

# NERC

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

## Reliability Standards Development Plan: 2011–2013

(Approved By: NERC Board of Trustees on March 10, 2011)

to ensure  
the reliability of the  
bulk power system

March 10, 2011

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## Acknowledgement

NERC would like to thank all the individuals who invest their time, energy, expertise, and resources in the development of NERC Reliability Standards and in the annual revision of this *Reliability Standards Development Plan*. The plan reflects comments and input from stakeholders, staff, the NERC technical community, and government agencies with oversight for North American electric reliability. Through collaboration and industry consensus, we expect to develop NERC Reliability Standards that are technically excellent, clear, enforceable, and ensure the reliability of the North American bulk power system.

## NERC's Mission

The North American Electric Reliability Corporation (NERC) is an international regulatory authority established to evaluate reliability of the bulk power system in North America. NERC develops and enforces Reliability Standards; assesses adequacy annually via a 10-year forecast and winter and summer forecasts; monitors the bulk power system; and educates, trains, and certifies industry personnel. NERC is the electric reliability organization for North America, subject to oversight by the U.S. Federal Energy Regulatory Commission (FERC) and governmental authorities in Canada.<sup>1</sup>

NERC assesses and reports on the reliability and adequacy of the North American bulk power system, which is divided into eight Regional areas, as shown on the map below and listed in Table A. The users, owners, and operators of the bulk power system within these areas account for virtually all the electricity supplied in the U.S., Canada, and a portion of Baja California Norte, México.



*Note: The highlighted area between SPP and SERC denotes overlapping Regional area boundaries. For example, some load serving entities participate in one Region and their associated transmission owner/operators in another.*

**Table A: NERC Regional Entities**

<b>FRCC</b> Florida Reliability Coordinating Council	<b>SERC</b> SERC Reliability Corporation
<b>MRO</b> Midwest Reliability Organization	<b>SPP RE</b> Southwest Power Pool Regional Entity
<b>NPCC</b> Northeast Power Coordinating Council	<b>TRE</b> Texas Reliability Entity
<b>RFC</b> ReliabilityFirst Corporation	<b>WECC</b> Western Electricity Coordinating Council

<sup>1</sup> As of June 18, 2007, the U.S. Federal Energy Regulatory Commission (FERC) granted NERC the legal authority to enforce Reliability Standards with all U.S. users, owners, and operators of the BPS, and made compliance with those standards mandatory and enforceable. In Canada, NERC presently has memorandums of understanding in place with provincial authorities in Ontario, New Brunswick, Nova Scotia, Québec, and Saskatchewan, and with the Canadian National Energy Board. NERC standards are mandatory and enforceable in Ontario and New Brunswick as a matter of provincial law. NERC has an agreement with Manitoba Hydro making reliability standards mandatory for that entity, and Manitoba has recently adopted legislation setting out a framework for standards to become mandatory for users, owners, and operators in the province. In addition, NERC has been designated as the “electric reliability organization” under Alberta’s Transportation Regulation, and certain reliability standards have been approved in that jurisdiction; others are pending. NERC and NPCC have been recognized as standards-setting bodies by the *Régie de l’énergie* of Québec, and Québec has the framework in place for reliability standards to become mandatory. Nova Scotia and British Columbia also have frameworks in place for reliability standards to become mandatory and enforceable. NERC is working with the other governmental authorities in Canada to achieve equivalent recognition.

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## Summary

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### **Purpose**

The North American Electric Reliability Corporation (NERC) is committed to developing reliability standards that deliver an Adequate Level of Reliability for the North American bulk power system. The NERC *Reliability Standards Development Plan* is the foundation for reliability standards development efforts. The plan serves as the management tool and blue print that guides, prioritizes, and coordinates revision or retirement of existing reliability standards and the development of new reliability standards for the immediate 3-year time horizon.

NERC developed the initial 3-year plan in 2006 and has updated it annually since. In updating the plan, NERC seeks input on the need for (and prioritization of) new or revised reliability standards from the other program areas within NERC, as well as from NERC's technical committees and industry groups, and from those governmental authorities with responsibility for approving reliability standards in the United States and Canada. The objectives of the plan include, but are not limited to:

- Addressing the recommendations for new or revised reliability standards identified in the *U.S.-Canada Power System Outage Task Force Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations*.
- Addressing directives identified in applicable Federal Energy Regulatory Commission (FERC) Orders.
- Addressing comments from industry stakeholders and others suggesting improvements to each reliability standard, including those comments received from industry stakeholders during public comment periods.
- Addressing quality issues to ensure each reliability standard has a clear statement of purpose, and has results-based requirements that are clear and measurable.
- Ensuring measures and compliance elements are aligned to support the requirements within the reliability standards and follow definitions outlined in the reliability standards template.
- Incorporating feedback from other NERC program areas such as Compliance Operations, Operations and Engineering, Reliability Assessments, and Event Analysis.
- Satisfying the requirement in Section 300 of the Rules of Procedure of the North American Electric Reliability Corporation for a five-year review of all reliability standards.

Developing technically excellent reliability standards is a long-term effort. This plan supports the effort in a dynamic fashion that can be continuously adapted to circumstances and changing priorities. The plan is reviewed and maintained by the NERC Standards Committee and Standards staff, and is updated on an annual basis (or more frequently if necessary).

On July 6, 2010 FERC held a Commissioner-led Technical Conference to address industry perspectives on issues pertaining to the development and enforcement of mandatory Reliability Standards for the bulk power system. The conference focused on the Electric Reliability

Organization's (ERO) standards development process; communication and interactions between the Commission, the ERO and Regional Entities; and ERO and Regional Entity monitoring and enforcement. Conference participants uniformly and strongly supported the standard-setting approach of the ERO model outlined in Section 215 of the Federal Power Act. The ERO model draws on the unmatched technical expertise of many hundreds of industry subject matter experts to develop standards that best serve the reliability of the bulk power system in North America. This expertise includes that of other stakeholders such as large and small customers and governmental authorities with expertise on the "receiving" end of reliability (i.e., those who depend upon and pay for reliability).

The need to establish priorities for NERC's standards development projects was a recurring theme during the technical conference. This *Reliability Standards Development Plan: 2011-2013* advances a concept for prioritization of standards development projects with the expectation that NERC staff will continue to coordinate with the NERC Standards Committee, applicable regulatory authorities, and industry participants in further advancing the prioritization process.

### **2011-2013 Projects**

This revised *Reliability Standards Development Plan: 2011-2013* identifies a total of 35 continent-wide standards development projects either active or planned as of March 1, 2011. These projects have been categorized in Table 1 as "High Priority Projects," "Projects Continuing and Expected to be Completed Shortly," and "Additional Projects to be Initiated in Order of Priority<sup>2</sup>." As each of the projects in the first two groups move to final balloting stage and receive Board and regulatory approval, this will free up staff and industry resources that can then be assigned to the "Additional Projects to be Initiated in Order of Priority."

