

## Frequency Response Standard Drafting Team Meeting

October 18, 2007 — 8 a.m. to 5 p.m. Central Time

October 19, 2007 — 8 a.m. to 3 p.m. Central Time

**Four Points by the Sheraton  
10249 W. Irving Park Road  
Schiller Park, Illinois  
847.671.6000**

### Agenda

- 1) Introductions
  - a) Anti-trust & Administrative (**Attachment 1**)
  - b) Review Meeting Objectives:
    - i) Understand SC Expectations
    - ii) Review FERC Standard Approval Criteria & Benchmarks of Excellence
    - iii) Review SAR
    - iv) Draft Standard
    - v) Create Comment Form
    - vi) Finalize Project Schedule
- 2) **Review Standards Committee Expectations (Attachment 2)**
- 3) **Review FERC Criteria for Approving Standards (Attachment 3) & 10 Benchmarks of Excellent Reliability Standards (Attachment 4)**
- 4) **Review SAR (Attachment 5)**
  - a) Ensure team understands scope and applicability of proposed standard
- 5) **Draft Standard Sections**
  - a) Section A: Introduction
  - b) Section B: Requirements
  - c) Section C: Measures
  - d) Section D: Compliance Elements (with Compliance Coordinator)
- 6) **Draft Comment Form (Attachment 6)**

- 7) Finalize Project Schedule (Attachment 7)**
- 8) Summarize Action Items**
- 9) Schedule Next Meeting**

Hotel map from web site

<http://www.starwoodhotels.com/fourpoints/property/area/map.html?propertyID=849>

## **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.

### **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, Bylaws, and Rules of Procedure are followed in conducting NERC business.

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.

# Frequency Response SDT Kick-off Meeting

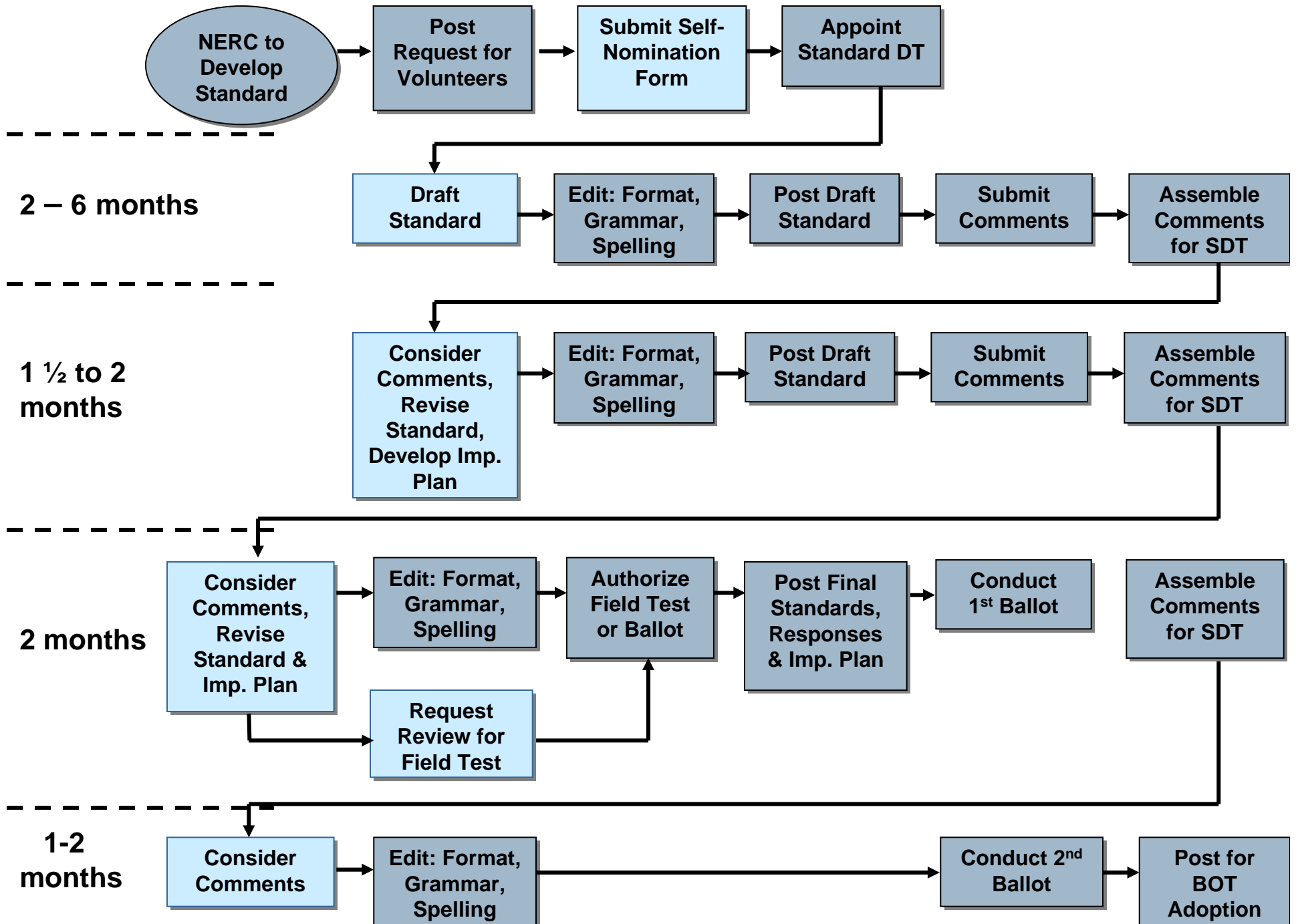
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October 18-19, 2007  
Chicago, IL

