

## AD HOC TEAM — RESULTS-BASED RELIABILITY STANDARDS INITIATIVE

Team Update to NERC Board of Trustees

February 16, 2010

### BACKGROUND

In Attachment 2 of the ERO Three-Year Assessment, stakeholders recommend that the industry should “focus existing reliability standards and reliability standards development on areas that will lead to the greatest improvement in bulk power system reliability.”

Stakeholder suggestions include: (i) focus the development of new reliability standards on those that will lead to the greatest improvement in reliability; i.e., address the greatest risks of wide-area cascading outages; (ii) reduce the number of existing reliability standards to just those that have a critical impact on reliability of the bulk power system and convert the remaining reliability standards to guidelines; and (iii) develop a more systematic process for prioritizing new reliability standards development projects based on risks to the bulk power system.

In its three-year assessment as the ERO, NERC acknowledged these stakeholder comments and committed to resolving the issues by: i) addressing quality issues to ensure each reliability standard has a clear statement of purpose, and has outcome-focused requirements that are clear and measurable; and ii) eliminating requirements that do not have an impact on bulk power system reliability.

An Ad Hoc group representing industry and NERC and regional staffs (see the roster of the ad hoc group in [Exhibit A](#)) was formed to develop recommendations to ensure that NERC’s reliability standards can have the greatest possible positive effect on the reliability of the bulk power system.

The Ad Hoc group’s recommendations outline a guiding set of principles based on performance and risk-based methods and presents specific recommendations for improving the development and format of reliability standards. Those recommendations were endorsed by the NERC Board of Trustees during the Board’s November 4, 2009 meeting. See Exhibit B for a listing of those recommendations.

To achieve an adequate level of reliability, a blended approach using three types of requirements is needed:

- **Performance-based** — defines a particular reliability objective or outcome to be achieved. In its simplest form, a results-based standard has four components: *who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome?*
- **Risk-based** — preventive requirements to reduce the risks of failure to acceptable tolerance levels. A risk-based reliability standard should be framed as: *who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome that reduces a stated risk to the reliability of the bulk power system?*

- **Competency-based** — defines a minimum set of capabilities an entity needs to have to demonstrate it is able to perform its designated reliability functions.

A defense-in-depth strategy for reliability standards should recognize that each requirement in the NERC standards has a role in preventing system failures, and that these roles are complementary and reinforcing. Reliability standards should not be viewed as a body of unrelated requirements, but rather should be viewed as part of a portfolio of requirements designed to achieve an overall defense-in-depth strategy.

## **MAJOR AD HOC TEAM ACCOMPLISHMENTS TO DATE FOR PHASE II (SINCE NOVEMBER BOT MEETING)**

### **A. Communications Plan**

The Ad Hoc Team enlisted the assistance of the NERC Standards Committee Communications and Planning Subcommittee to develop a communications plan for the results-based reliability standards initiative. The communications plan was approved by the Standards Committee on January 14, 2010 (see Exhibit C).

The mission of the communication plan is to inform and educate reliability stakeholders about the results-based standards project, and promote input and participation from reliability stakeholders.

The approved scope and objectives of the communication plan include:

- a. Obtain stakeholder (industry and government) buy-in by communicating the importance of the initiative, which includes:
  - i. Communicating the benefits to reliability, and
  - ii. justifying the allocation of resources;
- b. Ensure key audiences (FERC, trade groups, NERC committees) are kept abreast of the drafting team's plans, successes, and challenges;
- c. Prepare industry stakeholders, in particular the Registered Ballot Body, to respond promptly and fully to requests for comment and ballots by providing adequate information about drafting team discussions and decisions as they occur; and
- d. Create a feedback clearinghouse to determine information gaps and develop FAQ

### **B. Scorecard Completion**

One of the initial activities of the ad hoc team included the evaluation of the BOT-approved NERC reliability requirements based on the results-based concepts and developed a "scorecard" for each of the BOT-approved requirements. The preliminary results of this effort were provided to the BOT in November. Since the November BOT meeting the Ad Hoc Team has thoroughly reviewed the preliminary results and revised them for consistency across the entire scorecard. The revised scorecard results will be used for:

- a. *Standard Development Priorities*: As a reference document to help the Standards Committee and industry stakeholders prioritize standards with the greatest need for improvement.
- b. *Requirement Revision Priorities*: As a reference for Standards Drafting Teams to help them identify Requirements that need the most attention and point them toward a results-based focus.
- c. *Compliance Monitoring Priorities*: To share the final results with NERC Compliance program to inform them of possible priorities for audit and enforcement.

### **C. Proof of Concept – Standards Committee Approval and Implementation**

A subset of the Ad Hoc Team was tasked with recommending a set of reliability standards for a near-term proof of concept demonstration of results-based standards. The goal was to identify reliability standards the revision of which may have the greatest possible positive effect on the reliability of the bulk power system while:

- Striving to achieve a portfolio of performance, risk, and competency-based mandatory reliability requirements that provide an effective defense-in-depth strategy for achieving an adequate level of reliability of the bulk power system.
- Identifying a clear and measurable expected outcome, such as: i) a stated level of reliability performance, ii) a reduction in a specified reliability risk, or iii) a necessary competency.
- Being structured in the form of who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome (that reduces a stated risk to the reliability of the bulk power system).

On January 14, 2010, the Standards Committee approved the Ad Hoc Team's recommendation to use Project 2007-07 Vegetation Management as a first proof of concept for developing results-based standards and directed the Standard Drafting Team to propose an expedited development schedule with a target for final industry ballot by August 31, 2010 (see Exhibit D).

### **D. Consulting Firm Hired**

NERC has contracted with Compliance Automation Inc. to work with the Ad Hoc Team and the standard drafting team for Project 2007-07 Vegetation Management to convert the draft FAC-003-2 Transmission Vegetation Management Program reliability standard using results-based criteria. Compliance Automation Inc. specializes in requirement gathering, requirement writing, and requirement management.

## **UPCOMING MILESTONES AND ESTIMATED COMPLETION DATES**

The Ad Hoc Team has developed an aggressive schedule for transitioning the Results-based Reliability Standards Initiative over to the Standards Committee (see Exhibit E) and includes, among other things:

1. With Standards Committee approval, engage selected additional drafting team(s), and in consultation with those team(s), guide and expedite drafting of results-based standard(s)
2. Develop a training/orientation program for drafting teams and job aids (including criteria) to guide development of results-based standards
3. Develop road map for prioritized development of results-based standards and incorporate more fully into three-year plan
4. Work with Standards Committee to institutionalize results-based approach and to carry out expanded role of the Standards Committee in managing quality and timeliness of ongoing and future standards projects.