These priorities were in part determined based on risks and policy issues quantified through a new prioritization tool created by the Standards Committee and endorsed by the Standards Oversight and Technology Committee of the NERC Board of Directors in February 2011. This first generation prioritization tool assists the Standards Committee in examining the prioritization of each reliability standard or reliability issue needing attention each year. As NERC and the Standards Committee gain experience in use of the tool, we will work to improve and enhance the tool over time<sup>3</sup>.

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<sup>2</sup> Phase 1 of Project 2010-13 was not included in the prioritization process as it is near completion; Phase 2 was included and ranked as number 18. Project 2010-15 was not included in the prioritization, as it is an "urgent action" project and expected to complete shortly. Project 2010-16 was inadvertently excluded from the prioritization process, and will be considered in the next review of project priorities.

<sup>3</sup> [Reliability Standards Project Prioritization Tool - Link](#)

**Table 1**

High Priority Projects	
1	Project 2008-06 Cyber Security - Order 706
2	Project 2007-17 Protection System Maintenance & Testing
3	Project 2007-06 System Protection Coordination
4	Project 2010-07 Generator Requirements at the Transmission Interface
5	Project 2007-12 Frequency Response
6	Project 2007-02 Operating Personnel Communications Protocols
7	Project 2006-02 Assess Transmission and Future Needs
8	Project 2010-17 Definition of Bulk Electric System
9	Project 2007-03 Real-time Transmission Operations
10	Project 2007-09 Generator Verification
11	Project 2009-01 Disturbance and Sabotage Reporting
12	Project 2010-05 Protection Systems

Projects Continuing and Expected to Complete Shortly	
13	Project 2006-06 Reliability Coordination
15	Project 2007-07 Vegetation Management
-	Project 2010-13 Relay Loadability Order Phase 1
-	Project 2010-15 Remote Access Urgent Action

Additional Projects to be Initiated in Order of Priority	
14	Project 2010-14 Balancing Authority Reliability-based Control
16	Project 2007-11 Disturbance Monitoring
17	Project 2008-01 Voltage and Reactive Planning and Control
18	Project 2010-13 Relay Loadability Order Phase 2
19	Project 2009-02 Real-time Reliability Monitoring and Analysis Capabilities
20	Project 2009-03 Emergency Operations
21	Project 2008-12 Coordinate Interchange Standards
22	Project 2010-01 Support Personnel Training
23	Project 2009-04 Phasor Measurements
24	Project 2008-02 Undervoltage Load Shedding
25	Project 2009-07 Reliability of Protection Systems
26	Project 2010-08 Functional Model Glossary Revisions
27	Project 2010-04 Demand Data
28	Project 2010-03 Modeling Data

29	Project 2009-05 Resource Adequacy Assessments
30	Project 2012-02 Physical Protection
31	Project 2010-02 Connecting New Facilities to the Grid
32	Project 2012-01 Equipment Monitoring and Diagnostic Devices
-	Project 2010-16 Definition of System Operator

### ***Changes to Plan***

The number of projects proposed in this plan (35) is less than the 37 projects listed in the 2010-2012 version of the plan. The composition of these projects has changed significantly since approval of the 2010-2012 plan:

- The following five projects not identified in the 2010-2012 plan were initiated and completed since last year's plan was approved:
  - Project 2009-08 Nuclear Plant Interface Coordination
  - Project 2010-09 NUC Implementation Plans for CIP Version 2 and Version 3 Standards
  - Project 2010-10 FAC Order 729
  - Project 2010-11 TPL Table 1 Order
  - Project 2010-12 Order 693 Directives
- The following six projects identified in the 2010-2012 plan were completed and removed from this revised plan:
  - Project 2006-04 Backup Facilities
  - Project 2006-08 Transmission Loading Relief
  - Project 2007-01 Underfrequency Load Shedding
  - Project 2007-04 Certifying System Operators
  - Project 2009-06 Facility Ratings
  - Project 2009-18 Withdraw Three Midwest ISO Waivers
- Project 2010-06 Results-based Reliability Standards identified in the 2010-2012 plan was transitioned into an initiative, subsequently completed (more below), and removed from this revised plan.
- Project 2007-05 Balancing Authority Controls and Project 2007-18 Reliability-based Control were merged into Project 2010-14 Balancing Authority Reliability-based Control, which is an addition to this plan.
- The following five projects initiated in 2010 were not anticipated when the 2010-2012 plan was drafted and are additions to this plan:

- Project 2010-08 Functional Model Glossary Revisions
- Project 2010-13 Relay Loadability Order Phase 1 and 2
- Project 2010-15 Remote Access Urgent Action
- Project 2010-16 Definition of System Operator
- Project 2010-17 Definition of Bulk Electric System

It should be noted that this *Reliability Standards Development Plan: 2011-2013*, identifies the standards development projects that are currently expected to be worked on in the immediate three-year time horizon. Every attempt will be made to bring as many projects to completion as possible; however, not all of the projects identified in this plan will be completed in the immediate three-year time horizon.

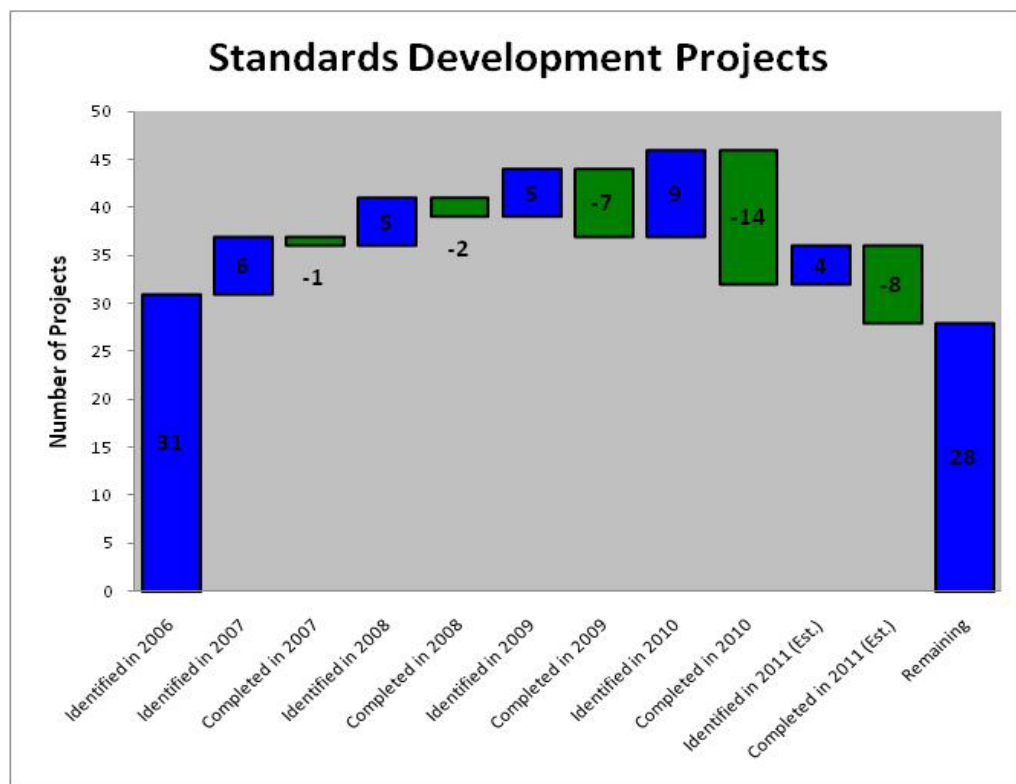
## Standards Development

NERC's standards program develops and maintains standards designed to ensure the reliability of the bulk power system in North America. The set of NERC reliability standards defines the reliability requirements for planning and operating the North American bulk power system. NERC staff facilitates standards drafting team activities; assists the drafting teams in adherence to the integrity of the development process, and ensures that the quality of documents produced meet the criteria for approval.

