Standard Development Roadmap

This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.

This proposed standard is the Version 0 PRC-002 modified to include a translation of planning measure I.F.M3, which was not included in the approval Version 0 reliability standards because it required further work.

Development Steps Completed:

1. A SAR was posted from December 2, 2004, through January 7, 2005.
2. The SAC appointed a standard drafting team on January 13, 2005.
3. The drafting team posted its response to SAR comments and all other historical comments on April 19, 2005.
4. The drafting team posted Draft 1 of the standard on April 21, 2005.
5. The drafting team posted Draft 2 of the standard on September 1, 2005.

Description of Current Draft:

This is the 3rd draft of the standard to be posted for industry comment from December 1, 2005–January 17, 2006.

Future Development Plan:

Anticipated Actions	Anticipated Date
1. Review comments from industry posting; post consideration of comments.	January 17–30, 2006
2. Post standards and implementation plan for 30-day pre-ballot review.	February 1–March 2, 2006
3. Conduct 1st ballot.	March 2–12, 2006
4. Consider comments submitted with 1st ballot; post consideration of comments	March 13–18, 2006
5. Conduct 2nd ballot.	March 18–March 28, 2006
6. Post standards and implementation plan for 30-day review by Board.	March 1–30, 2006
7. Board adoption date.	April 6, 2006
8. Effective date.	January 1, 2007

Definitions of Terms Used in Standard

This section includes all newly defined or revised terms used in the proposed standard. Terms already defined in the Reliability Standards Glossary of Terms are not repeated here. New or revised definitions listed below become approved when the proposed standard is approved. When the standard becomes effective, these defined terms will be removed from the individual standard and added to the Glossary.

Disturbance Monitoring Equipment (DME): Devices capable of recording system data pertaining to a Disturbance. Such equipment includes the following categories of recorders:

- Sequence of event recorders, which record equipment response to the event
- Fault recorders, which record actual waveform data replicating the system primary voltages and currents. This may include protective relays.
- Dynamic Disturbance Recorders (DDRs), which record incidents that portray power system behavior during dynamic events such as low-frequency (0.1 Hz – 3 Hz) oscillations and abnormal frequency or voltage excursions

A. Introduction

1. Title: **Define Regional Disturbance Monitoring and Reporting Requirements**

2. Number: PRC-002-1

3. Purpose: Ensure that Regional Reliability Organizations establish requirements for installation of Disturbance Monitoring Equipment and reporting of Disturbance data to facilitate analyses of events.

4. Applicability

4.1. Regional Reliability Organization.

5. Proposed Effective Date: January 1, 2007.

B. Requirements

R1. The Regional Reliability Organization shall establish the following installation requirements for sequence of event recording equipment:

R1.1. Location and monitoring requirements, including the following:

R1.1.1. Criteria for equipment location (e.g. by voltage, geographic area, station size, etc.).

R1.1.2. Protection System devices to be monitored.

R1.2. Equipment requirements, including the following:

R1.2.1. Each device shall record events with a resolution of one millisecond or better.

R1.2.2. Each device shall be synchronized to within four milliseconds of Coordinated Universal Time (UTC). The recorded time may be expressed as local time, as long as the local time zone used is clearly stated.

R2. The Regional Reliability Organization shall establish the following installation requirements for Fault Recording Equipment:

R2.1. Location, monitoring and recording requirements, including the following:

R2.1.1. Criteria for equipment location (e.g. by voltage, geographic area, station size, etc.).

R2.1.2. Elements to be monitored at each location

R2.1.3. Electrical quantities to be recorded for each monitored element shall be sufficient to determine the following:

R2.1.3.1. Three phase to neutral voltages

R2.1.3.2. Three phase currents and neutral currents

R2.1.3.3. Polarizing currents and voltages, if used

R2.1.3.4. Frequency

R2.1.3.5. Megawatts and megavars

R2.2. Equipment requirements, including the following:

R2.2.1. Recording duration requirements.

R2.2.2. Minimum sampling rate of 16 samples per cycle.

R2.2.3. Each device shall be synchronized to within four milliseconds of Coordinated Universal Time (UTC). The recorded time may be expressed as local time, as long as the local time zone used is clearly stated.

R2.2.4. Event triggering requirements.

R2.2.5. Data retention capabilities (e.g., length of time data is to be available for retrieval).

R3. The Regional Reliability Organization shall establish the following installation requirements for Dynamic Disturbance Recording (DDR) Equipment[1]:

R3.1. Location and monitoring requirements including the following:

R3.1.1. Criteria for equipment location giving consideration to the following:

- Site(s) in or near major load centers
- Site(s) in or near major generation clusters
- Site(s) in or near major voltage sensitive areas
- Site(s) on both sides of major transmission interfaces
- A major transmission junction
- Elements associated with Interconnection Reliability Operating Limits
- Major EHV interconnections between control areas
- Coordination with neighboring Regions within the interconnection

R3.1.2. Elements and number of phrases to be monitored at each location.