### **ELEMENTS NECESSARY FOR SUCCESS**

The Ad Hoc Team has identified the following issues going forward necessary for the successful implementation of the results-based reliability standards initiative:

1. Effective implementation of the Results Based Standards communications plan.
2. Consistent progress on the proof-of-concept through hands-on work with the standard drafting team for Project 2007-07 Vegetation Management.
3. Development and posting of completed Results-based Reliability Standards criteria and training materials that show clear expectations for the before and after differences in reliability requirements.
4. Staged development support and guidance to several additional standards development projects to be initiated in mid-2010 to demonstrate that high quality Results-based Standards can be successfully developed in the normal course of standards development, without extensive hands-on support.
5. Coordination between the Standards Committee and NERC staff regarding a programmatic approach to assessment of ongoing and proposed projects based on Results-Based Standards principles and other quality criteria.

## **EXHIBIT A — Ad Hoc Group on Results-Based Reliability Standards**

Gerry Adamski, NERC

Terry Bilke\*, Midwest ISO

Roman Carter, NERC

Gerry Cauley, NERC

Carter Edge, SERC Reliability Corporation

Michael Gildea, Dominion Resources Services, Inc.

Chris Hajovsky, RRI Energy, Inc.

Pete Heidrich, Florida Reliability Coordinating Council

Pat Huntley, SERC Reliability Corporation

Ben Li\*, Consultant – (formerly IESO)

Allen Mosher\*, American Public Power Association

Darrell Piatt, FERC (Observer)

Raj Rana, AEP

Eric Rollison, NERC

Steve Rueckert\*, Western Electricity Coordinating Council

Marty Sidor, NERC

David Taylor, NERC

Harry Tom, NERC

Guy Zito, NPCC

\* Members of NERC Standards Committee

**EXHIBIT B – Ad Hoc Group’s November 4, 2009  
Recommendations to the NERC Board of Trustees**

1. Strive to achieve a portfolio of performance, risk, and competency-based mandatory reliability requirements that provide an effective defense-in-depth strategy for achieving adequate reliability of the bulk power system.
2. Each requirement in the standards should identify a clear and measurable expected outcome, such as: i) a stated level of reliability performance, ii) a reduction in a specified reliability risk, or iii) a necessary competency.
3. Each requirement in the standards should be structured in the form of *who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome (that reduces a stated risk to the reliability of the bulk power system)*.
4. Provide instructions, training, and job aids to drafting teams to reinforce the results-based approach and structuring of requirements in this manner. (There currently exists a wide spectrum on what the next version of these results-based standards will look like and hence examples need to be developed.)
5. Provide the evaluation tool and criteria developed in this project to drafting teams and encourage use of the four questions outlined in Exhibit D throughout the drafting and commenting process.
6. Strive to minimize prescriptive, administrative (document something), and commercial requirements within the reliability standards.
7. Reduce the number of sub-requirements by incorporating essential components into the main body of the requirement statement for the purpose of reducing the compliance administration burden of numerous separate sub-requirements.
8. Provide increased focus in describing the applicability of each requirement by identifying not only the specific functional entities, but also any specific assets and conditions to which the requirement should apply to achieve the necessary reliability objective.
9. Provide active participation of compliance personnel in the development of standards to ensure performance requirements can be effectively measured in the field.
10. Evaluate the current three-year standards development plan and adjust priorities going forward to achieve the most reliability benefit using the principles outlined in this report.
11. Modify the standard template to distinguish elements that are mandatory for registered entities from elements that are informational or used to administer compliance (a sample template for a reliability standard is provided in Exhibit C).
  - a. Mandatory and enforceable sections of the standard should include: i) applicability, ii) performance requirements, iii) measures, and iv) data/record retention (plus any regional variations if applicable).

- b. Informational sections for the administration and application of the standards should include: i) compliance administration information, ii) procedures, and iii) guidelines or supporting information.
12. Revise the Standards Committee charter to clearly indicate that the committee is responsible not only for the integrity of the standards process, but also the essential quality attributes of the reliability standards in accordance with the ERO Rules of Procedure, as guided by the results-based principles outlined in this report, and without prejudice regarding the specific content of each standard.
  13. In the longer-term, NERC should develop a robust standards information management system based on relational database methods.

## Communications Plan for Results-based Standards Project

### **Background**

In November 2009, the NERC Board of Trustees approved a plan to improve the set of NERC reliability standards by making them more focused on reliability performance. This initiative, known as the "results-based standards project," aims to develop recommendations to ensure that NERC's reliability standards can have the greatest possible positive effect on the reliability of the bulk power system. An ad hoc group working on the project has outlined a guiding set of principles based on performance and risk-based methods and has presented specific recommendations for improving the development and format of reliability standards.

### **Mission**

Inform and educate reliability stakeholders about results-based standards project, and promote input and participation from reliability stakeholders.

### **Scope/Objectives**

1. Obtain stakeholder (industry and government) buy-in by communicating importance of initiative:
  - a. communicate benefits to reliability
  - b. justify allocation of resources
2. Ensure key audiences (FERC, trade groups, NERC committees) are kept abreast of the drafting team's plans, successes, and challenges
3. Prepare industry stakeholders, in particular the Registered Ballot Body, to respond promptly and fully to requests for comment and ballots by providing adequate information about drafting team discussions and decisions as they occur
4. Create a feedback clearinghouse to determine information gaps and develop FAQ

### **Audience**

- All NERC registered entities
- NERC standards, compliance, and other relevant staff (ex. Standard Coordinators, Compliance Registry, Enforcement, etc)
- NERC Standing Committees and relevant taskforces, ad hoc groups, subcommittees, and contractors (ex. Operating Committee, Planning Committee, CIPC, Standard Drafting Teams)
- Regional Entity staff and committees (ex. equivalent of NERC Standards Committee)
- Regional Entity management group

- FERC Commissioners, Office of Electric Reliability staff, and Office of Enforcement staff
- Industry executives (senior managers and CEOs)
- Line employees, subject matter experts, and members of standard drafting teams
- Trade associations (EEI, APPA, NRECA, EPSA, ELCON, NARUC)
- NERC drafting team coordinators, including contractors
- Public Utility Commissions

## Topics

Concepts	<ul style="list-style-type: none"> <li>○ core components of a result-based standard</li> <li>○ process used to identify three standards for this results-based pilot</li> <li>○ pilot test history (why those standards)</li> </ul>
Benefits and importance	<ul style="list-style-type: none"> <li>○ positive impact on overall reliability of the grid (helps to give some data)</li> <li>○ benefits to stakeholders for meeting compliance requirements</li> <li>○ what measure(s) will define success with the pilot</li> </ul>
Resources (industry experts needed)	<ul style="list-style-type: none"> <li>○ what resources are needed (what SME backgrounds)</li> <li>○ when and for how long</li> </ul> <p><i>especially important to executives so they can decide whether other things can be moved or deferred because employees are working on this project</i></p>
Timeline	<ul style="list-style-type: none"> <li>○ stages of the program and anticipated timelines <ul style="list-style-type: none"> <li>○ ex. NERC Board asked that pilot test be undertaken as quickly as possible with three standards completed and implemented in 2010</li> </ul> </li> <li>○ plans for implementation of lessons learned in this pilot on remaining standards in 2011 and beyond</li> </ul>
Impact on process	<ul style="list-style-type: none"> <li>○ what will be different in the drafting, reviewing, and balloting process for these three pilots as opposed to all other standards in the developmental pipeline in 2010 (maybe table of similarities and differences)</li> <li>○ leadership role of consultant until stakeholders adapt to new drafting model (will take time and practice to learn)</li> <li>○ inter-drafting team communication (who's doing what); important to target confusion and support coordination of possible overlaps</li> <li>○ status/impact of standards current currently undergoing drafting by industry members or sitting in the pipeline scheduled to start in 2010 (before this pilot got started)</li> </ul>
Information sources	<ul style="list-style-type: none"> <li>○ where stakeholders can get further information as project proceeds in 2010</li> <li>○ provide a place for feedback: ex. issues and concerns can go to the Standards Committee since it will oversee this pilot in coordination with NERC staff</li> <li>○ provide access to message packages as they are available (especially for trade groups)</li> </ul>