# Topics

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- Overview of Remaining Steps
- Expectations of SDT Members
- Drafting a Standard
  - Background Information
  - Introduction
  - Requirements, Violation Risk Factors, Time Horizons, & Measures
  - Compliance Elements
- Is Standard Ready to Post?
- Comment Forms
- Implementation Plan
- Field Testing



# Expectations of SDT Members

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- Produce a technically sound, complete standard that meets stakeholder approval and approval of regulatory authorities
- Produce a realistic implementation plan
- Preserve 'open' process



# Produce a Technically Sound Standard

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- Standard must:
  - Have a technically sound basis for the proposed requirements
  - Have widespread stakeholder support to achieve approval (66.6%)
  - Include all required elements, as described in the Reliability Standards Development Procedure
  - Address factors FERC considers

# Produce a Complete Standard

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- Some elements developed by SDT
- Some elements developed by CEDT
- Works best if SDT and CEDT meet jointly
- Expect all elements of standard to work together
- Expect standard to be posted with all elements in a single document at least once

## Standard – Sections Developed by SDT

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- **Title** (from SAR)
- **Purpose** (from SAR – can be abbreviated)
- **Applicability** (functional entities required to comply and any facility limits)
- **Proposed Effective Date** (when compliance is effective after regulatory approvals)
- **Requirements** (who must do what under what conditions for what outcome)
- **Violation Risk Factors** (impact to reliability of violating the requirement)
- **Time Horizon** (time frame available to mitigate a violation)
- **Measures** (what will be reviewed to determine if entity is compliant)

# Standard – Sections Developed by CEDT

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- **Compliance Enforcement Authority** (what entity will be the monitor – either Regional Entity or ERO)
- **Compliance Monitoring Period & Reset Time Frame** (time period in which a specific performance or outcome is measured, evaluated, and then reset)
- **Data Retention** (the data that must be kept and by what functional entities)
- **Other** (identify monitoring processes and any special information that the CEA needs)
- **Violation Severity Levels or VSLs** (tell how badly entity 'missed' being fully compliant with requirement or sub-requirement)

# FERC's Criteria for Approval

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- **Purpose**

- Achieves a specified reliability goal?

- **Applicability**

- Applicable to owners, users, or operators of the bulk-power system
- Applies throughout North America to the maximum extent achievable without favor
- Costs considered for smaller entities but not expense of reliability

- **Requirements**

- Provide technically sound method to achieve the goal
- Clear, unambiguous as to who is required to do what
- Achieve the reliability goal effectively and efficiently
- Do not represent "lowest common denominator"

**NERC**

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

# FERC's Criteria for Approval

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- **Measures**
  - Clear, objective measure for compliance
- **Violation Severity Levels**
  - Clear, understandable consequences & range of penalties
- **Implementation Plan**
  - Realistic
- **Other Considerations**
  - Cannot adversely impact competition or restrict grid
  - Evidence fair and open process was followed
  - Provides balance with other vital public interests

# Produce Realistic Implementation Plan

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- Consider time needed to become compliant with new requirements
  - Do entities need time to write procedures?
  - Do entities need time to modify and test software?
  - Do entities need time to conduct training?

# Preserve 'Open' Process



- 'Standards under Development' web site used for posting documents intended for stakeholder review and comment
  - Drafts of Standard
  - Comment Forms
  - Response to Comments
  - Implementation Plan
  - Field Test Results
- 'Related Files' section of each drafting team used for posting documents intended for use by team
  - Agendas and meeting notes (at least 5 days before/no more than 5 days after meeting)
- Meeting notices are posted on the 'Meetings' site
  - Anyone who registers may attend a meeting
  - Chair can limit the amount of time allocated to guests



# Drafting a Standard

Compliance

Introduction  
Requirements &  
Measures

Background

- Standard – Background Information
  - Standard Roadmap
  - Definitions
- Standard – Introduction, Requirements & Measures (SDT)
  - Introduction
  - Requirements (Violation Risk Factor) (Time Horizon)
  - Measures
- Standard – Compliance Elements (CEDT)
  - Monitoring Responsibility
  - Monitoring Period & Reset Timeframe
  - Data Retention
  - Other Compliance Info
  - Violation Severity Levels

# Standard – Background Info

Road-map

## Standard Roadmap

- Removed when standard is adopted by BOT
- 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 posted
- Schedule provided to SC in monthly progress reports

# Standard – Background Info

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## Definitions

- Most new or revised standards do not include any new definitions
- Limit terms to those with **unique** definitions
  - If a term is in a collegiate dictionary, it doesn't need to be defined
- Don't include explanatory information in a definition
- Need stakeholder support for any new definition
- Capitalize defined terms when used in the standard

