

Standard Development Roadmap

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Future Development Plan:

Anticipated Actions

1. Post for 30-day pre-ballot period.
2. First ballot of standards.
3. Recirculation ballot of standards.
4. 30-day posting before board adoption.
5. Board adopts standards.

Anticipated Date

March 15–April 13, 2007
April 16–25, 2007
May 1–10, 2007
To be determined
To be determined

Definitions of Terms Used in Standard

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Real-Time Data: Real-Time measured values, state estimator values derived from the measured values, or other calculated values derived from the measured values — may include directly monitored data, Inter-utility data exchange (e.g., Interconnection Control Area Communication Protocol or SCADA Data), and manually collected data.

Real-Time Monitoring: The act of scanning data and drawing conclusions about what the data indicates.

Self-Certification: A process by which an entity does a self-evaluation to determine if it is compliant with the specific requirements for a reliability standard.

A. Introduction

1. **Title:** **Monitoring the Reliability Coordinator Wide Area**
2. **Number:** IRO-007-1
3. **Purpose:** To prevent instability, uncontrolled separation, or cascading outages that adversely impact the reliability of the interconnection by ensuring that the Bulk Electric System is continuously monitored.
4. **Applicability**
 - 4.1. Reliability Coordinator
5. **Proposed Effective Date:** The latter of either the first day of the first quarter, three months after regulatory approvals **or** coincident with the effective date for FAC-014-1.

B. Requirements

- R1. The Reliability Coordinator shall perform Real-Time Monitoring of system operating parameters within its Wide Area to determine if operating parameters are within their associated Interconnection Reliability Operating Limits (IROLs). (*Violation Risk Factor: Medium*) (*Time Horizon: Real-time Operations*)
- R2. If unanimity cannot be reached on the value for an IROL or its T_v , all Reliability Coordinators who monitor that Facility (or group of Facilities) shall, without delay, use the most conservative of the values under consideration. (*Violation Risk Factor: High*) (*Time Horizon: Real-time Operations*)

C. Measures

- M1. The Reliability Coordinator shall have Real-Time Data for system operating parameters within its Wide Area available in a form that its System Operators can compare to its IROLs as evidence of real-time monitoring.
- M2. For an IROL or its T_v without agreement between Reliability Coordinators, the Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to, operating logs, voice recordings, transcripts of voice recordings, or other equivalent evidence to confirm that it used the most conservative of the values under consideration.

D. Compliance

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

Regional Entity
 - 1.2. **Compliance Monitoring Period and Reset Time Frame**

The Performance-Reset Period shall be 12 months from the last violation.
 - 1.3. **Data Retention**

The Reliability Coordinator shall have evidence of compliance with M1 upon request.

The Reliability Coordinator shall keep evidence to show compliance with M2 for three calendar years

The Compliance Monitor shall keep audited data for three calendar years.

1.4. Additional Compliance Information

The Reliability Coordinator shall demonstrate compliance through Self-Certification submitted to its Compliance Monitor annually. The Compliance Monitor may also use scheduled on-site reviews every three years, investigations initiated in response to a complaint, or other methods as provided for in the Compliance Monitoring Enforcement Program, to assess performance.

The Reliability Coordinator shall demonstrate the following to its Compliance Monitor to inspect during a scheduled, on-site review or as part of an investigation upon complaint:

1.4.1 Its System Operators actively monitoring and comparing Real-Time system operating parameters associated with IROLs.

2. Violation Severity Levels

2.1. Lower: Not applicable.

2.2. Moderate: Not applicable.

2.3. High: Not applicable.

2.4. Severe: A severe violation occurs if either of the following conditions are present:

2.4.1 System operating parameters not monitored in Real-Time and compared against IROLs.

2.4.2 There was a disagreement on the IROL or its T_v and the most conservative limit under consideration was not used.

E. Regional Differences

None

F. Associated Documents

None

Version History

Version	Date	Action	Change Tracking

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Future Development Plan:

Anticipated Actions

Anticipated Date

- | | |
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Definitions of Terms Used in Standard

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Operational Planning Analysis: An analysis of the expected system conditions for the next day's operation and up to 12 months ahead. Expected system conditions include things such as load forecast(s), generation output levels, and known system constraints (transmission facility outages, generator outages, equipment limitations, etc.).