R3.1.3. Electrical quantities to be recorded for each monitored element shall be sufficient to determine the following:

R3.1.3.1. Voltage, current and frequency

R3.1.3.2. Megawatts and megavars

R3.2. Equipment requirements, including the following:

R3.2.1. For installations effective three years after Board of Trustee adoption, capability for continuous recording.

R3.2.2. Each device shall be time synchronized to UTC within four milliseconds. The recorded time may be expressed as local time, as long as the local time zone used is clearly stated.

R3.2.3. Each device shall sample data at a rate of at least 1600 samples per second and shall record the RMS value of electrical quantities at a rate of at least 6 records per second.

R4. The Regional Reliability Organization shall establish the following requirements for the storage and retention of the Disturbance data for specific system Disturbance events.

[1] [1] These requirements do not address Phasor Measurement Units (PMUs).

R4.1. All continuously recording DDRs installed after January 1, 2008 shall retain data for at least ten days.

R4.2. All captured DME data for Regional Reliability Organization-identified events shall be archived for at least three years.

R5. The Regional Reliability Organization shall establish requirements for facility owners to report Disturbance data recorded by their DME installations. The data reporting requirements shall include the following:

R5.1. Criteria for events that require the collection of data from DMEs.

R5.2. List of entities that must be provided with recorded Disturbance data.

R5.3. Timetable for response to data request.

R5.4. Availability of recorded Disturbance data in COMTRADE format (in conformance with IEEE Std. C37.111-1999 or its successor standard).

R5.5. Naming of data files in conformance with the IEEE Recommended Practice for Naming Time Sequence Data Files (C37.232)[2].

R5.6. Data content requirements and guidelines.

R6. The Regional Reliability Organization shall establish requirements for DME maintenance and testing.

R7. The Regional Reliability Organization shall provide its requirements (and any revisions to those requirements) including those for DME installation; Disturbance data reporting; Disturbance data storage and retention; and DME maintenance and testing to the affected Transmission Owners and Generator Owners within 30 calendar days of approval of those requirements.

R8. The Regional Reliability Organization shall periodically (at least every five years) review, update and approve its Regional requirements for Disturbance monitoring and reporting.

C. Measures

M1. The Regional Reliability Organization's requirements for the installation of Disturbance Monitoring Equipment shall address Requirements 1 through 3.

M2. The Regional Reliability Organization's requirements for storage and retention of Disturbance data shall include all elements identified in Requirement 4.

M3. The Regional Reliability Organization's Disturbance monitoring data reporting requirements shall include all elements identified in Requirement 5.

M4. The Regional Reliability Organization shall have requirements for the maintenance and testing of DME equipment as required in Requirement 6.

M5. The Regional Reliability Organization shall have evidence it provided its Regional Disturbance monitoring and reporting requirements as required in Requirement 7.

M6. The Regional Reliability Organization shall have evidence it conducted a review at least once every five years of its regional requirements for Disturbance monitoring and reporting.

D. Compliance

[2] Compliance with this requirement is not effective until the IEEE Standard is approved.

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

NERC.

1.2. Compliance Monitoring Period and Reset Timeframe

One calendar year.

1.3. Data Retention

The Regional Reliability Organization shall retain documentation of its DME requirements and any changes to it for three years.

The Compliance Monitor will retain its audit data for three years.

1.4. Additional Compliance Information

The Regional Reliability Organization shall demonstrate compliance through providing its documentation of Disturbance Monitoring and Reporting requirements or self-certification as determined by the Compliance Monitor.

2. Levels of Non-Compliance

2.1. Level 1: There shall be a level one non-compliance if either of the following conditions exist:

2.1.1 Disturbance reporting requirements were not specified as required in R5.1 through R5.5.

2.1.2 DME maintenance and testing requirements were not specified.

2.2. Level 2: There shall be a level two non-compliance if any of the following conditions exist:

2.2.1 Equipment characteristics were not specified for one or more types of DMEs

2.2.2 Time synchronization requirements were not specified for one or more of the DMEs as required in R1.2.2, R2.2.3, and R3.2.2.

2.2.3 Requirements do not provide criteria for equipment location or criteria for monitored elements or monitored quantities as required R1.1, R2.1 and R3.1.

2.3. Level 3: Disturbance data storage and retention requirements were not specified for one or more of the DMEs as required in R4.

2.4. Level 4: Disturbance monitoring and reporting requirements were not available or were not provided to Transmission Owners and Generator Owners.

E. Regional Differences

None identified.

Version History

Version	Date	Action	Change Tracking