# Drafting a Standard – Introduction

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- **Title** – Frequency Response
- **Purpose** – from SAR (condense into a sentence or two) To collect data needed to accurately model existing Frequency Response.
- **Applicability** – identifies the ‘functional entities’ that must comply with requirements & any exemptions or limitations on physical applicability Reliability Authority, Balancing Authority, Generator Owner, Generator Operator, and Load Serving Entity
- **Proposed Effective Date** – can put ‘to be determined’ until final posting

# Applicability

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- DT must decide – do requirements apply to:
  - All Balancing Authorities?
  - All Generator Owners?
- Look at Compliance Registration Criteria
- If any variations from default applicability, must provide a reliability-related reason

# Proposed Effective Date

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- Can use 'to be determined' until last posting for comment – must match implementation plan
- Needs to identify the # of months needed to become compliant after applicable governmental approvals
- Needs to be the first day of the first month of a calendar quarter
- Needs to identify that some entities don't need to wait for regulatory approvals – their default is so many months after BOT adoption

First day of first quarter, six months after applicable governmental approvals or in those jurisdictions where regulatory approval is not required the Reliability Standard becomes effective on the first quarter six months after BOT adoption.

# Drafting a Standard – Requirements, VRFs, Time Horizons, Measures

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- Requirements identify mandatory performance or outcomes
- Each Requirement must have an associated Violation Risk Factor (VRF) and a Measure
- VRFs identify the reliability-related risk when a requirement is violated
- Time Horizons identify the time frame in which a violation could be mitigated

# What's in a Requirement?

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Tells - **Who** shall do **what** under what **conditions** for what **outcome**

- **R1.** When directed by its Reliability Coordinator to do so, each Balancing Authority shall provide its Reliability Coordinator with the following data needed to model the Balancing Authority's sub-minute Frequency Response to the frequency deviation:



# Requirements

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- Written in 'active voice' ('shall be' is passive)
- Identify the responsible entity or entities
- Include a 'shall' statement
- Identify the 'conditions' under which the performance is required
- Identify the required performance or outcome
- Avoid:
  - 'Negatives'
  - Ambiguous or subjective terms
  - 'How'
- Must be measurable

# Violation Risk Factors (VRFs)

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- Each Requirement must have an associated VRF
  - Sub-requirements **do not need individual VRFs** – if a sub-requirement has its own measure, then the sub-requirement must have its own VRF
- VRFs identify the reliability-related impact to the BES of violating a requirement
- VRFs are used to determine sanctions

## VRFs for Planning

Can a violation (**under the conditions anticipated by the preparations**) directly cause, contribute to, or place the BES at unacceptable risk of instability, separation, or cascading failures or hinder restoration?

If answer is . . .	Then VRF is . . .
Never	Lower
Possible but not likely	Medium
Yes	High

## VRFs for Operations

Can a violation directly cause, contribute to, or place the BES at unacceptable risk of instability, separation, or cascading failures?

If answer is . . .	Then VRF is . . .
Never	Lower
Possible but not likely	Medium
Yes	High

# What's the VRF?

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**R1.** When directed by its Reliability Coordinator to do so, each Balancing Authority shall provide its Reliability Coordinator with the following data needed to model the Balancing Authority's sub-minute Frequency Response to the frequency deviation: (Violation Risk Factor: ???)

Can violation **directly** cause, contribute to, or place the BES at unacceptable risk of instability, separation, or a cascading failures?

- Yes – High
- Possible but not likely – Medium
- Never - Lower

# Time Horizons

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- Identify how much time you'd have to mitigate a violation
- Used for determining sanctions
  - Bigger sanctions for real-time than for longer time horizons
- Each Requirement must have at least one Time Horizon
  - Some Requirements have multiple Time Horizons
  - If you assign VRFs to sub-requirements, the sub-requirement must have a Time Horizon

# Time Horizons

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- **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.

# What's the Time Horizon?

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R1. When directed by its Reliability Coordinator to do so, each Balancing Authority shall provide its Reliability Coordinator with the following data needed to model the Balancing Authority's sub-minute Frequency Response to the frequency deviation:  
*(Time Horizon: ???)*

**Long-term Planning** — 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



# Measures

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- Each Requirement must have at least one measure to identify what the Compliance Enforcement Authority will use to assess compliance
- If you assign VRFs to sub-requirements, then each sub-requirement must have an associated measure
- One measure can be used for multiple requirements or sub-requirements
- Avoid requiring specific types of evidence unless that is the **only** way to demonstrate compliance

# Sample Measure

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R1. When directed by its Reliability Coordinator to do so, each Balancing Authority shall provide its Reliability Coordinator with the following data needed to model the Balancing Authority's sub-minute Frequency Response to the frequency deviation:

M1. The Balancing Authority shall have evidence of data submission in accordance with R1.