Each standard must be technically excellent, timely, just, reasonable, not unduly discriminatory or preferential, in the public interest, and consistent with other applicable standards or regulations to be approved by the US and Canadian regulatory authorities. A link to the document describing the quality attributes of an excellent reliability standard is provided [here](#).

NERC continues to make progress in improving the quality of the set of NERC reliability standards. Since the establishment of this plan in 2006 through August 1, 2010 NERC has identified 59 standards development projects, the vast majority of which involve the revision of multiple standards. Of those, 19 projects have been completed.

The following chart summarizes the number of newly identified projects in each revision of the Reliability Standards Development Plan as well as the number of projects completed between revisions to the plan from 2006 through 2010 along with an estimate for 2011:



Short summaries of all the currently opened or planned standards development projects as of March 1, 2011 are provided [here](#). The summaries contain the project name, project number, a short description of the project, and the standards associated with the project.

More expansive overviews of each of the currently opened or planned reliability standards development projects as of March 1, 2011 are provided [here](#). Each project overview includes the project number, title, list of affected reliability standards, and hyperlinks to associated portions of the NERC standards web pages along with a brief description of the project. In prior plans, these overviews also included a list of “Issues to be Considered by the Standard Drafting Team” which was populated with information contained in the “NERC Standards Issues Database (Issues Database).” The Issues Database is used by the NERC standards program staff to track the issues and concerns identified with a particular standard, including a complete list of applicable regulatory directives.

### ***Standards Development Process***

NERC uses a formal process for refining, developing, and approving reliability standards that has received national, formal accreditation from the American National Standards Institute (ANSI) and approval by the Federal Energy Regulatory Commission (FERC) in the United States. A key element of this plan is to review and upgrade all the existing standards based on the directives in the FERC’s final rules on standards, previous industry comments, and actual experience gathered from using the standards.

The [Standard Processes Manual](#) provides a consensus-building process to confirm the need for a proposed new or revised standard, and then for developing and approving a new or revised standard. This standards development process, or its successor, will serve as the mechanism for achieving the improvements detailed in this plan. The standards development process includes active involvement of industry experts and stakeholders tasked with developing excellent standards.

The *Standard Processes Manual* is incorporated in Section 300 of the ERO [Rules of Procedure](#) as Appendix A. In its June 2006 ERO Certification Order, the Commission found that NERC’s proposed rules provide for reasonable notice and opportunity for public comment, due process, openness, and a balance of interests in developing reliability standards. The development process is open to any person or entity with a legitimate interest in the reliability of the bulk power system. NERC considers the comments of all stakeholders, and a vote of stakeholders is required to approve a reliability standard before it is submitted for NERC Board action and regulatory approval.

The *Standard Processes Manual* was approved by FERC on September 3, 2010. The following is a summary of the improvements in the *Standard Processes Manual* compared to the predecessor *Reliability Standards Development Procedure*.

- (1) Improved control on timing for initiation of new projects by giving the Standards Committee the authority to prioritize standards development activity so that some projects may be deferred to focus on higher priority projects, to require technical justification and documentation when a standard request is submitted, and to evaluate

- unplanned project proposals to assign an appropriate priority relative to planned project activities.
- (2) More efficient processing of new project requests by allowing informal comment periods for project proposals where the need to modify or develop the identified standard(s) has already been established.
  - (3) More extensive use of “informal” stakeholder feedback by allowing drafting teams to use a variety of means to collect feedback in the early stages of standards development.
  - (4) Enhanced technical writing support during the drafting of standards to make better use of subject matter experts.
  - (5) Ensuring a standard meets specific “quality” attributes by adding a step to the process for a formal “quality review” before the final draft of a standard is posted for formal stakeholder review.
  - (6) Concurrent formal commenting and balloting to involve more participants in determining the final wording of a standard.
  - (7) New process to expedite development of a new or revised standard where specific time constraints are associated with its completion.
  - (8) Improved clarity in the description of the processes for developing definitions; conducting field tests and collecting and analyzing data; interpretations; appeals; variances; standards developed to address confidential issues; and process for approving supporting references.

### **Internal NERC Coordination Efforts**

NERC has developed specific initiatives related to compliance monitoring and enforcement, reliability assessment and performance analysis, and event analysis to identify possible “high impact” reliability standard development projects that may have significant impact on the reliability of the bulk power system. For example, lessons learned and trends identified from system events tracked for the last three years that have been causal or contributory to the severity of system disturbances are helping NERC focus efforts and provide the technical foundation for standards development and modification efforts on issues that are most critical to bulk power system reliability. NERC has developed a broad-based reliability initiative that addresses issues in the area of system protection and control which is the basis for Project 2010-05 Protection Systems and a number of other ongoing standards development projects in the area of system protection and control. This initiative identified a compendium of system protection and control issues that have contributed to many system events. This ongoing collaborative effort between the Event Analysis program and Standards development will continue to be used to identify specific changes to reliability standards to ensure the reliability of the North American bulk power system.

In addition, the document [Risk-Informed Approach for Prioritizing Development of Standards](#) outlines one of the internal initiatives supported by reliability assessment and performance analysis that takes the form of a risk-informed approach for prioritizing new and enhancing existing reliability standards leading to the greatest improvement in reliability. Trend assessment

from event, condition and regulatory driven measures can provide additional risk-informed prioritization to standard development as bulk power system performance can provide insights into potential gaps and areas for standard improvements. These trends will be weighed against other NERC standard development initiatives during the prioritization process used in the development of this plan.

### **Coordination Efforts with NERC Technical Committees**

NERC's technical committees, subcommittees, working groups, and task forces provide technical research and analysis used to justify the development of new standards and provide guidance, when requested by the Standards Committee, in overseeing field tests or collection and analysis of data. The technical committees, subcommittees, working groups, and task forces provide feedback to drafting teams during both informal and formal comment periods.

The technical committees, subcommittees, working groups, and task forces share their observations regarding the need for new or modified standards or requirements with the standards staff for use in identifying the need for new standards projects for the three-year *Reliability Standards Development Plan*.

### **Coordination with NAESB**

In addition, NERC also coordinates its reliability standards development activities with the business practices developed by the [North American Energy Standards Board](#) (NAESB). Many of the existing NERC standards are related to business practices, although their primary purpose is to support reliability. Reliability standards, business practices, and commercial interests are inextricably linked. An example of an existing standard that is both a reliability standard and a business practice is the Transmission Loading Relief (TLR) Procedure currently used as an interconnection-wide congestion management method in the Eastern Interconnection.

