Forum has grown significantly and developed a robust set of programs to benefit its members. The Transmission Forum's organization and current programs are described in the document entitled "The Pursuit of Excellence – Transmission Owners and Operators Forum Organization and Programs." This document, which is available on the NERC Website under "Programs – Transmission Owners

and Operators Forum – About the Forum,” includes a brief history of the Transmission Forum, its mission, vision and core values, a description of Transmission Forum’s organization and governance, and descriptions of program activities. Specific achievements and measurables of the Transmission Forum include the following.

1. Practices

The Transmission Forum is writing practices in several areas. Two are complete, and several others are in various stages of drafting:

a. Vegetation Management

- Inspections — V 1.0.0 – Inspection frequency, methods, combining with other maintenance inspections, inspector qualifications and training, data and documentation, communications, and hazard trees. This practice is now in effect.
- Annual Work Plan — V 0.7.3 – Elements of the annual work plan, implementation, adjustments, data, documentation, and an example of a work plan for a line section. The draft is almost complete, and the practice should be ready to implement in 2009.
- Imminent Threat Procedures — V 0.2.1 – Identification, notification, mitigation, and documentation of vegetation that poses an imminent threat to one or more transmission lines.

b. Operator Tool and Environment

- Alarm Tools — V 1.0.0 – Advanced alarm processing techniques, alarm notification, alarm response, and alarm tool monitoring. This practice is now in effect.
- Emergency Tools — V 0.3.0 – Demand side management, standby generation, voltage reduction, rotational load shedding, and emergency communications. The draft is almost complete, and the practice should be ready to implement in the first half of 2009.
- Inter-Control Center Communications Protocol (ICCP) — V 0.3.0 – ICCP system availability, data coordination and quality, data updates and naming conventions, change management and coordination, system management, and dispute resolution. The draft is almost complete, and the practice should be ready to implement in the first half of 2009.
- State Estimator and Contingency Analysis — V 0.2.0 – Availability and solution quality monitoring, support and maintenance, triggering, save case management, external modeling, and solution validation. The draft is in process and should be ready by early summer 2009.

c. Compliance

The development of practices for compliance is in the early stages. Members have focused on sharing experiences and identifying elements to create a “culture of compliance.” The group is developing practices in five areas:



- Evidence — Determine and document from experience the best evidence of compliance with requirements of standards. Initial work will begin on the most frequently violated standards and those that are targeted for self-certification in 2009.
- Management — Guidance for senior management support of an internal compliance program.
- Internal Assessment — Procedures to perform an internal assessment/audit process for internal compliance programs, including tools to assess the effectiveness of a program.
- Document Management — Compliance evidence document management, including developing generic guidance on what should be included in the audit binders.
- Industry Experience — Identify items that your company should review and how to pass them along to the correct person. Including the flow of information when advisories are issued by NERC or a regional entity.

d. Operator Training and Development

- Systematic Approach to Training (SAT) — Objectives of the systematic approach to training and the various elements. The draft is almost complete, and the practice should be ready to implement in late spring 2009.
- Training Delivery — On the Job Training (OJT), e-learning, training simulators, classroom training, and drills. An initial draft of some areas has been developed and the practices should be ready to implement by late summer 2009.
- Management Support — Management’s commitment to training and supporting the SAT process, documented training management structure, training resources, development hours, and budget. An initial draft of some areas has been developed and the practices should be ready to implement by late summer 2009.
- Recordkeeping and Administration — Identify the requirements and practices associated with NERC personnel standards (PER) and continuing education program requirements. An initial draft of some areas has been developed and the practices should be ready to implement by late summer 2009.

2. Information Exchange

- The Forum’s members post internal system and equipment event reports and equipment alerts on a Web portal. They also post their own practices, procedures, and programs for sharing with other Forum members. For example, most Forum members have posted their Transmission Vegetation Management Programs.

- The Forum’s groups meet by Internet each month, and held two workshops (vegetation management and compliance practices) during 2008.
- The Forum also conducted 14 surveys ranging from vegetation management practices to relay protection maintenance to FAA marker requirements.