Real-Time Assessment: An examination of existing and expected system conditions, conducted by collecting and reviewing immediately available data.

A. Introduction

- 1. Title:** Reliability Coordinator Operational Analyses and Real-time Assessments
- 2. Number:** IRO-008-1
- 3. Purpose:** To prevent instability, uncontrolled separation, or cascading outages that adversely impact the reliability of the interconnection by ensuring that the Bulk Electric System is assessed during the operations horizon.
- 4. Applicability**
 - 4.1.** Reliability Coordinator.
- 5. Proposed Effective Date:** The latter of either the first day of the first quarter, three months after regulatory approvals **or** coincident with the effective date for FAC-014-1.

B. Requirements.

- R1.** The Reliability Coordinator shall perform Operational Planning Analysis to assess whether the planned operations for the next day within its Wide Area, will exceed any of its Interconnection Reliability Operating Limits (IROLs) during anticipated normal and Contingency event conditions. (*Violation Risk Factor: Medium*) (*Time Horizon: Operations Planning*)
- R2.** The Reliability Coordinator shall perform Real-Time Assessments at least every 30 minutes to determine if its Wide Area is exceeding any IROLs or is expected to exceed any IROLs. (*Violation Risk Factor: High*) (*Time Horizon: Real-time Operations*)
- R3.** When the results of the Reliability Coordinator's Operational Planning Analyses or Real-Time Assessments indicate the need for specific operational actions to prevent or mitigate instances of exceeding IROLs, the Reliability Coordinator shall share its results with those entities that are expected to take those actions. (*Violation Risk Factor: Medium*) (*Time Horizon: Real-time Operations or Same Day Operations*)

C. Measures

- M1.** The Reliability Coordinator shall have, and provide upon request, the results of its latest Operational Planning Analysis.
- M2.** The Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to computer output, operator logs, checklists, or other evidence to show it conducted a Real-Time Assessment at least once every 30 minutes.
- M3.** The Reliability Coordinator shall have and provide upon request, evidence that could include, but is not limited to operating logs, voice recordings, transcripts of voice records, facsimiles, or other equivalent evidence that will be used to confirm that it shared the results of its Operational Planning Analyses and Real-Time Assessments with those entities expected to take actions based on that information.

D. Compliance

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

Electric Reliability Organization

1.2. Compliance Monitoring Period and Reset Time Frame

The Performance-Reset Period shall be 12 months from the last violation.

1.3. Data Retention

The Compliance Monitor shall keep audited data for three calendar years.

The Reliability Coordinator shall keep its latest day-ahead Operational Planning Analysis.

The Reliability Coordinator shall keep evidence for M2 for the most recent two days.

The Reliability Coordinator shall keep evidence for M3 for one month.

1.4. Additional Compliance Information

The Reliability Coordinator shall demonstrate compliance through Self-Certification submitted to its Compliance Monitor annually. The Compliance Monitor may also use scheduled on-site reviews once every three years, investigations initiated in response to a complaint, or other methods as provided for in the Compliance Monitoring Enforcement Program, to assess performance.

2. Violation Severity Levels

2.1. Lower: Not applicable.

2.2. Moderate: Shared the results with some but not all of the entities that were required to take action (R3).

2.3. High: Real-Time Assessments were conducted but not as frequently as required (R2).

2.4. Severe: A severe violation exists if any of the following conditions are present:

2.4.1 Did not perform an Operational Planning Analysis for the next day in accordance with R1.

2.4.2 Did not perform any Real-time Assessments for any continuous eight-hour period (R2).

2.4.3 Did not share the results of its analyses or assessments with any of the entities that were required to take action (R3).