NERC has taken several steps to ensure its reliability standards do not have any undue adverse impact on business practices or competition. NERC and NAESB follow the [NERC NAESB Template Procedure for Joint Standards Development and Coordination](#) and the associated [supplement](#) in areas that have both reliability and business practice elements. This procedure is being implemented for all standards in which the reliability and business practice elements are closely related, thereby making joint development a more efficient approach. In addition to this formal process, drafting teams work with NAESB groups to ensure effective coordination of wholesale electric business practice standards and reliability standards.

To ensure each reliability standard does not have an undue adverse effect on competition, NERC requires that each standard meet the following criteria:

- Competition — A reliability standard shall not give any market participant an unfair competitive advantage.
- Market Structures — A reliability standard shall neither mandate nor prohibit any specific market structure.
- Market Solutions — A reliability standard shall not preclude market solutions to achieve compliance with that standard.

- Commercially Sensitive Information — A reliability standard shall not require the public disclosure of commercially sensitive information. All market participants shall have equal opportunity to access commercially non-sensitive information that is required for compliance with reliability standards.

### ***Transition to Results-based Standards***

To improve the overall quality of its Reliability Standards, NERC has introduced “results-based” principles into the standards development process. These principles require the standard drafting teams to achieve a portfolio of performance, risk, and competency-based requirements within the set of NERC reliability standards that support an effective defense-in-depth strategy for ensuring the reliability of the bulk power system. This concept enhances development of an integrated set of standards that build on the core entity competencies verified during NERC’s entity certification processes.

The term “results-based” is sometimes confused with the term “performance-based” when combined with the terms “standards” and “requirements”. Performance-based standards can have the connotation of measuring only ultimate performance – no oil spills, no mine disasters, no plane crashes, etc. The problem with a purely performance-based approach is that if the system fails, the consequences are unacceptable. NERC is not implementing performance-based standards that focus only on ultimate outcomes for the main body of its standards. NERC is implementing a portfolio of result-based requirements, each of which identifies a clear and measurable expected outcome, such as: a) a stated level of reliability performance, b) a reduction in a specified reliability risk, or c) a necessary competency. The set of NERC’s reliability standards works collectively in support of NERC’s reliability principles to prevent instability, uncontrolled separation and cascading. To achieve any one of NERC’s reliability principles a ‘defense in depth’ strategy is being employed such that there is a network of requirements spanning several standards that involve a mix of performance-based, risk-based, and competency-based requirements that in combination achieve NERC’s reliability principles.

For the bulk power system, only a small percentage of NERC’s requirements will be performance-based. Performance-based requirements are useful in situations where tracking and managing the “results” are the only way to manage, incentivize and correct outcomes. Control performance (BAL-001- Real Power Balancing Control Performance) is a good example of a standard that contains performance-based requirements. The goal of the standard is to maintain frequency within defined limits by balancing real power demand and supply in real-time, and the requirements identify specific actions of a Balancing Authority must take to achieve that goal. Following these requirements alone will not result in the goal of maintaining frequency within defined limits – this standard is supported by the Balancing Authority certification process where NERC verifies that prospective Balancing Authorities have the processes, procedures and tools needed to monitor and act to meet the requirements in BAL-001, as well as many other standards.

A majority of NERC’s requirements are, and will continue to be risk-based, or preventative requirements that if followed, reduce the risk of instability, uncontrolled separation, and cascading failures. The performance-based requirements in the BAL-001 standard are supported

by several risk-based standards such as EOP-001 – Emergency Operations Planning. EOP-001 requires the Balancing Authority to have action plans for mitigating various energy emergencies.

Another portion of NERC’s standards are ‘competency-based’, meaning they are requirements to have things such as tools, training, communications, and backup facilities. The performance-based requirements in the BAL-001 standard are supported by capability-based requirements in standards such as PER-003 Operating Personnel Credentials, where the Balancing Authority is required to staff its real-time operating positions with only certified system operators.

Results-based standards should not be associated with lax rules for industry. NERC is developing a strong portfolio of interdependent and overlapping requirements that work with the entity certification processes and address performance, risk mitigation, and competency. NERC is applying a defense in depth strategy that has proven successful in managing risks in many other industries including nuclear, aerospace, and other critical sectors.

A number of factors were considered when developing the plan for transitioning the current set of NERC Reliability Standards to results-based, including both the priority of projects as established by the Standards Committee as well as the then current status of each individual project. The goal of the plan is to smoothly transition existing standards to results-based standards while respecting and considering the amount of work existing standard drafting teams have expended in their respective projects to date relative to the planned completion date of the project. For example, to a large degree projects that are expected to be completed by year-end 2010 were not good candidates for transition to results-based because doing so would require each affected drafting team to redraft work which is essentially complete and ready for industry ballot, thereby extending the project by as much as six months. Consequently, projects which were in the very early stages of development or which have not been initiated were identified as early candidates for results-based implementation.

Drafting team training for teams working on results-based standards has been enhanced to include results-based concepts and will assist in building on this foundation for the transition to a complete set of results-based reliability standards.

### **Multi-faceted Results-based Training**

NERC has developed and implemented training in the results-based concepts to help stakeholders as well as drafting teams.

To commence the rollout to the industry of the results-based initiative, NERC staff provided a one-time training Webinar in the fall of 2010 for all stakeholders on the concepts of results-based reliability standards, highlighting what stakeholders should look for when commenting and voting upon these new standards. NERC also conducted a “Train the Trainer” session in 2010 to provide drafting team coordinators with the tools needed to apply the results-based approach to the development of standards.

The NERC coordinator assigned to a drafting team will be responsible for training his or her drafting teams in the results-based concepts. The core program provides a structure for developing standards starting with explicitly identifying the “Need”, “Goals”, and “Objectives”

of the particular standard under development. Since the majority of active standards development projects are beyond the “Need”, “Goals”, and “Objectives” phase of the process, portions of the program are not directly applicable to projects already under development but were summarized in the fall Webinar training. The fall Webinar training provided the existing drafting teams with the knowledge of the results-based principles that they can then apply to their respective projects on a prospective basis.

The following projects will reach completion without fully implementing the results-based concepts and format, since the full implementation of results-based principles would be too disruptive to the timely completion in these projects. However, the drafting teams associated with these projects are expected to incorporate results-based concepts if the opportunity arises in the course of the project (for example, between the last formal comment period and ballot or between ballots as permitted by the Standards Committee).

- Project 2006-02 Assess Transmission and Future Needs
- Project 2006-06 Reliability Coordination
- Project 2007-02 Operating Personnel Communications Protocols
- Project 2007-03 Real-time Transmission Operations
- Project 2007-09 Generator Verification
- Project 2007-11 Disturbance Monitoring
- Project 2007-12 Frequency Response
- Project 2007-17 Protection System Maintenance & Testing
- Project 2008-06 Cyber Security - Order 706

The standards associated with these projects, along with any other standards currently not associated with any project, will be updated to include the results-based principles the next time the standards are opened for review or revision.

### **Projects for Results-based Implementation**

The following projects will fully implement the results-based concepts. Leadership and training for this initiative is the responsibility of the NERC Coordinator for each specific project.