3. Peer Reviews

- The Forum conducted its first peer review in 2008, and plans at least three in 2009. These reviews are not compliance audits nor readiness evaluations. Instead, they bring Forum experts together from the practices groups to compare and share practices and “lessons learned.” The Forum’s first review spanned three days, and the 14-member review team presented its recommendations confidentially to the “peer host,” and brought back to the Forum the superior practices it learned.
- The Forum has just hired a peer review program manager, and plans to conduct at least three reviews in 2009.

4. Metrics Program

The Forum’s Metrics Working Group set the stage for moving the Forum’s spreadsheet-based metrics pilot to an on-line (Web-based) database for the Metrics program. The Forum will use the same “engine” as the NERCTADS, but the Forum will collect secondary cause codes as well, thus digging deeper in the “risk events” that occur on the transmission system. The Forum will also collect metrics on intentional forced outages, control system (EMS and SCADA) interruptions, operating limit violations, and vegetation contacts. The value added for the Forum members is quite profound. The Forum members’ metrics information will be available to all other Forum members, allowing them to compare their equipment performance with their peers. The Forum members will also be able to perform their own statistical analysis, set benchmarks and objectives, and measure improvements.

The Transmission Forum presently employs four people in carrying out these program activities.

**APPENDIX A**

**TO**

**ATTACHMENT 1**

**ANALYSIS OF DURATION OF STANDARDS DEVELOPMENT  
PROJECTS**

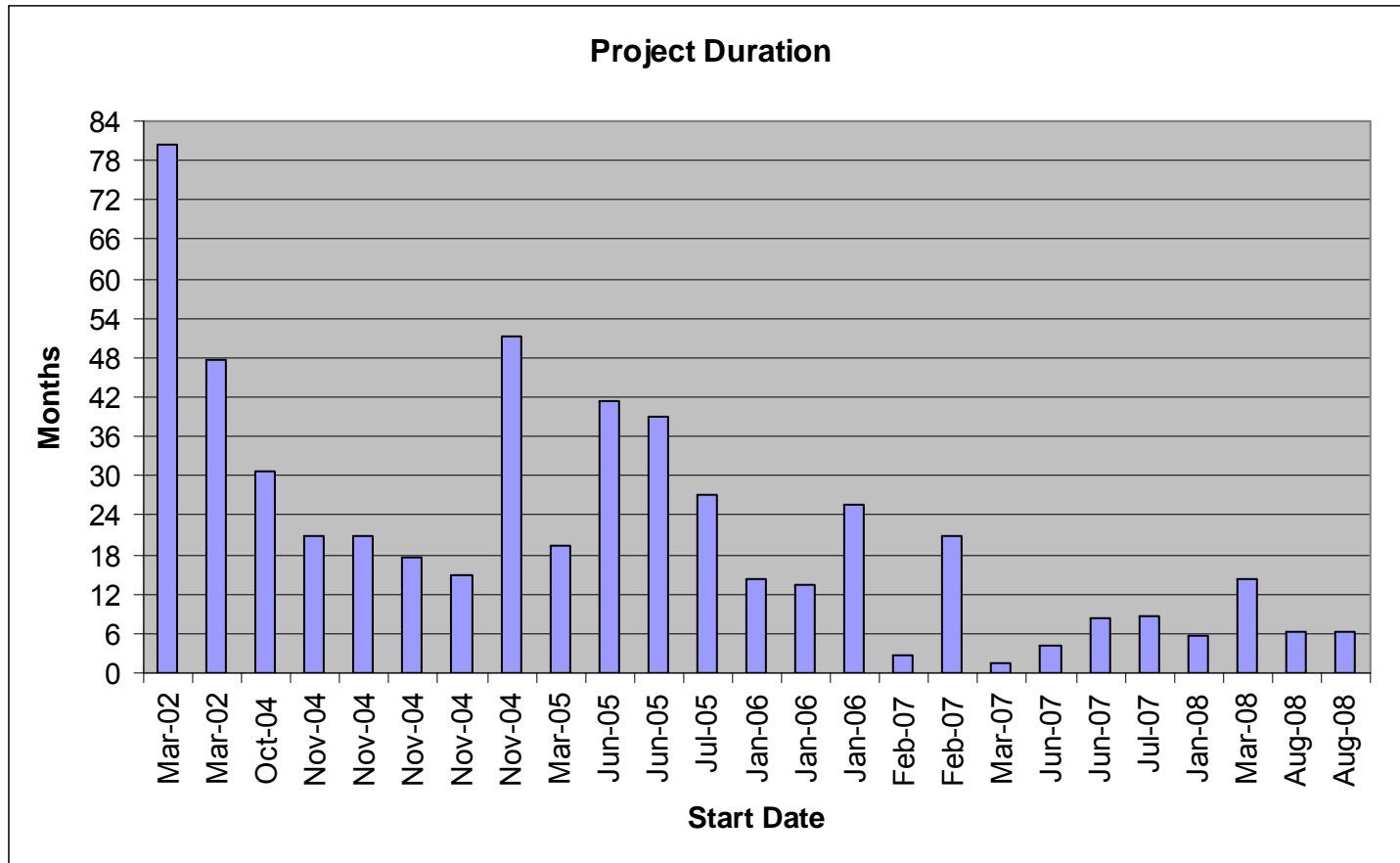
**JANUARY 2002 – MAY 2009**

**JULY 1, 2009**

# Standards Project Durations

## Project Duration Summary – Completed Projects

The tables below provide summary duration statistics for NERC standards projects completed between January 1, 2002 and May 31, 2009. In that period, NERC completed 25 full or sub-parts of projects (“projects”), each including one or more standards items: new standards, revised standards, or standards elements. (Requests for interpretation are not included.) The average project duration from the initial Standard Authorization Request (“SAR”) to NERC Board of Trustees adoption is 21.7 months. The shortened durations for the more recent projects are largely due to urgent action items.



