

Underfrequency Load Shedding (UFLS) Standard Drafting Team Meeting

June 20, 2007 — 1 to 5 p.m.
June 21, 2007 — 8 a.m. to 5 p.m.
June 22, 2007 — 8 a.m. to noon

Offices of the Florida Reliability Coordinating Council
The Towers at Westshore
1408 N. Westshore Boulevard, Suite 1002
Tampa, FL 33607
☎ 813-289-5644

Agenda

1) Administrative

a) Roll Call

David Taylor will lead the welcome of the standard drafting team members for Project 2007-01 Underfrequency Load Shedding and guests (see NERC UFLS Roster - **Attachment 1a**).

- Dana Cabbell – Southern California Edison Co.
- Paul Attaway - Georgia Transmission Corporation
- Brian Bartos – Banders Electric Cooperative
- Larry E. Brusseau - Midwest Reliability Organization
- Jonathan Glidewell - Southern Company Transmission Company
- Geral Keenan – Bonneville Power Administration
- Donal Kidney – Northeast Power Coordinating Council, Inc.
- Robert W. Millard - ReliabilityFirst Corporation
- Steven Myers - Electric Reliability Council of Texas, Inc.
- Mak Nagle - Southwest Power Pool
- Robert J. O'Keefe - American Electric Power
- Arthur Vierling – National Grid
- Robert Williams – Florida Municipal Power Agency
- Richard Young - American Transmission Company, LLC
- Mohsen Zamzam – Consolidated Edison Co. of New York
- David Taylor - North American Electric Reliability Corporation

Each team member is asked to verify the information on the UFLS roster and notify David Taylor via e-mail of any corrections that should be made.

b) NERC Antitrust Compliance Guidelines

David Taylor will review the NERC Antitrust Compliance Guidelines provided in **Attachment 1b**. It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition. It is the responsibility of every NERC participant and employee who may in any way affect NERC's compliance with the antitrust laws to carry out this commitment.

2) Standard Drafting Team Objectives

- a) David Taylor will provide a PowerPoint presentation (**Attachment 2a**) that will identify what the Standards Committee expects of the UFLS standard drafting team.

Drafting teams develop high-quality, enforceable, and technically correct reliability standards based on the reliability objective defined in the purpose section of an approved SAR. The teams work to ensure that standards reflect stakeholder comments and consensus within the scope of the defined purpose of the standard.

- b) David Taylor will review the schedule for Project 2007-01 UFLS (**Attachment 2b**).
- c) Dana Cabbell will review the SAR for Project 2007-01 UFLS (**Attachment 2c**).
- d) Dana Cabbell will review the comment report for Project 2007-01 UFLS (**Attachment 2d**) generated during the SAR development stage of the project.

3) UFLS Programs

Presentations outlining the regional UFLS programs will be provided by representatives of each of the NERC regions (**Attachment 3**).

- a) ERCOT – Steve Myers
- b) FRCC – John Odom
- c) MRO – Larry Brusseau
- d) NPCC – Mohsen Zamzam
- e) RFC – Bob Millard
- f) SERC – Jonathan Glidewell
- g) SPP – Mak Nagle
- h) WECC – Dana Cabbell

4) Standards Revisions

Dana Cabbell will lead the group in revising standards that are within the scope of the SAR for Project 2007-01:

- a) PRC-006 — Development and Documentation of Regional Reliability Organizations' Underfrequency Load Shedding Programs (**Attachment 4a**)
- b) PRC-007 — Assuring Consistency with Regional UFLS Programs (**Attachment 4b**)
- c) PRC-009 — UFLS Performance Following an Underfrequency Event (**Attachment 4c**)

5) Action Items

Dana Cabbell will review the action items generated during the meeting and confirm assignments.

6) Next Steps

The group will discuss and identify the next steps and establish future meeting dates and locations.

Next meetings:

- July 6, 2007
10 a.m. – 2 p.m. Eastern Time
Web Ex and conference call
- August 15 –17 – ERCOT Offices, Austin, TX (Tentative)
1 – 5 p.m. Central Time on August 15
8 a.m. – 5 p.m. Central Time on August 16
8 a.m. – noon Central Time on August 17

7) Adjourn

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Phone: 609.452.8060 • Fax: 609.452.9550 • www.nerc.com

Under Frequency Load Shedding Drafting Team

Chairman

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NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL

Princeton Forrestal Village, 116-390 Village Boulevard, Princeton, New Jersey 08540-5731

NERC ANTITRUST COMPLIANCE GUIDELINES

I. GENERAL

It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition.

It is the responsibility of every NERC participant and employee who may in any way affect NERC's compliance with the antitrust laws to carry out this commitment.

Antitrust laws are complex and subject to court interpretation that can vary over time and from one court to another. The purpose of these guidelines is to alert NERC participants and employees to potential antitrust problems and to set forth policies to be followed with respect to activities that may involve antitrust considerations. In some instances, the NERC policy contained in these guidelines is stricter than the applicable antitrust laws. Any NERC participant or employee who is uncertain about the legal ramifications of a particular course of conduct or who has doubts or concerns about whether NERC's antitrust compliance policy is implicated in any situation should consult NERC's General Counsel immediately.

II. PROHIBITED ACTIVITIES

Participants in NERC activities (including those of its committees and subgroups) should refrain from the following when acting in their capacity as participants in NERC activities (e.g., at NERC meetings, conference calls and in informal discussions):

- Discussions involving pricing information, especially margin (profit) and internal cost information and participants' expectations as to their future prices or internal costs.
- Discussions of a participant's marketing strategies.
- Discussions regarding how customers and geographical areas are to be divided among competitors.
- Discussions concerning the exclusion of competitors from markets.
- Discussions concerning boycotting or group refusals to deal with competitors, vendors or suppliers.

Approved by NERC Board of Trustees, June 14, 2002
Technical revisions, May 13, 2005

III. ACTIVITIES THAT ARE PERMITTED

From time to time decisions or actions of NERC (including those of its committees and subgroups) may have a negative impact on particular entities and thus in that sense adversely impact competition. Decisions and actions by NERC (including its committees and subgroups) should only be undertaken for the purpose of promoting and maintaining the reliability and adequacy of the bulk power system. If you do not have a legitimate purpose consistent with this objective for discussing a matter, please refrain from discussing the matter during NERC meetings and in other NERC-related communications.

You should also ensure that NERC procedures, including those set forth in NERC's Certificate of Incorporation and Bylaws are followed in conducting NERC business. Other NERC procedures that may be applicable to a particular NERC activity include the following:

- Reliability Standards Process Manual
- Organization and Procedures Manual for the NERC Standing Committees
- System Operator Certification Program

In addition, all discussions in NERC meetings and other NERC-related communications should be within the scope of the mandate for or assignment to the particular NERC committee or subgroup, as well as within the scope of the published agenda for the meeting.

No decisions should be made nor any actions taken in NERC activities for the purpose of giving an industry participant or group of participants a competitive advantage over other participants. In particular, decisions with respect to setting, revising, or assessing compliance with NERC reliability standards should not be influenced by anti-competitive motivations.

Subject to the foregoing restrictions, participants in NERC activities may discuss:

- Reliability matters relating to the bulk power system, including operation and planning matters such as establishing or revising reliability standards, special operating procedures, operating transfer capabilities, and plans for new facilities.
- Matters relating to the impact of reliability standards for the bulk power system on electricity markets, and the impact of electricity market operations on the reliability of the bulk power system.
- Proposed filings or other communications with state or federal regulatory authorities or other governmental entities.
- Matters relating to the internal governance, management and operation of NERC, such as nominations for vacant committee positions, budgeting and assessments, and employment matters; and procedural matters such as planning and scheduling meetings.

Any other matters that do not clearly fall within these guidelines should be reviewed with NERC's General Counsel before being discussed.

Project 2007-01

Underfrequency Load Shedding

Standard Drafting Team Kick-off Meeting
Florida Reliability Coordinating Council Offices
Tampa, FL
June 20-22, 2007

David W. Taylor
Manager of Regional Standards

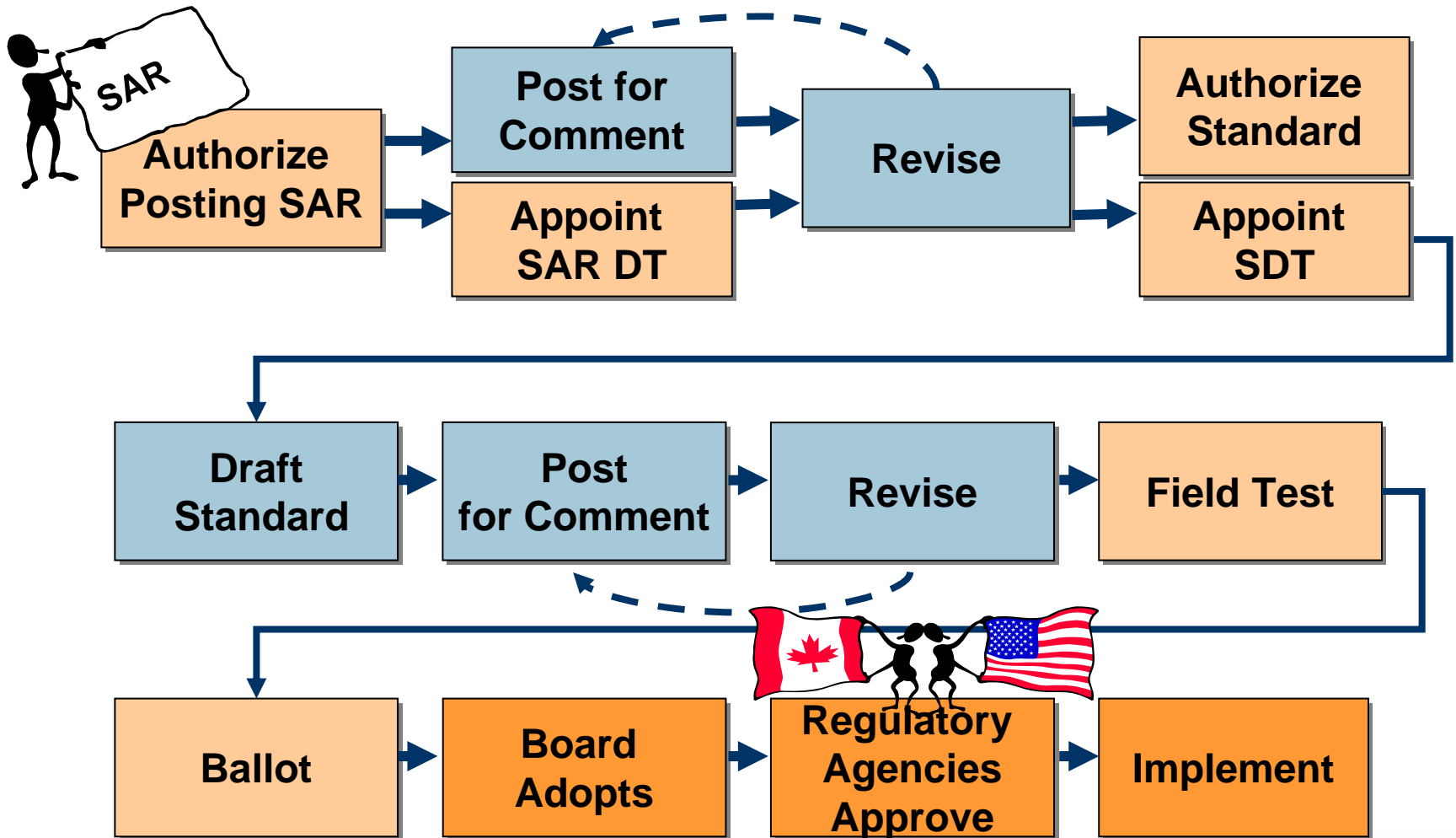
Topics

- Standards processes and roles
- Anatomy of an Excellent Standard
- Miscellaneous

Standards processes and roles

Standards Process Overview

Drafting Team
SC Approval
After DT Done



Key Roles in Standards Process



Board of Trustees



Regulators



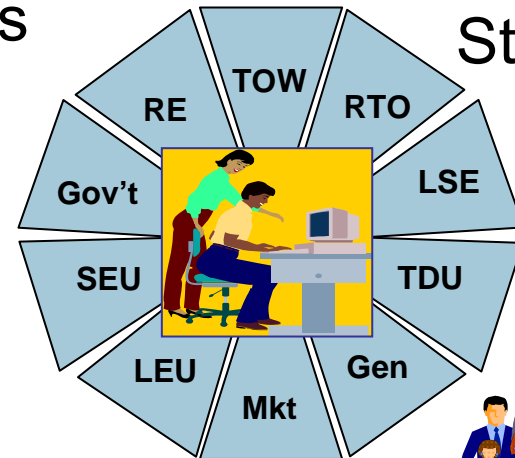
Stakeholders



Standards Committee



Standards Staff



Ballot Body



Drafting Teams



Ballot Pools

Drafting Teams

- SAR drafting teams
 - SC appoints as needed to assist requester with SAR development and response to comments
 - Requester 'owns' request until authorized for development
- Standard drafting teams
 - SC appoints expert team to draft standard
 - Works on behalf of stakeholders
 - Reports to Standards Committee
- Considerations
 - Necessary expertise and competencies provided
 - Balanced and inclusive perspectives
 - Efficient use of industry resources