E. Regional Differences

None

F. Associated Documents

None

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Occurrence Period: The time period in which performance is measured and evaluated.

A. Introduction

1. **Title:** Reliability Coordinator Actions to Operate Within IROLs
2. **Number:** IRO-009-1
3. **Purpose:** To prevent instability, uncontrolled separation, or cascading outages that adversely impact the reliability of the interconnection by ensuring prompt action to prevent or mitigate instances of exceeding Interconnection Reliability Operating Limits (IROLs).
4. **Applicability**
 - 4.1. Reliability Coordinator
5. **Proposed Effective Date:** The latter of either the first day of the first quarter, three months after regulatory approvals **or** coincident with the effective date for FAC-014-1.

B. Requirements

- R1.** For each IROL that is identified in advance of Real-time, the Reliability Coordinator shall have one or more Operating Processes, Procedures, or Plans that identify actions it shall take or actions it shall direct others to take to prevent exceeding those IROLs. (*Violation Risk Factor: Medium*) (*Time Horizon: Operations Planning or Same Day Operations*)
- R2.** For each IROL that is identified in advance of Real-time, the Reliability Coordinator shall have one or more Operating Processes, Procedures, or Plans that identify actions it shall take or actions it shall direct others to take (up to and including load shed) to mitigate the magnitude and duration of exceeding that IROL such that the IROL is relieved within the IROL's T_v . (*Violation Risk Factor: Medium*) (*Time Horizon: Operations Planning or Same Day Operations*)
- R3.** When an assessment of actual or expected system conditions predicts that an IROL will be exceeded, the Reliability Coordinator shall implement one or more Operating Processes, Procedures or Plans to prevent exceeding that IROL. (*Violation Risk Factor: High*) (*Time Horizon: Real-time Operations*)
- R4.** When actual system conditions show that there is an instance of exceeding an IROL, the Reliability Coordinator shall, without delay, act or direct others to act to mitigate the magnitude and duration of the instance of exceeding that IROL within the IROL's T_v . (*Violation Risk Factor: High*) (*Time Horizon: Real-time Operations*)

C. Measures

- M1.** The Reliability Coordinator shall have, and provide upon request, one or more documented Operating Processes, Procedures, or Plans that that will be used to confirm that it has Operating Processes, Procedures or Plans to address both preventing and mitigating instances of exceeding IROLs in accordance with Requirement 1 and Requirement 2.
- M2.** The Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to, operating logs, voice recordings, transcripts of voice

recordings, or other equivalent evidence that will be used to confirm that it acted or directed others to act in accordance with Requirement 3 and Requirement 4.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Electric Reliability Organization

1.2. Compliance Monitoring Period and Reset Time Frame

The Performance-Reset Period shall be 12 months from the last violation.

1.3. Data Retention

The Reliability Coordinator shall keep IROL Violation Reports, operations logs, or other documentation for three calendar years. The Compliance Monitor shall keep audited data for three calendar years.

1.4. Additional Compliance Information

The Reliability Coordinator shall demonstrate compliance through self-certification submitted to its Compliance Monitor annually and reporting by exception. If an IROL is exceeded for time greater than T_v , the Reliability Coordinator shall complete and submit to its Compliance Monitor within five days, an IROL Violation Report.

The Compliance Monitor may also use scheduled on-site reviews every three years, and investigations upon complaint, to assess performance.

The Reliability Coordinator shall have the following available for its Compliance Monitor to inspect during a scheduled, on-site review or within 5 days of a request as part of an investigation upon complaint:

1.4.1 Operations logs or other documentation indicating the magnitude and duration of each instance of exceeding an IROL and the actions or directives issued for each of these instances.