Average	Maximum	Minimum	Median
21.7	80.5	1.6	17.7

## Project Duration Details

The tables below provide duration details on NERC standards projects since January 1, 2002 (updated through May 31, 2009). In that period, NERC worked on 62 full or sub-parts of projects (“projects”), each including one to many standards items: new standards, revised standards, or standards elements. (Requests for interpretation are not included.) Twenty five projects were completed (successful adoption of standards by the NERC Board of Trustees). A number of projects are still in progress, while others were delayed or halted for various reasons, including industry rejection via balloting.

	<b>Projects</b>
Total	62
Completed	25
In progress	29
Failed Ballot	3
Withdrawn	3
Deferred/on hold	2

Project	Initial SAR	ERO Adoption	Months	Work Plan Estimate <sup>1</sup>	Comments
<b>Projects initiated prior to 2006 and not assigned a project number</b>					
Balance Resources and Demand Standards (no project number)	January 1, 2002	Ballot failed April 2007		N/A	Work carried forward into Project 2007-18
Certification of RC Certification of TOP Certification of BA (No project number)	December, 2002	SAR withdrawn November 2007		N/A	Certification process now within scope of Compliance and Certification Committee
Determine Facility Ratings, Operating Limits, and Transfer Capabilities	March 7, 2002	February 7, 2006	47.8	N/A	Long delays for Version 0 clean-up, development of compliance elements, staff resource support, and in clarifying Commission directives
IROL Standards – IRO-008, IRO-009, IRO-010 (no project number)	March 7, 2002	October 17, 2008	80.5	N/A	Long delays for Version 0 clean-up, development of compliance elements, staff resource support, and delays in approval of FAC-010 and FAC-011 (related standards)
Missing Measures and Compliance Elements	March 30, 2005	November 1, 2006	19.4	N/A	Completed per schedule