- Project 2007-06 System Protection Coordination
- Project 2007-07 Vegetation Management
- Project 2008-01 Voltage and Reactive Planning and Control
- Project 2008-02 Undervoltage Load Shedding
- Project 2008-12 Coordinate Interchange Standards
- Project 2009-01 Disturbance and Sabotage Reporting
- Project 2009-02 Real-time Reliability Monitoring and Analysis Capabilities
- Project 2009-03 Emergency Operations
- Project 2009-04 Phasor Measurements
- Project 2009-05 Resource Adequacy Assessments
- Project 2009-07 Reliability of Protection Systems
- Project 2010-01 Support Personnel Training
- Project 2010-02 Connecting New Facilities to the Grid

- Project 2010-03 Modeling Data
- Project 2010-04 Demand Data
- Project 2010-05 Protection Systems
- Project 2010-07 Transmission Requirements at the Generator Interface
- Project 2010-08 Functional Model Glossary Revisions
- Project 2010-13 Relay Loadability Order
- Project 2010-14 Balancing Authority Reliability-based Control
- Project 2012-01 Equipment Monitoring and Diagnostic Devices
- Project 2012-02 Physical Protection

All future projects not identified in this plan will be required to be developed following the results-based principles and formats. It will be the responsibility of the NERC Standards Committee to ensure that this plan is implemented accordingly.

The complete [Results-based Reliability Standards Transition Plan](#) is posted on the Standards portion of the [NERC Website](#).

### **Standards Project Prioritization**

This *Reliability Standards Development Plan: 2011-2013* is designed with the recognition that there are limited available staff and industry resources to complete the projects immediately and concurrently. NERC staff continually coordinates with the Standards Committee in establishing the number and types of projects to devote resources to at any point in time based on the limited resources that are available. Every effort will be made to bring as many of the standards projects identified in this *Reliability Standards Development Plan: 2011-2013* to completion over the immediate three-year time horizon.

As of March 1, 2011 NERC had 34 separate active or planned standards development projects - a number greater than NERC and stakeholders can address concurrently. Further, NERC, stakeholders and regulatory authorities are coming to the recognition that certain standards projects need to be completed on a priority basis – implying that other projects may need to be deferred until resources become available.

The need to establish priorities for NERC’s standards development projects was a recurrent topic of discussion during the technical conference held by FERC on July 6, 2010. Since the July 6 technical conference the Standards Committee has been developing a process for establishing the priority of standards development projects. On February 17, 2011 such a process was proposed to, and endorsed by, the NERC Board of Trustees. The Standards Committee process for project prioritization is summarized in Attachment 1 to this Reliability Standards Development Plan.

The Standards Committee project prioritization process is a method for identifying, prioritizing, and monitoring NERC standards development projects, taking into account the various drivers for project initiation and the industry’s resource constraints. The process provides the flexibility to accommodate new projects and to adjust project priorities and completion schedules in response to changing conditions.

The Standards Committee developed a “project prioritization tool” to guide Standards Committee decisions on the development priority of each project within the three-year Reliability Standards Development Plan. The tool calculates a ranking for a project based on ten separate criteria, including whether a specific project includes a new or revised standard that:

- Is needed to fill an identified gap in reliability,
- Will improve BPS reliability by a certain perceived level,
- Addresses a regulatory directive,
- Is needed to coordinate with another standard development project,
- Is approaching its five year review requirement, and
- Addresses compliance related issues.

The Standards Committee used the results provided by the tool to develop the standards development project prioritization list shown below. These projects have been categorized in Table 2 as “High Priority Projects,” “Projects Continuing and Expected to Complete Shortly,” and “Additional Projects to be Initiated in Order of Priority.”<sup>4</sup> As each of the projects in the first two groups achieve a successful ballot and are adopted by the Board of Trustees, the Standards Committee will select one of the projects on the “Additional Projects to be Initiated in Order of Priority” list and initiate active development of the project as a new “High Priority Project.”

**Table 2**

High Priority Projects	
1	Project 2008-06 Cyber Security - Order 706
2	Project 2007-17 Protection System Maintenance & Testing
3	Project 2007-06 System Protection Coordination
4	Project 2010-07 Generator Requirements at the Transmission Interface
5	Project 2007-12 Frequency Response
6	Project 2007-02 Operating Personnel Communications Protocols
7	Project 2006-02 Assess Transmission and Future Needs
8	Project 2010-17 Definition of Bulk Electric System
9	Project 2007-03 Real-time Transmission Operations
10	Project 2007-09 Generator Verification
11	Project 2009-01 Disturbance and Sabotage Reporting
12	Project 2010-05 Protection Systems

Projects Continuing and Expected to Complete Shortly

<sup>4</sup> Phase 1 of Project 2010-13 was not included in the prioritization process as it is near completion; Phase 2 was included and ranked as number 18. Project 2010-15 was not included in the prioritization, as it is an "urgent action" project and expected to complete shortly. Project 2010-16 was inadvertently excluded from the prioritization process, and will be considered in the next review of project priorities.

13	Project 2006-06 Reliability Coordination
15	Project 2007-07 Vegetation Management
-	Project 2010-13 Relay Loadability Order Phase 1
-	Project 2010-15 Remote Access Urgent Action

Additional Projects to be Initiated in Order of Priority	
14	Project 2010-14 Balancing Authority Reliability-based Control
16	Project 2007-11 Disturbance Monitoring
17	Project 2008-01 Voltage and Reactive Planning and Control
18	Project 2010-13 Relay Loadability Order Phase 2
19	Project 2009-02 Real-time Reliability Monitoring and Analysis Capabilities
20	Project 2009-03 Emergency Operations
21	Project 2008-12 Coordinate Interchange Standards
22	Project 2010-01 Support Personnel Training
23	Project 2009-04 Phasor Measurements
24	Project 2008-02 Undervoltage Load Shedding
25	Project 2009-07 Reliability of Protection Systems
26	Project 2010-08 Functional Model Glossary Revisions
27	Project 2010-04 Demand Data
28	Project 2010-03 Modeling Data
29	Project 2009-05 Resource Adequacy Assessments
30	Project 2012-02 Physical Protection
31	Project 2010-02 Connecting New Facilities to the Grid
32	Project 2012-01 Equipment Monitoring and Diagnostic Devices
-	Project 2010-16 Definition of System Operator

## Regional Standards Development

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NERC's Rules of Procedure Section 300 allows for a regional entity to develop regional reliability standards. A regional entity developing regional reliability standards must adhere to a NERC-approved regional reliability standards development procedure when developing its regional reliability standards. Each regional entity's regional standards development procedure is documented in Exhibit C of its regional delegation agreement with NERC.

No regional reliability standard shall be effective within a region unless approved and filed by NERC with the Commission and the applicable authorities in Canada and Mexico and approved by such regulatory authorities. Regional reliability standards, when approved by FERC and the applicable authorities in Canada and Mexico, shall be made part of the body of NERC reliability standards and shall be enforced upon all applicable bulk-power system owners, operators, and users within the applicable regional entity's region, regardless of membership in the region.