1.4.2 IROL Violation Reports.

2. Violation Severity Levels

2.1. Low: Not applicable.

2.2. Moderate Not applicable.

2.3. High: Not applicable.

2.4. Severe: **There shall be a severe violation severity level if any of the following conditions exist:**

2.4.1 One or more IROLs identified in advance of real-time do not have Operating Processes, Procedures, or Plans that identify actions to prevent or mitigate instances of exceeding those IROLs. (R1 and R2)

- 2.4.2 An assessment of actual or expected system conditions predicted that an IROL would be exceeded, but no Operating Processes, Procedures or Plans were implemented to prevent exceeding that IROL. (R3)
- 2.4.3 Actual system conditions showed that there was an instance of exceeding an IROL, and there was a delay of five¹ minutes or more before taking a control action or directing others to act to mitigate the magnitude and duration of the instance of exceeding that IROL (R4)
- 2.4.4 Actual system conditions showed that there was an instance of exceeding an IROL, and no actions or directions were given to mitigate the magnitude and duration of the instance of exceeding that IROL (R4)

E. Regional Differences

None

F. Associated Documents

IROL Violation Report

Version History

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¹ The five minutes is not a 'grace period' before taking any action – the five minutes recognizes that the first actions taken may not result in an action that can be independently confirmed.

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None introduced in this standard.

A. Introduction

1. **Title:** **Reliability Coordinator Data Specification and Collection**
2. **Number:** IRO-010-1
3. **Purpose:** To prevent instability, uncontrolled separation, or cascading outages that adversely impact the reliability of the interconnection by ensuring the Reliability Coordinator has the data it needs to monitor and assess the operation of its Reliability Coordinator Area.
4. **Applicability**
 - 4.1. Reliability Coordinator.
 - 4.2. Balancing Authority.
 - 4.3. Generator Owner.
 - 4.4. Generator Operator.
 - 4.5. Interchange Authority.
 - 4.6. Load-Serving Entity.
 - 4.7. Transmission Operator.
 - 4.8. Transmission Owner.
5. **Proposed Effective Date:** The latter of either the first day of the first quarter, three months after regulatory approvals **or** coincident with the effective date for FAC-014-1.

B. Requirements

- R1. The Reliability Coordinator shall have a documented data specification for data and information to build and maintain models to support Real-Time Monitoring, Operational Planning Analyses, and Real-time Assessments. The specification shall include the following: (*Violation Risk Factor: Low*) (*Time Horizon: Operations Planning*)
 - R1.1. List of required data and information
 - R1.2. Mutually agreeable format
 - R1.3. Timeframe and periodicity for providing data and information (based on its hardware and software requirements, and the time needed to do its Operational Planning Analyses)
 - R1.4. Process for data provision when automated Real-Time system operating data is unavailable.
- R2. The Reliability Coordinator shall distribute its data specification to entities that have Facilities monitored by the Reliability Coordinator and to entities that provide Facility status to the Reliability Coordinator. (*Violation Risk Factor: Low*) (*Time Horizon: Operations Planning*)
- R3. Each Balancing Authority, Generator Owner, Generator Operator, Interchange Authority, Load-serving Entity, Reliability Coordinator, Transmission Operator, and

Transmission Owner shall provide data and information, as specified, to the Reliability Coordinator(s) with which it has a reliability relationship. The data and information is limited to data needed by the Reliability Coordinator to support Real-Time Monitoring, Operational Planning Analyses, and Real-Time Assessments. (*Violation Risk Factor: Medium*) (*Time Horizon: Operations Planning; Same-day Operations; Real-time Operations*)

C. Measures

- M1.** The Reliability Coordinator shall have, and provide upon request, a documented data specification that contains all elements identified in Requirement 1.
- M2.** The Reliability Coordinator shall have, and provide upon request, evidence that it distributed its data specification to entities that have Facilities monitored by the Reliability Coordinator and to entities that provide Facility status to the Reliability Coordinator.
- M3.** The Balancing Authority, Generator Owner, Generator Operator, Load-Serving Entity, Reliability Coordinator, Transmission Operator and Transmission Owner shall each have, and provide upon request, evidence that could include but is not limited to, operator logs, voice recordings, computer printouts, SCADA data, or other equivalent evidence that will be used to confirm that it provided data and information, as specified in Requirement 3.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

Electric Reliability Organization

1.2. Compliance Monitoring Period and Reset Time Frame

The Performance-Reset Period shall be 12 months from the last violation.