## Delivery Methods

e-mail	<ul style="list-style-type: none"> <li>○ use distribution lists to ensure full coverage (NERC, Regional Entities, etc.)</li> <li>○ use Regional Entity distribution lists to reach targeted personnel</li> </ul>
Webinars	<ul style="list-style-type: none"> <li>○ record and “distribute/make available” for those who cannot attend</li> </ul>

	<ul style="list-style-type: none"> <li>○ include feedback option (on demand after structured presentation/Webinar)</li> </ul>
Committee meetings (NERC, Regional)	<ul style="list-style-type: none"> <li>○ attend meetings and communicate message</li> <li>○ request special call if necessary for briefing</li> </ul>
NERC Web site	<ul style="list-style-type: none"> <li>○ centralized place; linked from Regional Entity sites</li> <li>○ headline news, big button on home page (similar to “Renewables”), pop-up page, project page, standards under development, and other frequently hit pages</li> </ul>
structured conference call and/or meeting	for standards drafting team reps and NERC coordinators, including contractors; ensure participation from all teams
Face-to-face outreach	<ul style="list-style-type: none"> <li>○ ex. trade groups, FERC commissioners and staff, committees</li> <li>○ high-level involvement from NERC</li> </ul>
“Canned message”	<ul style="list-style-type: none"> <li>○ slides and presentations (project information – overview, etc.)</li> <li>○ files accessible via Web site and possible in-person delivery of record message</li> </ul>
Press releases	
Newsletters	NERC News; Regional Entity newsletters?
Workshops	<ul style="list-style-type: none"> <li>○ Agenda item on existing regional workshops (ex. compliance workshops; SERC has one mid-March)</li> <li>○ NERC Standards workshop (Spring 2010?)</li> </ul>
Regional Entity management group meetings/calls	<p>Group holds weekly (Friday) conference calls and meets face-to-face prior to certain high-level meetings – standing committees, BOT</p> <p>Ask Regional Entity Mangers to discuss the initiative at various conferences they attend to relay the message and gain additional support from stakeholders</p>

## Delivery Plan/Timeline

### Historical Tactics:

The ad hoc group has been examining the means by which reliability standards could be rewritten with a results-based orientation. (July – November 2009) The group has presented its findings:

- NERC standing committees (September 15, 2009)
- Standards development plan webinar (September 17, 2009)
- NERC standards workshop (October 15, 2009)
- NERC Board of Trustees and Member Representatives Committee (November 4-5, 2009) - NERC Board gave full support to the project and requested ad hoc team work with NERC staff, the NERC Standards Committee, and other stakeholders to bring the plan to fruition as expeditiously as possible. *See [link to MRC agenda item 8, attachment 8a; link to BOT minutes.]*

## Planned Tactics:

Date	Tactic	Audience	Content Developer(s)	Presenter/Delivery
Early January 2010	Conduct conference call to outreach to trade associations (will use slides from original plan)	Trade associations	Allen Mosher (with support from SCCPS)	Allen Mosher
January 14, 2010	Submit communications plan for endorsement	Standards Committee/NERC Senior Management	SCCPS	Raj Rana, Michael Gildea
End of January 2010	Solicit endorsement of staffing and budget allocation to undertake project in 2010	NERC Board	Dave Taylor, Gerry Adamski	Gerry Adamski
End of January 2010	Create web page for high-level updates (with links from home page and standards pages)	Industry/FERC	Shaun Streeter, Carl Dombek, SCCPS subteam	NERC staff (Dave Taylor)
End of January 2010	Develop talking points and core messages that would be used in various levels of detail for all communications	All	Project 2010-06 members, SCCPS members, NERC staff (Carl Dombek), NERC regional communications group	Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs)
End of January 2010	Develop press release <ul style="list-style-type: none"> <li>o scope and timeline</li> <li>o core messages</li> <li>o talking points</li> </ul>	All	Carl Dombek, Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs)	Carl Dombek
Early February 2010	Distribute press release announcing project (to NERC exploders; send material to Regional Entities for customized distribution)	Industry	Carl Dombek	Carl Dombek
Early February 2010	Develop a NERC address for stakeholder to submit questions	All	Shaun Streeter, Carl Dombek	Shaun Streeter, Carl Dombek
Early February 2010	Hold targeted conference calls to explain process and anticipated schedule	drafting teams selected to work on results-based standards	Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs)	Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs)
February 2010	Conduct conference call(s) and e-mail	All drafting team chairs, vice	Dave Taylor and Chris Hajovsky	Dave Taylor and Chris

Date	Tactic	Audience	Content Developer(s)	Presenter/Delivery
	messaging on expectations – separate above activity since message focus will be different	chairs, coordinators	(Project 2010-06 co-chairs)	Hajovsky (Project 2010-06 co-chairs)
February 2010	Provide project status update	NERC Board	Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs)	Chris Hajovsky (with Allen Mosher, Gerry Adamski, or Dave Taylor attending)
Monthly	Distribute any updated materials for use in regional forums (outlined in more detail in regional contact list created by SCCPS)	Regional Entities	SCCPS subteam, Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs)	Regional contacts (SCCPS contact list)
Mid-February 2010	Announce NERC-sponsored Webinar	Industry	Carl Dombek, Shaun Streeter	Carl Dombek, Shaun Streeter
Early March 2010	Conduct (and record) Webinar held on subject Solicit feedback during Webinar	Industry	SCCPS subteam, Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs)	Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs), Carl Dombek
Early March 2010	Provide individual briefings on anticipated process and schedule Obtain feedback	electric trade associations, FERC Reliability Office	Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs), Allen Mosher, Gerry Adamski	Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs), Allen Mosher, Gerry Adamski
As necessary	Request topic to be included on Regional Managers' weekly conference calls (regional call and/or NERC/regional call)	Regional Entities	SCCPS subteam, Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs)	SCCPS subteam, Julie Blair (current call coordinator), Gerry Adamski
	Develop a frequently asked questions document for Web page	All	SCCPS subteam, Shaun Streeter, Carl Dombek, Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs), drafting teams working on result-based projects	Shaun Streeter, Carl Dombek
Early March 2010	Request and collect status of draft standards	drafting teams working on results-based standards	Dave Taylor	Dave Taylor