Responsibilities of Chair

- Leads the Team in a neutral capacity
- Ensures the Team makes progress
- Conducts meetings of the Team
- Represents the Team to other bodies
- Reports progress to the SAC

Responsibilities of all Members

- Provide knowledge and expertise
- Participate actively
- Provide contributions, drafts, comments
- Attend meetings
- Participate in Industry Forums
- Provide feedback on Standards Development activities

Responsibilities of Coordinator

- Advises the Team in a neutral capacity
- Monitors, facilitates, reports on, ensures active progress
- Prepares and circulates Team documents
- Maintains membership records
- Prepares for and assists at meetings

Anatomy of an Excellent Standard

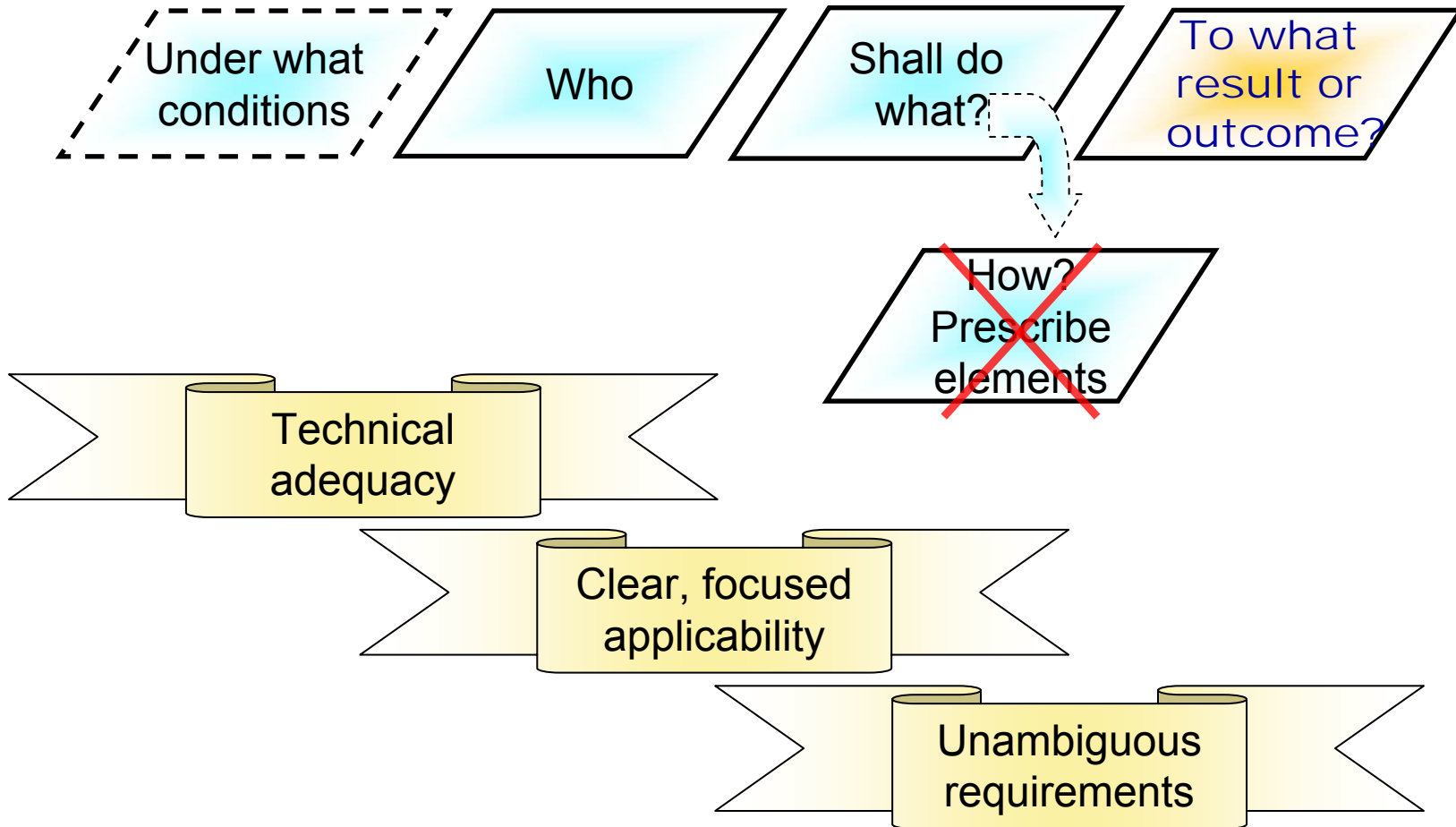
Standards Improvements

- NERC Standards Three-year Work Plan
 - Identifies general improvements standard drafting teams are to consider when revising standards
- FERC Order 693
 - Identifies specific directives needing to be made to specific standards

Benchmarks of Excellent Standards

1. Applicability
2. Purpose
3. Performance requirements
4. Measurability
5. Technical basis
6. Completeness
7. Known consequences
8. Clear language
9. Practicality
10. Consistent terminology

Excellent Reliability Standards



Vision for Regional Standards

NERC
Reliability
Standards

Region
A

B

C

E

F

D

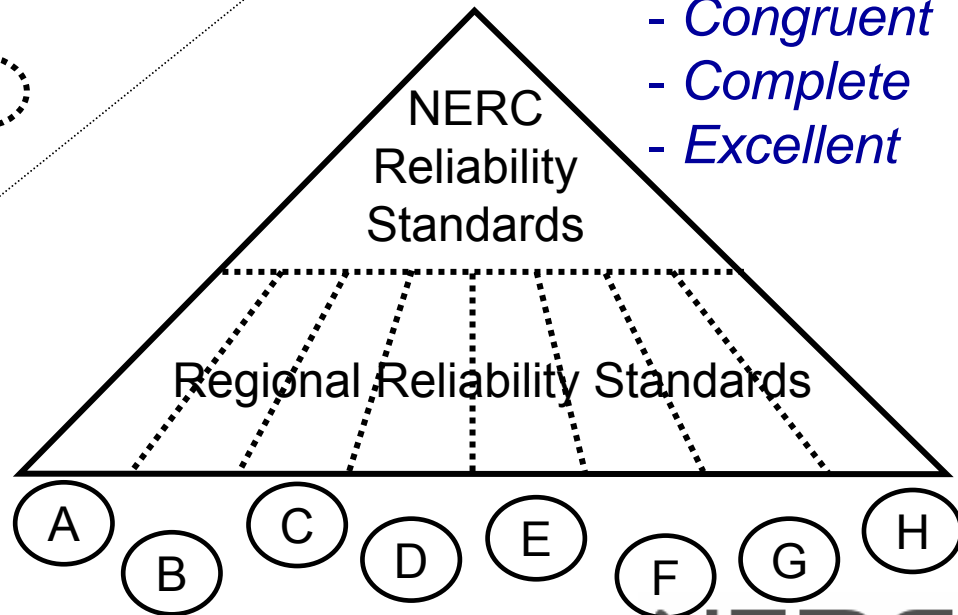
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Today

*ERO Vision:
NERC & regional
standards are*

- Consistent
- Congruent
- Complete
- Excellent

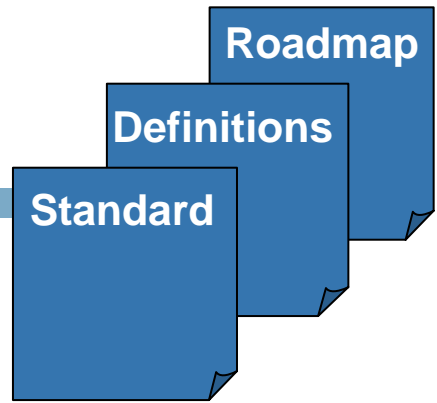


Regional Criteria and Procedures

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Standard



- Standard roadmap
- Definitions
- Standard
 - Performance Elements
 - Requirements, measures, risk factors, etc
 - Compliance Elements (SDT makes recommendation)
 - Monitoring responsibility
 - Monitoring period and reset timeframe
 - Data retention
 - Other compliance information
 - Violation Severity Levels

Standard Roadmap

- Shows where DT is in standard development progress
 - Lists steps completed
 - Lists steps to be completed with anticipated dates
 - Must be up to date when drafts posted
- Schedule provided to SC in progress reports
- Removed when standard is approved by BOT

Standard Definitions

- Limit terms to those with unique definitions
- Capitalize already defined terms
- Don't include explanatory information

Introduction Section

- Title – Keep it short; main topic and modifiers; minimize verbs
- Purpose – from SAR (condense into a sentence or two); clear indication of reliability value/benefit; no ‘shall’ or ‘must’ requirements
- Applicability:
 - Functions - lists the “functional entities” that must comply with the standard’s requirements along with any specific qualifications (i.e., that own UVLS programs)
 - Facilities – lists any qualifications to limit the scope of facilities addressed (i.e., 100 kV and above)

Requirements Section

- Requirements specifically state the technical, performance, and preparedness details that each entity must meet using the NERC reliability benchmark.
- The benchmark for a performance requirement is measured by the question: "Who shall do what, under what conditions and to what level, for what reliability result?" The benchmark breaks down into 5 construction elements that follow the sequence below:

Who (1) + "**shall**" do what (2) + under what conditions (3) and to what level (4) + for what expected reliability result (5)?

- The word **shall** is used before the verb to modify the meaning of the main verb, in the case of the NERC reliability standards, to expresses **necessity**. Using the 5 construction elements of the benchmark – with one and two in sequence – ensures that the performance requirement is written in active voice and clearly states the expected reliability objective.

Requirements

- Write in “active voice” (“shall be” is passive)
- Identify any qualifying conditions (if any) under which the performance is required
- Identify the responsible entity or entities
- Include the word “shall”
- Identify the required performance or outcome
- Identify what the performance will achieve
- Write as simply as possible
 - Avoid use of “negatives”
- Avoid use of ambiguous or subjective terms
- Don't tell “how”

Avoid Use of Ambiguous Words

- Adequate
- Data
- Immediately
- Timely
- Detailed
- Sufficient
- Comprehensive
- As appropriate
- Coordinate



Risk Factors

- High – violation could lead to cascading failures
- Medium – violation could have an adverse impact on system conditions capability, or situational awareness
- Lower – violation would not be expected to affect the electrical state or capability of the bulk power system, or the ability to effectively monitor and control the bulk power system

C.Measure

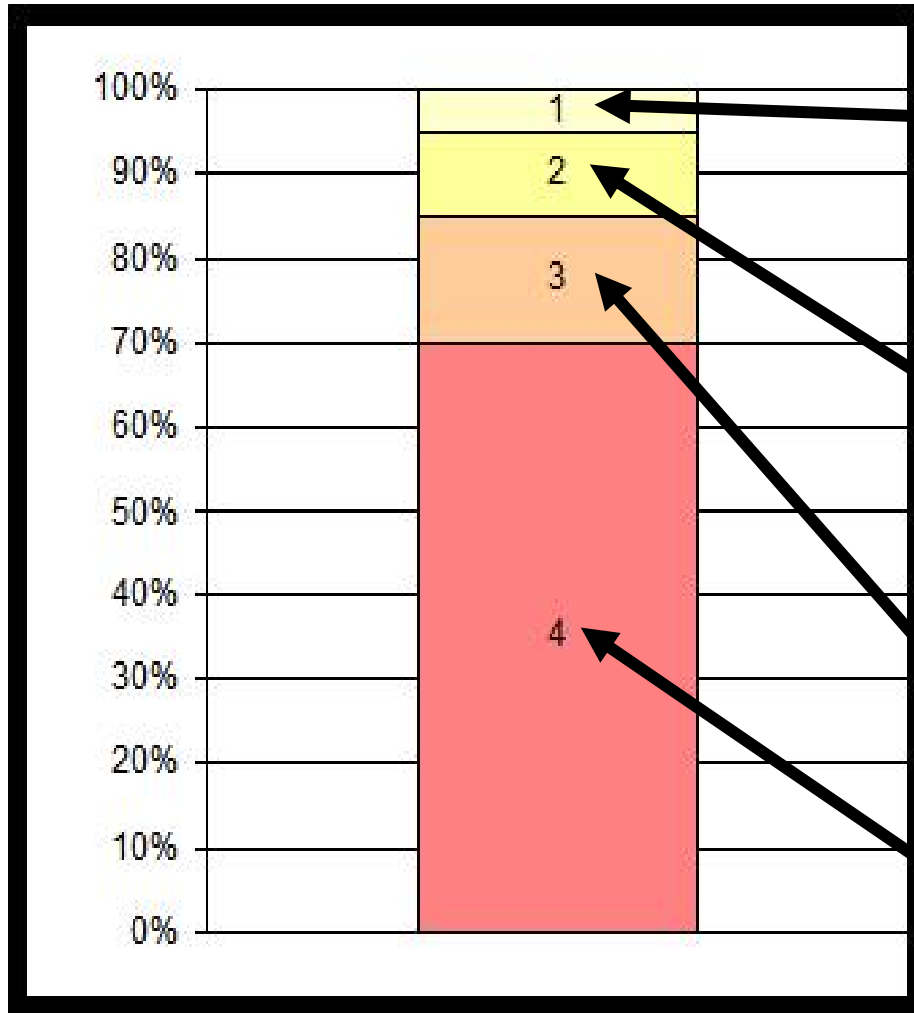
- M1. Each standard shall include one or more measures that will be used to assess performance and outcomes for the purpose of determining compliance with requirements.
- The DT should write measurements that identify how a third party or auditor would measure required performance or outcomes, e.g., compliance, including I identification of each entity to which the measure applies.
 - Each measure shall be tangible, objective, and as practical as possible

