

**A. Introduction**

- 1. Title:**       **Emergency Operations Planning**
- 2. Number:**    EOP-001-1
- 3. Purpose:**    Each Transmission Operator and Balancing Authority needs to develop, maintain, and implement a set of plans to mitigate operating emergencies. These plans need to be coordinated with other Transmission Operators and Balancing Authorities, and the Reliability Coordinator.
- 4. Applicability**
  - 4.1.** Balancing Authorities.
  - 4.2.** Transmission Operators.
- 5. Proposed Effective Dates:**

In those jurisdictions where no regulatory approval is required, the standard shall become effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after Board of Trustee adoption.

In those jurisdictions where regulatory approval is required, the standard shall become effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after applicable regulatory approval.

**B. Requirements**

- R1.** Balancing Authorities shall have operating agreements with adjacent Balancing Authorities that shall, at a minimum, contain provisions for emergency assistance, including provisions to obtain emergency assistance from remote Balancing Authorities.
- R2.** Each Transmission Operator and Balancing Authority shall:
  - R2.1.** Develop, maintain, and implement a set of plans to mitigate operating emergencies for insufficient generating capacity.
  - R2.2.** Develop, maintain, and implement a set of plans to mitigate operating emergencies on the transmission system.
  - R2.3.** Develop, maintain, and implement a set of plans for load shedding.
  - R2.4.** Develop, maintain, and implement a set of plans for system restoration.
- R3.** Each Transmission Operator and Balancing Authority shall have emergency plans that will enable it to mitigate operating emergencies. At a minimum, Transmission Operator and Balancing Authority emergency plans shall include:
  - R3.1.** Communications protocols to be used during emergencies.
  - R3.2.** A list of controlling actions to resolve the emergency. Load reduction, in sufficient quantity to resolve the emergency within NERC-established timelines, shall be one of the controlling actions.
  - R3.3.** The tasks to be coordinated with and among adjacent Transmission Operators and Balancing Authorities.
  - R3.4.** Staffing levels for the emergency.
- R4.** Each Transmission Operator and Balancing Authority shall include the applicable elements in Attachment 1-EOP-001-0 when developing an emergency plan.

- R5.** The Transmission Operator and Balancing Authority shall annually review and update each emergency plan. The Transmission Operator and Balancing Authority shall provide a copy of its updated emergency plans to its Reliability Coordinator and to neighboring Transmission Operators and Balancing Authorities.
- R6.** The Transmission Operator and Balancing Authority shall coordinate its emergency plans with other Transmission Operators and Balancing Authorities as appropriate. This coordination includes the following steps, as applicable:
  - R6.1.** The Transmission Operator and Balancing Authority shall establish and maintain reliable communications between interconnected systems.
  - R6.2.** The Transmission Operator and Balancing Authority shall arrange new interchange agreements to provide for emergency capacity or energy transfers if existing agreements cannot be used.
  - R6.3.** The Transmission Operator and Balancing Authority shall coordinate transmission and generator maintenance schedules to maximize capacity or conserve the fuel in short supply. (This includes water for hydro generators.)
  - R6.4.** The Transmission Operator and Balancing Authority shall arrange deliveries of electrical energy or fuel from remote systems through normal operating channels.

**C. Measures**

- M1.** The Transmission Operator and Balancing Authority shall have its emergency plans available for review by the Regional Reliability Organization at all times.
- M2.** The Transmission Operator and Balancing Authority shall have its two most recent annual self-assessments available for review by the Regional Reliability Organization at all times.

**D. Compliance**

**1. Compliance Monitoring Process**

**1.1. Compliance Monitoring Responsibility**

Regional Reliability Organization.

**1.2. Compliance Monitoring Period and Reset Time Frame**

The Regional Reliability Organization shall review and evaluate emergency plans every three years to ensure that the plans consider the applicable elements of Attachment 1-EOP-001-0.

The Regional Reliability Organization may elect to request self-certification of the Transmission Operator and Balancing Authority in years that the full review is not done.

Reset: one calendar year.

**1.3. Data Retention**

Current plan available at all times.

**1.4. Additional Compliance Information**

Not specified.

**Standard EOP-001-1 — Emergency Operations Planning**

**2. Violation Severity Levels:**

| <b>Requirement</b> | <b>Lower</b>                                                                                                                                                                                                                         | <b>Moderate</b>                                                                                                                                                                                                                   | <b>High</b>                                                                                                                                                                                                                        | <b>Severe</b>                                                                                                                                                                                                                          |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R1                 | The Balancing Authority failed to demonstrate the existence of the necessary operating agreements for less than 25% of the adjacent BAs.<br>Or less than 25% of those agreements do not contain provisions for emergency assistance. | The Balancing Authority failed to demonstrate the existence of the necessary operating agreements for 25% to 50% of the adjacent BAs.<br><br>Or 25 to 50% of those agreements do not contain provisions for emergency assistance. | The Balancing Authority failed to demonstrate the existence of the necessary operating agreements for 50% to 75% of the adjacent BAs.<br><br>Or 50% to 75% of those agreements do not contain provisions for emergency assistance. | The Balancing Authority failed to demonstrate the existence of the necessary operating agreements for 75% or more of the adjacent BAs.<br><br>Or more than 75% of those agreements do not contain provisions for emergency assistance. |
| R2                 | The Transmission Operator or Balancing Authority failed to comply with one (1) of the sub-components.                                                                                                                                | The Transmission Operator or Balancing Authority failed to comply with two (2) of the sub-components.                                                                                                                             | The Transmission Operator or Balancing Authority has failed to comply with three (3) of the sub-components.                                                                                                                        | The Transmission Operator or Balancing Authority has failed to comply with four (4) of the sub-components.                                                                                                                             |
| R2.1               | The Transmission Operator or Balancing Authority's emergency plans to mitigate insufficient generating capacity are missing minor details or minor program/procedural elements.                                                      | The Transmission Operator or Balancing Authority's has demonstrated the existence of emergency plans to mitigate insufficient generating capacity emergency plans but the plans are not maintained.                               | The Transmission Operator or Balancing Authority's emergency plans to mitigate insufficient generating capacity emergency plans are neither maintained nor implemented.                                                            | The Transmission Operator or Balancing Authority has failed to develop emergency mitigation plans for insufficient generating capacity.                                                                                                |
| R2.2               | The Transmission Operator or Balancing Authority's plans to mitigate transmission system emergencies are missing minor details or minor program/procedural elements.                                                                 | The Transmission Operator or Balancing Authority's has demonstrated the existence of transmission system emergency plans but are not maintained.                                                                                  | The Transmission Operator or Balancing Authority's transmission system emergency plans are neither maintained nor implemented.                                                                                                     | The Transmission Operator or Balancing Authority has failed to develop, maintain, and implement operating emergency mitigation plans for emergencies on the transmission system.                                                       |

**Standard EOP-001-1 — Emergency Operations Planning**

| <b>Requirement</b> | <b>Lower</b>                                                                                                                                                                           | <b>Moderate</b>                                                                                                                                  | <b>High</b>                                                                                                                                                                   | <b>Severe</b>                                                                                                                                                |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R2.3               | The Transmission Operator or Balancing Authority's load shedding plans are missing minor details or minor program/procedural elements.                                                 | The Transmission Operator or Balancing Authority's has demonstrated the existence of load shedding plans but are not maintained.                 | The Transmission Operator or Balancing Authority's load shedding plans are partially compliant with the requirement but are neither maintained nor implemented.               | The Transmission Operator or Balancing Authority has failed to develop, maintain, and implement load shedding plans.                                         |
| R2.4               | The Transmission Operator or Balancing Authority's system restoration plans are missing minor details or minor program/procedural elements.                                            | The Transmission Operator or Balancing Authority's system restoration plans are partially compliant with the requirement but are not maintained. | The Transmission Operator or Balancing Authority's restoration plans are neither maintained nor implemented.                                                                  | The Transmission Operator or Balancing Authority has failed to develop, maintain, and implement operating emergency mitigation plans for system restoration. |
| R3                 | The Transmission Operator or Balancing Authority failed to comply with one (1) of the sub-components.                                                                                  | The Transmission Operator or Balancing Authority failed to comply with two (2) of the sub-components.                                            | The Transmission Operator or Balancing Authority has failed to comply with three (3) of the sub-components.                                                                   | The Transmission Operator or Balancing Authority has failed to comply with all four (4) of the sub-components.                                               |
| R3.1               | The Transmission Operator or Balancing Authority's communication protocols included in the emergency plan are missing minor program/procedural elements.                               | N/A                                                                                                                                              | N/A                                                                                                                                                                           | The Transmission Operator or Balancing Authority has failed to include communication protocols in its emergency plans to mitigate operating emergencies.     |
| R3.2               | The Transmission Operator or Balancing Authority's list of controlling actions has resulted in meeting the intent of the requirement but is missing minor program/procedural elements. | N/A                                                                                                                                              | The Transmission Operator or Balancing Authority provided a list of controlling actions, however the actions fail to resolve the emergency within NERC-established timelines. | The Transmission Operator or Balancing Authority has failed to provide a list of controlling actions to resolve the emergency.                               |