# Avoid Use of Ambiguous Words

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

# Compliance Elements

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- Compliance Enforcement Authority
- Compliance Monitoring Period & Reset Period
- Data Retention
- Other - Identify how to demonstrate compliance
- Violation Severity Levels

## Standard – Compliance Elements

- **Compliance Enforcement Authority (CEA)** – what entity will be monitor – either Regional Entity or ERO
  - For most functional entities, the Regional Entity is the CEA
  - If requirements are assigned to the Regional Entity, then the ERO is the Compliance Monitor
  - If a RC is associated with a RE, then the RE cannot be the CEA
- **Monitoring Period and Reset Time Period**
  - The time period in which a specific performance or outcome is measured, evaluated, and then reset
  - The reset period cannot be longer than a month and may be as short as a day

## Standard – Compliance Elements

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- **Data Retention** – Identify what data must be kept and by what functional entities
  - For Responsible Entity – identify what must be kept and for how long with a reference to the associated measure (The RC shall keep evidence to show compliance with Measure 1 for 3 years)
  - For CEA - require that the retention of the last audit records and all requested and submitted subsequent audit records.

# Standard – Compliance Elements

## Other Compliance Information –

- Identify monitoring processes:
  - Compliance Audits
  - Self-Certifications
  - Spot Checking
  - Compliance Violation Investigations
  - Self-Reporting
  - Periodic Data Submittals
  - Exception Reporting
  - Complaints
- List any special information that the CEA needs such as:
  - If performance is averaged over time, identify the minimum period in which a violation could occur
  - Identify whether there can be more than one violation monitoring per period

# Standard – Compliance Elements

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- **Violation Severity Levels (VSLs)**
  - Tell how badly the entity 'missed' being fully compliant with a requirement or sub-requirement
- VSLs do not identify importance of a violation
- VSLs do not identify reliability-related impact of a violation
- Each requirement needs at least one violation severity level
  - If sub-requirements have individual VRFs, then there must be VSLs for the sub-requirements

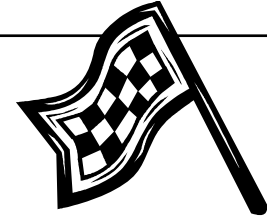


# Standard – Compliance Elements

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- **Lower:** mostly compliant with minor exceptions; closest to full compliance
- **Moderate:** mostly compliant with significant exceptions
- **High:** marginal performance or results
- **Severe:** poor performance or results; unacceptable performance

# Ready to Post?



- **General**

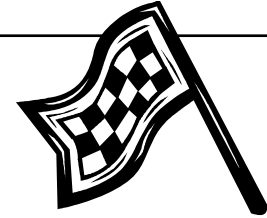
- Within scope of SAR?
- Defined terms capitalized?
- Ambiguous words removed?
- Correct format?

- **Applicability**

- All functional entities responsible for complying with requirements are listed
- If some entities or facilities are exempt, the exemption criteria is listed with a reliability-related reason

# Ready to Post?

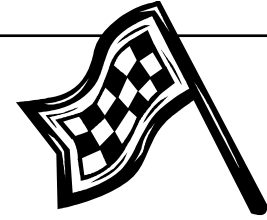
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- **Requirements**

- Each requirement written objectively and states what functional entity is responsible for doing what under what conditions and for what outcome
- Each requirement includes a 'shall' statement
- There is a VRF for each requirement
- There is a Time Horizon for each requirement

# Ready to Post?



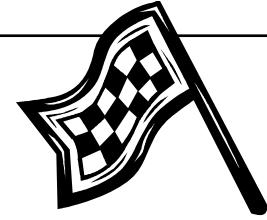
- **Measures**

- At least one measure for each requirement
- Each measure written objectively
- If sub-requirements have VRFs, then each sub-requirement must be in a measure

- **Compliance Monitoring**

- All sections completed
- Compliance monitoring seems reasonable for reliability impact of non-compliance
- Data retention meets needs of CEA without being overly burdensome to responsible entities

# Ready to Post?



- **Violation Severity Levels**

- There is a VSL for each requirement
- Where entities may not meet fully compliant with a requirement and partial compliance can be identified, there are multiple VSLs for that requirement
- If sub-requirements have VRFs, then each sub-requirement has an associated VSL

# Ready to Post?

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- Does standard meet FERC criteria for approval?
- Does standard meet NERC's benchmarks for reliability standards?

# Comment Forms

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- Ask very pointed questions
- Ask only questions that will result in responses that you will use
- If you've made changes, ask for feedback
- If you've defined terms, ask for feedback on the terms
- Ask for feedback on implementation plan
- Ask if field testing is needed

# Responding to Comments

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- Read through comments to get a 'sense' of stakeholders' reactions
- Consider & respond to every comment
  - Responses must be respectful
  - Responses should provide a justification
- Develop a 'summary response' to each question
- 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



# Incorporating Suggested Changes

If the suggestion is submitted by	And the suggestion . . .	Then . . .	Ask stakeholders to . . .
Multiple entities in multiple regions	Does /may have technical merit	Incorporate suggestion	Confirm change
	Does <b>not</b> have obvious technical merits	<b>Tell why</b> suggestion lacks technical merit	
Single entity or by multiple entities in a single region	Does /may have technical merit	If widespread support anticipated, incorporate suggestion	Confirm change
		If widespread support not anticipated, don't incorporate	Indicate preference for suggestion
	Does <b>not</b> have obvious technical merits	<b>Tell why</b> suggestion lacks technical merit	

# Weighing Comments

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# signatures	# companies	# segments	# comments
1	1	1	1
5	1	1	1
8	1	3	3
12	12	1	12
12	3	3	??