Compliance Elements



- Compliance Monitoring – who will be monitor?
- Identify how to demonstrate compliance:
 - Self-certification
 - Periodic reporting
 - Exception reporting
 - Triggered investigation
 - Spot reviews
 - Periodic audits
- Performance Monitoring & Reset Period
 - Time period for measuring performance & then re-starting measurement period
- Data Retention
 - What data must be kept & for how long & by whom

Violation Severity Levels



- Level 1: mostly compliant with minor exceptions
- Level 2: mostly compliant with significant exceptions
- Level 3: marginal performance or results
- Level 4: poor performance or results

Other Improvements

- Review technical adequacy and performance metrics
- Address 'fill-in-the-blank' standards
- Reorganize, streamline standards
- Merge in organization certification standards
- References
- Variances

Miscellaneous

Comment Forms

- Ask very pointed questions
- If you've made changes, ask for feedback
- Ask for feedback on implementation plan
- Ask if field testing is needed
- Ask if there are any Variances
- Ask if there are any known conflicts with existing regulations

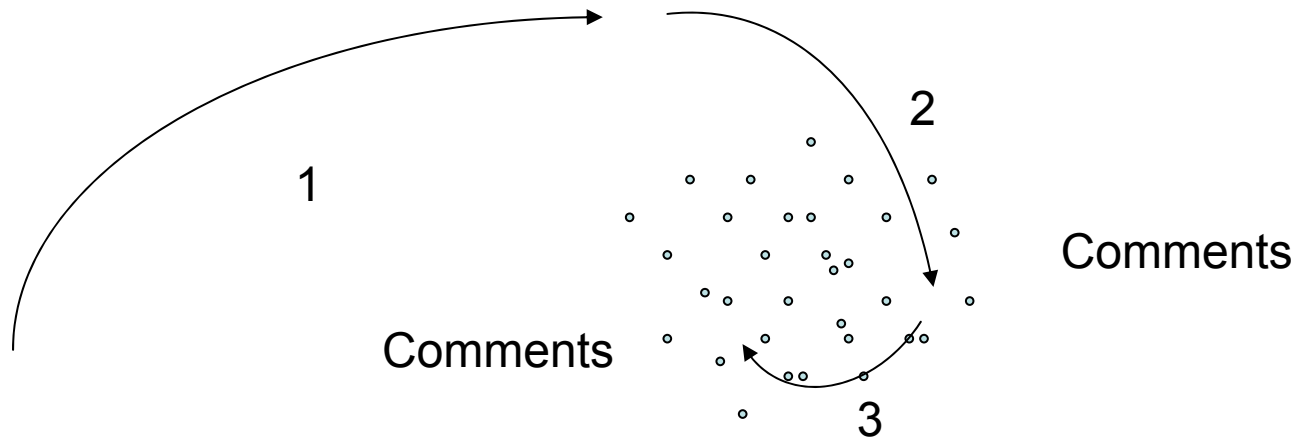
Responding to Comments

- Read through comments to get a 'sense' of stakeholders' reactions
- Consider and respond to **every** comment
 - Responses must be respectful
 - Responses should provide a justification
- Develop a 'summary response' to each form question
- Add an overview of the changes made – including the issues resolved and those that weren't resolved
- Make conforming changes to the standard
- Can't expand scope of SAR but can develop a standard that is smaller than the scope of the SAR – if needed, revise the SAR to expand the scope

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What Is "Consent of the Industry?"



Field Tests

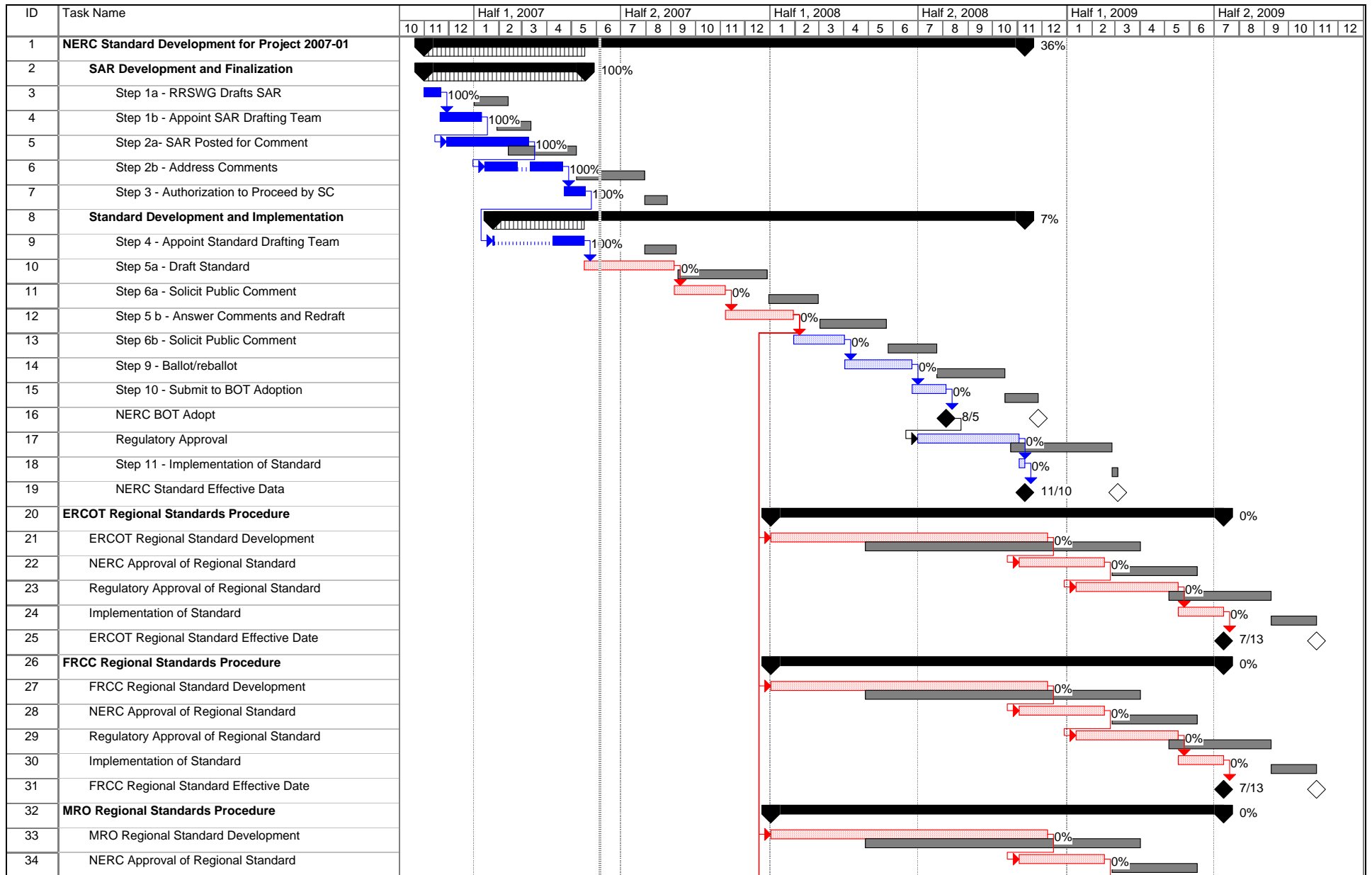
- As needed to validate concepts, methods, measures in a standard
- Drafting team develops field test plan
- Standards Committee approves and oversees field test
- Complete tests before ballot

Implementation Plan

- Part of final standard going to ballot
- Must be posted for comment at least once
- Includes
 - Proposed effective date(s) and implementation into compliance program
 - Withdrawal or modification of existing standards
 - Any tools, training, or other implementation considerations

Questions?





Project: Project 2007-01 UFLS Date: Tue 6/5/07	Critical		Split		Baseline Milestone		Project Summary	
	Critical Split		Task Progress		Milestone		External Tasks	
	Critical Progress		Baseline		Summary Progress		External Milestone	
	Task		Baseline Split		Summary		Deadline	

Standard Authorization Request Form

Title of Proposed Standard Project 2007-01	Underfrequency Load Shedding (UFLS) Standards
Request Date	November 14, 2006
Revised	March 28, 2007

SAR Requestor Information	SAR Type <i>(Check a box for each one that applies.)</i>
Name Regional Reliability Standards Working Group	<input type="checkbox"/> New Standard <input type="checkbox"/>
Primary Contact Robert W. Millard Director of Standards ReliabilityFirst Corporation	<input checked="" type="checkbox"/> Revision to existing Standards PRC-006, PRC-007, and PRC-009
Telephone (630) 261-2621 Fax (630) 691-4222	<input type="checkbox"/> Withdrawal of existing Standard <input type="checkbox"/>
E-mail bob.millard@rfirst.org	<input type="checkbox"/> Urgent Action <input type="checkbox"/>

Purpose (Describe the purpose of the standard — what the standard will achieve in support of reliability.)

PRC-006— Development and Documentation of Regional Reliability Organizations' Underfrequency Load Shedding Programs

PRC-007 — Assuring Consistency with Regional UFLS Programs

PRC-009 — UFLS Performance Following an Underfrequency Event

The purpose of revising the above standards is to:

1. Provide an adequate level of reliability for the North American bulk power systems – ensure each of the standards are complete and the requirements are set at an appropriate level to ensure reliability.
2. Ensure they are enforceable as mandatory reliability standards with financial penalties - the applicability to bulk power system owners, operators, and users, and as appropriate particular classes of facilities, is clearly defined; the purpose, requirements, and measures are results-focused and unambiguous; the consequences of violating the requirements are clear.
3. Incorporate other general improvements described in NERC's Reliability Standards Development Plan: 2007-2009 (summarized and outlined in the Reliability Standard Review Guidelines attached as Appendix A).
4. Consider the items mentioned in the Standard Review Forms (excerpted from NERC's Reliability Standards Development Plan: 2007-2009) attached as Appendix B, prepared by the NERC staff, which attempt to capture comments from the:
 - FERC NOPR (Docket # RM06-16-00 dated October 20, 2006) ,
 - FERC staff report dated May 11, 2006 concerning NERC standards submitted with ERO application,
 - Version 0 standards development (see note 1), and
 - Regional Fill-in-the-Blank Team (RRSWG – a NERC working group involved with regional standards development).

The standard drafting team should also consider any other issues that were not completely captured but were stated or referenced in the above materials.

5. Consider issues raised by the industry during the posting of the SAR for Project 2007-01 during the first comment period from November 29, 2006 through January 12, 2007, attached as Appendix C.
6. Satisfy the standards procedure requirement for five-year review of the standards.

Industry Need (Provide a detailed statement justifying the need for the proposed standard, along with any supporting documentation.)

The standards in this set are all Version 0 standards. As the electric reliability organization begins enforcing compliance with reliability standards under Section 215 of the Federal Power Act in the United States and applicable statutes and regulations in Canada, the industry needs a set of clear, measurable, and enforceable reliability standards. The Version 0 standards, while a good foundation, were translated from historical operating and planning policies and guides that were appropriate in an era of voluntary compliance. The Version 0 standards and recent updates were put in place as a temporary starting point to stand up the electric reliability organization and begin enforcement of mandatory standards. However, it is important to update the standards in a timely manner, incorporating improvements to make the standards more suitable for enforcement and to capture prior recommendations that were deferred during the Version 0 translation.

Brief Description (Describe the proposed standard in sufficient detail to clearly define the scope in a manner that can be easily understood by others.)

PRC-006 is one of the few reliability standards identified by the Regional Reliability Standards Working Group as a standard that has some requirements that need to be defined by each regional entity in a regional standard.