**Standard EOP-001-1 — Emergency Operations Planning**

| <b>Requirement</b> | <b>Lower</b>                                                                                                                                                                           | <b>Moderate</b>                                                                                                                  | <b>High</b>                                                                                                                                                                   | <b>Severe</b>                                                                                                                                                                                                         |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R3.3               | The Transmission Operator or Balancing Authority has demonstrated coordination with Transmission Operators and Balancing Authorities but is missing minor program/procedural elements. | N/A                                                                                                                              | N/A                                                                                                                                                                           | The Transmission Operator or Balancing Authority has failed to demonstrate the tasks to be coordinated with adjacent Transmission Operator and Balancing Authorities as directed by the requirement.                  |
| R3.4               | The Transmission Operator or Balancing Authority's emergency plan does not include staffing levels for the emergency                                                                   | N/A                                                                                                                              | N/A                                                                                                                                                                           | N/A                                                                                                                                                                                                                   |
| R4                 | The Transmission Operator and Balancing Authority's emergency plan has complied with 90% or more of the number of sub-components.                                                      | The Transmission Operator and Balancing Authority's emergency plan has complied with 70% to 90% of the number of sub-components. | The Transmission Operator and Balancing Authority's emergency plan has complied with between 50% to 70% of the number of sub-components.                                      | The Transmission Operator and Balancing Authority's emergency plan has complied with 50% or less of the number of sub-components                                                                                      |
| R5                 | The Transmission Operator and Balancing Authority is missing minor program/procedural elements.                                                                                        | The Transmission Operator and Balancing Authority has failed to annually review one of it's emergency plans                      | The Transmission Operator and Balancing Authority has failed to annually review two of its emergency plans or communicate with one of it's neighboring Balancing Authorities. | The Transmission Operator and Balancing Authority has failed to annually review and/or communicate any emergency plans with its Reliability Coordinator, neighboring Transmission Operators or Balancing Authorities. |
| R6                 | The Transmission Operator and/or the Balancing Authority failed to comply with one (1) of the sub-components.                                                                          | The Transmission Operator and/or the Balancing Authority failed to comply with two (2) of the sub-components.                    | The Transmission Operator and/or the Balancing Authority has failed to comply with three (3) of the sub-components.                                                           | The Transmission Operator and/or the Balancing Authority has failed to comply with four (4) or more of the sub-components.                                                                                            |

**Standard EOP-001-1 — Emergency Operations Planning**

| Requirement | Lower                                                                                                                                                                                                                      | Moderate | High | Severe |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|--------|
| R6.1        | The Transmission Operator or Balancing Authority has failed to establish and maintain reliable communication between interconnected systems.                                                                               | N/A      | N/A  | N/A    |
| R6.2        | The Transmission Operator or Balancing Authority has failed to arrange new interchange agreements to provide for emergency capacity or energy transfers with required entities when existing agreements could not be used. | N/A      | N/A  | N/A    |
| R6.3        | The Transmission Operator or Balancing Authority has failed to coordinate transmission and generator maintenance schedules to maximize capacity or conserve fuel in short supply.                                          | N/A      | N/A  | N/A    |
| R6.4        | The Transmission Operator or Balancing Authority has failed to arrange for deliveries of electrical energy or fuel from remote systems through normal operating channels.                                                  | N/A      | N/A  | N/A    |

**E. Regional Differences**

None identified.

**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              |                | Deleted R2<br>Replaced Levels of Non-compliance with the February 28, 2008 BOT approved Violation Severity Levels<br>Corrected typographical errors in BOT approved version of VSLs | Revised                |
|                |                |                                                                                                                                                                                     |                        |

**Attachment 1-EOP-001-0**

**Elements for Consideration in Development of Emergency Plans**

1. Fuel supply and inventory — An adequate fuel supply and inventory plan that recognizes reasonable delays or problems in the delivery or production of fuel.
2. Fuel switching — Fuel switching plans for units for which fuel supply shortages may occur, e.g., gas and light oil.
3. Environmental constraints — Plans to seek removal of environmental constraints for generating units and plants.
4. System energy use — The reduction of the system’s own energy use to a minimum.
5. Public appeals — Appeals to the public through all media for voluntary load reductions and energy conservation including educational messages on how to accomplish such load reduction and conservation.
6. Load management — Implementation of load management and voltage reductions, if appropriate.
7. Optimize fuel supply — The operation of all generating sources to optimize the availability.
8. Appeals to customers to use alternate fuels — In a fuel emergency, appeals to large industrial and commercial customers to reduce non-essential energy use and maximize the use of customer-owned generation that rely on fuels other than the one in short supply.
9. Interruptible and curtailable loads — Use of interruptible and curtailable customer load to reduce capacity requirements or to conserve the fuel in short supply.
10. Maximizing generator output and availability — The operation of all generating sources to maximize output and availability. This should include plans to winterize units and plants during extreme cold weather.
11. Notifying IPPs — Notification of cogeneration and independent power producers to maximize output and availability.
12. Requests of government — Requests to appropriate government agencies to implement programs to achieve necessary energy reductions.
13. Load curtailment — A mandatory load curtailment plan to use as a last resort. This plan should address the needs of critical loads essential to the health, safety, and welfare of the community. Address firm load curtailment.
14. Notification of government agencies — Notification of appropriate government agencies as the various steps of the emergency plan are implemented.
15. Notifications to operating entities — Notifications to other operating entities as steps in emergency plan are implemented.

**A. Introduction**

1. **Title:** **Reliability Coordination — Facilities**
2. **Number:** IRO 002-2
3. **Purpose:** Reliability Coordinators need information, tools and other capabilities to perform their responsibilities.
4. **Applicability**
  - 4.1. Reliability Coordinators.
5. **Proposed Effective Date:**

In those jurisdictions where no regulatory approval is required, the standard shall become effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after Board of Trustee adoption.

In those jurisdictions where regulatory approval is required, the standard shall become effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after applicable regulatory approval.

**B. Requirements**

- R1.** Each Reliability Coordinator shall have adequate communications facilities (voice and data links) to appropriate entities within its Reliability Coordinator Area. These communications facilities shall be staffed and available to act in addressing a real-time emergency condition.
- R2.** Each Reliability Coordinator — or its Transmission Operators and Balancing Authorities — shall provide, or arrange provisions for, data exchange to other Reliability Coordinators or Transmission Operators and Balancing Authorities via a secure network.
- R3.** Each Reliability Coordinator shall have multi-directional communications capabilities with its Transmission Operators and Balancing Authorities, and with neighboring Reliability Coordinators, for both voice and data exchange as required to meet reliability needs of the Interconnection.
- R4.** Each Reliability Coordinator shall have detailed real-time monitoring capability of its Reliability Coordinator Area and sufficient monitoring capability of its surrounding Reliability Coordinator Areas to ensure that potential or actual System Operating Limit or Interconnection Reliability Operating Limit violations are identified. Each Reliability Coordinator shall have monitoring systems that provide information that can be easily understood and interpreted by the Reliability Coordinator's operating personnel, giving particular emphasis to alarm management and awareness systems, automated data transfers, and synchronized information systems, over a redundant and highly reliable infrastructure.
- R5.** Each Reliability Coordinator shall monitor Bulk Electric System elements (generators, transmission lines, buses, transformers, breakers, etc.) that could result in SOL or IROL violations within its Reliability Coordinator Area. Each Reliability Coordinator shall monitor both real and reactive power system flows, and operating reserves, and the status of Bulk Electric System elements that are or could be critical to SOLs and IROLs and system restoration requirements within its Reliability Coordinator Area.
- R6.** Each Reliability Coordinator shall have adequate analysis tools such as state estimation, pre- and post-contingency analysis capabilities (thermal, stability, and voltage), and wide-area overview displays.

- R7.** Each Reliability Coordinator shall continuously monitor its Reliability Coordinator Area. Each Reliability Coordinator shall have provisions for backup facilities that shall be exercised if the main monitoring system is unavailable. Each Reliability Coordinator shall ensure SOL and IROL monitoring and derivations continue if the main monitoring system is unavailable.
- R8.** Each Reliability Coordinator shall control its Reliability Coordinator analysis tools, including approvals for planned maintenance. Each Reliability Coordinator shall have procedures in place to mitigate the effects of analysis tool outages.