Project	Initial SAR	ERO Adoption	Months	Work Plan Estimate <sup>1</sup>	Comments
Nuclear Power Interface Coordination Standard (no project number)	October 24, 2004	May 2, 2007	30.7	N/A	Delayed to solve problem of identifying responsible entities.
Phase III & IV Standards	November 17, 2004	August 2, 2006	20.8		Generator Verification field test results rolled into and being developed in Project 2007-09
<i>Phase III &amp; IV Standards - Set 1, Part 1</i>	<i>November 17, 2004</i>	<i>February 7, 2006</i>	<i>14.9</i>		<i>MOD-024-1, MOD-025-1, PRC-003-1, PRC-004-1, PRC-005-1, PRC-020-1, PRC-021-1, PRC-022-1</i>
<i>Phase III &amp; IV Standards - Set 1, Part 2</i>	<i>November 17, 2004</i>	<i>August 2, 2006</i>	<i>20.8</i>		<i>PRC-002-1 and PRC-018</i>
<i>Phase III &amp; IV Standards - Set 2, Part 1</i>	<i>November 17, 2004</i>	<i>May 2, 2006</i>	<i>17.7</i>		<i>EOP-005-1, MOD-013-1, MOD-016-1</i>
<i>Phase III &amp; IV Standards - Set 2, Part 2</i>	<i>November 17, 2004</i>	<i>August 2, 2006</i>	<i>20.8</i>		<i>VAR-001-1, VAR-002-1, TOP-002-1</i>
Resource Adequacy	November 11, 2004	Deferred until 2009 as Project 2009-05.		24	Delayed while determining best approach to conduct assessment and to address higher priority projects.
Revise Standards Process to Include Cost Benefit Analysis – FRCC	October 2005	Withdrawn in June 2007			Unplanned.
<b>Projects initiated in 2006 or carried into initial long-range work plan from prior years</b>					
V0 Risk Factors (no project number)	January 5, 2006	February 13, 2007	13.5	N/A	Stakeholders rejected “single ballot” for all Version 0 and Version 1 VRFs - subdividing and conducting new ballot delayed completion
V1 Risk Factors (no project number)	January 5, 2006	March 12, 2007	14.4	N/A	Stakeholders rejected “single ballot” for all Version 0 and Version 1 VRFs - subdividing and conducting new ballot delayed completion
PRC-023-1 – Transmission Relay Loadability (no project number)	January 9, 2006	February 12, 2008	25.5	N/A	More postings required than anticipated – project delayed to consider Commission’s concerns in 2007
Project 2006-01 – System Personnel Training – PER-005-1	November 30, 2004	February 10, 2009	51.1	33*	Delays acquiring staff, changes to drafting team leadership and members, changes to the standards process, and response to new FERC directives impacted deliverable schedule.
Project 2006-02 — Assess Transmission Future Needs	March 6, 2002 May 1, 2004	[In Progress]	[61]	36*	Long delays for Version 0 clean-up and for acquiring staff resource support – restarted after two-year delay.

Project	Initial SAR	ERO Adoption	Months	Work Plan Estimate <sup>1</sup>	Comments
Project 2006-03 — System Restoration and Blackstart	October 26, 2006	August 2009 (anticipated)	[32]	30	Original project schedule optimistic that only two postings were needed. Five postings were conducted.
Project 2006-04 — Backup Facilities	October 26, 2006	[In Progress]	[32]	33	Original project schedule optimistic that only two postings were needed. Three postings were conducted and estimate updated to reflect need.
Project 2006-06 — Reliability Coordination	December 18, 2006	[In Progress]	[29]	30	Project delayed to address removal of requirements from standards to certification process. Otherwise, near expected schedule.
Project 2006-07 – ATC et al Standards – MOD-001, MOD-008, MOD-028 through MOD-030, MOD-004	June, 2005	November 2008	41	24*	Long delays due to staff changes, project scope expansion, drafting team changes, and responding to many new Commission directives issued while project underway.
<i>Project 2006-07a</i>	<i>June 16, 2005</i>	<i>August 26, 2008</i>	<i>38.9</i>		<i>MOD-001_8_28_29_30v1</i>
<i>Project 2006-07b</i>	<i>June 16, 2005</i>	<i>November 13, 2008</i>	<i>41.5</i>		<i>MOD-004-1 CBM</i>
Project 2006-07 – ATC MOD-030-2	August 8, 2008	February 10, 2009	6.2		MOD-030-2 Flowgate Methodology
Project 2006-08 – IRO-006-4 – Reliability Coordination – Transmission Loading Relief	July 14, 2005	[In Progress]	[46]	30*	Project scope expanded and broken into phases – first phase complete in 2007
<i>Project 2006-08a</i>	<i>July 14, 2005</i>	<i>October 9, 2007</i>	<i>27.2</i>		<i>IRO-006-4</i>
<i>Project 2006-08b</i>	<i>July 14, 2005</i>	[In Progress]			<i>IRO-006-5 and IRO-006-EAST-1</i>
Project 2006-09 – FAC-008-2 – Facility Ratings	December 18, 2006	Failed ballot in December 2008	24	18	Delays due to need for clarity on responding to FERC directives; FAC-008-2 failed.
Refine Applicability in Approved Standards – FRCC	June 2006	Withdrawn in June 2007			Unplanned. Need for SAR replaced by detailed project plans in 3-year work plan.
<b>Projects initiated in late 2006, in 2007, or carried into initial long-range work plan from prior years – assigned a project number starting with “2007”</b>					
Project 2007-01 — Underfrequency Load Shedding	November 14, 2006	[In Progress]	[30]	33	Original project schedule optimistic that only two postings were needed (three postings expected). Also dealing with issue on applicability to other than Regional Entity. Project coordinator swapped in mid-project due to change in assignments. Schedule adjusted accordingly.

