

Standard Authorization Request Form

Title of Proposed Standard:	Disturbance Monitoring (Project 2007-11)
Request Date:	March 1, 2007
Revised Date:	May 21, 2007

SAR Requester Information

Name: Robert W. Millard on behalf of the Regional Reliability Standards Working Group	SAR Type (Check one box.)	
Company: ReliabilityFirst Corporation	<input type="checkbox"/>	New Standard
Telephone: (708) 588-9886	<input checked="" type="checkbox"/>	Revision to Existing Standard
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E-mail: bob.millard@rfirst.org	<input type="checkbox"/>	Urgent Action

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

~~To establish requirements for installation of Disturbance Monitoring Equipment (DME) and reporting of disturbance data to facilitate analyses of events and verify system models.~~

~~PRC 002 — Define and Document Disturbance Monitoring Equipment Requirements~~

~~PRC 018 — Disturbance Monitoring Equipment Installation and Data~~

~~PRC 002 was a Version 0 standard that was modified solely to add Phase III & IV Planning Measures; PRC 018 is a new standard developed as a translation of Phase III & IV Planning Measures. 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 and Mexico, the industry needs a set of clear, measurable, and enforceable Reliability Standards. The Version 0 standards and the translation of Phase III & IV Planning Measures, 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, Phase III & IV standards, and recent updates were put in place as a temporary starting point to start 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 and Phase III & IV translations.~~

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

PRC-002 is being revised to ensure the capturing of power system data following a system disturbance. (Note that the development of PRC-002-2 under Project 2007-11 was made informal in 2011.) The emphasis will not be on what equipment may be used to capture this data, but on ensuring that the requisite data is captured. PRC-002-2 will also include the pertinent requirements of PRC-018-1 that will allow that Standard to be retired. This will improve system reliability by providing personnel with described data to enable more effective post events analyses. This information will also be used to verify system models.

- ~~1. Provide an adequate level of reliability for the North American bulk power systems ensure 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 ensure~~
 - ~~(a) the applicability to bulk power system owners, operators, and users, and as appropriate particular classes of facilities, is clearly defined,~~
 - ~~(b) the purpose, requirements, and measures are results-focused and unambiguous and~~
 - ~~(c) the consequences of violating the requirements are clear.~~
- ~~3. Consider comments received during the initial development of this set of standards and other comments received from ERO regulatory authorities and stakeholders as described in the Detailed Description section below.~~
- ~~4. Bring the standards into conformance with the latest version of the Reliability Standards Development Procedure and the ERO Rules of Procedure as described in Attachment 1 below.~~
- ~~5. Satisfy the standards procedure requirement for five year review of the standards.~~

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

By this Standard the Drafting Team will establish the requirements for capturing power system disturbance data to enable the effective analysis of power system disturbances.

~~PRC-002 and PRC-018 were approved in 2006.~~

~~PRC-002 is one of four 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 review PRC-002 and each of the current regional programs developed in accordance with that standard, including any other associated programs and/or requirements related to or contained with the disturbance monitoring program documentation. The SDT shall determine which requirements should be continent wide requirements and which requirements should be included in regional standards.~~

~~When revising PRC-002 and PRC-018 the SDT will, the SDT shall consider comments and issues as described in the Detailed Description section and Attachment 1 below for drafting and including other improvements to the standards deemed appropriate by the drafting team, with the consensus of stakeholders through the standards development procedure, consistent with establishing high quality, enforceable and technically sufficient bulk power system reliability standards.~~

~~Note: Phasor measurement networks are to be addressed by Project 2008-06.~~

Reliability Functions

The Standard will Apply to the Following Functions (Check all applicable boxes.)		
<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 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 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 its specific loads within a Planning Coordinator area.
<input type="checkbox"/>	Transmission Planner	Develops a >one 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 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 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.

Reliability and Market Interface Principles

Applicable Reliability Principles (Check all boxes that apply.)	
<input checked="" type="checkbox"/>	1. Interconnected bulk power 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 power 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 power 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 power 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 power systems.
<input type="checkbox"/>	6. Personnel responsible for planning and operating interconnected bulk power systems shall be trained, qualified, and have the responsibility and authority to implement actions.
<input checked="" type="checkbox"/>	7. The reliability of the interconnected bulk power 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.
Does the proposed Standard comply with all of the following Market Interface Principles? (Select 'yes' or 'no' from the drop-down box.)	
Recognizing that reliability is an essential requirement of a robust North American economy:	
1. A reliability standard shall not give any market participant an unfair competitive advantage. Yes	
2. A reliability standard shall neither mandate nor prohibit any specific market structure. Yes	
3. A reliability standard shall not preclude market solutions to achieving compliance with that standard. Yes	
4. A reliability standard shall not require the public disclosure of commercially sensitive information. All market participants shall have equal opportunity to access commercially non-sensitive information that is required for compliance with reliability standards. Yes	

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Detailed Description (Provide enough detail so that an independent entity familiar with the industry could draft a standard based on this description.)

Using the version of PRC-002-2 that had been developed when the Project was categorized as informal in 2011, the Drafting Team will make the revisions necessary to reflect the goal of collecting sufficient Bulk Electric System disturbance data. The revised version will be posted for industry comment, and the Standard revised and reposted as necessary. The Drafting Team will also review technical justifications for requirements in the Standard.