**C. Measures**

- M1.** Each Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, a document that lists its voice communications facilities with Transmission Operators, Balancing Authorities and Generator Operators within its Reliability Coordinator Area and with neighboring Reliability Coordinators, that will be used to confirm that it has communication facilities in accordance with Requirements 1 and 3.
- M2.** Each Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, a data-link facility description document, computer print-out, training-document, or other equivalent evidence that will be used to confirm that it has data links with entities within its Reliability Coordinator Area and with neighboring Reliability Coordinators, as specified in Requirements 1 and 3.
- M3.** Each Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, Energy Management System description documents, computer printouts, SCADA data collection system communications performance or equivalent evidence to demonstrate that it has real-time monitoring capability of its Reliability Coordinator Area and monitoring capability of its surrounding Reliability Coordinator Areas to identify potential or actual System Operating Limit or Interconnection Reliability Operating Limit violations.
- M4.** Each Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, documentation from suppliers, operating and planning staff training documents, examples of studies, or other equivalent evidence to show that it has analysis tools in accordance with Requirement 6.
- M5.** Each Reliability Coordinator shall provide evidence such as equipment specifications, operating procedures, staff records of their involvement in training, or other equivalent evidence to show that it has a backup monitoring facility that can be used to identify and monitor SOLs and IROLs. (Requirement 7)
- M6.** Each Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, a documented procedure or equivalent evidence that will be used to confirm that the Reliability Coordinator has the authority to veto planned outages to analysis tools, including final approvals for planned maintenance as specified in Requirement 8 Part 1.
- M7.** Each Reliability Coordinator shall have and provide upon request its current procedures used to mitigate the effects of analysis tool outages as specified in Requirement 8 Part 2.

**D. Compliance**

**1. Compliance Monitoring Process**

**1.1. Compliance Monitoring Responsibility**

Regional Reliability Organizations shall be responsible for compliance. Monitoring.

**1.2. Compliance Monitoring and Reset Time Frame**

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

- Self-certification (Conducted annually with submission according to schedule.)
- Spot Check Audits (Conducted anytime with up to 30 days notice given to prepare.)
- Periodic Audit (Conducted once every three years according to schedule.)
- Triggered Investigations (Notification of an investigation must be made within 60 days of an event or complaint of noncompliance. The entity will have up to 30 days to prepare for the investigation. An entity may request an extension of the preparation period and the extension will be considered by the Compliance Monitor on a case-by-case basis.)

The Performance-Reset Period shall be 12 months from the last finding of non-compliance.

**1.3. Data Retention**

Each Reliability Coordinator shall have current in-force documents used to show compliance with Measures 1 through 7.

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 requested and submitted subsequent compliance records.

**1.4. Additional Compliance Information**

None.

2. Violation Severity Levels:

| Requirement | Lower                                                                                                                                                                                                    | Moderate                                                                                                                                                                                                                                                                         | High                                                                                                                                                                                                                                                                             | Severe                                                                                                                                                                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R1          | The Reliability Coordinator has demonstrated communication facilities for both voice and data exist to all appropriate entities and that they are staffed and available but they are less than adequate. | The Reliability Coordinator has failed to demonstrate that is has:<br>1) Voice communication links with one appropriate entity or<br>2) Data links with one appropriate entity.                                                                                                  | The Reliability Coordinator has failed to demonstrate that is has:<br>1) Voice communication links with two appropriate entities or<br>2) Data links with two appropriate entities.                                                                                              | The Reliability Coordinator has failed to demonstrate that is has:<br>1) Voice communication links with more than two appropriate entities or<br>2) Data links with more than two appropriate entities or<br>3) Communication facilities are not staffed or<br>4) Communication facilities are not ready. |
| R2          | N/A                                                                                                                                                                                                      | The Reliability Coordinator or designated Transmission Operator and Balancing Authority has failed to demonstrate it provided or arranged provision for the exchange of data with one of the other Reliability Coordinators or Transmission Operators and Balancing Authorities. | The Reliability Coordinator or designated Transmission Operator and Balancing Authority has failed to demonstrate it provided or arranged provision for the exchange of data with two of the other Reliability Coordinators or Transmission Operators and Balancing Authorities. | The Reliability Coordinator or designated Transmission Operator and Balancing Authority has failed to demonstrate it provided or arranged provision for the exchange of data with three of the other Reliability Coordinators or Transmission Operators and Balancing Authorities.                        |
| R3          | N/A                                                                                                                                                                                                      | The Reliability Coordinator has failed to demonstrate multi-directional communication capabilities to one of the Transmission Operators and Balancing Authorities in its Reliability Coordinator Area and with neighboring Reliability Coordinators.                             | The Reliability Coordinator has failed to demonstrate multi-directional communication capabilities to two or more of the Transmission Operators and Balancing Authorities in its Reliability Coordinator Area and with neighboring Reliability Coordinators.                     | The Reliability Coordinator has failed to demonstrate multi-directional communication capabilities to all of the Transmission Operators and Balancing Authorities in its Reliability Coordinator Area and with all neighboring Reliability Coordinators.                                                  |

**Standard IRO-002-2 — Reliability Coordination — Facilities**

| Requirement | Lower                                                                                                                                                                                                                                                                                                                           | Moderate                                                                                                                                                                                                                                                                                                                                                               | High                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Severe                                                                                                                                                                                                                                                                                                                                                            |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R4          | The Reliability Coordinator's monitoring systems provide information in a way that is not easily understood and interpreted by the Reliability Coordinator's operating personnel or particular emphasis was not given to alarm management and awareness systems, automated data transfers and synchronized information systems. | The Reliability Coordinator has failed to demonstrate that is has detailed real-time monitoring capabilities in its Reliability Coordinator Area and sufficient monitoring capabilities of its surrounding Reliability Coordinator Areas to ensure that one potential or actual SOL or IROL violation is not identified.                                               | The Reliability Coordinator has failed to demonstrate that is has detailed real-time monitoring capabilities in its Reliability Coordinator Area and sufficient monitoring capabilities of its surrounding Reliability Coordinator Areas to ensure that two or more potential and actual SOL and IROL violations are not identified.                                                                                                                                                                                                                              | The Reliability Coordinator has failed to demonstrate that is has detailed real-time monitoring capabilities in its Reliability Coordinator Area and sufficient monitoring capabilities of its surrounding Reliability Coordinator Areas to ensure that all potential and actual SOL and IROL violations are identified.                                          |
| R5          | The Reliability Coordinator failed to monitor:<br>1) the status, real power flow or reactive power flow of Bulk Electric System elements that could result in one SOL violations or<br>2) or operating reserves for a small portion of the Reliability Authority Area.                                                          | The Reliability Coordinator failed to monitor:<br>1) the status, real power flow or reactive power flow of Bulk Electric System elements critical to assessing one IROL or to system restoration,<br>2) the status, real power flow or reactive power flow of Bulk Electric System elements that could result in multiple SOL violations, or<br>3) operating reserves. | The Reliability Coordinator failed to monitor:<br>1) the status, real power flow or reactive power flow of Bulk Electric System elements critical to assessing two or more IROLs; or one IROL and to system restoration,<br>2) the status, real power flow or reactive power flow of Bulk Electric System elements that could result in multiple SOL violations and operating reserves, or<br>3) the status, real power flow or reactive power flow of Bulk Electric System elements critical to assessing one IROL or system restoration and operating reserves. | The Reliability Coordinator failed to monitor:<br>1) the status, real power flow or reactive power flow of Bulk Electric System elements critical to assessing all IROLs and to system restoration, or<br>2) the status, real power flow or reactive power flow of Bulk Electric System elements critical to assessing all SOL violations and operating reserves. |

Standard IRO-002-2 — Reliability Coordination — Facilities

| Requirement | Lower                                                                                                                                                                                                                                                                                                                                 | Moderate                                                                                                                                                                                                                                                                                                                                                                  | High                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Severe                                                                                                                                                                                                                                                                                                                                |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R6          | <p>The Reliability Coordinator failed to demonstrate that it has:</p> <ol style="list-style-type: none"> <li>1) analysis tools capable of assessing all pre-contingency flows,</li> <li>2) analysis tools capable of assessing all post-contingency flows, or</li> <li>3) all necessary wide-area overview displays exist.</li> </ol> | <p>The Reliability Coordinator failed to demonstrate that it has:</p> <ol style="list-style-type: none"> <li>1) analysis tools capable of assessing the majority of pre-contingency flows,</li> <li>2) analysis tools capable of assessing the majority of post-contingency flows, or</li> <li>3) the majority of necessary wide-area overview displays exist.</li> </ol> | <p>The Reliability Coordinator failed to demonstrate that it has:</p> <ol style="list-style-type: none"> <li>1) analysis tools capable of assessing a minority of pre-contingency flows,</li> <li>2) analysis tools capable of assessing a minority of post-contingency flows, or</li> <li>3) a minority of necessary wide-area overview displays exist.</li> </ol>                                                                                                                                                                                                    | <p>The Reliability Coordinator failed to demonstrate that it has:</p> <ol style="list-style-type: none"> <li>1) analysis tools capable of assessing any pre-contingency flows,</li> <li>2) analysis tools capable of assessing any post-contingency flows, or</li> <li>3) any necessary wide-area overview displays exist.</li> </ol> |
| R7          | <p>The Reliability Coordinator failed to demonstrate that:</p> <ol style="list-style-type: none"> <li>1) it or a delegated entity monitored SOLs when the main monitoring system was unavailable or</li> <li>2) it has provisions to monitor SOLs when the main monitoring system is not available.</li> </ol>                        | <p>The Reliability Coordinator failed to demonstrate that:</p> <ol style="list-style-type: none"> <li>1) it or a delegated entity monitored one IROL when the main monitoring system was unavailable or</li> <li>2) it has provisions to monitor one IROL when the main monitoring system is not available.</li> </ol>                                                    | <p>The Reliability Coordinator failed to demonstrate that:</p> <ol style="list-style-type: none"> <li>1) it or a delegated entity monitored two or more IROLs when the main monitoring system was unavailable,</li> <li>2) it or a delegated entity monitored SOLs and one IROL when the main monitoring system was unavailable</li> <li>3) it has provisions to monitor two or more IROLs when the main monitoring system is not available, or</li> <li>4) it has provisions to monitor SOLs and one IROL when the main monitoring system was unavailable.</li> </ol> | <p><b>R9.</b> The Reliability Coordinator failed to demonstrate that it continuously monitored its Reliability Authority Area.</p>                                                                                                                                                                                                    |