Regional reliability standards provide for as much uniformity as possible with reliability standards across the interconnected bulk power system of the North American continent. A regional reliability standard shall be:

- more stringent than a continent-wide reliability standard, including regional standards that address matters that continent-wide reliability standards do not; or
- necessitated by a physical difference in the bulk power system.

With the exception of regional standards developed in support of continent-wide standards, regional entities may independently initiate regional standards development and forward such standards to NERC for review and approval.

Regional entity standards are anticipated to be developed by the individual regions over the next three years. The [Regional Reliability Standards Development Projects](#) document provides an overview of each of the planned regional standards development projects for the immediate three year period.

## Resource Documents

Links to the following resource documents are provided here for convenience. These documents provide a portion of the historical perspective on the development of reliability standards since the inception of the ERO.

- [FERC NOPR on Reliability Standards, October 20, 2006.](#)
- [FERC Staff Preliminary Assessment of Proposed Reliability Standards, May 11, 2006.](#)
- [FERC Order No. 693 Mandatory Reliability Standards for the Bulk Power System, March 16, 2007.](#)
- [FERC Order No. 693-A Mandatory Reliability Standards for the Bulk Power System, July 19, 2007.](#)
- [FERC Order No. 890 Preventing Undue Discrimination and Preference in Transmission Service, February 16, 2007.](#)
- [Comments of the North American Electric Reliability Council and North American Electric Reliability Corporation on Staff Preliminary Assessment of Reliability Standards, June 26, 2006.](#)
- [Comments of the North American Electric Reliability Corporation on Staff Preliminary Assessment of NERC Standards CIP-002 through CIP-009, February 12, 2007.](#)
- [Comments of the North American Electric Reliability Corporation on the Notice of Proposed Rulemaking for Facilities Design, Connections and Maintenance Reliability standards, September 19, 2007.](#)
- [Comments received during the development of Version 0 reliability standards.](#)
- [Consideration of comments of the Missing Compliance Elements drafting team.](#)
- [Consideration of comments of the Violation Risk Factors drafting team.](#)
- [Consideration of comments in the Phase III–IV standards.](#)
- [Q&A for Standards and Compliance.](#)

## **Attachment 1**

### **Standards Committee Process for Standards Project Identification, Prioritization, and Monitoring**

# NERC

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

## Standards Committee Process for Standards Project Identification, Prioritization, and Monitoring

February 2011

to ensure  
the reliability of the  
bulk power system

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## **Objective**

This document presents a Standards Committee process for identifying, prioritizing, and monitoring NERC standards development projects, taking into account the various drivers for project initiation and the industry's resource constraints. The process provides the flexibility to accommodate new projects and to adjust project priorities and completion schedules in response to changing conditions.

## **Background**

Since the startup of the ERO, the number of standards development projects has grown significantly. Coupled with the increasing number of requests for interpretations and directives issued by regulatory authorities, the industry has experienced a rapid and sustained increase in standards development related workload. The standards development process allows for any individual to propose a new project or request an interpretation. While the Standards Committee can exercise its discretion to delay the start of any project to cope with increased workload and to better manage standard projects to achieve timely completion, additional flexibility beyond just withholding the start of a project is needed.

At its April 2010 meeting, the NERC Standards Committee endorsed a proposal to develop a structured process to assist in managing standards development projects from the project planning stage through submission of a completed standard to the NERC Board of Trustees. The process outlined in this document takes into account industry resource constraints and changing conditions as new projects emerge and as issues are encountered during the course of standard development.

### **1. Identifying the List of Standards Projects**

In general, standards projects may be initiated for a variety of reasons, including:

- a. **Periodic Review** — To meet the five-year standard revision cycle requirement
- b. **Reliability Need** — Industry participants, NERC staff or the Board of Trustees identify the need for a new standard or revision to an existing standard to meet a reliability need or fill a reliability gap
- c. **Clarity, Quality and Coordination**— Industry participants, NERC and Regional Entity staff identify quality and clarity gaps in NERC's existing reliability standards that need to be remedied to ensure consistent industry compliance. Regional Entities and stakeholders may propose continent-wide NERC standards that will avoid the need to develop regional standards which will be phased out when the NERC standards are put in place
- d. **Interpretations** — Industry participants submit formal requests for interpretation that may identify a gap or deficiency in an existing standard

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- e. **Regulatory Directives** — FERC or Canadian regulatory authorities may direct the ERO to make changes to standards, to incorporate suggested improvements, address deficiencies in existing NERC standards, or respond to new energy policies.

Plans for developing standards to take care of the periodic review requirement (Driver (a), above) can be developed with some degree of accuracy. However, the scope and complexity of project plans for standards initiated in response to the other four drivers are much harder to predict. It is therefore very difficult to develop a standards development work plan that accounts for all new projects to be initiated in a future year with any degree of accuracy. However, for planning purposes, a baseline list of projects can be developed for a future year based on:

- a. Current projects expected to continue into the next year
- b. New projects to address the five-year periodic review requirement expected within the next year.

As a first pass, a baseline list of standard projects can be developed and prioritized without regard to resource constraints. A cutoff line will then apply to the baseline list using the resource constraint assumptions presented in Section 3, below.

## 2. Listing and Prioritizing Baseline Projects

Some standard projects need to be placed at a higher priority than the others due to the urgency or significance of the associated drivers for development or revision. For example, revising a standard to fill a reliability gap should normally have a higher priority than revising a standard to improve quality or clarity. Similarly, removing ambiguity (which itself may be a form of reliability gap) from a standard that has a large number of violations would normally have a higher priority than combining two or more standards to remove overlaps and consolidate similar or related requirements.

However, the rationale presented in the above two examples only represents a general principle, which cannot be applied objectively to develop a standard project priority list that balances all interests, unless a systematic approach is developed to provide a balanced weighting of each of the development drivers outlined above. The Standards Committee, in trying to prioritize projects in the Standards Development Work Plan for 2011-2013, adopted the concept of using a project prioritization tool to develop standard project priorities for the coming year. (See Attachment A)

The use of a “*prioritization tool*” is essential to ensuring all the drivers for new projects are fully considered in the allocation of NERC and industry resources between each of the projects in NERC’s Reliability Standards Development Plan. With prior inputs from all concerned parties on the prioritization criteria and associated weighting of these criteria, the tool will establish a relative priority score for each project, irrespective of who and why the project is proposed. This is particularly important to avoid arbitrary or highly subjective decisions on which projects should be placed at a higher priority than the others.

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Ultimately the prioritization tool described below is just that – a tool to guide informed decision making by the NERC Standards Committee and the NERC Board of Trustees on the relative priority of proposed and ongoing standards development projects.

**3. Developing the Project Cut-off Line Based on Resource Constraints**

The baseline project list represents a snapshot of the projects that the Standards Committee needs to manage in the current year. Recognizing that the resources needed at NERC and in the industry for standards development are not unlimited, the Standards Committee must determine which ongoing projects should be directed to continue development work to ensure timely completion, which new projects must be initiated to address NERC reliability objectives and meet regulatory deadlines, and when necessary, which standard development projects should be placed on hold until additional NERC and industry resources become available.