# Implementation Plan

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- Tells stakeholders how/when standard will be implemented and identifies:
  - Any prerequisites for implementation – such as another standard that needs to be implemented first
  - Any already approved standards that should be modified as a result of the proposed standards
  - Functions that must comply
  - When entities must be compliant (matches proposed effective date in standard)
  - Reasons for any recommended delay in implementation such as time to develop procedures, time to provide training, or to modify software

# Field Testing

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- Ask stakeholders for their views
- Document drafting team's views
- Ask VP, Director of Compliance to send SC a recommendation on field testing compliance elements of standard
  
- SC makes final determination – may ask a tech committee to oversee field test

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**Questions?**



## **FERC's Criteria for Approving Reliability Standards**

As drafting teams begin their work, they should consider the following criteria used by FERC when determining whether to approve a reliability standard:

1. Must be designed to achieve a specified reliability goal
2. Must contain a technically sound method to achieve the goal
3. Must be applicable to owners, users, or operators of the bulk-power system, and not others
4. Must be clear and unambiguous as to what is required and who is required to comply
5. Must include clear and understandable consequences and a range of penalties (monetary and/or non-monetary) for a violation
6. Must identify clear and objective criterion or measure for compliance, so that it can be enforced in a consistent and non-preferential manner
7. Should achieve a reliability goal effectively and efficiently - but does not necessarily have to reflect "best practices" without regard to implementation cost
8. Cannot be "lowest common denominator," i.e., cannot reflect a compromise that does not adequately protect bulk-power system reliability
9. Costs to be considered for smaller entities but not at consequence of less than excellence in operating system reliability
10. Must be designed to apply throughout North American to the maximum extent achievable with a single Reliability Standard while not favoring one area or approach
11. No undue negative effect on competition or restriction of the grid
12. Implementation time (balance of any urgency in the need to implement it against the reasonableness of the time allowed for those who must comply to develop the necessary procedures, software, facilities, staffing or other relevant capability)
13. Whether the reliability standard process was open and fair
14. Balance with other vital public interests
15. Reliability Standard not conflict with prior Commission Orders, tariffs, etc

## The Ten Benchmarks of an Excellent Reliability Standard

1. **Applicability** — Each reliability standard shall clearly identify the functional classes of entities responsible for complying with the reliability standard, with any specific additions or exceptions noted. Such functional classes include: reliability coordinators, balancing authorities, transmission operators, transmission owners, generator operators, generator owners, interchange authorities, transmission service providers, market operators, planning coordinators, transmission planners, resource planners, load-serving entities, purchasing-selling entities, and distribution providers. Each reliability standard shall also identify the geographic applicability of the standard, such as the entire North American bulk power system, an interconnection, or within a regional entity area. As applicable, a standard may also identify any limitations on the applicability of the standard based on electric facility characteristics, such as generators with a nameplate rating of 20 megawatts or greater, or transmission facilities energized at 200 kilovolts or greater.
2. **Purpose** — Each reliability standard shall have a clear statement of the purpose of the standard. The purpose shall describe how the standard contributes to the reliability of the bulk power system.
3. **Performance Requirements** — Each reliability standard shall 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 practice and the public interest. Each requirement is not a “lowest common denominator” compromise, but instead achieves an objective that is the best approach for bulk power system reliability, taking account of the costs and benefits of implementing the proposal.
4. **Measurability** — Each performance requirement shall be stated so as to be objectively measurable by a third party with knowledge or expertise in the area. Each performance requirement shall have one or more associated measures used to objectively evaluate compliance with the requirement. If performance can be practically measured quantitatively, metrics shall be provided to determine satisfactory performance.
5. **Technical Basis in Engineering and Operations** — Each reliability standard shall be based upon sound engineering and operating judgment, analysis, or experience, as determined by expert practitioners in the particular field.
6. **Completeness** — Reliability standards shall be complete and self-contained. The standards shall not depend on external information to determine the required level of performance.
7. **Consequences for Noncompliance** — In combination with guidelines for penalties and sanctions, as well as other ERO and regional entity compliance documents, the consequences of violating a standard are clearly known to the responsible entities.
8. **Clear Language** — Each reliability standard shall be stated using clear and unambiguous language. Responsible entities, using reasonable judgment and in keeping with good utility practice, are able to arrive at a consistent interpretation of the required performance.
9. **Practicality** — Each reliability standard shall establish requirements that can be practically implemented by the assigned responsible entities within the specified effective date and thereafter.

**Consistent Terminology** — To the extent possible, reliability standards shall use a set of standard terms and definitions that are approved through the NERC reliability standards development procedure.