The standard drafting team (SDT) will work with stakeholders to review PRC-006 and each of the current regional programs developed in accordance with that standard, including any other associated programs and/or requirements related to and contained with the UFLS program documentation. The SDT shall determine which requirements should be continent-wide requirements and which requirements should be included in regional standards.

PRC-007 and PRC-009 have some 'fill-in-the-blank' characteristics, as identified in the Regional Reliability Standards Working Group work plan, which need to be removed. These standards shall be included with PRC-006 for consideration as one or more revised standards as necessary for consistency and clarity of overall program requirements and any other associated programs and/or requirements that affect or impact the UFLS program.

The standard drafting team may include other improvements to the standards deemed appropriate by the drafting team, with the consensus of stakeholders, consistent with establishing high quality, enforceable and technically sufficient bulk power system reliability standards.

Reliability Functions

The Standard will Apply to the Following Functions <i>(Check box for each one that applies.)</i>		
<input checked="" type="checkbox"/>	Reliability Coordinator	Responsible for the real-time operating reliability of its Reliability Coordinator Area in coordination with its neighboring Reliability Coordinator's wide area view.
<input checked="" type="checkbox"/>	Balancing Authority	Integrates resource plans ahead of time, and maintains load-interchange-resource balance within its metered boundary and supports system frequency in real time.
<input type="checkbox"/>	Interchange Coordinator	Ensures communication of interchange transactions for reliability evaluation purposes and coordinates implementation of valid and balanced interchange schedules between Balancing Authority Areas.

<input checked="" type="checkbox"/>	Planning Coordinator	Assesses the longer-term reliability of its Planning Coordinator Area.
<input type="checkbox"/>	Resource Planner	Develops a >one year plan for the resource adequacy of specific loads within a Planning Coordinator area.
<input checked="" type="checkbox"/>	Transmission Planner	Develops a >one year plan for the reliability of interconnected Bulk Power System within its portion of the Planning Coordinator area.
<input type="checkbox"/>	Transmission Service Provider	Administers the transmission tariff and provides transmission services under applicable transmission service agreements (e.g., the pro forma tariff).
<input checked="" type="checkbox"/>	Transmission Owner	Owns and maintains transmission facilities.
<input checked="" type="checkbox"/>	Transmission Operator	Ensures the real-time operating reliability of the transmission assets within a Transmission Operator Area.
<input checked="" type="checkbox"/>	Distribution Provider	Delivers electrical energy to the End-use customer.
<input checked="" type="checkbox"/>	Generator Owner	Owns and maintains generation facilities.
<input checked="" type="checkbox"/>	Generator Operator	Operates generation unit(s) to provide real and reactive power.
<input type="checkbox"/>	Purchasing-Selling Entity	Purchases or sells energy, capacity, and necessary reliability-related services as required.
<input type="checkbox"/>	Market Operator	Interface point for reliability functions with commercial functions.
<input checked="" type="checkbox"/>	Load-Serving Entity	Secures energy and transmission (and related reliability-related services) to serve the End-use Customer.

Reliability and Market Interface Principles

Applicable Reliability Principles <i>(Check box for all that apply.)</i>	
<input checked="" type="checkbox"/>	Interconnected bulk electric systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards.
<input checked="" type="checkbox"/>	The frequency and voltage of interconnected bulk electric systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.
<input checked="" type="checkbox"/>	Information necessary for the planning and operation of interconnected bulk electric systems shall be made available to those entities responsible for planning and operating the systems reliably.
<input checked="" type="checkbox"/>	Plans for emergency operation and system restoration of interconnected bulk electric systems shall be developed, coordinated, maintained and implemented.
<input checked="" type="checkbox"/>	Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk electric systems.
<input type="checkbox"/>	Personnel responsible for planning and operating interconnected bulk electric systems shall be trained, qualified, and have the responsibility and authority to implement actions.
<input type="checkbox"/>	The security of the interconnected bulk electric systems shall be assessed, monitored and maintained on a wide area basis.
Does the proposed Standard comply with all of the following Market Interface Principles? <i>(Select 'yes' or 'no' from the drop-down box.)</i>	
The planning and operation of bulk electric systems shall recognize that reliability is an essential requirement of a robust North American economy. Yes	
An Organization Standard shall not give any market participant an unfair competitive advantage. Yes	
An Organization Standard shall neither mandate nor prohibit any specific market structure. Yes	
An Organization Standard shall not preclude market solutions to achieving compliance with that Standard. Yes	
An Organization 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. Yes	

Standards Authorization Request Form - Project 2007-01 Underfrequency Load Shedding (UFLS)

Related Standards

Standard No.	Explanation
EOP-003-1	This standard may not be changed because of the work associated with Project 2007-01 but the standard drafting team should keep it in mind as they work on this set of standards.

Related SARs

SAR ID	Explanation

Regional Differences

Region	Explanation
ERCOT	
FRCC	
MRO	
NPCC	
SERC	
RFC	
SPP	
WECC	

Appendix A: Reliability Standard Review Guidelines

Applicability

Does this reliability standard clearly identify the functional classes of entities responsible for complying with the reliability standard, with any specific additions or exceptions noted? Where multiple functional classes are identified is there a clear line of responsibility for each requirement identifying the functional class and entity to be held accountable for compliance? Does the requirement allow overlapping responsibilities between Registered Entities possibly creating confusion for who is ultimately accountable for compliance?

Does this reliability standard identify the geographic applicability of the standard, such as the entire North American bulk power system, an interconnection, or within a regional entity area? If no geographic limitations are identified, the default is that the standard applies throughout North America.

Does this reliability standard identify any limitations on the applicability of the standard based on electric facility characteristics, such as generators with a nameplate rating of 20 MW or greater, or transmission facilities energized at 200 kV or greater or some other criteria? If no functional entity limitations are identified, the default is that the standard applies to all identified functional entities.

Purpose

Does this reliability standard have a clear statement of purpose that describes how the standard contributes to the reliability of the bulk power system? Each purpose statement should include a value statement.

Performance Requirements

Does this reliability standard state one or more performance requirements, which if achieved by the applicable entities, will provide for a reliable bulk power system, consistent with good utility practices and the public interest?

Does each requirement identify who shall do what under what conditions and to what outcome?

Measurability

Is each performance requirement stated so as to be objectively measurable by a third party with knowledge or expertise in the area addressed by that requirement?

Does each performance requirement have one or more associated measures used to objectively evaluate compliance with the requirement?

If performance results can be practically measured quantitatively, are metrics provided within the requirement to indicate satisfactory performance?

Technical Basis in Engineering and Operations

Is this reliability standard based upon sound engineering and operating judgment, analysis, or experience, as determined by expert practitioners in that particular field?

Completeness

Is this reliability standard complete and self-contained? Does the standard depend on external information to determine the required level of performance?

Consequences for Noncompliance

In combination with guidelines for penalties and sanctions, as well as other ERO and regional entity compliance documents, are the consequences of violating a standard clearly known to the responsible entities?

Clear Language

Is the reliability standard stated using clear and unambiguous language? Can responsible entities, using reasonable judgment and in keeping with good utility practices, arrive at a consistent interpretation of the required performance?

Practicality

Does this reliability standard establish requirements that can be practically implemented by the assigned responsible entities within the specified effective date and thereafter?

Capability Requirements versus Performance Requirements

In general, requirements for entities to have ‘capabilities’ (this would include facilities for communication, agreements with other entities, etc.), should be located in the standards for certification. The certification requirements should indicate that entities have a responsibility to ‘maintain’ their capabilities.

Consistent Terminology

To the extent possible, does this reliability standard use a set of standard terms and definitions that are approved through the NERC reliability standards development process?

If the standard uses terms that are included in the NERC Glossary of Terms Used in Reliability Standards, then the term must be capitalized when it is used in the standard. New terms should not be added unless they have a ‘unique’ definition when used in a NERC reliability standard. Common terms that could be found in a college dictionary should not be defined and added to the NERC Glossary.

Are the verbs on the ‘verb list’ from the DT Guidelines? If not – do new verbs need to be added to the guidelines or could you use one of the verbs from the verb list?

Violation Risk Factors (Risk Factor)

High Risk Requirement

A requirement that, if violated, could directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures;

or a requirement in a planning time frame that, if violated, could, under emergency, abnormal, or restorative conditions anticipated by the preparations, directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures, or could hinder restoration to a normal condition.

Medium Risk Requirement

This is a requirement that, if violated, could directly affect the electrical state or the capability of the bulk electric system, or the ability to effectively monitor and control the bulk electric system. However, violation of a medium risk requirement is unlikely to lead to bulk electric system instability, separation, or cascading failures;

or a requirement in a planning time frame that, if violated, could, under emergency, abnormal, or restorative conditions anticipated by the preparations, directly and adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor, control, or restore the bulk electric system. However, violation of a medium risk requirement is unlikely, under emergency, abnormal, or restoration conditions anticipated by the preparations, to lead to bulk electric system instability, separation, or cascading failures, nor to hinder restoration to a normal condition.

Lower Risk Requirement

A requirement that, if violated, would not be expected to adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor and control the bulk electric system. A requirement that is administrative in nature;

Or a requirement in a planning time frame that, if violated, would not, under the emergency, abnormal, or restorative conditions anticipated by the preparations, be expected to adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor, control, or restore the bulk electric system. A planning requirement that is administrative in nature.

Mitigation Time Horizon

The drafting team should also indicate the time horizon available for mitigating a violation to the requirement using the following definitions:

- **Long-term Planning** — a planning horizon of one year or longer.
- **Operations Planning** — operating and resource plans from day-ahead up to and including seasonal.
- **Same-day Operations** — routine actions required within the timeframe of a day, but not real-time.
- **Real-time Operations** — actions required within one hour or less to preserve the reliability of the bulk electric system.
- **Operations Assessment** — follow-up evaluations and reporting of real time operations.

Violation Severity Levels

The drafting team should indicate a set of violation severity levels that can be applied for the requirements within a standard. ('Violation severity levels' replaces the existing 'levels of non-compliance.')

The violation severity levels may be applied for each requirement or combined to cover multiple requirements, as long as it is clear which requirements are included.

The violation severity levels should be based on the following definitions:

- **Lower: mostly compliant with minor exceptions** — the responsible entity is mostly compliant with and meets the intent of the requirement but is deficient with respect to one or more minor details. Equivalent score: 95% to 99% compliant.
- **Moderate: mostly compliant with significant exceptions** — the responsible entity is mostly compliant with and meets the intent of the requirement but is deficient with respect to one or more significant elements. Equivalent score: 85% to 94% compliant.
- **High: marginal performance or results** — the responsible entity has only partially achieved the reliability objective of the requirement and is missing one or more significant elements. Equivalent score: 70% to 84% compliant.

- **Severe: poor performance or results** — the responsible entity has failed to meet the reliability objective of the requirement. Equivalent score: less than 70% compliant.

Compliance Monitor

Replace, ‘Regional Reliability Organization’ with ‘Regional Entity’

Fill-in-the-blank Requirements

Do not include any ‘fill-in-the-blank’ requirements. These are requirements that assign one entity responsibility for developing some performance measures without requiring that the performance measures be included in the body of a standard – then require another entity to comply with those requirements.

Every reliability objective can be met, at least at a threshold level, by a North American standard. If we need regions to develop regional standards, such as in under-frequency load shedding, we can always write a uniform North American standard for the applicable functional entities as a means of encouraging development of the regional standards.

Requirements for Regional Reliability Organization

Do not write any requirements for the Regional Reliability Organization. Any requirements currently assigned to the RRO should be re-assigned to the applicable functional entity.

Effective Dates

Must be 1st day of 1st quarter after entities are expected to be compliant – must include time to file with regulatory authorities and provide notice to responsible entities of the obligation to comply. If the standard is to be actively monitored, time for the Compliance Monitoring and Enforcement Program to develop reporting instructions and modify the Compliance Data Management System(s) both at NERC and Regional Entities must be provided in the implementation plan.

Associated Documents

If there are standards that are referenced within a standard, list the full name and number of the standard under the section called, ‘Associated Documents’.