NERC has a finite annual budget and the industry has finite resources; together these factors limit the number of standards development projects that can be worked on concurrently. While an increase in NERC staff resources may address certain development bottlenecks, there is no clear indication or assurance that a corresponding increase in industry resources to participate in the drafting, reviewing, commenting and balloting the standards is forthcoming. The Standards Committee must consider these resource constraints when planning for the number of projects that can be effectively managed in any given time period.

There are no fixed rules or formulas with which to estimate staff and industry resource requirements or constraints for standards development. For a baseline estimate, past experience is the best source of information. Recent Standards Committee and NERC staff experience generally supports the conclusion that NERC and the industry can manage the development of no more than ten to twelve standards projects under active development at any one time. This judgment of course depends on the complexity of these projects and considerations as to whether projects draw upon the same subject matter expert (“SME”) resource pool during the same period. Nonetheless, our informed judgment is that attempts to develop more than ten or twelve projects during the same period will result in an actual loss of throughput and/or a reduction in standards quality.

**4. Adding New Projects and Adjusting Project Priority**

The baseline list does not factor in new projects that may emerge during a given project development year due to the other four drivers (b) through (e) in Section A. This uncertainty is particularly difficult to address with respect to regulatory directives. When new projects emerge and are evaluated, the Prioritization Tool is designed to score each new project on a stand-alone basis. The resulting point scores may indicate that some new projects should have priorities higher than other projects on the baseline list that are currently under active development. It is generally assumed that ongoing projects should have highest priority and should continue development work regardless of other projects’ emergence. Unfortunately, both emerging reliability issues and regulatory directives may lead the Standards Committee to direct that one or more projects that are currently above

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the cutoff line must now be put on hold until resources become available and development work can be restarted.

The Standards Committee will decide if any of the ongoing projects should be stopped or deferred and advise the respective Standard Drafting Teams (SDTs) accordingly, or develop other remedial actions to launch the new projects and continue with all ongoing projects. If in its judgment none of the ongoing projects should be stopped and the new projects should be launched but no resource relief can be provided, the Standards Committee will bring the situation along with options and recommendations to the Board of Trustees for its attention and direction.

**5. Developing Projects Schedules**

The time required to complete a standard development project varies from one project to another depending on the scope of work and the complexity of the issues to be addressed. While the SAR proponents generally have a good grasp of the time required to complete a standard project from the formation of the SDT to balloting, the SDT itself may have more intimate knowledge of the technical issues involved and hence a better feel of the time needed to complete its assigned project. Further, since SDT members are industry volunteers that are committed to their projects, it is desirable and appropriate that the SDTs provide inputs into their project schedules and milestone events.

In general, NERC staff together with the Standards Committee will develop an initial project schedule based on past experience, complexity of the standards and other considerations such as available expertise, compliance deadlines, etc. To the extent possible, the SDT should be given the opportunity to review and adjust the project schedule at its initial meetings, and present a revised schedule, where appropriate, to the Standards Committee for consideration. Once approved by the Standards Committee, the SDT will take ownership of the project and its schedule, and monitor and report project progress to the Standards Committee on an as-needed basis.

**6. Monitoring Projects**

The SDTs are responsible for monitoring all milestone events and completion schedules for their assigned projects. If at any time the milestone dates for a project are expected to be missed, the responsible SDT should report to the Standards Committee, and present options to put the project back on schedule or request accepting delays with supporting rationale. Where necessary, the SDT may seek the Standards Committee's endorsement or advice for other remedial actions including additional resource support, resolution of contentious issues, accepting an extension of the project schedule, or other actions deemed appropriate.

Such reporting should be made at least two months prior to a milestone date in danger of being missed, and at least four months prior to the scheduled completion date (end of re-circulation balloting) that is in danger of being missed. The Standards Committee will act upon receiving a report from the SDT of potential slippage. In its deliberation, it will

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assess impacts of implementing any remedial actions on the status of other ongoing or pending projects.

From time to time, the Standards Committee may request the Chair or a representative of an SDT to report on the progress of a project even there is no indication of a potential slippage.

**7. Project Identification, Prioritization and Management Flow Diagram**

A flow diagram showing the process described in 1 to 6, above, is shown in Figure 1, attached.

**8. Project Prioritization Tool Description**

The intent of the Prioritization Tool is to allow for a consistent relative ranking of projects based upon inputs from a variety of sources. An example of the tool is contained in Attachment A of this document. The working version of the tool is maintained by the Standards Committee Process Subcommittee. The tool is a spreadsheet containing information and parameters described as follows:

**Rows**

Row 1 Contains general information and macro buttons.

The *Click Here to Sort Projects by Priority* macro button simply sorts rows 3 through 250 in descending order of column E (Overall Priority Ranking) and re-establishes the priority number listed in column B (Priority Number).

The *Click Here to Insert a Row* macro button shifts all existing data down one row to insert a blank row in row 3. Data will then need to be entered into the new row.

Row 2 Contains the column headers.

**Columns**

Column A Blank.

Column B **Priority Number:** The relative ranking of each project as a result of the data input and summed in Column E (**Overall Priority Rating**).

Column C **Project Number and Name**

Column D **Short Description** (of the Project)

Column E **Overall Priority Rating** – The result of summing the inputs in columns F through O. If column N (**Project Percent Complete**) = 100, then E = 0 so that all completed projects fall to the bottom of the priority list.

Column F **Meet a time-constrained regulatory directive** due in:

Less than 12 months = 100

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13 to 18 months = 75

Greater than 18 months = 50

Column G ***Address regulatory directives without a time-constraint:***

Directive Index Sum for Project times two, range 0 to 50, rounded to the nearest integer.

Directive Index Calculation:

Q1 - The directive relates to which of the following (choose one or more)?

- Bulk electric system instability – 10 points
- Separation/Islanding – 10 points
- Cascading sequence of failures – 10 points
- Items from the Blackout Report – 9 points
- Regulator Critical – 9 points
- Other operational or planning issues – 4 points
- Administrative issues – 0 points

Q2 - What kind of improvement to BPS reliability will the directive, if addressed, provide?