Date	Tactic	Audience	Content Developer(s)	Presenter/Delivery
Early March 2010 (then on regular basis)	Distribute status of draft standards <ul style="list-style-type: none"> <li>• meeting agenda topics, such as reports to Standards Committee</li> <li>• NERC Newsletters</li> <li>• dedicated NERC Web page (monthly)</li> <li>• e-mail lists (ex. Regional Entities)</li> </ul>	Industry, Standards Committee (primary), and NERC Management, Regional Entities	Dave Taylor, Shaun Streeter, drafting teams working on results-based standards	Shaun Streeter, Maureen Long, Carl Dombek
April 2010 (or about 3 months after project approval)	Host advanced scheduled conference call to review what's working with program roll-out and make adjustments, including communications efforts.	SCCPS, Regional Contacts, and NERC staff involved program implementation	Raj Rana, Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs)	Raj Rana, Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs)
May 2010	Provide drafting team status report to NERC MRC at May meeting (include assessment of ability to meet targets)	Industry	Dave Taylor	Gerry Adamski, Allen Mosher
May 2010	Provide project status update	NERC Board	Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs)	Chris Hajovsky (with Allen Mosher, Gerry Adamski, or Dave Taylor attending)
As standards are ready	Announce comment periods, pre-ballot reviews, and ballots	Industry	Shaun Streeter	Shaun Streeter, Lauren Koller
June/July 2010	Announce NERC-sponsored Webinar	Industry	Carl Dombek, Shaun Streeter	Carl Dombek, Shaun Streeter
June/July 2010	Conduct (and record) Webinar for status, Q&A that has surfaced as result of project implementation, successes, and challenges Solicit feedback during Webinar	Industry	SCCPS subteam, Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs)	Dave Taylor and Chris Hajovsky (Project 2010-06 co-chairs), Carl Dombek
June/July 2010	Review efforts conducted through June and draft plan for remainder of year			

## EXHIBIT D — Ad Hoc Team’s Recommendation for Proof-of-concept Demonstration Project

### Results-based Reliability Standards Proof of Concept Demonstration Candidates

**Issue:** A sub-team of the *ad hoc* group of industry participants established for developing a plan for implementing Project 2010-06 Results-based Reliability Standards (as defined in the Reliability Standards Development Plan: 2010-2012) has been tasked with recommending a set of reliability standards for a near-term proof of concept demonstration of results-based standards.

**Purpose:** Results-based quality attributes ensure that NERC Reliability Standards have the greatest possible positive effect on the reliability of the bulk power system while:

- Striving to achieve a portfolio of performance, risk, and competency-based mandatory reliability requirements that provide an effective defense-in-depth strategy for achieving an adequate level of reliability of the bulk power system.
- Identifying a clear and measurable expected outcome, such as: i) a stated level of reliability performance, ii) a reduction in a specified reliability risk, or iii) a necessary competency.
- Being structured in the form of *who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome (that reduces a stated risk to the reliability of the bulk power system).*

### **Procedure:**

**Step 1** — Develop a short list of potential demonstration standards with a perceived high value return for the effort expended – seek input from persons experienced in implementing the existing set of NERC Board of Trustee approved reliability standards.

### **Actions**

A survey with the following question was sent to industry participants with a broad base of NERC Standards experience.

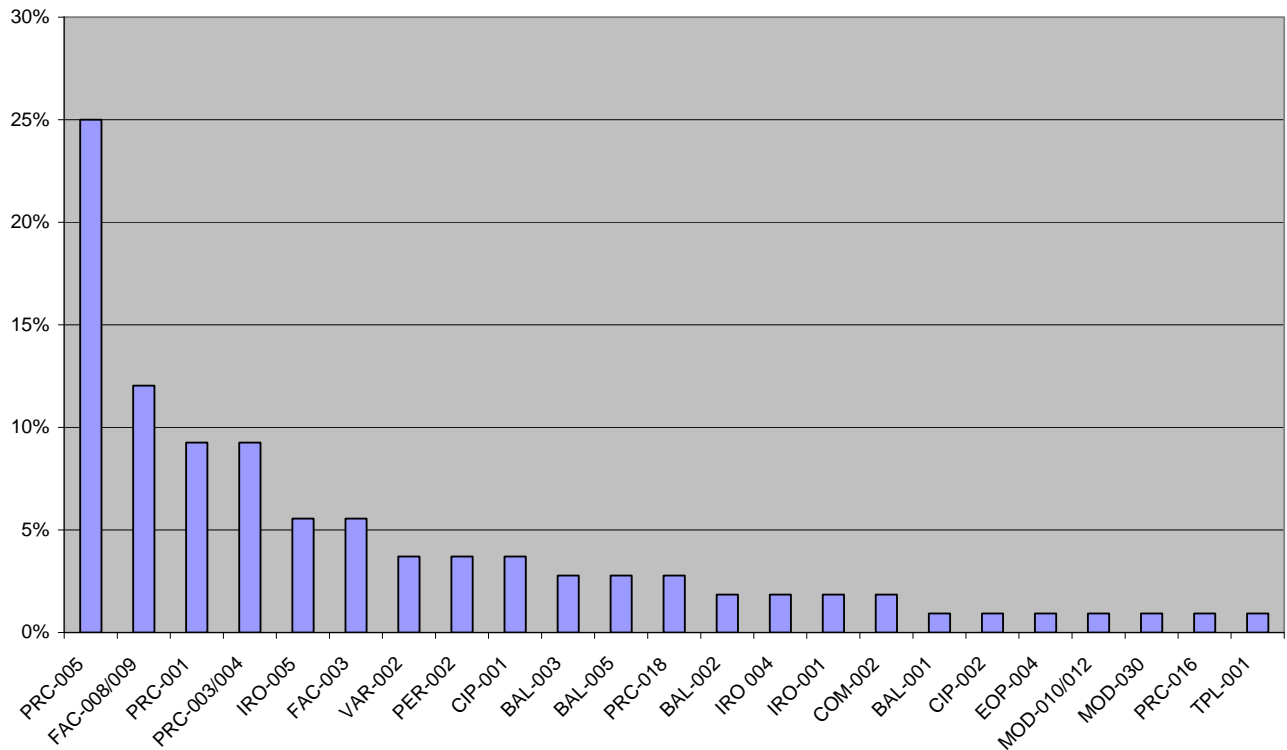
***“Which FERC-approved NERC reliability standards do you feel should be revised in the immediate future because the resulting effort would have the highest potential for improvement in terms of impact to reliability of the bulk electric system (BES). Please provide a prioritized list (with “1” being the highest priority).”***

There were 21 respondents to the brief survey. These respondents represented various registered entities subject to the standards, ERO auditors, standards committee members, and contract personnel who provide professional services with respect to entity compliance programs.