Appendix B: PRC-006, PRC-007, and PRC-009 Standard Review Forms

Excerpted from NERC's Reliability Standards Development Plan: 2007 - 2009

Standard Review Form Project 2007-01 Underfrequency Load Shedding		
Standard #	PRC-006-0	Comments
Title	Development and Documentation of Regional Reliability Organizations' Underfrequency Load Shedding Programs	Too long – slight difference with header.
Purpose		Implement vs. develop & document. Underfrequency spelled differently.
Applicability		RRO not in FM.
Requirements	<i>Conditions</i>	Okay
	<i>Who?</i>	R1.1 – includes sub-regions.
	<i>Shall do what?</i>	R1.3 – define sufficient; model at RRO or others or both? R1.4.2 – check grammar and capitalization; loosely worded. R2 & 3 – format of documentation.
	<i>Result or Outcome</i>	Missing
Measures		No real measures and definition of evidence required.
Issues to Consider	<p>FERC NOPR</p> <ul style="list-style-type: none"> o Commission will not propose to accept or remand this Reliability Standard until the ERO submits additional information. (see recommendations for improvement) <p>FERC staff report</p> <ul style="list-style-type: none"> o Concern with Blackout items (especially #21) o Fill in the blank o Definition of RRO as user of system o Lack of coordination <p>Regional Fill-in-the-Blank Team Comments</p> <ul style="list-style-type: none"> o Modify R1 to require each Region to develop a regional standard, and o Determine what elements (if any) of UFLS should be included in the North American standard and what elements should be included in the regional standards. o Development of regional standards needs to be coordinated with Regional entities. Regional entities should begin process for developing regional standards once the drafting team for the North American standard has determined what elements of UFLS should be included in the continent-wide standard and what elements should be included in the regional standards. o PRC-006 will be a continent-wide standard supported by Regional Reliability Standards. o Related PRC-007, PRC-008, and 009. <p>V0 Industry Comments</p> <ul style="list-style-type: none"> o Not a standalone standard o Who do you submit compliance material to? o Need to define evidence 	

Standards Authorization Request Form - Project 2007-01 Underfrequency Load Shedding (UFLS)

Standard Review Form		
Project 2007-01 Underfrequency Load Shedding		
Standard #	PRC-007-0	Comments
Title	Assuring Consistency of Entity Underfrequency Load Shedding Programs with Regional Reliability Organizations' Underfrequency Load Shedding Program Requirements	Too long and different than header.
Purpose		Same as 006 and doesn't address 007. No value proposition or benefit. Spelling of Underfrequency.
Applicability		Okay
Requirements	<i>Conditions</i>	Okay
	<i>Who?</i>	Okay
	<i>Shall do what?</i>	R1 – what about coordination? R2 – provide format, etc. and define 'as necessary'.
	<i>Result or Outcome</i>	Missing
Measures		2 M for 3 R. M1 – define consistency M2 – define evidence
Issues to Consider	FERC NOPR <ul style="list-style-type: none"> o No changes identified. Regional Fill-in-the-Blank Team Comments <ul style="list-style-type: none"> o Change "program" to "standard" in R1. o Coordinated with PRC-006. o The regional procedures need to be converted to a standard to implement this. VO Industry Comments <ul style="list-style-type: none"> o Need to include RA o Need to refine levels of non-compliance 	

Standards Authorization Request Form - Project 2007-01 Underfrequency Load Shedding (UFLS)

Standard Review Form		
Project 2007-01 Underfrequency Load Shedding		
Standard #	PRC-009-0	Comments
Title	Analysis and Documentation of Underfrequency Load Shedding Performance Following an Underfrequency Event	Too long and different than header.
Purpose		Same as previous and it doesn't fit. No benefit or value proposition.
Applicability		Okay
Requirements	<i>Conditions</i>	Okay
	<i>Who?</i>	Okay
	<i>Shall do what?</i>	Okay
	<i>Result or Outcome</i>	Missing
Measures		M1 not really a measure. M2 needs definition of evidence.
Issues to Consider	FERC NOPR <ul style="list-style-type: none"> o No changes identified. FERC staff report <ul style="list-style-type: none"> o No corresponding standard for under-voltage Regional Fill-in-the-Blank Team Comments <ul style="list-style-type: none"> o Change "program" to "standard". o See notes for PRC-007. VO Industry Comments <ul style="list-style-type: none"> o Define evidence o 90 days vs. 30 days o Exemptions for those with shunt reactors who don't shed load 	

Appendix C: Issues Raised by Industry during 1st Posting of SAR for Project 2007-01

With respect to Question #2 of the comment form: *Do you agree with the scope of the proposed project? (The scope includes all the items noted on the 'Standard Review Forms' attached to the SAR as well as other improvements to the standards that meet the consensus of stakeholders, consistent with establishing high quality, enforceable, and technically sufficient bulk power system reliability standards.)*

NCMPA:

NCMPA1 agrees with the need to develop measures to shed load during an underfrequency event that are consistent across the interconnected electric system. However, NCMPA1 disagrees with the approach that has been taken by the regions in responding to this requirement, and we are concerned that the same approach is suggested in this SAR. We are specifically concerned that it is simply not practical for smaller entities to comply with the requirements proposed by this SAR.

As a result of the Energy Policy Act, many small utilities are required to register with their respective RROs, and these entities are now subject to mandatory compliance with the reliability standards. Some of these entities have peak annual loads that are smaller than 10 MW. Some are even smaller than 1 MW. Requirements within most, if not all, of the regions state that load must be shed in multiple steps (three steps in SERC, for example) at different underfrequency set points. While shedding load in multiple steps is perfectly rational for larger systems, most small loads are served by one distribution feeder bus. Furthermore, the entire peak demand on a small entity is a mere fraction of the amount of load that is shed by a larger entity in just one step. Furthermore, larger utilities have the advantage of aggregating load from multiple delivery points that can be shed in one step. Smaller entities do not have this advantage, and face the possibility of large expenditures in order to meet the multiple step shedding criteria.

NCMPA1 questions the benefit to reliability by requiring all utilities, regardless of size, to shed load in multiple steps as a result of an underfrequency event. We urge the SAR/standard drafting teams to address this issue and establish simplified requirements for small entities, whereby,

- Compliance with the UFLS standards be non-compulsory for entities with annual peak demands less than 10 MW
- Load shedding can be carried out in one step for entities with annual peak demands less than 100 MW.

American Electric Power

We would request that the drafting team consider geographic dispersion of the underfrequency response load.

We would request that this SAR apply to all entities that have an impact on the bulk energy system.

MRO

MRO believes that the UFLS standards, PRC-007 through PRC-009 could be broadly applied to ALL entities that comply with a customized Regional UFLS standard. Therefore, for simplification purposes, the MRO would support combining standards PRC-007 through PRC-009 into one UFLS NERC standard.

BPA Transmission Services

Standards Authorization Request Form

The To Do List for PRC-009 notes a consideration from V0 Industry Comments of an exemption for those with shunt reactors who don't shed load. As these devices are more associated with UVLS than UFLS, BPA recommends the removal of this item.

PJM

There should only be 7 requirements in this standard. These seven would be split between NERC and the entity that has installed UFLS devices.

- NERC establish what the UFLS criteria should be, which would include transmission and generation UFLS set-points, time-delays, etc.
- NERC should establish acceptable maintenance intervals
- NERC shall establish and maintain a database of all UFLS information
- NERC should conduct an assessment of its criteria every five years
- Each entity shall meet the established criteria
- Each entity shall update its information in the NERC database each year
- Each entity shall investigate and analyze all UFLS events

The remaining requirements in the four standards should all go away. The entities would all be subject to compliance audits to verify their compliance

KCP&L

"Lack of coordination" - It is probably a good idea to know and understand the UFLS program requirements of neighboring regions.

"Develop Continent Standard" - The current standard is sufficient in scope and requirements to stand as a national standard. As stated above, the requirements are clear and complete to allow Regional Entities and their members to develop their unique UFLS programs, to implement them, to monitor the UFLS regional effectiveness and Regional member effectiveness in maintaining their UFLS equipment. This standard serves a comprehensive national standard for development and implementation of UFLS in the regions.

"Who submit compliance material to?" - I think it is understood by the industry all compliance programs are administered by Reliability Coordinators and does not need to be included in this standard.

The remaining comments in this part of the SAR lack sufficient information to provide a specific response.

PRC-007

"Need language to implement" - I do not agree with the notion mentioned in the SAR document that it is necessary to add language requiring "implementation" of programs. The UFLS regional programs are required to specify in PRC-006 the frequency steps and load shed at a given step for TO's and Distribution Providers to adhere to. PRC-008 requires TO's and Distribution Providers to maintain and test their UFLS equipment. It is not possible to comply with these standards without equipment installed in the field.

PRC-008

"Maintenance intervals not addressed" - I do agree that a minimum maintenance interval should be included in the standard for the industry to comment on. I imagine solid state relays and electromechanical relays probably have differing maintenance needs.

PRC-009

"No corresponding standard for under-voltage" - This comment is outside the scope of this standard. Any development of an under-voltage standard should be separate and distinct from the UFLS standard. Both UFLS and under-voltage involve shedding of load but to address different operating condition recovery.

General comments:

Standards Authorization Request Form

The remainder of the SAR items in the "To Do Lists" are basically editorial in nature and do not change the substance of the standard. I do not have any fundamental problems with making the suggested modifications to the standards, but I also do not see any great need either. It is unclear who the entity responsible for determining the interconnections setpoints should be.

LADWP

Comments regarding the scope of the project (Question #2) and additional revisions that needs to be incorporated into the standards (Question #3).

The Reliability Functions checked off on page 3 of the SAR should include the Generator Owner and Generator Operator. This is because of the need to closely coordinate load tripping frequency settings to the generating unit off-nominal protection frequency and time delay settings. The objective is to provide enough separation between the load tripping and generating unit protection frequency and time delay settings. This will allow load tripping to be completed and thereby arrest system frequency decline without activating any generating unit off-nominal frequency protection.

The recommended generating unit off-nominal frequency protection settings vary depending on the unit manufacturer and type of unit. The number of generating units in an interconnection is numerous so will the variety of manufacturer's recommended off-nominal frequency and time delay settings. The worst case of these generating unit off-nominal protection settings have to be taken into account in determining the size of load tripped at each load-shedding step. If some units are not included in the consideration, it is possible for these units to have off-nominal settings that would trip the unit during load shedding, exacerbating the situation. A solution to this problem is requiring the owner of the generating unit to trip additional load to cover the additional loss of generation. But this solution is discriminatory if an extensive survey of generator off-nominal frequency protection was not conducted prior to the design of the load shedding steps. It would be similar to adding insult to injury to require generator owners to trip additional load when their generating units were excluded in the design of Regional Reliability Organization's (RRO) UFLS Program, in the first place. Besides these generator owners may not have load available for load shedding.

It is therefore important to add a requirement to "Standard PRC-006-0 – Development and Documentation of Regional UFLS programs that a thorough survey of all the off-nominal frequency protection settings of all interconnection generating units be conducted and the results used in the design of the RRO's Regional UFLS Program.

Manitoba Hydro

PRC-007 - To Do List:

- Need to include RA. [This should refer to the new functional model.]
- Need to refine levels of compliance. [In what manner? Different percentages of insufficient UFLS at stated non-compliance levels? Perhaps 90%-80%-70% instead of the 95%-90%-85% presently stated?]

PRC-008 - To Do List:

- Include a requirement that maintenance and testing of UFLS programs must be carried out within a maximum allowable interval appropriate to the relay type and the potential impact on the Bulk-Power System. [A maximum maintenance interval based on the relay type and system impact should not be defined by the standard. The required maintenance frequencies can not only be dependent upon relay type and system impact, but also many factors, including relay construction, age, maintenance practices, maintenance philosophies, environment, and operating context. The responsible entities are best situated to determine the maintenance requirements of their equipment. Revising PRC-008-0 requirements to be similar to the PRC-005-1 requirements provides more consistency across the standards and includes R1.1. Maintenance and testing intervals and their basis.
R1.2. Summary of maintenance and testing intervals.

Standards Authorization Request Form

Both these requirements make available information which can be used for a review of an entity's maintenance frequencies and practices.]

PRC-009:

- Requirements – Result or Outcome. [Do not agree the “results” are “missing”. The results are inherently implied by adhering to the conditions stated in the requirements. Same as for PRC-007.]

Measures - [M1 - Disagree.]

To Do List:

- Change "program" to "standard" in R1. [Disagree. Using "standard" in this location of R1 could easily be confused with using the word "standard" in the rest of the document. There is nothing inappropriate with the word "program" in the context of R1. Same as for PRC-007.]

-90 days vs 30 days. [Depending on complexity of UFLS involved disturbance, 90 days may be required to properly analyze event and document results.]

-Exemptions for those with shunt reactor who don't shed load. [Do not understand context of comment. Whether or not shunt reactors are tripped out by UF relays (possibly via UFLS relay facilities) is not relevant. Dumping reactors will increase voltages, but provide no significant (if any) improvements to sagging network frequency compare

So. Company Transmission, Generation, and Alabama Power

The term Evidence should be used in the Measurements in this standard as in other standards- it includes but is not limited to, operator logs, voice recordings or transcripts of voice recordings, electronic communications, computer printouts or other equivalent evidence.

With respect to Question #3 of the comment form: Please identify any additional revisions that should be incorporated into this set of standards, beyond those that have already been identified in the SAR.

IRC Standards Review Committee

Please take a closer look at the applicability of each of the standard requirements. We believe some of them may not cover all the responsible entities. For example:

a. PRC-007-0

TOP's & LSE's are missing from R1, R2 & M1.

b. PRC-008-0

TOP's & LSE's are missing from the Applicability, Requirements & Measures sections.