- Significant – 10 points
- Moderate – 8 points
- Incremental – 6 points
- Minimal – 4 points
- None – 0 points

Take the sum of the Q1 responses, up to a maximum of 20. Add the Q2 response. Then divide by 30. The result is the Individual Directive Index.

$$IDI = (\text{MIN}(20, \text{SUM}(Q1)) + Q2)/30$$

To determine the Project Directive Index, add all the IDIs for the directives assigned to a specific project. Multiply it by two, up to a maximum of 50.

$$PDI = \text{MIN}(50, 2x (\text{SUM}(IDI_1 \dots IDI_n)))$$

Column H ***Fill an identified gap in reliability:***

Severe or widespread risk to reliability = 100

Moderate and widespread = 50

Moderate risk or scope = 25

## Standards Committee Process for Standards Project Identification, Prioritization, and Monitoring

	Small risk = 0
Column I	<b><i>Improves existing reliability standards:</i></b> The project includes changes to existing reliability standards or includes new requirements that would improve the overall reliability of the Bulk Electric System.  Significantly = 100 Moderately = 75 Incrementally = 50 Minimally = 25 None = 0
Column J	<b><i>Coordinate changes with another project:</i></b> Each project that is working in coordination with another project is assigned the same value in the prioritization tool. Coordination is occurring or is needed with another project:  Immediately = 50 In 1 to 2 years = 40 In more than 2 years = 30 None needed = 0
Column K	<b><i>Scheduled for its 5 year review in<sup>5</sup>:</i></b>  1 year or less = 50 1 to 2 years = 25 2 to 3 years = 15 Over 3 years = 0
Column L	<b><i>Address compliance issues:</i></b> Value assigned based upon NERC audit team experience during audits. Consideration also given to the number of registered entity complaints about the standards addressed in this project. Range 0 to 50
Column M	<b><i>Address failed interpretation or SDT inability to develop and interpretation:</i></b>  Major gap = 50 Moderate gap = 40 Administrative issues = 10 None = 0
Column N	<b><i>Project Percent Complete:</i></b> The percentage complete of the project per the NERC @Task software ranging from 0 to 100.
Column O	<b><i>Other Factor:</i></b> Value assigned by the Standards Committee and must be accompanied by an explanation of the relative value provided in Column P.

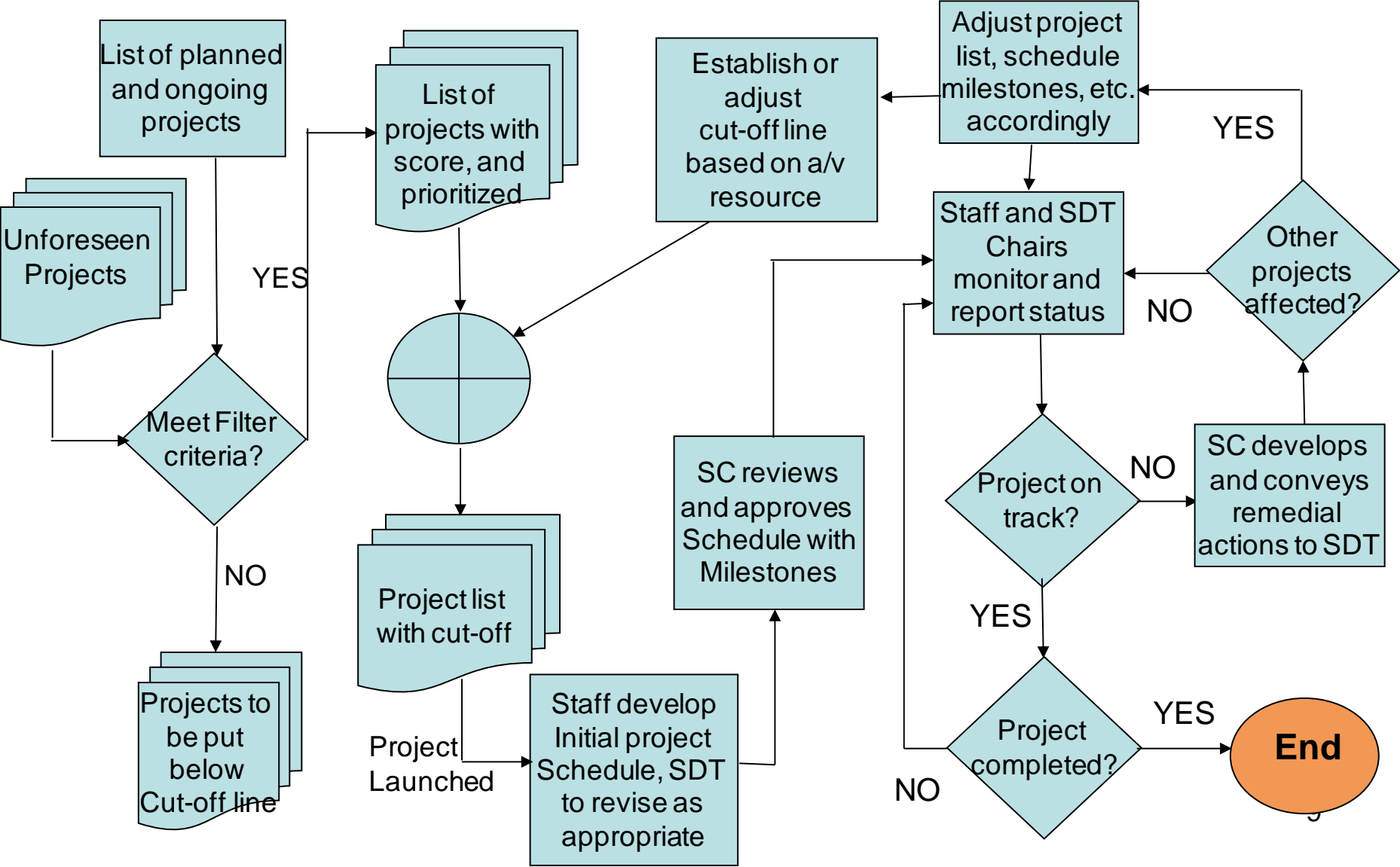
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<sup>5</sup> The rating assigned advises the Standards Committee when a standard is close to its five-year review date; the rating does not indicate whether the standard will meet this five-year review requirement.

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Column P     *Explanation:* the explanation of the value set in column O: Other Factor.

Figure 1: Project Prioritization and Monitoring Flow Chart



Standards Committee Process for Standards Project Identification, Prioritization, and Monitoring

Attachment A: Prioritization Tool

NERC Standards Committee  
Project Prioritization Worksheet

STANDARDS COMMITTEE Reliability Standard Project Prioritization				(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
						Click Here to Sort Projects by Priority		Click Here to Insert a Row	Cells with this color are blank and need a value entered.					
Priority Number	Project Number and Name	Short Description	Overall Priority Rating	Meet a time-constrained regulatory directive due in: (100) < 12 mo. (75) < 18 mo. (50) > 18 mo.	Address regulatory directives without a time-constraint (Directive Index for Project times two, with 0 to 50 range)	Fill an identified gap in reliability 100 = severe and widespread risk to reliability 75 = moderate and widespread 50 = moderate risk or scope 25 = small risk 0 = none	Improves existing reliability standards: 100 = Significantly 75 = Moderately 50 = Incrementally 25 = Minimally 0 = none	Coordinate changes with another project: 50 = Immediately 40 = in 1 to 2 years 30 = in more than 2 years 0 = none needed	Scheduled for its 5 year review in: 50 = 1 year or less 25 = 1 to 2 years 15 = 2 to 3 years 0 = over 3 years	Address compliance issues (0 to 50)	Address failed interpretation or SDT inability to develop an interpretation 50 = major gap 25 = moderate 10 = admin 0 = none	Project Percent Complete per NERC @Task Software (0 to 100)	OTHER FACTOR (Explanation for the rating must be indicated in the column to the right) (0 to 100)	Explanation
1	Project x	Description of Project X	371	0	50	75	100	0	25	0	50	71	0	
2	Project Y	Description of Project Y	363	0	8	50	100	0	25	50	50	55	25	