Project	Initial SAR	ERO Adoption	Months	Work Plan Estimate <sup>1</sup>	Comments
Project 2007-02 — Operating Personnel Communications Protocols	March 1, 2007	[In Progress]	[26]	30	Significant delays in preparing initial draft relative to defined scope; expect in late 2010.
Project 2007-03 — Real-time Operations	March 15, 2007	[In Progress]	[26]	30	Delays encountered to address removal of requirements during consolidation; expect late 2009/early 2010
Project 2007-04 — Certifying System Operators	July 11, 2007	[In Progress]	[23]	27	Project slightly behind schedule to address Commission staff concerns.
Project 2007-05 — Balancing Authority Controls	June 20, 2007	[In Progress]	[23]	36	Project not active after SAR was presented due to lack of staff resources to assign for coordinator support. Coordinator working on ATC project as top priority. First posting anticipated by year end.
Project 2007-06 — System Protection Coordination	May 7, 2007	[In Progress]	[24]	42	Project on or ahead of schedule due to diminished scope in initial phase. Subsequent projects to deal with generation – transmission coordination issues.
Project 2007-07 — Vegetation Management Revisions	January 9, 2007	[In Progress]	[29]	27	Significant delays in preparing initial draft relative to defined scope and to provide technical justification for team positions; expect in early 2010.
Project 2007-09 — Generator Verification	April 3, 2007	[In Progress]	[25]	33	Significant delays in preparing initial draft relative to defined scope and to provide technical justification for team positions; expect in mid-2010.
<i>Project 2007-09a</i>	<i>April 3, 2007</i>				<i>PRC-024 and MOD-026</i>
<i>Project 2007-09b</i>	<i>April 3, 2007</i>				<i>MOD-024 and MOD-025</i>
<i>Project 2007-09c</i>	<i>April 3, 2007</i>				<i>MOD-027</i>
<i>Project 2007-09d</i>	<i>April 3, 2007</i>				<i>PRC-019</i>
Project 2007-11 — Disturbance Monitoring	March 1, 2007	[In Progress]	[26]	36	Additional technical study work needed to better define standard requirements; expect delivery in mid-2010
Project 2007-12 - Frequency Response	April 7, 2004	Project on hold	[61]	30*	Project is presently on hold. Delayed to determine what data are needed to analyze current situation and the best mechanism to collect the data. The SAR/standard is being replaced with a "data request" to be issued by NERC. The SAR/standard is being re-evaluated.
Project 2007-14 – Changes to CI Timing Tables	February 2007	October 29, 2008	20.8	18	Completed on target