**Standard IRO-002-2 — Reliability Coordination — Facilities**

| Requirement | Lower                                                                                                                                                                                                                       | Moderate                                                                                                                                              | High                                                                                                                                                                                                                                                                               | Severe                                                                    |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| R8          | Reliability Coordinator has approval rights for planned maintenance outages of analysis tools but does not have approval rights for work on analysis tools that creates a greater risk of an unplanned outage of the tools. | Reliability Coordinator has approval rights for planned maintenance but does not have plans to mitigate the effects of outages of the analysis tools. | Reliability Coordinator has approval rights for planned maintenance but does not have plans to mitigate the effects of outages of the analysis tools and does not have approval rights for work on analysis tools that creates a greater risk of an unplanned outage of the tools. | Reliability Coordinator approval is not required for planned maintenance. |

**E. Regional Variances**

None identified.

**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              |                  | Deleted R2, M3 and associated compliance elements<br>Replaced Levels of Non-compliance with the Feb 28, BOT approved Violation Severity Levels (VSLs)<br>Corrected typographical errors in BOT approved version of VSLs | Revised                |

**A. Introduction**

1. **Title:** **Reliability Coordination — Operations Planning**
2. **Number:** IRO-004-2
3. **Purpose:** Each Reliability Coordinator must conduct next-day reliability analyses for its Reliability Coordinator Area to ensure the Bulk Electric System can be operated reliably in anticipated normal and Contingency conditions. System studies must be conducted to highlight potential interface and other operating limits, including overloaded transmission lines and transformers, voltage and stability limits, etc. Plans must be developed to alleviate System Operating Limit (SOL) and Interconnection Reliability Operating Limit (IROL) violations.
4. **Applicability**
  - 4.1. Balancing Authorities.
  - 4.2. Transmission Operators.
  - 4.3. Transmission Service Providers.
5. **Effective Date:** In those jurisdictions where no regulatory approval is required, the standard shall be retired on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after BOT adoption.

In those jurisdictions where regulatory approval is required, the standard shall be retired effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after applicable regulatory approval.

**B. Requirements**

- R1. Each Transmission Operator, Balancing Authority, and Transmission Service Provider shall comply with the directives of its Reliability Coordinator based on the next day assessments in the same manner in which it would comply during real time operating events.

**C. Measures**

None

**D. Compliance**

**1. Compliance Monitoring Process**

Entities will be selected for an on-site audit at least every three years. For a selected 30-day period in the previous three calendar months prior to the on site audit, Reliability Coordinators will be asked to provide documentation showing that next-day reliability analyses were conducted each day to ensure the bulk power system could be operated in anticipated normal and Contingency conditions; and that they identified potential interface and other operating limits including overloaded transmission lines and transformers, voltage and stability limits, etc.

- 1.1. **Compliance Monitoring Responsibility**
- 1.2. **Compliance Monitoring Period and Reset Time Frame**
- 1.3. **Data Retention**
- 1.4. **Additional Compliance Information**

**2. Violation Severity Levels**

| Requirement | Lower                                                                                                                                                                                                                                                   | Moderate                                                                                                                                                                                                                                                              | High                                                                                                                                                                                                                                                                  | Severe                                                                                                                                                                                                                                                              |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R1          | The responsible entity failed to comply with the directives of its Reliability Coordinator based on the next day assessments in the same manner in which it would comply during real time operating events on one (1) occasion during a calendar month. | The responsible entity failed to comply with the directives of its Reliability Coordinator based on the next day assessments in the same manner in which it would comply during real time operating events on two (2) to three (3) occasions during a calendar month. | The responsible entity failed to comply with the directives of its Reliability Coordinator based on the next day assessments in the same manner in which it would comply during real time operating events on four (4) to five (5) occasions during a calendar month. | The responsible entity failed to comply with the directives of its Reliability Coordinator based on the next day assessments in the same manner in which it would comply during real time operating events on more than five (5) occasions during a calendar month. |

**E. Regional Variances**

**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              |                | Replaced Levels of Non-compliance with the February 28, 2008 BOT approved Violation Severity Levels<br>Retired R1 through R6, and associated Measures, Data Retention, and VSLs | Revision               |

## A. Introduction

1. **Title:** **Reliability Coordination — Current Day Operations**
2. **Number:** IRO-005-3
3. **Purpose:** The Reliability Coordinator must be continuously aware of conditions within its Reliability Coordinator Area and include this information in its reliability assessments. The Reliability Coordinator must monitor Bulk Electric System parameters that may have significant impacts upon the Reliability Coordinator Area and neighboring Reliability Coordinator Areas.
4. **Applicability**
  - 4.1. Reliability Coordinators.
  - 4.2. Balancing Authorities.
  - 4.3. Transmission Operators.
  - 4.4. Transmission Service Providers.
  - 4.5. Generator Operators.
  - 4.6. Load-Serving Entities.
  - 4.7. Purchasing-Selling Entities.

5. **Effective Date:**

In those jurisdictions where no regulatory approval is required, the standard shall become effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after BOT adoption.

In those jurisdictions where regulatory approval is required, the standard shall become effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after applicable regulatory approval.

## B. Requirements

- R1. Each Reliability Coordinator shall monitor its Reliability Coordinator Area parameters, including but not limited to the following:
  - R1.1. Current status of Bulk Electric System elements (transmission or generation including critical auxiliaries such as Automatic Voltage Regulators and Special Protection Systems) and system loading.
  - R1.2. Current pre-contingency element conditions (voltage, thermal, or stability), including any applicable mitigation plans to alleviate SOL or IROL violations, including the plan's viability and scope.
  - R1.3. Current post-contingency element conditions (voltage, thermal, or stability), including any applicable mitigation plans to alleviate SOL or IROL violations, including the plan's viability and scope.
  - R1.4. System real and reactive reserves (actual versus required).
  - R1.5. Capacity and energy adequacy conditions.
  - R1.6. Current ACE for all its Balancing Authorities.

- R1.7.** Current local or Transmission Loading Relief procedures in effect.
- R1.8.** Planned generation dispatches.
- R1.9.** Planned transmission or generation outages.
- R1.10.** Contingency events.
- R2.** Each Reliability Coordinator shall monitor its Balancing Authorities' parameters to ensure that the required amount of operating reserves is provided and available as required to meet the Control Performance Standard and Disturbance Control Standard requirements. If necessary, the Reliability Coordinator shall direct the Balancing Authorities in the Reliability Coordinator Area to arrange for assistance from neighboring Balancing Authorities. The Reliability Coordinator shall issue Energy Emergency Alerts as needed and at the request of its Balancing Authorities and Load-Serving Entities.
- R3.** Each Reliability Coordinator shall ensure its Transmission Operators and Balancing Authorities are aware of Geo-Magnetic Disturbance (GMD) forecast information and assist as needed in the development of any required response plans.
- R4.** The Reliability Coordinator shall disseminate information within its Reliability Coordinator Area, as required.
- R5.** Each Reliability Coordinator shall monitor system frequency and its Balancing Authorities' performance and direct any necessary rebalancing to return to CPS and DCS compliance. The Transmission Operators and Balancing Authorities shall utilize all resources, including firm load shedding, as directed by its Reliability Coordinator to relieve the emergent condition.
- R6.** The Reliability Coordinator shall coordinate with Transmission Operators, Balancing Authorities, and Generator Operators as needed to develop and implement action plans to mitigate potential or actual SOL, CPS, or DCS violations. The Reliability Coordinator shall coordinate pending generation and transmission maintenance outages with Transmission Operators, Balancing Authorities, and Generator Operators as needed in both the real time and next-day reliability analysis timeframes.
- R7.** As necessary, the Reliability Coordinator shall assist the Balancing Authorities in its Reliability Coordinator Area in arranging for assistance from neighboring Reliability Coordinator Areas or Balancing Authorities.
- R8.** The Reliability Coordinator shall identify sources of large Area Control Errors that may be contributing to Frequency Error, Time Error, or Inadvertent Interchange and shall discuss corrective actions with the appropriate Balancing Authority. The Reliability Coordinator shall direct its Balancing Authority to comply with CPS and DCS.
- R9.** Whenever a Special Protection System that may have an inter-Balancing Authority, or inter-Transmission Operator impact (e.g., could potentially affect transmission flows resulting in a SOL or IROL violation) is armed, the Reliability Coordinators shall be aware of the impact of the operation of that Special Protection System on inter-area flows. The Transmission Operator shall immediately inform the Reliability Coordinator of the status of the Special Protection System including any degradation or potential failure to operate as expected.
- R10.** In instances where there is a difference in derived limits, the Transmission Operators, Balancing Authorities, Generator Operators, Transmission Service Providers, Load-Serving Entities, and Purchasing-Selling Entities shall always operate the Bulk Electric System to the most limiting parameter.
- R11.** The Transmission Service Provider shall respect SOLs and IROLs in accordance with filed tariffs and regional Total Transfer Calculation and Available Transfer Calculation processes.