MISO Stakeholders Committee

One major change needed in all the standards is to separate the standard into two pieces. The first is the set of core reliability requirements. The second portion is the supporting text. More than half the text in the current standards is supporting text that explains the true requirements. Now NERC is in the process of developing measures for and assigning risk to sentences that were never intended to be measured.

ATC

The SDT should also develop a new standard that addresses Generator Frequency Response. It's our opinion that Generator Frequency Response goes hand-in-hand with Under Frequency Load Shedding and therefore should be included in this set of standards.

American Electric Power

Standards Authorization Request Form

We would request clarity regarding compliance measures. Some requirements will lend themselves to plus or minus tolerances for a prescribed value, while others may be best described in terms of greater than or less than the prescribed value.

Standard PRC-009 requires a simulation of the event (in addition to a description, a review of the set points and tripping times, and a summary of the findings). The time frame associated with providing documentation of the analysis, following the underfrequency event, is 90 calendar days (Requirement R2). Based on our experiences, we would request that the drafting team consider a longer time frame, such as 120 days.

ISO-NE

Because PRC-005, -008, -011, and -017 are related in the maintenance issues that they cover, there would be a benefit in consolidating these requirements of the standards into one standard.

PRC-006-0 would benefit from greater description as to the technical requirements. Specifically, R1.2.4 needs to be defined as to what particular generator protection schemes will be included in the requirement e.g. U/F trip settings.

R1.2.8 is too broad & encompassing in scope covering "any other schemes that are part of or impact the UFLS programs". The schemes that may be impacted by this requirement need to be defined in order to be measurable.

The levels of non-compliance should be augmented in PRC-006-0. For example, a level 2 non-compliance should be added for not meeting 2 or more elements of R1. A level 3 non-compliance should be added for not meeting R2. Level 4 non-compliance should be modified to target only those entities that do not complete a UFLS assessment within the last five years or those entities who do not provide this assessment to the regional entity.

As indicated by FERC, PRC-008 should be modified "to include a requirement that maintenance and testing of programs must be carried out within a maximum allowable interval appropriate to the relay type and the potential impact on the Bulk-Power System."

The PRC Standards need to be reviewed to ensure applicable entities/functions are appropriately identified. TOP's & LSEs' are missing from: (i) R1, R2 & M1 in PRC-007, and (ii) the Applicability, Requirements and Measures sections in PRC-008. In addition, in certain instances (PRC-007 & -008), because independent system operators and regional transmission organizations are TOPs, the PRC-007 and PRC-008 may not be appropriately applied to these entities, because such entities do not own/operate UFLS.

The SAR should consider deleting PRC-009, and add the requirements to PRC-006-0 as R1.4.3.

KCP&L

The standards would be better organized by separating the reliability requirements from the supporting text that explains the requirements. Measures should then be applied only to the requirements and not the text.

Manitoba Hydro

PRC – 007:

- Purpose -If each standard included a list of all other closely related standards, the individual non-repeated purposes of related standards could be more easily compared by readers when necessary.
- Requirements – Shall Do What?
- R2 – "As necessary" should be removed. Annual updates of UFLS data to the RRO are necessary, even if they just only confirm that the previous year's data is still valid. Please refer to R3 comment below.

Standards Authorization Request Form

- R3 – Recommend further revision of R3. As well as RRO requested data within 30 days, there should be a mandatory requested annual update. This will coordinate with comment of R2.
- Measures - 2M for 3R.
- By making revisions to R2 and R3 as shown above, measure M2 will now appropriately cover both R2 and R3 for annual data updating and appropriate documentation transmission to RRO.

PRC-008-0:

Measure M1 needs to be revised to clearly reflect the measures applied to Requirement R1.

So. Company Transmission, Generation, and Alabama Power

Under PRC-006, Requirement 1.2, it is recommended the Regions have the responsibility for design details for determining Load Shedding Blocks (MWs), intentional and total tripping time delays, Generation protection, Islanding Schemes, Tie tripping schemes (within a Region), frequency set points (excludes BAL standard) and Load Restoration schemes. Also, the reporting of the time delay should only include the total time and not include the intentional time delay. The intentional time delay is included in the total time.

In PRC-006, Requirement 1.3, the Regional UFLS database is required to be updated at least every 5 years. However, under PRC-007, R2, the Transmission Owner is required to update its underfrequency data at least annually. These two timing update requirements should be consistent with one another.

In PRC-008 it is unclear how often the Transmission Owners are required to assess its maintenance and testing program. We recommend adding language to the SAR that says on a "as needed" basis.

Under PRC-008, Requirement 2, it states that Transmission Owner must implement its maintenance and testing program that is required in R1. It would seem more appropriate to include the implementation portion of R2 into R1 to say the Transmission Owner must have and implement a maintenance and testing program.

The SAR drafting team should recognize that individual generator frequency trip set points are established by the manufacturer of the generator and not by the Generator Owner. Therefore, in the development of the underfrequency load shedding scheme, each Transmission Owner should recognize that these generator frequency trip settings cannot be adjusted and the load shedding schemes should take this into account. This standard should not require a Generator Owner to operate beyond the limits set by the manufacturer.

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

The Underfrequency Load Shedding (UFLS) SAR drafting team thanks all commenters who submitted comments on Draft 2 of the UFLS SAR. This SAR was posted for a 30-day public comment period from **February 8 through March 9, 2007**. The SAR drafting team asked stakeholders to provide feedback on the standard through a special standard Comment Form. There were 17 sets of comments received, including comments from more than 31 different people from 15 organizations representing 9 of the 10 industry segments as shown in the table on the following pages.

The SAR drafting team recommends that the Standards Committee accept the revised SAR for Project 2007-01 UFLS for development as a standard.

Based on comments received on the second posting of this SAR for comment the SAR drafting team revised the Applicability section of the SAR to include Reliability Coordinator and updated the Applicability section to reflect the latest version of the SAR form. It was noted by the SAR drafting team that the "applicability" identified in the SAR is the starting point for consideration of redrafting of the standard and that the standard drafting team is to review the appropriate applicability of the standard. Finally, the SAR drafting team noted a number of comments outside the scope of responsibility of the SAR drafting team to resolve which will be forwarded to the standard drafting team for consideration.

In this "Consideration of Comments" document stakeholder comments have been organized so that it is easier to see the responses associated with each question. All comments received on the standards can be viewed in their original format at:

http://www.nerc.com/~filez/standards/Underfrequency_Load_Shedding.html

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you can contact the Director of Standards, Gerry Adamski, at 609-452-8060 or at gerry.adamski@nerc.net. In addition, there is a NERC Reliability Standards Appeals Process.¹

¹ The appeals process is in the Reliability Standards Development Procedures: <http://www.nerc.com/standards/newstandardsprocess.html>.

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

The Industry Segments are:

- 1 — Transmission Owners
- 2 — RTOs, ISOs
- 3 — Load-serving Entities
- 4 — Transmission-dependent Utilities
- 5 — Electric Generators
- 6 — Electricity Brokers, Aggregators, and Marketers
- 7 — Large Electricity End Users
- 8 — Small Electricity End Users
- 9 — Federal, State, Provincial Regulatory or other Government Entities
- 10 — Regional Reliability Organizations, Regional Entities

Commenter		Organization	Industry Segment											
			1	2	3	4	5	6	7	8	9	10		
1.	Anita Lee (G1)	AESO		✓										
2.	Jason Shaver	American Transmission Co.	✓											
3.	Mike Viles	BPA	✓											
4.	Gary Keenan	BPA	✓											
5.	Brent Kingsford (G1)	CAISO		✓										
6.	Ed Thompson	ConEd	✓											
7.	Steve Myers (G1)	ERCOT		✓										
8.	Bruno Jesus (G2)	Hydro One Networks, Inc.	✓											
9.	Roger Champagne	Hydro Québec TransÉnergie	✓											
10.	Ron Falsetti (G1)	IESO		✓										
11.	Matt Goldberg (G1)	ISO New England		✓										
12.	Kathleen Goodman (G1)	ISO New England		✓										
13.	Bill Shemley (G2)	ISO New England		✓										
14.	Brian Thumm (G1)	ITC Holdings	✓											
15.	Jim Cyrulewski (G3)	JDRJC Associates									✓			
16.	Michael Gammon	KCPL	✓											
17.	Don Nelson (G2)	MA Dept. of Tele. And Energy											✓	
18.	Robert Coish	Manitoba Hydro	✓		✓			✓	✓					
19.	Jason Marshall (G3)	Midwest ISO Stakeholders Standards Collaboration Participants		✓										
20.	Brian F. Thumm (G3)	Midwest ISO Stakeholders Standards Collaboration Participants		✓										
21.	Jim Cyrulewski (G3)	Midwest ISO Stakeholders Standards Collaboration Participants									✓			
22.	Bill Phillips (G1)	MISO		✓										
23.	Randy MdDonald (G2)	NBSO		✓										
24.	Herb Schrayshuen (G2)	NGrid	✓											
25.	Guy V. Zito (G2)	NPCC												✓
26.	Jerad Barnhart (G2)	NStar	✓											

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

Commenter		Organization	Industry Segment											
			1	2	3	4	5	6	7	8	9	10		
27.	Murale Gopinathan (G2)	NU	✓											
28.	Mike Calimano (G1)	NYISO		✓										
29.	Greg Campoli (G2)	NYISO		✓										
30.	Ralph Rufrano (G2)	NYPA	✓											
31.	Al Adamson (G2)	NYSRC		✓										
32.	Richard Kafka (G4)	Pepco Holdings, Inc.												
33.	Alicia Daughtery (G1)	PJM		✓										
34.	Charles Yeung (G1)	SPP		✓										
35.	Roger Champagne (G2)	TransÉnergie Hydro-Québec	✓											
36.	Howard Rulf	We Energies			✓	✓	✓							
37.	Alvin Depew (G4)	Potomac Electric Power Co.	✓											
38.	Carl Kinsley (G4)	Delmarva Power & Light	✓											
39.	Evan Sage (G4)	Potomac Electric Power Co.	✓											
40.	Travis Sykes	TVA	✓											
41.	Darrell Pace	Alabama Electric Coop.	✓											
42.	John Sullivan	Ameren	✓											
43.	Bob McGarrah	Ameren	✓											
44.	Charles Long	Entergy	✓											
45.	David Weekley	MEAG Power	✓											
46.	Pat Huntley	SERC Reliability Corp.												✓
47.	Phil Kleckley	SC Electric and Gas			✓									
48.	Bob Jones	Southern Company Services, Inc.	✓											
49.	Brian Moss	Duke Energy Carolinas	✓											
50.	Fred J. Frederick	Vectren Energy Delivery												
51.	Charles Rogers (G6)	Comsumers Energy												
52.	W. Mark Carpenter (G6)	TXU Energy Delivery												
53.	David Angell (G6)	Idaho Power												
54.	Deven Bhan (G6)	WAPA												
55.	Joseph Burdis (G6)	PJM												
56.	John Ciufu (G6)	Hydro One												
57.	Jim Ingelson (G6)	NYISO												
58.	Mike McDonald (G6)	Ameren												
59.	William Miller (G6)	Exelon												
60.	John Muklhausen (G6)	FPL												
61.	James Roberts (G6)	TVA												
62.	Evan Sage (G6)	Pepco												
63.	Jon Sykes (G6)	SRP												
64.	Phil Tatro (G6)	National Grid												
65.	Joe Uchiyama (G6)	U.S. Bureau of Reclamation												

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

Commenter		Organization	Industry Segment											
			1	2	3	4	5	6	7	8	9	10		
66.	Eric Udren (G6)	KEMA												
67.	Tom Wiedman (G6)	Wiedman Consulting												
68.	Philip Winston (G6)	Georgia Power												
69.	Baj Agrawal (G6)	Arizona Public Service												
70.	Henry Miller (G6)	AEP												
71.	Robert Cummings (G6)	NERC Staff												
72.	Dean Sikes (G6)	CLECO												
73.	Robert Stuart (G6)	Elequant												
74.	Roman Carter (G7)	Southern Company Transmission	✓											
75.	Jonathan Glidewell (G7)	Southern Company Transmission	✓											
76.	Marc Butts (G7)	Southern Company Transmission	✓											
77.	JT Wood (G7)	Southern Company Transmission	✓											
78.	Jim Busbin (G7)	Southern Company Transmission	✓											
79.	Barry Dyer (G7)	Alabama Power Company			✓									
80.	Phil Winston (G7)	Georgia Power Company			✓									

I – Indicates that individual comments were submitted in addition to comments submitted as part of a group

G1 - IRC Standards Review Committee

G2 – NPCC CP9 Reliability Standards Working Group (NPCC CP9)

G3 – Midwest ISO Stakeholders Standards Collaboration Participants (MISO SSC)

G4 – Pepco Holdings, Inc. – Affiliates

G5 – SERC PC Planning Standards Subcommittee

G6 – NERC System Protection and Control Task Force

G7 – Southern Company Transmission

Index to Questions, Comments, and Responses

1. Do you agree that PRC-008 should be removed from the list of standards to be revised in association with Project 2007-01 and placed into a project with all the relay maintenance and testing standards? If not, please explain in the comment area.6

2. Do you agree with revising the SAR to clarify the scope of work to be performed on each standard including the addition of Appendix A and Appendix C to the SAR? If not, please explain in the comment area.....7

3. Do you agree with expanding the Applicability section of the SAR to include Balancing Authority, Planning Authority or Planning Coordinator, Transmission Planner, Generator Owner, and Generator Operator so that the standard drafting team can consider these entities when reviewing the appropriate applicability of the standards? If not, please explain in the comment area..... 10

4. Do you have any other concerns with the revisions made to the SAR? If yes, please explain in the comment area..... 13

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

1. Do you agree that PRC-008 should be removed from the list of standards to be revised in association with Project 2007-01 and placed into a project with all the relay maintenance and testing standards? If not, please explain in the comment area.