## Standard Authorization Request Form

Title of Proposed Standard	Frequency Response
Request Date	11/25/06
Revised Date	06/30/07

SAR Requestor Information	SAR Type (Put an 'x' in front of one of these selections)	
Name Terry Bilke	<input checked="" type="checkbox"/>	New Standard
Primary Contact Terry Bilke	<input type="checkbox"/>	Revision to existing Standard
Telephone (317) 249-5463 Fax (317) 249-5994	<input type="checkbox"/>	Withdrawal of existing Standard
E-mail tbilke@midwestiso.org	<input type="checkbox"/>	Urgent Action

### Purpose/Industry Need

Frequency Response, a measure of an Interconnection's ability to stabilize frequency immediately following the sudden loss of generation or load, is a critical component to the reliable operation of the bulk power system, particularly during disturbances and restoration. The proposed standard's intent is to collect data needed to accurately model existing Frequency Response. There is evidence of continuing decline in Frequency Response in the three Interconnections over the past 10 years, but no confirmed reason for the apparent decline. The proposed standard requires entities to provide data so that Frequency Response in each of the Interconnections can be modeled, and the reasons for the decline in Frequency Response can be identified. Once the reasons for the decline in Frequency Response are confirmed, requirements can be written to control Frequency Response to within defined reliability parameters.



## Reliability Functions

The Standard will Apply to the Following Functions (Check box for each one that applies by double clicking the grey boxes.)		
<input checked="" type="checkbox"/>	Reliability Authority	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 a Balancing Authority Area and supports interconnection frequency in real time
<input type="checkbox"/>	Interchange Authority	Ensures communication of interchange transactions for reliability evaluation purposes and coordinates implementation valid and balanced Interchange Schedules between Balancing Authority Areas.
<input type="checkbox"/>	Planning Coordinator	Assesses the longer-term reliability of its Planning Coordinator Area.
<input type="checkbox"/>	Resource Planner	Develops a >1 year plan for the resource adequacy of its specific loads within a Planning Authority area.
<input type="checkbox"/>	Transmission Planner	Develops a >1 year plan for the reliability of the interconnected Bulk Electric 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 type="checkbox"/>	Transmission Owner	Owns and maintains transmission facilities
<input type="checkbox"/>	Transmission Operator	Ensures the real-time operating reliability of the transmission assets within a Transmission Operator Area.
<input 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 service (and reliability-related services) to serve the End-use Customer.

## Reliability and Market Interface Principles

<b>Applicable Reliability Principles</b> (Check boxes for all that apply by double clicking the grey boxes.)	
<input checked="" type="checkbox"/>	1. 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"/>	2. 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"/>	3. 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 type="checkbox"/>	4. Plans for emergency operation and system restoration of interconnected bulk electric systems shall be developed, coordinated, maintained and implemented.
<input checked="" type="checkbox"/>	5. Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk electric systems.
<input checked="" type="checkbox"/>	6. Personnel responsible for planning and operating interconnected bulk electric systems shall be trained, qualified and have the responsibility and authority to implement actions.
<input checked="" type="checkbox"/>	7. The security of the interconnected bulk electric systems shall be assessed, monitored and maintained on a wide area basis.
<input type="checkbox"/>	8. Bulk power systems shall be protected from malicious physical or cyber attacks.
<b>Does the proposed Standard comply with all of the following Market Interface Principles?</b> (Select 'yes' or 'no' from the drop-down box by double clicking the grey area.)	
1. The planning and operation of bulk electric systems shall recognize that reliability is an essential requirement of a robust North American economy. Yes	
2. An Organization Standard shall not give any market participant an unfair competitive advantage. Yes	
3. An Organization Standard shall neither mandate nor prohibit any specific market structure. Yes	
4. An Organization Standard shall not preclude market solutions to achieving compliance with that Standard. Yes	
5. 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	

**Detailed Description (Provide enough detail so that an independent entity familiar with the industry could draft, modify, or withdraw a Standard based on this description.)**

The proposed technical/preparedness standard will require or provide the following:

1. Each Balancing Authority shall collect and provide data [scan rate tie deviation and frequency for up to 5\* minutes per event] needed to model its sub-minute Frequency Response to loss of large generating units and load.
2. Each Balancing Authority shall report each loss of generation or load greater than the respective Interconnection reporting threshold to its Reliability Coordinator.
3. Each Reliability Coordinator will relay Frequency Response Standard (FRS) event information to other Reliability Coordinators in its Interconnection. The Interconnection Time Monitor will maintain a log of FRS events.
4. NERC will annually post a list of FRS events. These events will be used by Balancing Authorities to calculate and report their annual Frequency Response and Bias.
5. NERC, in conjunction with the respective Regions, will establish a Target Frequency Response for each Interconnection. Absent an agreement, the observed Frequency Response in the first year of the FRS will be used as a target.
6. Balancing Authorities with less than [75%]\* of their share of Target Frequency Response shall provide generation-level data to their Region for use by Transmission Planners and Planning Coordinators.
  - a. Each Generator Operator that operates a generator larger than [10 MW]\*, shall provide data to its Balancing Authority, as required in item 6, to support this standard and for use in developing models of Frequency Response in the associated Interconnection.
  - b. Load Serving Entities shall provide data, as required in item 6, to their BA and Region to support the standard.

\*These values are representative and will be refined based on stakeholder input during the standard drafting phase.