- R12.** Each Reliability Coordinator who foresees a transmission problem (such as an SOL or IROL violation, loss of reactive reserves, etc.) within its Reliability Coordinator Area shall issue an alert to all impacted Transmission Operators and Balancing Authorities in its Reliability Coordinator Area without delay. The receiving Reliability Coordinator shall disseminate this information to its impacted Transmission Operators and Balancing Authorities. The Reliability Coordinator shall notify all impacted Transmission Operators, Balancing Authorities, when the transmission problem has been mitigated.

**C. Measures**

- M1.** The Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, Energy Management System description documents, computer printouts, a prepared report specifically detailing compliance to each of the bullets in Requirement 1, EMS availability, SCADA data collection system communications performance or equivalent evidence that will be used to confirm that it monitors the Reliability Coordinator Area parameters specified in Requirements 1.1 through 1.9.
- M2.** If one of its Balancing Authorities has insufficient operating reserves, the Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to computer printouts, operating logs, voice recordings or transcripts of voice recordings, or equivalent evidence that will be used to determine if the Reliability Coordinator directed and, if needed, assisted the Balancing Authorities in the Reliability Coordinator Area to arrange for assistance from neighboring Balancing Authorities. (Requirement 2 and Requirement 7)
- M3.** The Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, operator logs, voice recordings or transcripts of voice recordings, electronic communications or equivalent evidence that will be used to determine if it informed Transmission Operators and Balancing Authorities of Geo-Magnetic Disturbance (GMD) forecast information and provided assistance as needed in the development of any required response plans. (Requirement 3)
- M4.** The Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, operator logs, voice recordings or transcripts of voice recordings, Hot Line recordings, electronic communications or equivalent evidence that will be used to determine if it disseminated information within its Reliability Coordinator Area in accordance with Requirement 4.
- M5.** The Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, computer printouts, operator logs, voice recordings or transcripts of voice recordings, electronic communications or equivalent evidence that will be used to confirm that it monitored system frequency and Balancing Authority performance and directed any necessary rebalancing, as specified in Requirement 5 Part 1.
- M6.** The Transmission Operators and Balancing Authorities shall have and provide upon request evidence that could include, but is not limited to, operator logs, voice recordings or transcripts of voice recordings, electronic communications or equivalent evidence that will be used to confirm that it utilized all resources, including firm load shedding, as directed by its Reliability Coordinator, to relieve an emergent condition. (Requirement 5 Part 2)
- M7.** The Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, voice recordings or transcripts of voice recordings, electronic communications, operator logs or equivalent evidence that will be used to determine if it coordinated with Transmission Operators, Balancing Authorities, and Generator Operators as needed to develop and implement action plans to mitigate potential or actual SOL, CPS, or DCS violations including the coordination of pending generation and transmission maintenance

outages with Transmission Operators, Balancing Authorities and Generator Operators.  
(Requirement 6 Part 1)

- M8.** If a large Area Control Error has occurred, the Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, operator logs, voice recordings or transcripts of voice recordings, Hot Line recordings, electronic communications or equivalent evidence that will be used to determine if it identified sources of the Area Control Errors, and initiated corrective actions with the appropriate Balancing Authority if the problem was within the Reliability Coordinator's Area (Requirement 8 Part 1)
- M9.** If a Special Protection System is armed and that system could have had an inter-area impact, the Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, agreements with their Transmission Operators, procedural documents, operator logs, computer analysis, training modules, training records or equivalent evidence that will be used to confirm that it was aware of the impact of that Special Protection System on inter-area flows. (Requirement 9)
- M10.** If there is an instance where there is a disagreement on a derived limit, the Transmission Operator, Balancing Authority, Generator Operator, Load-serving Entity, Purchasing-selling Entity and Transmission Service Provider involved in the disagreement shall have and provide upon request evidence that could include, but is not limited to, operator logs, voice recordings, electronic communications or equivalent evidence that will be used to determine if it operated to the most limiting parameter. (Part 2 of Requirement 10)
- M11.** The Transmission Service Providers shall have and provide upon request evidence that could include, but is not limited to, procedural documents, operator logs, voice recordings or transcripts of voice recordings, electronic communications or equivalent evidence that will be used to confirm that it respected the SOLs or IROLs in accordance with filed tariffs and regional Total Transfer Calculation and Available Transfer Calculation processes.(Requirement 11 Part 2)
- M12.** The Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, operator logs, voice recordings or transcripts of voice recordings, electronic communications or equivalent evidence that will be used to confirm that it issued alerts when it foresaw a transmission problem (such as an SOL or IROL violation, loss of reactive reserves, etc.) within its Reliability Coordinator Area, to all impacted Transmission Operators and Balancing Authorities in its Reliability Coordinator Area as specified in Requirement 12 Part 1.
- M13.** The Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, operator logs, voice recordings or transcripts of voice recordings, electronic communications or equivalent evidence that will be used to confirm that upon receiving information such as an SOL or IROL violation, loss of reactive reserves, etc. it disseminated the information to its impacted Transmission Operators and Balancing Authorities as specified in Requirement 12 Part 2.
- M14.** The Reliability Coordinator shall have and provide upon request evidence that could include, but is not limited to, operator logs, voice recordings or transcripts of voice recordings, electronic communications or equivalent evidence that will be used to confirm that it notified all impacted Transmission Operators, Balancing Authorities and Reliability Coordinators when a transmission problem has been mitigated. (Requirement 12 Part 3)

## **D. Compliance**

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

**1.1. Compliance Monitoring Responsibility**

Regional Reliability Organizations shall be responsible for compliance monitoring.

**1.2. Compliance Monitoring and Reset Time Frame**

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

- Self-certification (Conducted annually with submission according to schedule.)
- Spot Check Audits (Conducted anytime with up to 30 days notice given to prepare.)
- Periodic Audit (Conducted once every three years according to schedule.)
- Triggered Investigations (Notification of an investigation must be made within 60 days of an event or complaint of noncompliance. The entity will have up to 30 days to prepare for the investigation. An entity may request an extension of the preparation period and the extension will be considered by the Compliance Monitor on a case-by-case basis.)

The Performance-Reset Period shall be 12 months from the last finding of non-compliance.

**1.3. Data Retention**

For Measures 1 and 9, each Reliability Coordinator shall have its current in-force documents as evidence.

For Measures 2–8 and Measures 12 through 13, the Reliability Coordinator shall keep 90 days of historical data (evidence).

For Measure 6, the Transmission Operator and Balancing Authority shall keep 90 days of historical data (evidence).

For Measure 10, the Transmission Operator, Balancing Authority, and Transmission Service Provider shall keep 90 days of historical data (evidence).

For Measure 11, the Transmission Service Provider shall keep 90 days of historical data (evidence).

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 requested and submitted subsequent compliance records.

**1.4. Additional Compliance Information**

None.

2. Violation Severity Levels:

| Requirement | Lower                                                                                                                                                                                                                                                 | Moderate                                                                                                      | High                                                                                                            | Severe                                                                                                                    |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| R1          | The Reliability Coordinator failed to monitor one (1) of the elements listed in IRO-005-1 R1.1 through R1.10.                                                                                                                                         | The Reliability Coordinator failed to monitor two (2) of the elements listed in IRO-005-1 R1.1 through R1.10. | The Reliability Coordinator failed to monitor three (3) of the elements listed in IRO-005-1 R1.1 through R1.10. | The Reliability Coordinator failed to monitor more than three (3) of the elements listed in IRO-005-1 R1.1 through R1.10. |
| R1.1        | The Reliability Coordinator failed to monitor the current status of Bulk Electric System elements (transmission or generation including critical auxiliaries such as Automatic Voltage Regulators and Special Protection Systems) and system loading. | N/A                                                                                                           | N/A                                                                                                             | N/A                                                                                                                       |
| R1.2        | The Reliability Coordinator failed to monitor current pre-contingency element conditions (voltage, thermal, or stability), including any applicable mitigation plans to alleviate SOL or IROL violations, including the plan’s viability and scope.   | N/A                                                                                                           | N/A                                                                                                             | N/A                                                                                                                       |