A total of 23 individual NERC Reliability Standards in 11 standards categories were identified as potential candidate standards for a proof of concept demonstration project which portrayed a fairly diverse target set. However, to assist in analyzing the results, standards ranked a #1

priority in each response were assigned three points. Those ranked as a #2 priority were assigned two points and those ranked as a #3 priority were assigned one point. The following chart displays the results in terms of the percentage of the total weighted points each standard received.

**Potential candidate standards for a proof of concept demonstration project**



**Step 2** – Summarize the results of the survey responses received and highlight the pros and cons for a near-term proof of concept demonstration considering: 1) reliability impact; 2) violation frequency; 3) political importance; and 4) ability to get entire redraft done in 2010.

**Summary**

1. PRC-005 — Transmission and Generation Protection System Maintenance and Testing
  - The requirements of this standard on average have a **high** impact to reliability
  - Violations of this standard have been cited **102** times to date
  - Rated by the survey as the **#1** standard that could benefit from results-based quality attributes
  - [Project 2007-17 Protection System Maintenance and Testing](#) has a drafting team in place and a current estimated completion date of Q4 2010
  - Current draft standard is a major improvement to the current enforceable standard but may need some significant changes to comport with the results-based standard criteria

- Project 2007-17 Protection System Maintenance and Testing includes the following standards, modifications to which would all need to be coordinated simultaneously:
    - **PRC-005-1 — Transmission and Generation Protection System Maintenance and Testing**
    - PRC-008-0 — Underfrequency Load Shedding Equipment Maintenance Programs
    - PRC-011-0 — UVLS System Maintenance and Testing
    - PRC-017-0 — Special Protection System Maintenance and Testing
2. FAC-008 - Facility Ratings Methodology & FAC-009 - Establish and Communicate Facility Ratings
- The requirements of these two standards on average have a **high** impact to reliability
  - Violations of these standards have been cited **86** times to date
  - Rated by the survey as the **#2** standard area that could benefit from results-based quality attributes
  - [Project 2009-06 Facility Ratings](#) has a drafting team in place
  - FAC-008-2 Facility *Ratings* is currently posted for pre-ballot review through January 12, 2010 with the initial ballot schedule to commence January 13
  - Over the course of Project 2009-06: Facility Ratings the Standard Drafting Team has had difficulty striking a balance between the directives contained in FERC Order No. 693 and gaining industry consensus
  - There is the possibility within the standards development process to pull this draft standard from ballot and take the opportunity and time to develop this standards area using results-based quality attributes
  - Project 2009-06 Facility Ratings includes the following standards, both of which need coordinated simultaneously:
    - **FAC-008-1 — Facility Ratings Methodology**
    - **FAC-009-1 — Establish and Communicate Facility Ratings**
3. PRC-001 System Protection Coordination
- The requirements of this standard on average have a **high** impact to reliability
  - Violations of this standard has been cited **six** times to date
  - Tied with PRC-003/004 for the **#3** standards area that could benefit from results-based quality attributes
  - [Project 2007-06 System Protection Coordination](#) has a drafting team in place and a current estimated completion date of Q4 2010
  - The standard drafting team for Project 2007-06 System Protection Coordination has held a couple discussions with FERC staff that indicate more work might be needed before this standard can be balloted. The risk associated with the additional work might cause an adverse impact to the schedule and therefore, would preclude this standard from being used for the proof of concept demonstration.

- Project 2007-06 System Protection Coordination includes the following standard:
    - **PRC-001-1 — System Protection Coordination**
4. PRC-003 Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems & PRC-004 Analysis and Mitigation of Transmission and Generation Protection System Misoperations.
    - The requirements of this standard on average have a **high** impact to reliability
    - Violations of these standards have been cited **six** times to date
    - Tied with PRC-001 for the **#3** standards area that could benefit from results-based quality attributes
    - Project 2010-05 Protection Systems is identified in the Board-approved Reliability Standards Development Plan: 2010-2012 to be initiated in 2010. As such, a drafting team is not in place yet
    - Since the project for these standards will not be initiated until sometime in 2010, the sub-team of the ad hoc group suggests that PRC-003 and PRC-004 are not good candidates to use for the proof of concept demonstration to assess the Results-Based Reliability Standard project
  5. IRO-005 Reliability Coordination — Current Day Operations
    - The requirements of this standard on average have a **high** impact to reliability
    - Violations of this standards has been cited **two** times to date
    - Tied with FAC-003 as the **#4** standard that could benefit from results-based quality attributes
    - [Project 2006-06 Reliability Coordination](#) has a drafting team in place and a current estimated completion date of Q3 2010
    - Project 2006-06 Reliability Coordination includes the following standards, modifications to which would all need to be coordinated simultaneously:
      - COM-001-1 — Telecommunications
      - COM-002-2 — Communications and Coordination
      - IRO-001-1 — Reliability Coordination — Responsibilities and Authorities
      - IRO-002-1 — Reliability Coordination — Facilities
      - **IRO-005-2 — Reliability Coordination — Current-Day Operations**
      - IRO-014-1 — Procedures, Processes, or Plans to Support Coordination Between Reliability Coordinators
      - IRO-015-1 — Notifications and Information Exchange Between Reliability Coordinators
      - IRO-016-1 — Coordination of Real-time Activities Between Reliability Coordinators
  6. FAC-003 — Transmission Vegetation Management Program

