

## A. Introduction

1. **Title:** Monitoring System Conditions
2. **Number:** TOP-006-3
3. **Purpose:** To ensure critical reliability parameters are monitored in real-time.
4. **Applicability:**
  - 4.1. **Functional Entities**
    - 4.1.1 Transmission Operators
    - 4.1.2 Balancing Authorities
    - 4.1.3 Generator Operators
    - 4.1.4 Reliability Coordinators
5. **(Proposed) Effective Date:** All requirements become effective the first day of the first calendar quarter following applicable regulatory approval. In those jurisdictions where no regulatory approval is required, the requirements become effective the first day of the first calendar quarter following Board of Trustees adoption, or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

## B. Requirements

- R1. Each Transmission Operator and Balancing Authority shall know the status of all generation and transmission resources available for use. [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time Operations*]
  - R1.1. Each Generator Operator shall inform its Host Balancing Authority and the Transmission Operator of all generation resources available for use. [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time Operations*]
  - R1.2. Each Transmission Operator shall inform the Reliability Coordinator and other affected Transmission Operators of all transmission resources available for use. [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time Operations*]

Transmission Operators deal with transmission information while Balancing Authorities deal with generation information as detailed in Functional Model v5.
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- R1.3. Each Balancing Authority shall inform its Reliability Coordinator of all generation resources available for use. [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time Operations*]
- R2. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall monitor applicable transmission line status, real and reactive power flows, voltage, load-tap-changer settings, and status of rotating and static reactive resources. [*Violation Risk Factor: High*] [*Time Horizon: Real-time Operations*]
- R3. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall provide its operating personnel with appropriate technical information concerning protective relays within the Reliability Coordinator Area, the Transmission Operator

Area, and the Balancing Authority Area, respectively. [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time Operations*]

Entities can only provide information related to items for which they have responsibility.
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- R4.** Each Transmission Operator, and Balancing Authority shall have information, including weather forecasts and past load patterns, available to predict the system's near-term load pattern. [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time Operations*]
- R5.** Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall use monitoring equipment to bring to the attention of operating personnel important deviations in operating conditions and to indicate, if appropriate, the need for corrective action. [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time Operations*]
- R6.** Each Balancing Authority and Transmission Operator shall use sufficient metering of suitable range, accuracy and sampling rate (if applicable) to ensure accurate and timely monitoring of operating conditions under both normal and emergency situations. [*Violation Risk Factor: High*] [*Time Horizon: Real-time Operations*]
- R7.** Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall monitor system frequency. [*Violation Risk Factor: High*] [*Time Horizon: Real-time Operations*]

### **C. Measures**

- M1.** The Generator Operator shall have and provide upon request evidence that could include but is not limited to, operator logs, voice recordings, electronic communications, or other equivalent evidence that will be used to confirm that it informed its Host Balancing Authority and Transmission Operator of all generation resources available for use. (Requirement R1.1)
- M2.** Each Transmission Operator shall have and provide upon request evidence that could include but is not limited to, operator logs, voice recordings, electronic communications, or other equivalent evidence that will be used to confirm that it informed its Reliability Coordinator and other affected Transmission Operators of all transmission resources available for use. (Requirement R1.2)
- M3.** Each Balancing Authority shall have and provide upon request evidence that could include but is not limited to, operator logs, voice recordings, electronic communications, or other equivalent evidence that will be used to confirm that it informed its Reliability Coordinator of all generation resources available for use. (Requirement R1.3)
- M4.** Each Reliability Coordinator, Transmission Operator and Balancing Authority shall have and provide upon request evidence that could include but is not limited to, computer printouts or other equivalent evidence that will be used to confirm that it monitored each of the applicable items listed in Requirement R2.

- M5.** Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall have and provide upon request evidence that could include but is not limited to, operator logs, voice recordings, electronic communications, operating instructions, training materials, or other equivalent evidence that will be used to confirm that it informed its operating personnel of appropriate technical information concerning protective relays within the Reliability Coordinator Area, the Transmission Operator Area, and the Balancing Authority Area, respectively. (Requirement R3)
- M6.** Each Transmission Operator and Balancing Authority shall have and provide upon request evidence that could include but is not limited to, printouts, training documents, description documents or other equivalent evidence that will be used to confirm that it has weather forecasts and past load patterns, available to predict the system's near-term load pattern. (Requirement R4)
- M7.** Each Reliability Coordinator, Transmission Operator and Balancing Authority shall have and provide upon request evidence that could include but is not limited to, a description of its EMS alarm capability, training documents, or other equivalent evidence that will be used to confirm that important deviations in operating conditions and the need for corrective actions will be brought to the attention of its operators. (Requirement R5)
- M8.** Each Reliability Coordinator, Transmission Operator and Balancing Authority shall have and provide upon request evidence that could include but is not limited to, a list of the frequency monitoring points available to the shift-operators or other equivalent evidence that will be used to confirm that it monitors system frequency. (Requirement R7)

## **D. Compliance**

### **1. Compliance Monitoring Process**

#### **1.1. Compliance Enforcement Authority**

The Regional Entity shall serve as the Compliance Enforcement Authority (CEA) unless the applicable entity is owned, operated, or controlled by the Regional Entity. In such cases the ERO or a Regional Entity approved by FERC or other applicable governmental authority shall serve as the CEA.

#### **1.2. Data Retention**

Each Generator Operator shall keep 90 days of historical data (evidence) for Measure 1.