**Standard IRO-005-3 — Reliability Coordination — Current Day Operations**

| Requirement | Lower                                                                                                                                                                                                                                                | Moderate | High | Severe |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|--------|
| R1.3        | The Reliability Coordinator failed to monitor current post-contingency element conditions (voltage, thermal, or stability), including any applicable mitigation plans to alleviate SOL or IROL violations, including the plan’s viability and scope. | N/A      | N/A  | N/A    |
| R1.4        | The Reliability Coordinator failed to monitor system real and reactive reserves (actual versus required).                                                                                                                                            | N/A      | N/A  | N/A    |
| R1.5        | The Reliability Coordinator failed to monitor capacity and energy adequacy conditions.                                                                                                                                                               | N/A      | N/A  | N/A    |
| R1.6        | The Reliability Coordinator failed to monitor current ACE for all its Balancing Authorities.                                                                                                                                                         | N/A      | N/A  | N/A    |
| R1.7        | The Reliability Coordinator failed to monitor current local or Transmission Loading Relief procedures in effect.                                                                                                                                     | N/A      | N/A  | N/A    |
| R1.8        | The Reliability Coordinator failed to monitor planned generation dispatches.                                                                                                                                                                         | N/A      | N/A  | N/A    |
| R1.9        | The Reliability Coordinator failed to monitor planned transmission or generation outages.                                                                                                                                                            | N/A      | N/A  | N/A    |

**Standard IRO-005-3 — Reliability Coordination — Current Day Operations**

| Requirement | Lower                                                             | Moderate                                                                                                                                                                     | High                                                                                                                                                                                                                                              | Severe                                                                                                                                                                                                                                                                      |
|-------------|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R1.10       | The Reliability Coordinator failed to monitor contingency events. | N/A                                                                                                                                                                          | N/A                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                         |
| R2          | N/A                                                               | The Reliability Coordinator failed to direct the Balancing Authorities in the Reliability Coordinator Area to arrange for assistance from neighboring Balancing Authorities. | The Reliability Coordinator failed to issue Energy Emergency Alerts as needed and at the request of its Balancing Authorities and Load-Serving Entities.                                                                                          | The Reliability Coordinator failed to monitor its Balancing Authorities' parameters to ensure that the required amount of operating reserves was provided and available as required to meet the Control Performance Standard and Disturbance Control Standard requirements. |
| R3          | N/A                                                               | N/A                                                                                                                                                                          | The Reliability Coordinator ensured its Transmission Operators and Balancing Authorities were aware of Geo-Magnetic Disturbance (GMD) forecast information, but failed to assist, when needed, in the development of any required response plans. | The Reliability Coordinator failed to ensure its Transmission Operators and Balancing Authorities were aware of Geo-Magnetic Disturbance (GMD) forecast information.                                                                                                        |
| R4          | N/A                                                               | N/A                                                                                                                                                                          | N/A                                                                                                                                                                                                                                               | The Reliability Coordinator failed to disseminate information within its Reliability Coordinator Area, when required.                                                                                                                                                       |

**Standard IRO-005-3 — Reliability Coordination — Current Day Operations**

| Requirement | Lower | Moderate | High                                                                                                                                                                                  | Severe                                                                                                                                                                                                                                                                                                                                                    |
|-------------|-------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R5          | N/A   | N/A      | The Reliability Coordinator monitored system frequency and its Balancing Authorities' performance but failed to direct any necessary rebalancing to return to CPS and DCS compliance. | The Reliability Coordinator failed to monitor system frequency and its Balancing Authorities' performance and direct any necessary rebalancing to return to CPS and DCS compliance or the responsible entity failed to utilize all resources, including firm load shedding, as directed by its Reliability Coordinator to relieve the emergent condition. |

**Standard IRO-005-3 — Reliability Coordination — Current Day Operations**

| Requirement | Lower | Moderate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | High                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Severe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R6          | N/A   | The Reliability Coordinator coordinated with Transmission Operators, Balancing Authorities, and Generator Operators, as needed, to develop action plans to mitigate potential or actual SOL, CPS, or DCS violations but failed to implement said plans, or the Reliability Coordinator coordinated pending generation and transmission maintenance outages with Transmission Operators, Balancing Authorities, and Generator Operators as needed in the real-time reliability analysis timeframe but failed to coordinate pending generation and transmission maintenance outages in the next-day reliability analysis timeframe. | The Reliability Coordinator failed to coordinate with Transmission Operators, Balancing Authorities, and Generator Operators as needed to develop and implement action plans to mitigate potential or actual SOL, CPS, or DCS violations, or the Reliability Coordinator failed to coordinate pending generation and transmission maintenance outages with Transmission Operators, Balancing Authorities, and Generator Operators as needed in both the real-time and next-day reliability analysis timeframes. | The Reliability Coordinator failed to coordinate with Transmission Operators, Balancing Authorities, and Generator Operators as needed to develop and implement action plans to mitigate potential or actual SOL, CPS, or DCS violations and the Reliability Coordinator failed to coordinate pending generation and transmission maintenance outages with Transmission Operators, Balancing Authorities, and Generator Operators as needed in both the real-time and next-day reliability analysis timeframes. |
| R7          | N/A   | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | The Reliability Coordinator failed to assist the Balancing Authorities in its Reliability Coordinator Area in arranging for assistance from neighboring Reliability Coordinator Areas or Balancing Authorities, when necessary.                                                                                                                                                                                                                                                                                 |

**Standard IRO-005-3 — Reliability Coordination — Current Day Operations**

| Requirement | Lower | Moderate                                                                                                                                                                                                                                                                                                         | High                                                                                                                                                                                                                                             | Severe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R8          | N/A   | The Reliability Coordinator identified sources of large Area Control Errors that were contributing to Frequency Error, Time Error, or Inadvertent Interchange and discussed corrective actions with the appropriate Balancing Authority but failed to direct the Balancing Authority to comply with CPS and DCS. | The Reliability Coordinator identified sources of large Area Control Errors that were contributing to Frequency Error, Time Error, or Inadvertent Interchange but failed to discuss corrective actions with the appropriate Balancing Authority. | The Reliability Coordinator failed to identify sources of large Area Control Errors that were contributing to Frequency Error, Time Error, or Inadvertent Interchange.                                                                                                                                                                                                                                                                                                                                                      |
| R9          | N/A   | N/A                                                                                                                                                                                                                                                                                                              | N/A                                                                                                                                                                                                                                              | The Reliability Coordinator failed to be aware of the impact on inter-area flows of an inter-Balancing Authority or inter-Transmission Operator, following the operation of a Special Protection System that is armed (e.g., could potentially affect transmission flows resulting in a SOL or IROL violation), or the Transmission Operator failed to immediately inform the Reliability Coordinator of the status of the Special Protection System including any degradation or potential failure to operate as expected. |

**Standard IRO-005-3 — Reliability Coordination — Current Day Operations**

| Requirement | Lower | Moderate                                                                                                                                                   | High | Severe                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R10         | N/A   | N/A                                                                                                                                                        | N/A  | The responsible entity failed to operate the Bulk Electric System to the most limiting parameter in instances where there was a difference in derived limits.                                                                                                                                                                                                                                                                                               |
| R11         | N/A   | N/A                                                                                                                                                        | N/A  | The Transmission Service Provider failed to respect SOLs or IROLs in accordance with filed tariffs and regional Total Transfer Calculation and Available Transfer Calculation processes.                                                                                                                                                                                                                                                                    |
| R12         | N/A   | The Reliability Coordinator failed to notify all impacted Transmission Operators, Balancing Authorities, when the transmission problem had been mitigated. | N/A  | The Reliability Coordinator who foresaw a transmission problem (such as an SOL or IROL violation, loss of reactive reserves, etc.) within its Reliability Coordinator Area failed to issue an alert to all impacted Transmission Operators and Balancing Authorities in its Reliability Coordinator Area, or the receiving Reliability Coordinator failed to disseminate this information to its impacted Transmission Operators and Balancing Authorities. |

**E. Regional Differences**

None identified.

**Version History**

| Version | Date           | Action                                                                                                                                                                                                                                                                                                                                                                                  | Change Tracking |
|---------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 0       | April 1, 2005  | Effective Date                                                                                                                                                                                                                                                                                                                                                                          | New             |
| 0       | August 8, 2005 | Removed “Proposed” from Effective Date                                                                                                                                                                                                                                                                                                                                                  | Errata          |
| 1       |                | Retired R2, R3, R5; modified R9, R13 and R14; retired R16 and R17<br>Retired M2 and M3; modified M9 and M12; retired M13<br>Made conforming changes to data retention<br>Replaced Levels of Non-compliance with the Feb 28, BOT approved Violation Severity Levels (VSLs)<br>Retired VSLs associated with R2, R3, R5, R16 and R17;<br>Modified VSLs associated with R9 and R13, and R14 | Revised         |

**E. Regional Differences**

None identified.