The Drafting Team will also be responsible for taking the steps necessary to expose industry to the content of the Standard. This will give industry the opportunity to make more informed comments, and improve the overall process.

In the Applicability Section, responsible entity was used to include the Planning Coordinator and Reliability Coordinator functional entities as described in the NERC Functional Model. The Drafting Team recognized that among the different regions there are different entities that address Dynamic Disturbance recording. The appropriate use of responsible entity will ensure that the responsibility for collecting needed disturbance data will be recognized. For requirements for which neither the Planning Coordinator or the Reliability Coordinator is the appropriate applicable entity, the specific functional entity will be named.

The Transmission Owners and Generator Owners will be responsible for the bulk of the Requirements in this Standard. The Planning Coordinators and Reliability Coordinators will be responsible for specifying locations requiring Dynamic Disturbance data.

The drafting team is creating the following new terms: Sequence of Events Recording, Fault Recording, and Dynamic Disturbance Recording.

~~The SDT shall consider the following comments (excerpted from NERC's Reliability Standards Development Plan: 2007-2009) 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, and~~

~~Regional Fill in the Blank Team (RRSWG—a NERC working group involved with regional standards development);~~

- ~~◆ Phase III & IV Standard Drafting Team~~
- ~~◆ Violation Risk Factors Drafting Team~~

~~PRC-002—Define and Document Disturbance Monitoring Equipment Requirements~~

~~FERC NOPR~~

~~◆ Commission will not propose to accept or remand this Reliability Standard until the ERO submits additional information related to the fill in the blank aspects of this standard as further defined below under “Regional Fill in the Blank Team Comments”.~~

~~FERC Staff Report~~

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~~• This standard designates RROs as the applicable entity. Staff is concerned about the appropriateness of RROs serving as the applicable entity in the new mandatory standards structure. These standards have been referred to as “fill in the blank” standards (see comments under “Regional Fill in the Blank Team Comments” below).~~

~~Phase III/IV comments~~

~~• There are no criteria that the RROs must use in specifying the process for identifying locations where DMEs are required (to be addressed when considering issues under “Regional Fill in the Blank Team Comments” below).~~

~~Violation Risk Factor Drafting Team Comments~~

~~• R1—This standard and all related sub-requirements are after the fact data analysis.~~

~~Regional Fill in the Blank Team Comments~~

~~• Determine what elements (if any) should be included in the North American standard and what elements should be included in the regional standards.~~

~~• Development of regional standards needs to be coordinated with regional entities.~~

~~• Regional entities should be notified to begin process for developing regional standards once the standard drafting team has determined what elements should be included in the continent wide standard and what elements should be included in the regional standards.~~

~~PRC 018—Disturbance Monitoring Equipment Installation and Data~~

~~Violation Risk Factor Drafting Team Comments~~

~~• R3.4, 3.5, 3.6, 3.7—Requirements as written are ambiguous and need more clearly defined.~~

~~1. The SDT will bring the standards into conformance with the latest version of the Reliability Standards Development Procedure and the ERO Rules of Procedure as described in Attachment 1 below.~~

~~2. The SDT should also consider any other issues that were not completely captured but were stated or referenced in the above materials.~~

~~3.1. The SDT should consider issues raised by the industry during the posting of the SAR for Project 2007-11 during the first comment period from March 22 through April 20, 2007, attached as Attachment 2.~~

Related Standards

Standard No.	Explanation

SAR for Project 2007-11 Disturbance Monitoring

Related SARs

SAR ID	Explanation

Regional Variances

Region	Explanation
ERCOT	
FRCC	
MRO	
NPCC	
RFC	
SERC	
SPP	
WECC	

Attachment 1

~~Excerpts from the Reliability Standards Development Procedure Manual, Version 6 and the ERO Rules of Procedure:~~

~~(The drafting team will reference and follow, as appropriate, the following guidelines (or later version as appropriate) in determining what changes to make to the standards to bring them into conformance with these guidelines.)~~

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

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.

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’ replace 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’.~~

~~**Functional Model Version 3**~~

~~Review the requirements against the latest descriptions of the responsibilities and tasks assigned to functional entities as provided in pages 13 through 53 of the draft Functional Model Version 3.~~

Attachment 2

Issues Raised by Industry During 1st Posting of SAR for Project 2007-11 Which are Outside the Responsibility of the SAR Drafting Team

Question 4 of the Comment Form: Please provide any other comments (that you have not already provided in response to the first three questions on this form) that you have on the revised SAR.

IRC Standards Review Committee commented:

The SDT should pose questions regarding:

(1a) whether or not NERC should require data recording performance requirements that can only be met by purchasing specific assets

(1b) If it is sufficient to mandate what information and performance is required rather than the hardware itself (it should accomplish the same results but would avoid the issue of asset purchasing)

(1c) Should assets per se be handled by the certification / recertification process—if the entity does not have the equipment, then it can not be certified; and if it doesn't continue to meet the requirements, it would not be able to meet compliance objectives

(2) If the PRC-002 requirements were not interconnection wide, then DT should ask whether or not the obligation for the DME characteristic plans be assigned to the PC or TOP rather than the Regional Entity? PCs and TOPs have a better understanding of their own locality than would a region that may be tempted to homogenize the characteristic requirements

(3) Should ad hoc hardware details (sampling rates, file naming; format) be left to NAESB rather than NERC? Reliability only needs the information—efficiency and commonality would seem to be more related to Business Practices.