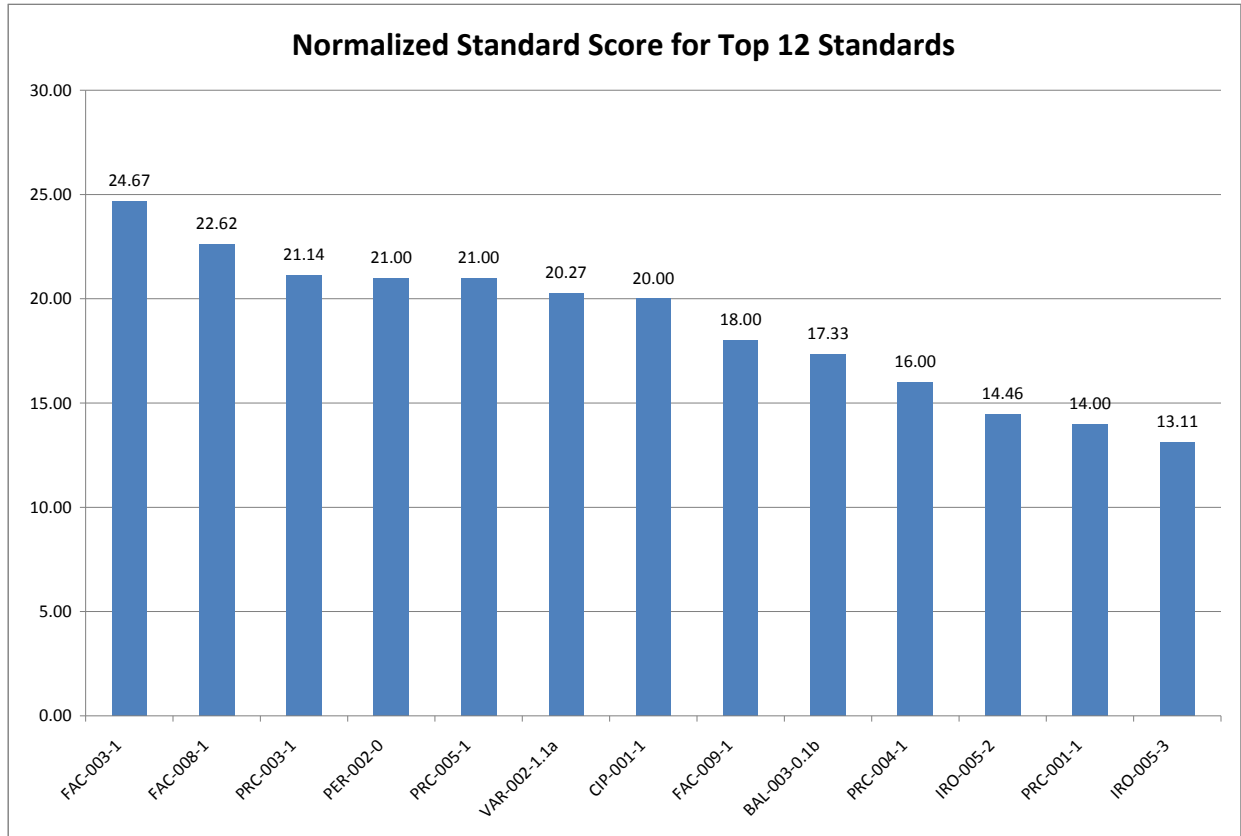
- The requirements of this standard on average have a **high** impact to reliability
- Violations of these standards have been cited **24** times to date
- Tied with IRO-005 for the **#4** standards area that could benefit from results-based quality attributes
- [Project 2007-07 Transmission Vegetation Management](#) has a drafting team in place and a current estimated completion date of Q4 2010
- Project 2007-07 Transmission Vegetation Management includes the following standard:
  - FAC-003-1 — Transmission Vegetation Management Program

Beyond the projects identified above, convergence on consensus of priority of standard development projects to pursue falls off considerably.

**Step 3** — Compare the survey results in step 2 above with the work of the sub-team validating the reliability standard requirements scorecard developed earlier in the overall project. Of the projects identified above, those with the poorest scorecard ratings should be considered of higher priority relative to the other projects.

### Results

Input from the scorecard effort evaluating the requirements of the top standards identified from the survey resulted in the following ranking:



On a scale of 1 to 30, the underlying requirements of these existing standards have the greatest deviation from quality attributes of results-based standards and thus a standard with a higher score would potentially benefit more from the proof of concept relative to one with a lower score. The scores have been normalized to allow comparison.

**Step 4** — Finalize list.

In summary, four current standards development projects are potential candidates to use for the proof of concept demonstration to assess the Results-Based Reliability Standard project. These four standard development projects are ranked and recommended in the following order of precedence.

1. Project 2007-07 Transmission Vegetation Management:
  - **FAC-003-1 — Transmission Vegetation Management Program**
2. Project 2009-06 Facility Ratings:
  - **FAC-008-1 — Facility Ratings Methodology**
  - **FAC-009-1 — Establish and Communicate Facility Ratings**
3. Project 2007-17 Protection System Maintenance and Testing:
  - **PRC-005-1 — Transmission and Generation Protection System Maintenance and Testing**
  - PRC-008-0 — Underfrequency Load Shedding Equipment Maintenance Programs
  - PRC-011-0 — UVLS System Maintenance and Testing
  - PRC-017-0 — Special Protection System Maintenance and Testing
4. Project 2006-06 Reliability Coordination:
  - COM-001-1 — Telecommunications
  - COM-002-2 — Communications and Coordination
  - IRO-001-1 — Reliability Coordination — Responsibilities and Authorities
  - IRO-002-1 — Reliability Coordination — Facilities
  - **IRO-005-2 — Reliability Coordination — Current-Day Operations**
  - IRO-014-1 — Procedures, Processes, or Plans to Support Coordination Between Reliability Coordinators
  - IRO-015-1 — Notifications and Information Exchange Between Reliability Coordinators
  - IRO-016-1 — Coordination of Real-time Activities Between Reliability Coordinators

**Additional stakeholder perspectives considered on the proposed standards:**

PRC-005
It is the most violated standard and requires an inordinate amount of paperwork.
PRC-005 version 2 drafting is out of control in the detail of the draft standard. It can be turned around to meet the quality attributes of a results-based standard before posting again. It is the reported second-most violated standard (102 times) and the second-highest penalized (\$387,000 total penalty amount) standard according to the published NOP.
This standard is recommended since lack of maintenance and testing of Protection Systems can have detrimental impact on BES reliability, lead to BES equipment damage and safety concerns. The present standard is one of the most heavily violated standards yet without evidence of real reliability issues resulting. This brings into question if appropriate performance expectations are being placed on industry. We propose the starting point be the draft PRC-005-2 that is presently under development.
Transmission and Generation Protection System Maintenance and Testing is the most violated NERC Reliability Standard for the period of 11/01/08 through 10/31/09. The purpose of this reliability standard is to ensure all transmission and generation Protection Systems affecting the reliability of the Bulk Electric System (BES) are maintained and tested. Without the appropriate maintenance and testing procedures in place, safeguarding the BES is not plausible. Due to the direct impact to the BES, this Reliability Standard needs clarification and would benefit from the concept demonstration of performance-based standards.
Highest number of violations, plus confusion to which equipment is covered by the standard and which equipment is excluded.
Utilities are found out of compliance with this standard more often than most other standards. Greater clarity may result in fewer fines. In addition, maintenance and testing requirements for current transformers, potential transformer, and the control circuits add confusions. In many cases CTs and other instruments are buried in generation housings, power transformer, and switchgear where detailed observation and testing pose significant challenges that may result in issues that adversely impact equipment availability.
PRC-005 - this is a standard currently under revision - based on the interpretation for this standard, we know that the standard needs clarity
This standard has gathered a lot public attention and hence, is the political hot potato. While I do not believe the standard needs a lot of new rewriting, some will help it.

FAC-008/009
It is one of the most violated standard and in my opinion contributes nothing to reliability of the BES by including generators in the applicability. I am also not convinced that it does anything for consistency in the calculation of ATC.
FAC-008 and 009 if taken together are the third most violated (86 times) and third highest penalized (\$241,500).
FAC-008-1 - Should be coupled with FAC-009-1 to make it a complete ratings methodology standard. Entities maybe be using the most limiting machine rating but do not have a specified methodology to show compliance.
Some companies may overlook that equipment listed in R1.2.1 shall each be addressed using the considerations

listed in R1.3.
FAC-008-009, since facility ratings are the foundation of planning and operation for a bulk electric system.
Facility Ratings Methodology is the fifth most violated NERC Reliability Standard for the period of 11/01/08 through 10/31/09. The purpose of this reliability standard is to ensure that Facility Ratings used in the reliable planning and operation of the Bulk Electric System (BES) are determined based on an established methodology or methodologies. Without the appropriate and accurate facility ratings methodology and ensuing facility ratings, the resulting planning and operation of the BES is not possible. Due to the direct impact to the BES, this reliability standard needs clarification and would benefit from the concept demonstration of performance-based standards.