**Version History**

| Version | Date           | Action                                                                                                                                                                                                                                                                                                                                                                                  | Change Tracking |
|---------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 0       | April 1, 2005  | Effective Date                                                                                                                                                                                                                                                                                                                                                                          | New             |
| 0       | August 8, 2005 | Removed “Proposed” from Effective Date                                                                                                                                                                                                                                                                                                                                                  | Errata          |
| 1       |                | Retired R2, R3, R5; modified R9, R13 and R14; retired R16 and R17<br>Retired M2 and M3; modified M9 and M12; retired M13<br>Made conforming changes to data retention<br>Replaced Levels of Non-compliance with the Feb 28, BOT approved Violation Severity Levels (VSLs)<br>Retired VSLs associated with R2, R3, R5, R16 and R17;<br>Modified VSLs associated with R9 and R13, and R14 | Revised         |

## A. Introduction

1. **Title:** **Planned Outage Coordination**
2. **Number:** TOP-003-1
3. **Purpose:** Scheduled generator and transmission outages that may affect the reliability of interconnected operations must be planned and coordinated among Balancing Authorities, Transmission Operators, and Reliability Coordinators.
4. **Applicability**
  - 4.1. Generator Operators.
  - 4.2. Transmission Operators.
  - 4.3. Balancing Authorities.
  - 4.4. Reliability Coordinators.
5. **Proposed Effective Date:**

In those jurisdictions where no regulatory approval is required, the standard shall become effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after BOT adoption.

In those jurisdictions where regulatory approval is required, the standard shall become effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after applicable regulatory approval.

## B. Requirements

- R1. Generator Operators and Transmission Operators shall provide planned outage information.
  - R1.1. Each Generator Operator shall provide outage information daily to its Transmission Operator for scheduled generator outages planned for the next day (any foreseen outage of a generator greater than 50 MW). The Transmission Operator shall establish the outage reporting requirements.
  - R1.2. Each Transmission Operator shall provide outage information daily to affected Balancing Authorities and Transmission Operators for scheduled generator and bulk transmission outages planned for the next day (any foreseen outage of a transmission line or transformer greater than 100 kV or generator greater than 50 MW) that may collectively cause or contribute to an SOL or IROL violation or a regional operating area limitation.
  - R1.3. Such information shall be available by 1200 Central Standard Time for the Eastern Interconnection and 1200 Pacific Standard Time for the Western Interconnection.
- R2. Each Transmission Operator, Balancing Authority, and Generator Operator shall plan and coordinate scheduled outages of system voltage regulating equipment, such as automatic voltage regulators on generators, supplementary excitation control, synchronous condensers, shunt and series capacitors, reactors, etc., among affected Balancing Authorities and Transmission Operators as required.

- R3.** Each Transmission Operator, Balancing Authority, and Generator Operator shall plan and coordinate scheduled outages of telemetering and control equipment and associated communication channels between the affected areas.
- R4.** Each Reliability Coordinator shall resolve any scheduling of potential reliability conflicts.

**C. Measures**

- M1.** Evidence that the Generator Operator, Transmission Operator, and Balancing Authority reported and coordinated scheduled outage information as indicated in the requirements above.

**D. Compliance**

**1. Compliance Monitoring Process**

Each Regional Reliability Organization shall conduct a review every three years to ensure that each responsible entity has a process in place to provide planned generator and/or bulk transmission outage information to their Reliability Coordinator, and with neighboring Transmission Operators and Balancing Authorities.

Investigation: At the discretion of the Regional Reliability Organization or NERC, an investigation may be initiated to review the planned outage process of a monitored entity due to a complaint of non-compliance by another entity. Notification of an investigation must be made by the Regional Reliability Organization to the entity being investigated as soon as possible, but no later than 60 days after the event. The form and manner of the investigation will be set by NERC and/or the Regional Reliability Organization.

**1.1. Compliance Monitoring Responsibility**

A Reliability Coordinator makes a request for an outage to “not be taken” because of a reliability impact on the grid and the outage is still taken. The Reliability Coordinator must provide all its documentation within three business days to the Regional Reliability Organization. Each Regional Reliability Organization shall report compliance and violations to NERC via the NERC Compliance Reporting process.

**1.2. Compliance Monitoring Period and Reset Timeframe**

One calendar year without a violation from the time of the violation.

**1.3. Data Retention**

One calendar year.

**1.4. Additional Compliance Information**

Not specified.

2. Violation Severity Levels:

| Requirement | Lower | Moderate | High | Severe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------|-------|----------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R1          | N/A   | N/A      | N/A  | The Generator Operator failed to provide outage information, in accordance with its Transmission Operators established outage reporting requirements, to its Transmission Operator for scheduled generator outages planned for the next day (any foreseen outage of a generator greater than 50 MW).                                                                                                                                                                                                                                                                     |
| R1.1        | N/A   | N/A      | N/A  | The Transmission Operator failed to provide outage information, in accordance with its Reliability Coordinators established outage reporting requirement, to its Reliability Coordinator, and to affected Balancing Authorities and Transmission Operators for scheduled generator and bulk transmission outages planned for the next day (any foreseen outage of a transmission line or transformer greater than 100 kV or generator greater than 50 MW) that may collectively cause or contribute to an SOL or IROL violation or a regional operating area limitation. |

**Standard-TOP-003-1 — Planned Outage Coordination**

| Requirement | Lower                                                                                                                                                                                                                                                                                                     | Moderate | High | Severe                                                                                                                                                                                                                                                                                                                                                  |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R1.2        | The responsible entity failed to provide the information by 1200 Central Standard Time for the Eastern Interconnection and 1200 Pacific Standard Time for the Western Interconnection.                                                                                                                    | N/A      | N/A  | N/A                                                                                                                                                                                                                                                                                                                                                     |
| R1.3        | N/A                                                                                                                                                                                                                                                                                                       | N/A      | N/A  | The responsible entity failed to plan or coordinate scheduled outages of system voltage regulating equipment, such as automatic voltage regulators on generators, supplementary excitation control, synchronous condensers, shunt and series capacitors, reactors, etc., among affected Balancing Authorities and Transmission Operators when required. |
| R2          | The responsible entity planned and coordinated scheduled outages of telemetering and control equipment and associated communication channels with its Reliability Coordinator, but failed to coordinate with affected neighboring Transmission Operators, Balancing Authorities, and Generator Operators. | N/A      | N/A  | The responsible entity failed to plan and coordinate scheduled outages of telemetering and control equipment and associated communication channels between the affected areas.                                                                                                                                                                          |

**Standard-TOP-003-1 — Planned Outage Coordination**

| Requirement | Lower                                                                                                                                                                                                                                                                                 | Moderate                                                                                                                                                                                                                                                                              | High                                                                                                                                                                                                                                                                                  | Severe                                                                                                                                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R3          | N/A                                                                                                                                                                                                                                                                                   | N/A                                                                                                                                                                                                                                                                                   | N/A                                                                                                                                                                                                                                                                                   | The Reliability Coordinator failed to resolve any scheduling of potential reliability conflicts.                                                                                                                                                 |
| R4          | The Transmission Operator entering an unknown operating state (i.e., any state for which valid operating limits have not been determined), failed to restore operations to respect proven reliable power system limits for more than 30 minutes but less than or equal to 35 minutes. | The Transmission Operator entering an unknown operating state (i.e., any state for which valid operating limits have not been determined), failed to restore operations to respect proven reliable power system limits for more than 35 minutes but less than or equal to 40 minutes. | The Transmission Operator entering an unknown operating state (i.e., any state for which valid operating limits have not been determined), failed to restore operations to respect proven reliable power system limits for more than 40 minutes but less than or equal to 45 minutes. | The Transmission Operator entering an unknown operating state (i.e., any state for which valid operating limits have not been determined), failed to restore operations to respect proven reliable power system limits for more than 45 minutes. |

**E. Regional Variances**

None identified.

**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              |                | Modified R1.2<br>Modified M1<br>Replaced Levels of Non-compliance with the Feb 28, BOT approved Violation Severity Levels (VSLs) | Revised                |
|                |                |                                                                                                                                  |                        |

## A. Introduction

1. **Title:** **Operational Reliability Information**
2. **Number:** TOP-005-2
3. **Purpose:** To ensure reliability entities have the operating data needed to monitor system conditions within their areas.
4. **Applicability**
  - 4.1. Transmission Operators.
  - 4.2. Balancing Authorities.
  - 4.3. Purchasing Selling Entities.
5. **Proposed Effective Date:**

In those jurisdictions where no regulatory approval is required, the standard shall become effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after BOT adoption.

In those jurisdictions where regulatory approval is required, the standard shall become effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after applicable regulatory approval.

## B. Requirements

- R1. As a condition of receiving data from the Interregional Security Network (ISN), each ISN data recipient shall sign the NERC Confidentiality Agreement for “Electric System Reliability Data.”
- R2. Upon request, each Balancing Authority and Transmission Operator shall provide to other Balancing Authorities and Transmission Operators with immediate responsibility for operational reliability, the operating data that are necessary to allow these Balancing Authorities and Transmission Operators to perform operational reliability assessments and to coordinate reliable operations. Balancing Authorities and Transmission Operators shall provide the types of data as listed in Attachment 1-TOP-005 “Electric System Reliability Data,” unless otherwise agreed to by the Balancing Authorities and Transmission Operators with immediate responsibility for operational reliability.
- R3. Each Purchasing-Selling Entity shall provide information as requested by its Host Balancing Authorities and Transmission Operators to enable them to conduct operational reliability assessments and coordinate reliable operations.