Summary Consideration:

Question #1			
Commenter	Yes	No	Comment
We Energies	<input checked="" type="checkbox"/>		
ATC LLC	<input checked="" type="checkbox"/>		
BPA	<input checked="" type="checkbox"/>		
ERCOT	<input checked="" type="checkbox"/>		
HQT	<input checked="" type="checkbox"/>		
IESO	<input checked="" type="checkbox"/>		
IRC	<input checked="" type="checkbox"/>		
ISO-NE	<input checked="" type="checkbox"/>		
ITC Holdings	<input checked="" type="checkbox"/>		
KCPL	<input checked="" type="checkbox"/>		
Manitoba Hydro	<input checked="" type="checkbox"/>		
MISO SCC	<input checked="" type="checkbox"/>		
NPCC CP9 RSWG	<input checked="" type="checkbox"/>		
NYISO	<input checked="" type="checkbox"/>		
Pepco	<input checked="" type="checkbox"/>		PHI concurs that relay maintenance standards should be consolidated.
SERC PSS	<input checked="" type="checkbox"/>		
Vectren			No comment.
Southern Company Transmission	<input checked="" type="checkbox"/>		
SPCTF	<input checked="" type="checkbox"/>		

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

2. Do you agree with revising the SAR to clarify the scope of work to be performed on each standard including the addition of Appendix A and Appendix C to the SAR? If not, please explain in the comment area.

Summary Consideration:

Question #2			
Commenter	Yes	No	Comment
We Energies	<input checked="" type="checkbox"/>		
ATC LLC	<input checked="" type="checkbox"/>		
BPA	<input checked="" type="checkbox"/>		
ERCOT	<input checked="" type="checkbox"/>		However, the drafting team should be encouraged to more clearly communicate that such Appendices are lists of topics and comments that are to be considered, but they are not lists of requirements that must be included in the standard to be developed.
<p>Response:</p> <p>The SAR drafting team agrees with the comment.</p>			
HQT	<input checked="" type="checkbox"/>		
IESO	<input checked="" type="checkbox"/>		
IRC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	The addition of Appendix A and Appendix C does not seem to improve clarity on the scope of work, but rather just add a list of "things to consider" for the standards drafting team. As it stands the scope of work is fairly wide open. However, we do not disagree that the standards drafting team should consider those comments.
<p>Response:</p> <p>The scope of the SAR is designed to provide the standard drafting team with a high degree of flexibility for revising the existing standards. Volume I of NERC's three-year reliability standards development plan identifies a set of specific issues each standard drafting team is to consider when revising a standard.</p>			
ISO-NE	<input checked="" type="checkbox"/>		
ITC Holdings	<input checked="" type="checkbox"/>		
KCPL	<input checked="" type="checkbox"/>		

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

Question #2			
Commenter	Yes	No	Comment
Manitoba Hydro	<input checked="" type="checkbox"/>		MH believes a lot of good effort has been put into the drafting of this SAR to identify all the significant issues that need to be considered in drafting the UFLS standards. The standard drafting team has its work cut out for it! - but at least, hopefully, all the significant issues are identified.
MISO SCC		<input checked="" type="checkbox"/>	In general, we agree with the inclusion of Appendix A and the relevant comments that are included in Appendix C. However, we have the following specific issues with regard to the comments in Appendix C. On Page C-2, we do not agree with KCP&L's assertion that all compliance programs are administered by Reliability Coordinators. Reliability Coordinators do not administer compliance programs. Additionally, we are concerned with the meaning of Manitoba Hydro's general comment on Page C-3 that the RA needs to be included. We are assuming they mean Reliability Coordinator. We do not oppose the Reliability Coordinator being included to the extent they are made aware and have the settings of the UFLS relays available to them; however, we clearly do not believe the Reliability Coordinator should have any coordination role or should replace the role of the RRO.
<p>Response:</p> <p>The standard drafting team will review all comments identified in Appendix C of the SAR and make recommendations accordingly. The standard drafting team's recommendations will be posted for public comment at which time the MISO SCC can review and comment further.</p>			
NPCC CP9 RSWG	<input checked="" type="checkbox"/>		
NYISO	<input checked="" type="checkbox"/>		The addition of Appendix A and Appendix C does not seem to improve clarity on the scope of work, but rather just add a list of "things to consider" for the standards drafting team. As it stands the scope of work is fairly wide open. However, we do not disagree that the standards drafting team should consider those comments.
<p>Response:</p> <p>The scope of the SAR is designed to provide the standard drafting team with a high degree of flexibility for revising the existing standards. Volume I of NERC's three-year reliability standards development plan identifies a set of specific issues each standard drafting team is to consider when revising a standard.</p>			
Pepco	<input checked="" type="checkbox"/>		
SERC PSS	<input checked="" type="checkbox"/>		
Vectren			No comment.

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

Question #2			
Commenter	Yes	No	Comment
Southern Company Transmission	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
SPCTF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The SPCTF has developed a report which provides a technical assessment of all three of these standards, which is attached. Please include the observations from this report in the scope of work on these standards.
Response: SPCTF's report will be forwarded to the standard drafting team for their consideration.			

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

3. Do you agree with expanding the Applicability section of the SAR to include Balancing Authority, Planning Authority or Planning Coordinator, Transmission Planner, Generator Owner, and Generator Operator so that the standard drafting team can consider these entities when reviewing the appropriate applicability of the standards? If not, please explain in the comment area.

Summary Consideration:

Question #3			
Commenter	Yes	No	Comment
We Energies	<input checked="" type="checkbox"/>		
ATC LLC	<input checked="" type="checkbox"/>		
BPA	<input checked="" type="checkbox"/>		
ERCOT	<input checked="" type="checkbox"/>		
HQT	<input checked="" type="checkbox"/>		
IESO	<input checked="" type="checkbox"/>		
IESO	<input checked="" type="checkbox"/>		
IRC	<input checked="" type="checkbox"/>		
ISO-NE	<input checked="" type="checkbox"/>		
ITC Holdings		<input checked="" type="checkbox"/>	None of the UFLS standards currently apply to either Planning function, and the SAR does not contemplate adding any requirements that do. The Planning Coordinator and the Transmission Planner should be removed from the scope of the SAR.
Response:			
<p>The "applicability" identified in the SAR is the starting point for consideration of redrafting of the standard. The standard drafting team will review the applicability section of the standard and make a recommendation accordingly. Therefore the SAR drafting team does not agree with removing the Planning Coordinator and the Transmission Planner from the Applicability section.</p>			
KCPL		<input checked="" type="checkbox"/>	Even though it is not mentioned in the question, the Reliability Coordinator should be included as one of the Applicable Entities. On the SAR the Reliability Authority is not checked in "The Standard will Apply to the Following Functions" table.
Response:			

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

Question #3			
Commenter	Yes	No	Comment
<p>The SAR drafting team added Reliability Coordinator as a potential functional entity the revised standard might apply to.</p>			
Manitoba Hydro	<input checked="" type="checkbox"/>		
MISO SCC	<input checked="" type="checkbox"/>		Is Planning Authority still in the functional model? We believe this function has been replaced.
<p>Response:</p> <p>The drafting team agrees and the standard drafting team will be required to use the latest version of the functional model.</p>			
NPCC CP9 RSWG	<input checked="" type="checkbox"/>		We agree with the additional functions proposed in the Applicability section to allow the drafting team the ability to fully consider any entities that may have a role in the standard, also the entities need to be updated to match the latest version of the Functional Model.
<p>Response:</p> <p>The drafting team agrees and has transferred the information to the latest version of the SAR form.</p>			
NYISO	<input checked="" type="checkbox"/>		
Pepco	<input checked="" type="checkbox"/>		
SERC PSS	<input checked="" type="checkbox"/>		The PSS does not see a reason for including the BA, GO, and GOP, but has no objections to allowing the SDT to consider these entities.
<p>Response:</p> <p>The “applicability” identified in the SAR is the starting point for consideration of redrafting of the standard. The standard drafting team will review the applicability section of the standard and make a recommendation accordingly.</p>			
Vectren			No comment.
Southern Company Transmission	<input checked="" type="checkbox"/>		Southern does not object to the Standard Drafting team considering the BA, GO, and GOP in the applicability section. However, only after the requirements of the future standard are developed should a final determination be made on the applicability.
<p>Response:</p> <p>The “applicability” identified in the SAR is the starting point for consideration of redrafting of the standard. The standard drafting team will review the applicability section of the standard and make a recommendation accordingly.</p>			

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

Question #3			
Commenter	Yes	No	Comment
SPCTF		<input checked="" type="checkbox"/>	Please see the comments in the attached SPCTF report for the SPCTFs position on the applicable entities.
Response: SPCTF's report will be forwarded to the standard drafting team for their consideration.			

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

4. Do you have any other concerns with the revisions made to the SAR? If yes, please explain in the comment area.

Summary Consideration:

Question #4			
Commenter	Yes	No	Comment
We Energies		<input checked="" type="checkbox"/>	
ATC LLC	<input checked="" type="checkbox"/>		<p>The standard should address both underfrequency and overfrequency, to avoid shedding too much load. The standard should also make it clear that generators must be well-protected, while still supporting the integrity of the system. Thus, Generators Owners must be part of the decision process when the regional entities establish the requirements for generators to remain on-line.</p> <p>Since it is possible that an island can be formed that envelopes more than one regional entity, we recommend strong coordination between neighboring regions so that different and/or conflicting standards are not identified as resolution for a common island.</p>
<p>Response:</p> <p>The SAR drafting team will forward ATC LLC’s comments to the standard drafting team for their consideration.</p>			
BPA		<input checked="" type="checkbox"/>	
ERCOT		<input checked="" type="checkbox"/>	
HQT		<input checked="" type="checkbox"/>	
IESO		<input checked="" type="checkbox"/>	
IRC		<input checked="" type="checkbox"/>	
ISO-NE		<input checked="" type="checkbox"/>	
ITC Holdings	<input checked="" type="checkbox"/>		<p>Independent transmission companies do not have direct access to load (location, nature, etc.) in order to fully implement a UFLS program. The applicability of the Standard should be further modified to reflect the need for the DP/LSE to own/operate/develop/maintain a UFLS program in cooperation with its TO/TOP/RC. The standard is currently written to allow the Regional Entity to require a Transmission Operator or Operator to own/operate a UFLS program, and, in general, an independent transmission company does not have the means to implement load shedding programs.</p>
<p>Response:</p>			

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

Question #4			
Commenter	Yes	No	Comment
<p>The SAR drafting team will forward ITC Holdings' comments to the standard drafting team for their consideration.</p>			
KCPL		<input checked="" type="checkbox"/>	
Manitoba Hydro	<input checked="" type="checkbox"/>		<p>Re-iterating significant comments made in 1st draft of SAR, but not included in MH comment section of Appendix C in 2nd draft:</p> <p>PRC – 007 – 0</p> <p>Measures.</p> <p>M1 - If "consistency" is to be clarified here, it must also be clarified for R1 as well. If R1 does not require this clarification, neither does M1. Also, does "consistency" really require further clarification?</p> <p>NEW COMMENTS FOR 2ND DRAFT.</p> <p>Appendix C -</p> <p>PJM Comments. I believe RRO's should stand between regional UFLS owner/control areas and NERC. Various RRO's may have some different methodologies and procedures which are appropriate to their specific RRO regions and not to others. There should not be a single UFLS criteria from NERC that covers ALL UFLS conditions and concerns for the entire grid.</p> <p>NCMPA Comments. I agree with non-compulsory compliance for utilities with very low peak loads if they are surrounded by utilities with load levels sizable enough to require compliance to UFLS programs. However, if there are a lot of small load utilities in an RRO region whose total peak load is sizeable enough to require UFLS, these small utilities will have to coordinate as if they were one large utility in order to conform with their RRO's UFLS program in the same fashion a single large load utility would, to ensure proper total RRO region low frequency UFLS mitigation.</p>