PRC-003/004
PRC-004 - relay misoperations have a very high potential to create a cascading event:
In the 2009 Long-Term Reliability Assessment report, the figure Trend 2 (on page 357) indicates that protection system misoperations are increasing substantially each year (2006 less than 10%, 2007 less than 40%, & in 2008 greater than 50%) and looking at Figure Trends 1 (page 356), they appear to be causing disturbance events of categories 2 and 3. PRC-004 & PRC-003 would address these misoperations and hopefully corrective action plans could be implemented to resolve the current trend.
Even though the QRSAs identify the type of equipment, emphasis should be considered in including the definition of "protection system" as defined in the NERC Glossary of Terms in the standard (bullet point, bold print, etc). Many entities still miss the point here.

PRC-001
The consequences of this standard's impact on the bulk electric system are significant and yet I am hearing reports back from auditors working on many different company records that about problems with relays in the field that are not being captured by the existing standard on this topic.
PRC-001 - Coordination of settings is a very vague area and needs further clarification.
PRC-001 There are Generator Operators who have been indoctrinated to give first priority to the facilities they operate, and as a result, they do not understand the consequences of the degraded relay on the reliability of the power system.
PRC-001-1 - System Protection Coordination--the criticality of system protection to the reliable operation of the Bulk Power System can only be ensured through the coordination of information between entities.

FAC-003
Does not cover momentary contact outages which can be a precursor to larger and more significant contact outages.
Not clear that vegetation contact and outage is a violation. Need to establish a requirement to address.
Has had a high profile and would benefit from a results-oriented review.

Vegetation maintenance is an important preventative risk management standard to ensure reliable operation of the BES and one of the most heavily violated standards. Again, are appropriate risk management expectations being placed on industry? We propose the starting point be the draft FAC-003-2 that is presently under development. Utilizing the drafting team's work will also make use of supporting guideline documents, envisioned by the Results-Based initiation, that are in development for each of those projects.

**IRO-005**

To maintain real-time continuity of service, real-time operations must be addressed.

**Comments on remaining candidate standards:**

<b>VAR-002</b>	It allows the TO/TOP to provide the generator a reactive schedule but requires the Generator to maintain the AVR in the auto voltage mode.
<b>BAL-002</b>	Critical for reliability of the BES.
<b>BAL-003</b>	This is a standard that has an impact on frequency and has had several requests for interpretation.
<b>CIP-001</b>	Sabotage Reporting is the third most violated NERC Reliability Standard for the period of 11/01/08 through 10/31/09. The purpose of this reliability standard is to report disturbances or unusual occurrences, suspected or determined to be caused by sabotage to the appropriate systems, governmental agencies, and regulatory bodies. The non-report of a suspected or determined sabotage event could have a major impact to the BES. Due to the direct impact to the BES, this reliability standard needs clarification and would benefit from the concept demonstration of performance-based standards.
<b>IRO 004</b>	Clarify what information is needed for system studies.
<b>IRO-001</b>	IRO-001/TOP-001 - Understanding what a directive is and following directives is critical to maintain BES stability. Coordination of real time activities fits into this as well.
<b>CIP-002</b>	This standard may be a good compliment to round out the results-based proof of concept effort. The CIP-002 is a very high profile standard being afforded leeway for expedited standard development. It is important that this standard be written in a manner that supports the results-based initiative and that the industry demonstrates it can deliver a quality product in a timely manner. Including this project will deliver an example proof of concept well before year-end 2010.
<b>COM-002</b>	Existence and maintenance of communication facilities is required to have an effective means of transmitting critical generation information and directives.
<b>EOP-004</b>	Disturbance event reporting is a major source of confusion and frustration in the industry right now. Event analysis and lessons-learned are fundamental to lowering the "risk curve", a clear and consistent reporting threshold is needed for reporting of system events. Data shows that the vast majority of events analyses as well as CIQ/CVIs, originate from system event reports. Alleged violations of EOP-004 have only been enforced four times with no penalties assessed.

<b>MOD-010/012</b>	Clarify generator testing requirements and specifically what generators need to be tested within plants that have multiple generators. A number of the MOD standards refer back to the RRO for details; however, RROs do not have approved criteria to provide guidance.
<b>PRC-016</b>	Version 0 standard lacks critical detail for ensuring continued future reliability of BES.
<b>TPL-001</b>	Correctly planning the performance of system would also resolve this trend; that is why I suggest the TPL-001-1.

## EXHIBIT E — Ad Hoc Team’s Work Plan and Schedule

### Reliability Standards Initiative Ad Hoc Group Work Plan and Schedule Updated January 6, 2009

#### Phase 1 — Concept Development

Milestone/Deliverable	Assigned to	Date	Status
1. Kickoff meeting and discussion of scope and participation.	Cauley	8/7/09	Complete
2. Develop startup work plan.	Cauley	8/14/09	Complete
3. Distribute documents on related efforts to improve standards.	Li, Bilke, Taylor	8/14/09	Complete (Bibliography to be developed by Cauley – deferred to Phase 2)
4. Draft a <b>written design philosophy</b> for reliability standards.	Cauley	10/22/09	Complete – presented to Standards Committee, MRC and Board
5. Develop criteria/attributes for review of existing standards.	Bilke	8/28/09	Complete
6. Communicate to stakeholders <ul style="list-style-type: none"> <li>a. Standards Committee conf call briefing</li> <li>b. Standing committees joint presentation</li> <li>c. Standards three-year plan webinar</li> <li>d. WIRAB conference</li> </ul>	Taylor/Cauley Cauley/Taylor Taylor/Cauley Cauley	9/3/09 9/15/09 9/17/09 10/16/09	Complete Complete Complete Complete
7. Conduct a review and develop “scorecard” and assign “category” for each existing requirement based on criteria above.	All	9/11/09	Complete
8. Develop a <b>gap analysis report</b> on the existing standards compared to criteria.		9/30/09	Complete – based on 1360 board-approved requirements
9. Develop improved <b>construct/format of a reliability standard</b> , including supporting documents; reference SCPS’s prior effort.		10/22/09	Complete – preliminary outline in final report
10. Develop several <b>examples of model performance-based standards</b> focused on reliability objectives.		10/16/09	Deferred to Phase 2
11. Develop a <b>roadmap and high-level work plan for implementing modified approach to standards development</b> .		10/16/09	Deferred to Phase 2

Milestone/Deliverable	Assigned to	Date	Status
12. Develop a <b>communications plan</b> .		10/23/09	Deferred to Phase 2
13. Present deliverables to NERC Standards Committee for approval (meeting). Carmel IN	Adamski	10/7-8/09	Complete
14. Present deliverables to NERC MRC and board	Adamski	11/4-5/09	Complete
15. Sunset ad hoc group and transition ownership to Standards Committee (conference call 12/3/09).	Adamski	12/3/09	Deferred at request of NERC Board to continue Phase 2