Project	Initial SAR	ERO Adoption	Months	Work Plan Estimate <sup>1</sup>	Comments
<i>Project 2007-14a – Urgent Action – Changes to CI Timing Tables</i>	<i>February 7, 2007</i>	<i>May 2, 2007</i>	<i>2.8</i>		<i>Urgent Action SAR</i>
<i>Project 2007-14b – Permanent Changes to CI Timing Tables</i>	<i>February 13, 2007</i>	<i>October 29, 2008</i>	<i>20.8</i>		<i>Permanent Changes completed with 100% approval during initial ballot.</i>
Project 2007-17 — Protection System Maintenance & Testing	May 7, 2007	[In Progress]	[24]	36	Delay in project commencement due to lack of staff coordinator resources. Schedule still close to target.
Project 2007-18 — Reliability-based Control	May 3, 2007	[In Progress]	[24]	42	Project is currently under field test and is currently on track for completion.
Project 2007-19 – Urgent Action Removal of WECC Waiver from INT-001 and INT-004	June 4, 2007	October 9, 2007	4.2	N/A	Unplanned. Urgent action.
Project 2007-21– Supplemental Version 1 Violation Risk Factors	March 15, 2007	May 2, 2007	1.6	N/A	Unplanned. Urgent action.
Project 2007-23 – Replace Levels of Noncompliance with VSLs	June 27, 2007	[In Progress]	[23]	N/A	Unplanned.
<i>Project 2007-23a – Replace Levels of Noncompliance with VSLs</i>	<i>June 27, 2007</i>	<i>February 28, 2008</i>	<i>8.2</i>		<i>Industry approved eight of nine ballots; all nine were filed with FERC</i>
<i>Project 2007-23b – Replace Levels of Noncompliance with VSLs</i>	<i>June 19, 2008<sup>2</sup></i>	<i>[In Progress]</i>	<i>[12]</i>		<i>Part 2: to address FERC VSL order; to be filed September 2009</i>
Urgent Action – Changes to BAL-004-0 for OC (no project number)	July 11, 2007	March 26, 2008	8.6	N/A	Unplanned. Urgent action.
<b>Projects initiated in 2008</b>					
Project 2008-04 – FAC-010, FAC-011, FAC-014 – Order 705	January 1, 2008	June 24, 2008	5.8	N/A	Unplanned. FAC-010-2, FAC-011-2, FAC-014-2
Project 2008-05 — Credible Multiple Element Contingencies (FAC-011-2)	November 3, 2007	[In Progress]	[11]	15	SAR was revised on August 7, 2008. TPL project team to consider issue in lieu of separate project. Activity ceased in 4Q08.

Project	Initial SAR	ERO Adoption	Months	Work Plan Estimate <sup>1</sup>	Comments
Project 2008-06 — Cyber Security – Order 706	March 1, 2008	May 6, 2009	14.4	24	Phase 1 completed on time; team working on Phase II changes
Project 2008-08 — EOP VSL Revisions	March 26, 2008	[In Progress]	[14]	12	VSLs considered as part of comprehensive VSL filing; extension granted to September 2009.
Project 2008-12 — Coordinate Interchange Standards	May 27, 2008	[In Progress]	[12]	N/A	Will be a multi-part project. Estimate not included in latest development plan.
Project 2008-14 — Cyber Security Violation Severity Levels Revisions	November 3, 2008	[In Progress]	[8]	8	SAR was revised on March 13, 2009.
Project 2008-16 — Transmission Operations Violation Severity Levels (TOP-004-2)	August 8, 2008	February 10, 2009	6.2	N/A	Unplanned
<b>Projects initiated in 2009</b>					
Project 2009-01 – Disturbance and Sabotage Reporting	April 2009	[In Progress]	[1]	N/A	Project schedule to be developed after scope is defined in SAR.
Project 2009-06 – Facility Ratings	January 2009	[In Progress]	[4]	N/A	Unplanned
Project 2009-07 - Reliability of Protection Systems	January 2009	[In Progress]	[4]	N/A	Unplanned
Project 2009-08 – Nuclear Plant Interface Coordination	February 2009	[In Progress]	[3]	N/A	Unplanned – schedule to complete in August 2009.
Project 2009-18 – Withdraw of Three MISO Waivers	April 2009	[In Progress]	[1]	N/A	Unplanned
Order 706B Nuclear Implementation Plan	May 2009	[In Progress]	[0]	N/A	Unplanned – filing obligation in September 2009.

<sup>1</sup> Development plan timeline reflects estimates to complete project when the plan was updated in October 2008.