Each Transmission Operator shall keep 90 days of historical data (evidence) for Measure 2.

Each Balancing Authority shall keep 90 days of historical data (evidence) for Measure 3.

Each Reliability Coordinator, Transmission Operator and Balancing Authority shall have current documents as evidence for Measure 4, 5, 7 and 8

Each Transmission Operator and Balancing Authority shall have current documents as evidence of compliance to Measure 6.

If an entity is found non-compliant the entity shall keep information related to the noncompliance until found compliant or for two years plus the current year, whichever is longer.

Evidence used as part of a triggered investigation shall be retained by the entity being investigated for one year from the date that the investigation is closed, as determined by the Compliance Monitor.

The Compliance Monitor shall keep the last periodic audit report and all supporting compliance data.

**1.3. Compliance Monitoring and Assessment Processes**

One or more of the following methods will be used to assess compliance:

- Compliance Audit
- Self-Certification
- Spot Checking
- Compliance Investigation
- Self-Reporting
- Complaint

**1.4. Additional Compliance Information**

None.

**Table of Compliance Elements**

R #	Time Horizon	VRF	Violation Severity Levels			
			Lower VSL	Moderate VSL	High VSL	Severe VSL
<b>R1</b>	Real-time Operations	Medium	N/A	N/A	N/A	<p>The responsible entity failed to know the status of all generation and transmission resources available for use, even though said information was reported by the Generator Operator, Transmission Operator, or Balancing Authority.</p> <p>OR</p> <p>The Generator Operator failed to inform its Host Balancing Authority and the Transmission Operator of all generation resources available for use.</p> <p>OR</p> <p>The responsible entity failed to inform the Reliability Coordinator and other affected Balancing Authorities and Transmission Operators of all generation and transmission resources available for use.</p>

<b>R1.1</b>	Real-time Operations	Medium	N/A	N/A	N/A	N/A
<b>R1.2</b>	Real-time Operations	Medium	N/A	N/A	N/A	N/A
<b>R1.3</b>	Real-time Operations	Medium	N/A	N/A	N/A	The responsible entity failed to inform its Reliability Coordinator of all generation resources available for use.
<b>R2</b>	Real-time Operations	High	The responsible entity failed to monitor 5% or less of applicable transmission line status, real and reactive power flows, voltage, load-tap-changer settings, and status of rotating and static reactive resources.	The responsible entity failed to monitor more than 5% up to (and including) 10% of applicable transmission line status, real and reactive power flows, voltage, load-tap-changer settings, and status of rotating and static reactive resources.	The responsible entity failed to monitor more than 10% up to (and including) 15% of applicable transmission line status, real and reactive power flows, voltage, load-tap-changer settings, and status of rotating and static reactive resources.	The responsible entity failed to monitor more than 15% of applicable transmission line status, real and reactive power flows, voltage, load-tap-changer settings, and status of rotating and static reactive resources.
<b>R3</b>	Operations Planning	Medium	The responsible entity failed to provide 5% or less of the appropriate technical information concerning protective relays to its operating personnel.	The responsible entity failed to provide more than 5% up to (and including) 10% of the appropriate technical information concerning protective relays to its operating personnel.	The responsible entity failed to provide more than 10% up to (and including) 15% of the appropriate technical information concerning protective relays to its operating personnel.	The responsible entity failed to provide more than 15% of the appropriate technical information concerning protective relays to its operating personnel.
<b>R4</b>	Operations Planning, Same-day Operations, Real-time	Medium	N/A	N/A	The responsible entity has either weather forecasts or past load patterns, available to predict the system's near-term load pattern, but not both.	The responsible entity has neither weather forecasts nor past load patterns available to predict the system's near-term load pattern.

	Operations					
<b>R5</b>	Real-time Operations	Medium	N/A	N/A	The responsible entity used monitoring equipment to bring to the attention of operating personnel important deviations in operating conditions, but it does not have indication of the need for corrective action.	The responsible entity failed to use monitoring equipment to bring to the attention of operating personnel important deviations in operating conditions.
<b>R6</b>	Real-time Operations	High	N/A	N/A	N/A	The responsible entity failed to use sufficient metering of suitable range, accuracy and sampling rate (if applicable) to ensure accurate and timely monitoring of operating conditions under both normal and emergency situations.
<b>R7</b>	Real-time Operations	High	N/A	N/A	N/A	The responsible entity failed to monitor system frequency.

**E. Regional Variances**

None.

**F. Associated Documents**

**Version History**

<b>Version</b>	<b>Date</b>	<b>Action</b>	<b>Change Tracking</b>
0	April 1, 2005	Effective Date	New
0	August 8, 2005	Removed “Proposed” from Effective Date	Errata
1	November 1, 2006	Adopted by Board of Trustees	Revised
2		Modified R4 Modified M4 Modified Data Retention for M4 Replaced Levels of Non-compliance with the Feb 28, BOT approved Violation Severity Levels (VSLs)	Revised
2	October 17, 2008	Adopted by NERC Board of Trustees	
2	March 23, 2011	Order issued by FERC approving TOP-006-2 (approval effective 5/23/11)	
3	November 7, 2012	Adopted by NERC Board of Trustees	Changes to bring document format to new guidelines. Added Time Horizons. Rapid revision to accommodate interpretation request for Requirements R1.2 & R3. Updates made to the VSL table.