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

Question #4			
Commenter	Yes	No	Comment
<p>Response:</p> <p>The SAR drafting team will forward MH's comments to the standard drafting team for their consideration.</p>			
MISO SCC	<input checked="" type="checkbox"/>		In general, this SAR is much improved. We do support ATC's assertion on Page C-4 of Appendix C that the SDT should consider generation frequency response. We ask that they coordinate with the Frequency Response SAR drafting team.
<p>Response:</p> <p>The SAR drafting team will forward MISO SCC's comments to the standard drafting team for their consideration.</p>			
NPCC CP9 RSWG		<input checked="" type="checkbox"/>	
NYISO		<input checked="" type="checkbox"/>	
Pepco		<input checked="" type="checkbox"/>	
SERC PSS		<input checked="" type="checkbox"/>	
Vectren	<input checked="" type="checkbox"/>		UFLS steps should be set with a considerable amount of bandwidth. That is if there are 5 steps of 5% required, an entity could drop as much as say 10% in the first step and possibly drop as little as 1% in the second step. As long as the cumulative amount is within the requirements of that level of steps (5-10-15-20-25%). Trying to meet an exact amount of load drop is very difficult and would not provide enough benefit to justify the cost.
<p>Response:</p> <p>The SAR drafting team will forward Vectren's comments to the standard drafting team for their consideration.</p>			
Southern Company Transmission	<input checked="" type="checkbox"/>		<p>We have a general concern with the ambiguity associated with the violation severity levels. For example, Moderate and High severity levels both state that an entity is deficient in one or more significant elements. It would seem reasonable that High severity would mean you were deficient in multiple (at least greater than one) significant elements and not just in one element as moderate states.</p> <p>Are we to interpret a significant element is to mean a standard requirement? What are examples of a significant element other than a requirement contained in the standard?</p>

Consideration of Comments on 2nd Posting of Underfrequency Load Shedding SAR

Question #4			
Commenter	Yes	No	Comment
			<p>Finally, we have a general comment about the SAR development process as a whole. FERC is concerned with the amount of time it takes NERC (through the ANSI accredited process) to develop a standard. Since the SAR development process only outlines the scope of the future standard development (in other words, there are no requirements to a SAR), it is recommended that the NERC standards development process accelerate through the SAR phase in order to initiate the more complex task of developing the requirements of a particular Standard. In other words, there should only be, at most, two rounds of comments for a SAR prior to it shifting to the standards drafting team.</p>
<p>Response:</p> <p>The SAR drafting team will forward Southern Company Transmission’s comments contained in the first two paragraphs above to the standard drafting team for their consideration.</p> <p>With respect to the last paragraph, this is outside the scope of the SAR drafting team’s responsibility.</p>			
SPCTF		<input checked="" type="checkbox"/>	

Automatic Underfrequency Load Shedding

SUMMARY

Frequency Minimum Load Dropped (%)

<u>Region</u>	<u>Comments Received</u>
ERCOT	11/16/2006
FRCC	11/17/2006
MRO	11/16/2006
NPCC	11/16/2006
RFC	12/12/2006
SERC	11/16/2006
SPP	11/17/2006
WECC	12/18/2006

A. Introduction

1. **Title:** Development and Documentation of Regional Reliability Organizations' Underfrequency Load Shedding Programs
2. **Number:** PRC-006-0
3. **Purpose:** Provide last resort system preservation measures by implementing an Under Frequency Load Shedding (UFLS) program.
4. **Applicability:**
 - 4.1. Regional Reliability Organization
5. **Effective Date:** April 1, 2005

B. Requirements

- R1. Each Regional Reliability Organization shall develop, coordinate, and document an UFLS program, which shall include the following:
 - R1.1. Requirements for coordination of UFLS programs within the subregions, Regional Reliability Organization and, where appropriate, among Regional Reliability Organizations.
 - R1.2. Design details shall include, but are not limited to:
 - R1.2.1. Frequency set points.
 - R1.2.2. Size of corresponding load shedding blocks (% of connected loads.)
 - R1.2.3. Intentional and total tripping time delays.
 - R1.2.4. Generation protection.
 - R1.2.5. Tie tripping schemes.
 - R1.2.6. Islanding schemes.
 - R1.2.7. Automatic load restoration schemes.
 - R1.2.8. Any other schemes that are part of or impact the UFLS programs.
 - R1.3. A Regional Reliability Organization UFLS program database. This database shall be updated as specified in the Regional Reliability Organization program (but at least every five years) and shall include sufficient information to model the UFLS program in dynamic simulations of the interconnected transmission systems.
 - R1.4. Assessment and documentation of the effectiveness of the design and implementation of the Regional UFLS program. This assessment shall be conducted periodically and shall (at least every five years or as required by changes in system conditions) include, but not be limited to:
 - R1.4.1. A review of the frequency set points and timing, and
 - R1.4.2. Dynamic simulation of possible Disturbance that cause the Region or portions of the Region to experience the largest imbalance between Demand (Load) and generation.
- R2. The Regional Reliability Organization shall provide documentation of its UFLS program and its database information to NERC on request (within 30 calendar days).

- R3.** The Regional Reliability Organization shall provide documentation of the assessment of its UFLS program to NERC on request (within 30 calendar days).

C. Measures

- M1.** The Regional Reliability Organization shall have documentation of the UFLS program and current UFLS database.
- M2.** The Regional Reliability Organization shall have evidence it provided documentation of its UFLS program and its database information to NERC as specified in Reliability Standard PRC-006-0_R2.
- M3.** The Regional Reliability Organization shall have evidence it provided documentation of its assessment of its UFLS program to NERC as specified in Reliability Standard PRC-006-0_R3.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Compliance Monitor: NERC.

1.2. Compliance Monitoring Period and Reset Timeframe

On request (within 30 calendar days) for the program, database, and results of assessments.

1.3. Data Retention

None specified.

1.4. Additional Compliance Information

None.

2. Levels of Non-Compliance

- 2.1. Level 1:** Documentation demonstrating the coordination of the Regional Reliability Organization's UFLS program was incomplete in one of the elements in Reliability Standard PRC-006-0_R1.
- 2.2. Level 2:** Not applicable.
- 2.3. Level 3:** Not applicable.
- 2.4. Level 4:** Documentation demonstrating the coordination of the Regional Reliability Organization's UFLS program was incomplete in two or more requirements or documentation demonstrating the coordination of the Regional Reliability Organization's UFLS program was not provided, or an assessment was not completed in the last five years.

E. Regional Differences

1. None identified.

Version History

Version	Date	Action	Change Tracking
0	April 1, 2005	Effective Date	New

A. Introduction

- 1. Title:** Assuring Consistency of Entity Underfrequency Load Shedding Programs with Regional Reliability Organization's Underfrequency Load Shedding Program Requirements
- 2. Number:** PRC-007-0
- 3. Purpose:** Provide last resort System preservation measures by implementing an Under Frequency Load Shedding (UFLS) program.
- 4. Applicability:**
 - 4.1.** Transmission Owner required by its Regional Reliability Organization to own a UFLS program
 - 4.2.** Transmission Operator required by its Regional Reliability Organization to operate a UFLS program
 - 4.3.** Distribution Provider required by its Regional Reliability Organization to own or operate a UFLS program
 - 4.4.** Load-Serving Entity required by its Regional Reliability Organization to operate a UFLS program
- 5. Effective Date:** April 1, 2005

B. Requirements

- R1.** The Transmission Owner and Distribution Provider, with a UFLS program (as required by its Regional Reliability Organization) shall ensure that its UFLS program is consistent with its Regional Reliability Organization's UFLS program requirements.
- R2.** The Transmission Owner, Transmission Operator, Distribution Provider, and Load-Serving Entity that owns or operates a UFLS program (as required by its Regional Reliability Organization) shall provide, and annually update, its underfrequency data as necessary for its Regional Reliability Organization to maintain and update a UFLS program database.
- R3.** The Transmission Owner and Distribution Provider that owns a UFLS program (as required by its Regional Reliability Organization) shall provide its documentation of that UFLS program to its Regional Reliability Organization on request (30 calendar days).

C. Measures

- M1.** Each Transmission Owner's and Distribution Provider's UFLS program shall be consistent with its associated Regional Reliability Organization's UFLS program requirements.
- M2.** Each Transmission Owner, Transmission Operator, Distribution Provider, and Load-Serving Entity that owns or operates a UFLS program shall have evidence that it provided its associated Regional Reliability Organization and NERC with documentation of the UFLS program on request (30 calendar days).

D. Compliance

- 1. Compliance Monitoring Process**
 - 1.1. Compliance Monitoring Responsibility**

Compliance Monitor: Regional Reliability Organization.

1.2. Compliance Monitoring Period and Reset Timeframe

On request (within 30 calendar days).

1.3. Data Retention

None specified.

1.4. Additional Compliance Information

None.

2. Levels of Non-Compliance

2.1. Level 1: The evaluation of the entity’s UFLS program for consistency with its Regional Reliability Organization’s UFLS program is incomplete or inconsistent in one or more requirements of Reliability Standard PRC-006-0_R1, but is consistent with the required amount of Load shedding.

2.2. Level 2: The amount of Load shedding is less than 95percent of the Regional requirement in any of the Load steps.

2.3. Level 3: The amount of Load shedding is less than 90percent of the Regional requirement in any of the Load steps.

2.4. Level 4: The evaluation of the entity’s UFLS program for consistency with its Regional Reliability Organization’s UFLS program was not provided or the amount of Load shedding is less than 85 percent of the Regional requirement on any of the Load steps.

E. Regional Differences

1. None identified.

Version History

Version	Date	Action	Change Tracking
0	April 1, 2005	Effective Date	New

A. Introduction

1. **Title:** **Analysis and Documentation of Underfrequency Load Shedding Performance Following an Underfrequency Event**
2. **Number:** PRC-009-0
3. **Purpose:** Provide last resort System preservation measures by implementing an Under Frequency Load Shedding (UFLS) program.
4. **Applicability:**
 - 4.1. Transmission Owner required by its Regional Reliability Organization to own a UFLS program.
 - 4.2. Transmission Operator required by its Regional Reliability Organization to operate a UFLS program.
 - 4.3. Load-Serving Entity required by the Regional Reliability Organization to operate a UFLS program.
 - 4.4. Distribution Provider required by the Regional Reliability Organization to own or operate a UFLS program.
5. **Effective Date:** **June 18, 2007**

B. Requirements

- R1. The Transmission Owner, Transmission Operator, Load-Serving Entity and Distribution Provider that owns or operates a UFLS program (as required by its Regional Reliability Organization) shall analyze and document its UFLS program performance in accordance with its Regional Reliability Organization's UFLS program. The analysis shall address the performance of UFLS equipment and program effectiveness following system events resulting in system frequency excursions below the initializing set points of the UFLS program. The analysis shall include, but not be limited to: *[Violation Risk Factor: Medium]*
 - 5.1. A description of the event including initiating conditions. *[Violation Risk Factor: Medium]*
 - 5.2. A review of the UFLS set points and tripping times. *[Violation Risk Factor: Medium]*
 - 5.3. A simulation of the event. *[Violation Risk Factor: Medium]*
 - 5.4. A summary of the findings. *[Violation Risk Factor: Medium]*
- R2. The Transmission Owner, Transmission Operator, Load-Serving Entity, and Distribution Provider that owns or operates a UFLS program (as required by its Regional Reliability Organization) shall provide documentation of the analysis of the UFLS program to its Regional Reliability Organization and NERC on request 90 calendar days after the system event. *[Violation Risk Factor: Lower]*

C. Measures

- M1. Each Transmission Owner's, Transmission Operator's, Load-Serving Entity's and Distribution Provider's documentation of the UFLS program performance following an

underfrequency event includes all elements identified in Reliability Standard PRC-009-0_R1.

- M2.** Each Transmission Owner, Transmission Operator, Load-Serving Entity and Distribution Provider that owns or operate a UFLS program, shall have evidence it provided documentation of the analysis of the UFLS program performance following an underfrequency event as specified in Reliability Standard PRC-009-0_R1.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Compliance Monitor: Regional Reliability Organization.

1.2. Compliance Monitoring Period and Reset Time Frame

On request 90 calendar days after the system event.

1.3. Data Retention

None specified.

1.4. Additional Compliance Information

None.

2. Levels of Non-Compliance

2.1. Level 1: Analysis of UFLS program performance following an actual underfrequency event below the UFLS set point(s) was incomplete in one or more elements in Reliability Standard PRC-009-0_R1.

2.2. Level 2: Not applicable.

2.3. Level 3: Not applicable.

2.4. Level 4: Analysis of UFLS program performance following an actual underfrequency event below the UFLS set point(s) was not provided.

E. Regional Differences

None identified.

F. Associated Documents

Version History

Version	Date	Action	Change Tracking
0	April 1, 2005	Effective Date	New
0	April 4, 2007	Regulatory Approval — Effective Date	New