<sup>2</sup> FERC VSL Order

\* Projects commenced prior to initial 2007-2009 development plan estimate and estimate reflects remaining work expected.

**APPENDIX B**

**TO**

**ATTACHMENT 1**

**ANALYSIS OF STANDARDS BALLOT RESULTS**

**JULY 2006 – MAY 2009**

**JULY 1, 2009**

## Voting Statistics (Industry Participation)

The tables below include a summary of final ballot statistics for participation and voting during the period from July 20, 2006 through May 31, 2009. The ballot events are segmented into two categories: 1) standards (new standards, modified standards, or standards elements) – averaging 80.85% approval with three failed ballots, and 2) interpretations of standards – averaging 93.14% approval with no failed ballots<sup>1</sup>. A summary of the stated reasons for the rejected ballots follows the tables.

### Approved Standards: New Standards, Modified Standards, Standards Elements

Final Approved Ballot Events	48
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	Ballot Pool Size	Total # of Votes	Quorum	Weighted Segment Approval
Average	217	199	91.65	82.26
Median	211	200	91.55	81.92
Minimum	111	88	78.57	67.79
Maximum	284	272	97.45	100.00

### Approved Interpretations of Standards

Final Ballot Events	13
Approved	13
Rejected	0

	Ballot Pool Size	Total # of Votes	Quorum	Weighted Segment Approval
Average	204	184	90.14	93.14
Median	210	184	89.67	96.26
Minimum	153	134	83.57	78.31
Maximum	243	221	98.69	99.12

<sup>1</sup> Although no final ballots of interpretations failed, there were several instances in which the initial ballot did not achieve a two-thirds weighted segment approval. In these instances, the response team re-convened to revise the response and then successfully proceeded through the ballot process.

## Failed Standards: New Standards, Modified Standards, Standards Elements

Final Approved Ballot Events	3
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	Ballot Pool Size	Total # of Votes	Quorum	Weighted Segment Approval
Average	221	209	94.57	58.21
Median	223	213	95.24	57.37
Minimum	210	200	93.04	57.30
Maximum	230	214	95.52	59.95

### Summary of Reasons for Negative Votes for Rejected Ballot Events:

#### 1. Balance Resources and Demand standards (BAL-007 through BAL-011):

Comments submitted with the negative ballots cited a variety of process-related as well as technical reasons, including the following:

- a. All regions did not participate in the field test.
- b. The proposed standards would lead to an increase in violations of interconnected reliability operating limits (“IROLs”).
- c. The new standards would result in “dragging” on the system.
- d. “Time horizons” should not be included in the standards since the latest approved version of the *Reliability Standards Development Procedure* does not include a discussion of time horizons.
- e. Assigning a requirement to NERC would lead to a standard that is not enforceable.
- f. The field test had led to an increase in the number of transmission loading relief (“TLR”) activations.

Ballot Pool Size	Total # of Votes	Quorum	Weighted Segment Approval
223	213	95.52	57.30

- #### 2. VSLs for Emergency Operations Standards:
- Examples of the reasons for negative ballot are below (statistics are from the initial ballot; some balloters changed votes their votes between initial and final ballots):

Reasons Cited for Negative Vote	Number of Balloters Citing Reason
VSL is incorrect	15
Double jeopardy	20
Use of generic language in text of VSLs	20

Failure to apply VSL guidelines consistently	4
Failure to consider risk in setting VSLs	1
Failure to comply with the standards process	6
Disagreement with criteria in VSL guidelines	4
Errata	5

Ballot Pool Size	Total # of Votes	Quorum	Weighted Segment Approval
210	200	95.24	59.95

3. **FAC-008-2 — Facility Ratings:** The primary reason for rejecting the ballot was Requirement R7, which was developed to address the following directive - to identify, for critical facilities, the limiting component and the theoretical increase in rating if that component were no longer limiting. Most balloters stated the requirement was not needed for reliability purposes and indicated the issue would be more efficiently and appropriately addressed in the transmission tariff and regional transmission organization (“RTO”) market processes.

Ballot Pool Size	Total # of Votes	Quorum	Weighted Segment Approval
230	214	93.04	57.37