1.3. Data Retention

The Reliability Coordinator shall keep its most current data specification.

The Reliability Coordinator shall keep evidence to show compliance with Measure 2

For data that is requested in advance of real-time, the Balancing Authority, Generator Owner, Generator Operator, Load-Serving Entity, Reliability Coordinator, Transmission Operator and Transmission Owner shall keep evidence used to show compliance with Measure 3 for 3 months.

The Compliance Monitor shall keep audited data for three calendar years.

1.4. Additional Compliance Information

The Reliability Coordinator shall demonstrate compliance through Self-Certification submitted to its Compliance Monitor annually. The Compliance Monitor may also use scheduled on-site reviews every three years, and investigations initiated in response to a complaint, or other methods as provided for in the Compliance Monitoring Enforcement Program, to assess performance.

The Reliability Coordinator shall have the following available for its Compliance Monitor to inspect during a scheduled, on-site review or within 5 days of a request as part of an investigation upon complaint:

1.4.1 Data specification(s).

1.4.2 Proof of distribution of the data specification(s).

2. Violation Severity Levels for the Reliability Coordinator

2.1. Lower: There shall be a lower violation severity level if any of the following conditions exist:

2.1.1 Distributed its data specification to greater than or equal to 95% but less than 100% of the entities that have Facilities monitored by the Reliability Coordinator and the entities that provide the Reliability Coordinator with Facility status. (R2)

2.1.2 Provided greater than or equal to 95%- but less than 100% of the data and information to other Reliability Coordinators as specified. (R3)

2.2. Moderate: There shall be a moderate violation severity level of any of the following conditions exist:

2.2.1 Distributed its data specification to greater than or equal to 85% but less than 95% of the entities that have Facilities monitored by the Reliability Coordinator and the entities that provide the Reliability Coordinator with Facility status. (R2)

2.2.2 Provided greater than or equal to 85%, but less than 95% of the data and information to other Reliability Coordinators as specified. (R3)

2.3. High: There shall be a high violation severity level of any of the following conditions exist:

2.3.1 Data specification incomplete (missing one of the following: list of required data, a mutually agreeable format, a timeframe for providing data, a data provision process to use when automated Real-Time system operating data is unavailable). (R1)

2.3.2 Distributed its data specification to greater than or equal to 70%- but less than 85% of the entities that have Facilities monitored by the Reliability Coordinator and the entities that provide the Reliability Coordinator with Facility status. (R2)

2.3.3 Provided greater than or equal to 70%- but less than 85% of the data and information to other Reliability Coordinators as specified. (R3)

2.4. Severe: There shall be a severe violation severity level of any of the following conditions exist:

2.4.1 No data specification (R1)

2.4.2 Data specification distributed to less than 70% of the entities that have Facilities monitored by the Reliability Coordinator and the entities that provide the Reliability Coordinator with Facility status. (R2)

2.4.3 Provided less than 70% of the data and information to other Reliability Coordinators as specified. (R3)

3. Violation Severity Levels for the Balancing Authority, Generator Owner, Generator Operator, Load-Serving Entity, Reliability Coordinator, Transmission Operator and Transmission Owner

3.1. **Lower:** Provided greater than or equal to 95%- but less then 100% of the data and information to the Reliability Coordinator as specified. (R3)

3.2. **Moderate:** Provided greater than or equal to 85%, but less than 95% of the data and information to the Reliability Coordinator as specified. (R3)

3.3. **High:** Provided greater than or equal to 70%, but less than 85% of the data and information to the Reliability Coordinator as specified. (R3)

3.4. **Severe:** Provided less than 70% of the data and information to the Reliability Coordinator as specified. (R3)

E. Regional Differences

None

F. Associated Documents

None

Version History

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