### Phase 2 — Demonstration of Concepts

Milestone/Deliverable	Assigned to	Date	Status
16. Develop Phase 2 work plan, deliverables and assignments.	Cauley	11/20/09	Draft reviewed 11/13/09
17. Obtain services of consultant with qualifications in results-based standards to assist team.	Cauley and Taylor	11/30/09	Potential candidate identified
18. Validate rankings of existing, enforceable requirements: 1) priority on top 10 most violated standards to feed Task 19; 2) share final results with compliance program to inform priorities for audit and enforcement.	Cauley, Rollinson, Rueckert, Hajovsky	12/15/09	Taylor provided a list of top 10 violated from BCC open meeting 11/4/09 Hajovsky coordinating the validation of the scorecard
<p>19. Perform gap analysis to determine highest priority standard(s) for near-term proof of concept demonstration (1 to 3 standards) based on: 1) reliability impact; 2) violation frequency; 3) political importance; and 4) ability to get done in 2010.</p> <p>Note:</p> <p>The Ad Hoc group agreed to use Project 2007-07 Transmission Vegetation Management (FAC-003-1 — Transmission Vegetation Management Program) as the proof-of-concept demonstration and to place the following three projects as priority projects with respect to implementing results-based criteria:</p> <p>5. <u>Project 2009-06 Facility Ratings:</u></p> <ul style="list-style-type: none"> <li>• <b>FAC-008-1 — Facility Ratings Methodology</b></li> <li>• <b>FAC-009-1 — Establish and Communicate Facility Ratings</b></li> </ul>	Edge	12/15/09	<p>Industry survey was issued and summarized. Sub-team provided a list of standards to be considered by entire group on 12/18/09</p> <p>Results of Activity 18 above were incorporated into final recommendation and recommendation was provided to Ad Hoc group for the 01/08/2010 meeting.</p> <p>Complete</p>

Milestone/Deliverable	Assigned to	Date	Status
<p>6. <u>Project 2007-17 Protection System Maintenance and Testing:</u></p> <ul style="list-style-type: none"> <li>• <b>PRC-005-1 — Transmission and Generation Protection System Maintenance and Testing</b></li> <li>• PRC-008-0 — Underfrequency Load Shedding Equipment Maintenance Programs</li> <li>• PRC-011-0 — UVLS System Maintenance and Testing</li> <li>• PRC-017-0 — Special Protection System Maintenance and Testing</li> </ul> <p>7. <u>Project 2006-06 Reliability Coordination:</u></p> <ul style="list-style-type: none"> <li>• COM-001-1 — Telecommunications</li> <li>• COM-002-2 — Communications and Coordination</li> <li>• IRO-001-1 — Reliability Coordination — Responsibilities and Authorities</li> <li>• IRO-002-1 — Reliability Coordination — Facilities</li> <li>• <b>IRO-005-2 — Reliability Coordination — Current-Day Operations</b></li> <li>• IRO-014-1 — Procedures, Processes, or Plans to Support Coordination Between Reliability Coordinators</li> <li>• IRO-015-1 — Notifications and Information Exchange Between Reliability Coordinators</li> <li>• IRO-016-1 — Coordination of Real-time Activities Between Reliability Coordinators</li> </ul>			
<p>20. Review concepts and plan with FERC staff and obtain feedback (repeat as needed). Alan Gerry and Gerry</p>	Adamski and Cauley	12/15/09	
<p>21. Develop and implement communications plan and communicate at all available opportunities.</p> <p>Additions to include in plan drafted for 12/18/2009 meeting:</p> <ul style="list-style-type: none"> <li>• Make specific assignments for each activity</li> <li>• Outreach to trade organizations (in January to include EEI CEO Meeting, Large Public Power Meeting, and APPA CEO Meeting)</li> <li>• Outreach to others</li> </ul>	<p>Mosher, Rana, Streeter</p> <p>(NERC Standards Committee Communications and Planning Subcommittee)</p>	1/15/10	Draft communication plan was provided during 12/18/2009 meeting. Will be presented to the SC during their January meeting.

Milestone/Deliverable	Assigned to	Date	Status
<ul style="list-style-type: none"> <li>Develop communications for drafting teams</li> </ul>			
<p>22. Apply results-based criteria to all current working drafts of standards and deliver to drafting teams; work with SDT chairs and coordinators to do.</p> <ul style="list-style-type: none"> <li>Inform all current drafting teams of the results-based criteria consistent with presentation from November MRC</li> </ul>	Taylor and Drafting Teams	2/28/10	Plan is to provide “proof-of-concept” SDT with beta training material and provide remaining drafting teams with new criteria for developing draft standards.
<p>23. Engage selected drafting team(s), and in consultation with those team(s), develop expedited drafts of results-based standard(s) using existing format. Like PRC 5; do another that can be done quicker; CIP-002; one that could be done quickly to vote; one close or easy</p>	Cauley, Taylor, Bilke Selected Drafting Teams	3/31/10	Charles Rogers (chair of the SDT for Project 2007-17 Protection System Maintenance & Testing has requested Ad Hoc attendance at the Feb 16-17 meeting of the team to help with conversion to the results-based criteria format.
<p>24. Develop each of these standard(s) in proposed modified format (mandatory vs. informational sections).</p>	Huntley and Li	4/15/10	<p>Ben suggested the new format for standards be vetted through the Standards Committee Process Subcommittee. Ben will be working with the SCPS to further develop the format.</p> <p>As discussed during the 12/29/2009 meeting of the Ad Hoc Group, a revised format is not an essential activity for this Ad Hoc Group to finalize.</p> <p>Engagement of a consultant in the near future is essential to complete this activity in conjunction with the SCPS.</p>
<p>25. Develop a training/orientation program for drafting teams and job aids (including criteria) to assist in constructing results-based standards.</p> <ul style="list-style-type: none"> <li>Beta version of training materials to be prepared and delivered to the SDT that will work on proof-of-concept</li> </ul>	Sidor (lead), Taylor, and Consultant	4/30/10	
<p>26. Develop road map for prioritized development of results-based standards; incorporate more fully into 3-year plan.</p>	Taylor	4/30/10	
<p>27. Work with Standards Committee to institutionalize results-based approach and expanded role of committee in managing quality and timeliness of results.</p>	Mosher and Long	4/30/10	
<p>28. Present final results to Standards Committee, MRC, and Board.</p>	Adamski and Cauley	5/5/10	
<p>29. Deliver training and tools; initiate periodic review and refresher training</p>	Sidor and Taylor	Begin	

Milestone/Deliverable	Assigned to	Date	Status
program. Begin 4/10 and continuing through 2010.		4/30/10	
30. Prepare bibliography of resources.	Li	5/31/10	
31. Sunset ad hoc team.	NERC Board	5/31/10	