## C. Measures

- M1. Evidence that the Balancing Authority, Transmission Operator, and Purchasing-Selling Entity is providing the information required, within the time intervals specified, and in a format agreed upon by the requesting entities.

## D. Compliance

1. **Compliance Monitoring Process**

**1.1. Compliance Monitoring Responsibility**

Self-Certification: Entities shall annually self-certify compliance to the measures as required by its Regional Reliability Organization.

Exception Reporting: Each Region shall report compliance and violations to NERC via the NERC compliance reporting process.

**1.2. Compliance Monitoring Period and Reset Time Frame**

Periodic Review: Entities will be selected for operational reviews at least every three years. One calendar year without a violation from the time of the violation.

**1.3. Data Retention**

Not specified.

**1.4. Additional Compliance Information**

Not specified.

2. Violation Severity Levels:

| Requirement | Lower                                                                                                                        | Moderate | High | Severe                                                                                                                       |
|-------------|------------------------------------------------------------------------------------------------------------------------------|----------|------|------------------------------------------------------------------------------------------------------------------------------|
| R1          | N/A                                                                                                                          | N/A      | N/A  | The ISN data recipient failed to sign the NERC Confidentiality Agreement for “Electric System Reliability Data”.             |
| R2          | The responsible entity failed to provide any of the data requested by other Balancing Authorities or Transmission Operators. | N/A      | N/A  | The responsible entity failed to provide all of the data requested by its host Balancing Authority or Transmission Operator. |
| R3          | The responsible entity failed to provide any of the data requested by other Balancing Authorities or Transmission Operators. | N/A      | N/A  | The responsible entity failed to provide all of the data requested by its host Balancing Authority or Transmission Operator. |

**E. Regional Variances**

None identified.

**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              |                | Removed the Reliability Coordinator from the list of responsible functional entities<br>Deleted R1 and R1.1<br>Modified M1 to omit the reference to the Reliability Coordinator<br>Deleted VSLs for R1 and R1.1 | Revised                |

## Attachment 1-TOP-005

### Electric System Reliability Data

This Attachment lists the types of data that Balancing Authorities, and Transmission Operators are expected to share with other Balancing Authorities and Transmission Operators.

1. The following information shall be updated at least every ten minutes:
  - 1.1. Transmission data. Transmission data for all Interconnections plus all other facilities considered key, from a reliability standpoint:
    - 1.1.1 Status.
    - 1.1.2 MW or ampere loadings.
    - 1.1.3 MVA capability.
    - 1.1.4 Transformer tap and phase angle settings.
    - 1.1.5 Key voltages.
  - 1.2. Generator data.
    - 1.2.1 Status.
    - 1.2.2 MW and MVAR capability.
    - 1.2.3 MW and MVAR net output.
    - 1.2.4 Status of automatic voltage control facilities.
  - 1.3. Operating reserve.
    - 1.3.1 MW reserve available within ten minutes.
  - 1.4. Balancing Authority demand.
    - 1.4.1 Instantaneous.
  - 1.5. Interchange.
    - 1.5.1 Instantaneous actual interchange with each Balancing Authority.
    - 1.5.2 Current Interchange Schedules with each Balancing Authority by individual Interchange Transaction, including Interchange identifiers, and reserve responsibilities.
    - 1.5.3 Interchange Schedules for the next 24 hours.
  - 1.6. Area Control Error and frequency.
    - 1.6.1 Instantaneous area control error.
    - 1.6.2 Clock hour area control error.
    - 1.6.3 System frequency at one or more locations in the Balancing Authority.
2. Other operating information updated as soon as available.
  - 2.1. Interconnection Reliability Operating Limits and System Operating Limits in effect.

- 2.2. Forecast of operating reserve at peak, and time of peak for current day and next day.
- 2.3. Forecast peak demand for current day and next day.
- 2.4. Forecast changes in equipment status.
- 2.5. New facilities in place.
- 2.6. New or degraded special protection systems.
- 2.7. Emergency operating procedures in effect.
- 2.8. Severe weather, fire, or earthquake.
- 2.9. Multi-site sabotage.

## A. Introduction

1. **Title:** **Monitoring System Conditions**
2. **Number:** TOP-006-2
3. **Purpose:** To ensure critical reliability parameters are monitored in real-time.
4. **Applicability**
  - 4.1. Transmission Operators.
  - 4.2. Balancing Authorities.
  - 4.3. Generator Operators.
  - 4.4. Reliability Coordinators.
5. **Proposed Effective Date:**

In those jurisdictions where no regulatory approval is required, the standard shall become effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after BOT adoption.

In those jurisdictions where regulatory approval is required, the standard shall become effective on the latter of either April 1, 2009 or the first day of the first calendar quarter, three months after applicable regulatory approval.

## B. Requirements

- R1. Each Transmission Operator and Balancing Authority shall know the status of all generation and transmission resources available for use.
  - R1.1. Each Generator Operator shall inform its Host Balancing Authority and the Transmission Operator of all generation resources available for use.
  - R1.2. Each Transmission Operator and Balancing Authority shall inform the Reliability Coordinator and other affected Balancing Authorities and Transmission Operators of all generation and transmission resources available for use.
- 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.
- R3. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall provide appropriate technical information concerning protective relays to their operating personnel.
- 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.
- 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.

- 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.
- R7.** Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall monitor system frequency.

**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 1.1)
- M2.** Each 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, or other equivalent evidence that will be used to confirm that it informed its Reliability Coordinator and other affected Balancing Authorities and Transmission Operators of all generation and transmission resources available for use. (Requirement 1.2)
- M3.** 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 2.
- M4.** 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 4)
- M5.** 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 5)
- M6.** 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 7)

**D. Compliance**

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

Regional Reliability Organizations shall be responsible for compliance monitoring.

### **1.2. Compliance Monitoring and Reset Time Frame**

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

- Self-certification (Conducted annually with submission according to schedule.)
- Spot Check Audits (Conducted anytime with up to 30 days notice given to prepare.)
- Periodic Audit (Conducted once every three years according to schedule.)
- Triggered Investigations (Notification of an investigation must be made within 60 days of an event or complaint of noncompliance. The entity will have up to 30 days to prepare for the investigation. An entity may request an extension of the preparation period and the extension will be considered by the Compliance Monitor on a case-by-case basis.)

The Performance-Reset Period shall be 12 months from the last finding of non-compliance.

### **1.3. Data Retention**

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

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

Each Reliability Coordinator, Transmission Operator and Balancing Authority shall have current documents as evidence for Measure 3, 5 and 6.

Each Transmission Operator and Balancing Authority shall have current documents as evidence of compliance to Measure 4.

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

### **1.4. Additional Compliance Information**

None.

2. Violation Severity Levels:

| Requirement | Lower | Moderate                                                                                                                                                                                                              | High                                                                                                                                                                                                                 | Severe                                                                                                                                                                                                                               |
|-------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R1          | N/A   | N/A                                                                                                                                                                                                                   | N/A                                                                                                                                                                                                                  | 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. |
| R1.1        | N/A   | N/A                                                                                                                                                                                                                   | N/A                                                                                                                                                                                                                  | The Generator Operator failed to inform its Host Balancing Authority and the Transmission Operator of all generation resources available for use.                                                                                    |
| R1.2        | N/A   | N/A                                                                                                                                                                                                                   | N/A                                                                                                                                                                                                                  | 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.                              |
| R2          | N/A   | The responsible entity monitors the applicable transmission line status, real and reactive power flows, voltage, load-tap-changer settings, but is not aware of the status of rotating and static reactive resources. | The responsible entity fails to monitor all of the applicable transmission line status, real and reactive power flows, voltage, load-tap-changer settings, and status of all rotating and static reactive resources. | The responsible entity fails to monitor any of the applicable transmission line status, real and reactive power flows, voltage, load-tap-changer settings, and status of rotating and static reactive resources.                     |

**Standard TOP-006-2 — Monitoring System Conditions**

| <b>Requirement</b> | <b>Lower</b>                                                                                                                                     | <b>Moderate</b> | <b>High</b>                                                                                                                                                                                                     | <b>Severe</b>                                                                                                                                                                                                                       |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| R3                 | The responsible entity failed to provide any of the appropriate technical information concerning protective relays to their operating personnel. | N/A             | N/A                                                                                                                                                                                                             | The responsible entity failed to provide all of the appropriate technical information concerning protective relays to their operating personnel.                                                                                    |
| R4                 | 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 failed to have both weather forecasts and past load patterns, available to predict the system's near-term load pattern.                                                                                      |
| R5                 | N/A                                                                                                                                              | N/A             | The responsible entity used monitoring equipment to bring to the attention of operating personnel important deviations in operating conditions, but 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.                                                                            |
| R6                 | 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. |
| R7                 | N/A                                                                                                                                              | N/A             | N/A                                                                                                                                                                                                             | The responsible entity failed to monitor system frequency.                                                                                                                                                                          |

**E. Regional Variances**

None identified.

**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<br>Modified M4<br>Modified Data Retention for M4<br>Replaced Levels of Non-compliance with the Feb 28, BOT approved Violation Severity Levels (VSLs) | Revised                |