***Related Standards***

<b>Standard No.</b>	<b>Explanation</b>
BAL-001-0 through BAL-006-0	Balancing Standards, version 0
Balance Resources and Demand draft standards	Balancing Resources and Demand BAL-007 through BAL-012 draft standards, are in standards development process

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**Related SARs**

<b>SAR ID</b>	<b>Explanation</b>
Frequency Response SAR, version 0	Original Frequency Response SAR
MOD-027	Verification and Status of Generator Frequency Response. The proposed standard would provide a mechanism to validate compliance with MOD-027. The proposed standard could also provide a means to achieve MOD-027 (if the Balancing Authority implements on-line measurement of generator frequency using SCADA data).

**Regional Variances**

<b>Region</b>	<b>Explanation</b>
ECAR	
ERCOT	Single Balancing Authority Interconnections calculate Frequency Response based on the change in generation (or load) rather than Tie-Line deviation (ERCOT).
FRCC	
MAAC	
MAIN	
MAPP	
NPCC	
SERC	
SPP	
WECC	

**Related NERC Operating Policies or Planning Standards**

<b>ID</b>	<b>Explanation</b>
MOD-013-0	The proposed standard would enable better input data to the modeling standards.


## Comment Form — Frequency Response Standard

Please use this form to submit comments on the proposed Frequency Response Standard. Comments must be submitted by **[Due Date in bold]**. You may submit the completed form by e-mail to [sarcomm@nerc.net](mailto:sarcomm@nerc.net) with the words "Frequency Response Standard" in the subject line. If you have questions please contact Linda Clarke at [linclrke@msn.com](mailto:linclrke@msn.com) or by telephone at 610.310.7210.

<b>Individual Commenter Information</b>		
(Complete this page for comments from one organization or individual.)		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region	<input type="checkbox"/>	Registered Ballot Body Segment
<input type="checkbox"/> ERCOT	<input type="checkbox"/>	1 — Transmission Owners
<input type="checkbox"/> FRCC	<input type="checkbox"/>	2 — RTOs and ISOs
<input type="checkbox"/> MRO	<input type="checkbox"/>	3 — Load-serving Entities
<input type="checkbox"/> NPCC	<input type="checkbox"/>	4 — Transmission-dependent Utilities
<input type="checkbox"/> RFC	<input type="checkbox"/>	5 — Electric Generators
<input type="checkbox"/> SERC	<input type="checkbox"/>	6 — Electricity Brokers, Aggregators, and Marketers
<input type="checkbox"/> SPP	<input type="checkbox"/>	7 — Large Electricity End Users
<input type="checkbox"/> WECC	<input type="checkbox"/>	8 — Small Electricity End Users
<input type="checkbox"/> NA – Not Applicable	<input type="checkbox"/>	9 — Federal, State, Provincial Regulatory or other Government Entities
	<input type="checkbox"/>	10 — Regional Reliability Organizations and Regional Entities



### Background Information:

Frequency Response, a measure of an Interconnection's ability to stabilize frequency immediately following the sudden loss of generation or load, is a critical component to the reliable operation of the bulk power system, particularly during disturbances and restoration. The proposed standard's intent is to collect data needed to accurately model existing Frequency Response. There is evidence of continuing decline in Frequency Response in the three Interconnections over the past 10 years, but no confirmed reason for the apparent decline. The proposed standard requires entities to provide data so that Frequency Response in each of the Interconnections can be modeled, and the reasons for the decline in Frequency Response can be identified. Once the reasons for the decline in Frequency Response are confirmed, requirements can be written to control Frequency Response to within defined reliability parameters.

The Frequency Response Standard Drafting Team would like to receive industry comments on Standard. Accordingly, we request that you include your comments on this form and e-mail to [sarcomm@nerc.net](mailto:sarcomm@nerc.net) with the subject "Frequency Response Standard" by **[Due Date in bold]**.



**You do not have to answer all questions. Enter All Comments in Simple Text Format.**

*Insert a "check" mark in the appropriate boxes by double-clicking the gray areas.*

**1. Question 1? If not, please explain in the comment area.**

Yes

No

Comments:

**2. Question 2? If not, please explain in the comment area.**

Yes

No

Comments:

**3. Question 3? If not, please explain in the comment area.**

Yes

No

Comments:

**4. Question 4? If not, please explain in the comment area.**

Yes

No

Comments:

**5. Question 5? If not, please explain in the comment area.**

Yes

No

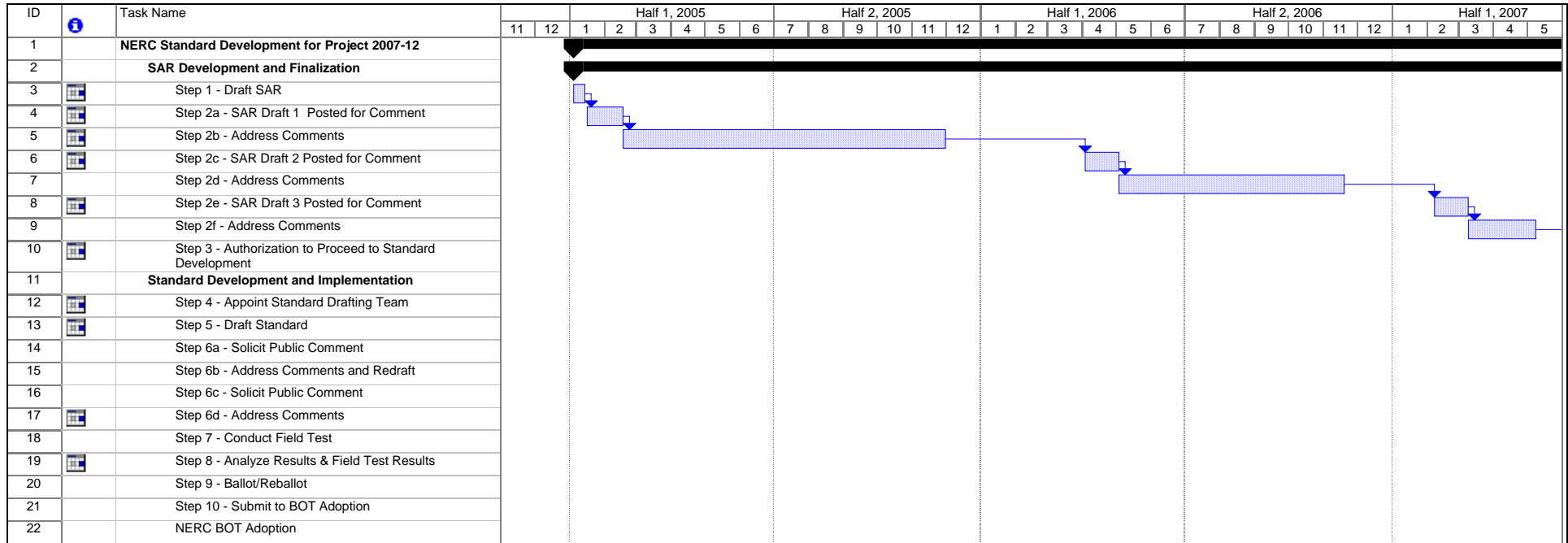
Comments:

**6. Question 6? If not, please explain in the comment area.**

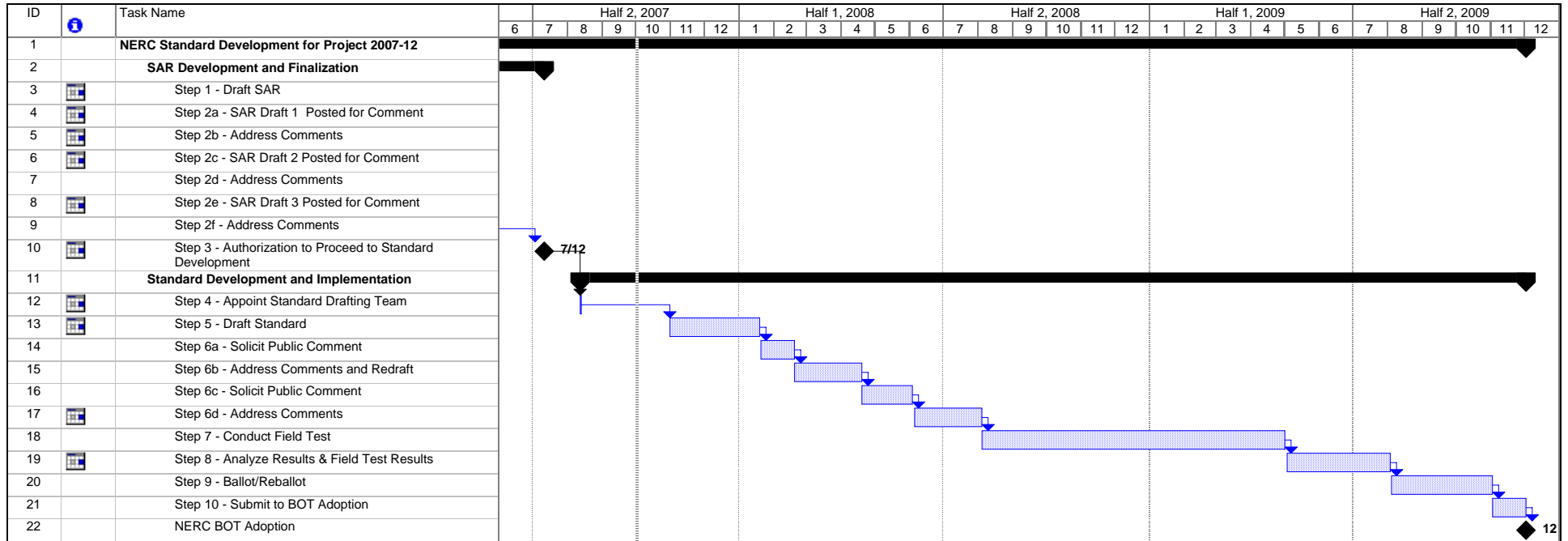
Yes

No

Comments:



Project: Project 2007-12 Frequency Response Date: Tue 10/2/07	Task		Summary		Rolled Up Progress		Project Summary	
	Progress		Rolled Up Task		Split		Group By Summary	
	Milestone		Rolled Up Milestone		External Tasks			



Project: Project 2007-12 Frequency Response Date: Tue 10/2/07	Task		Summary		Rolled Up Progress		Project Summary	
	Progress		Rolled Up Task		Split		Group By Summary	
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