NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Implementation Plan for Operate Within Interconnection Reliability Operating Limits Standards (IRO-008–IRO-10)

Introduction

This implementation plan is associated with the following Interconnection Reliability Operating Limit (IROL) standards:

IRO-008 — Reliability Coordinator Operational Analyses and Real-time Assessments

IRO-009 — Reliability Coordinator Actions to Operate Within IROLs

IRO-010 — Reliability Coordinator Data Specification and Collection

These three standards are "new" standards, not revisions to Version 0 standards. These standards do, however address some of the same topics as addressed in some of the Version 0 standards.

The ballot for each of the IROL standards includes the retirement of associated requirements from some already approved standards and effective dates identified in this implementation plan.

116-390 Village Blvd.
Princeton, NJ 08540
609.452.8060 | www.nerc.com

Implementation Plan Contents:

Prerequisite Approvals

There are no SARs or standards under development that need to be effective before this set of standards becomes effective:

IRO-008 — Reliability Coordinator Operational Analyses and Real-time Assessments
IRO-009 — Reliability Coordinator Actions to Operate Within IROLs
IRO-010 — Reliability Coordinator Data Specification and Collection

Conforming Changes to Requirements in Already Approved Standards

Many elements contained in the set of proposed "Operate within IROL Standards" address the same or similar performance objectives as requirements in already approved standards. To eliminate duplication and minimize confusion, the IROL SDT recommends that the retirement or revision of the following requirements in Version 0 Standards coincident with the implementation of the proposed standards. Justification for these revisions and retirements is provided in the tables on the following pages.

EOP-001-0 — Emergency Operations Planning

- Retire R2

IRO-002-1 — Reliability Coordination – Facilities

- Retire R2

IRO-004-1 — Reliability Coordination – Operations Planning

- Retire ~~entire standard (~~R1 through R6~~)~~

IRO-005-2 — Reliability Coordination – Current Day Operations

- Retire R2, R3, and R5; modify R9, R13 and R14; retire R16 and R17

TOP-003-0 — Planned Outage Coordination

- Modify R1.2

TOP-005-1 — Operational Reliability Information

- Retire R1 and R1.1
- ~~Convert~~ Modify Attachment 1 ~~into a reference~~

TOP-006-1 — Monitoring System Conditions Voltage and Reactive Control

- Modify R4

Revisions or Retirements to Already Approved Standards

The following tables identify the sections of approved standards that shall be retired or revised when this standard is implemented. If the drafting team is recommending the retirement or revision of a requirement, that text is blue.

Already Approved Standard (text in blue is recommended for retirement)	**Proposed Replacement Requirement(s)**
EOP-001-0 **R2.** The Transmission Operator shall have an emergency load reduction plan for all identified IROLs. The plan shall include the details on how the Transmission Operator will implement load reduction in sufficient amount and time to mitigate the IROL violation before system separation or collapse would occur. The load reduction plan must be capable of being implemented within 30 minutes.	**IRO-009-1 R1.** **R1.** For each IROL (in its Reliability Coordinator Area) that the Reliability Coordinator identifies ~~all IROLs identified~~ one or more days prior to the current day, ~~each~~ 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 shedding) that can be implemented in time to prevent exceeding those IROLs.
Notes: ▪ When IRO-009-1 becomes effective, EOP-001-0 R2 should be retired. ▪ The Reliability Coordinator, not the Transmission Operator, is responsible for developing plans for mitigating IROLs. There are no measures or levels of non-compliance that need to be revised or retired when EOP-001-0 R2 is deleted. Mitigation plans need to be implemented so that the instance of exceeding the IROL is mitigated within the IROL's T_v, which can be shorter than 30 minutes.	

Already Approved Standard (text in blue is recommended for retirement)	Proposed Replacement Requirement(s)
IRO-002-1 **R2.** Each Reliability Coordinator shall determine the data requirements to support its reliability coordination tasks and shall request such data from its Transmission Operators, Balancing Authorities, Transmission Owners, Generation Owners, Generation Operators, and Load-Serving Entities, or adjacent Reliability Coordinators.	**IRO-010-1** **R1.** The Reliability Coordinator shall have a documented specification for data and information to build and maintain models to support Real-time monitoring, Operational Planning Analyses, and Real-time Assessments of its Reliability Coordinator Area to prevent instability, uncontrolled separation, and cascading outages. The specification shall include the following: **R1.1**. List of required data and information needed by the Reliability Coordinator to support Real-Time Monitoring, Operational Planning Analyses, and Real-Time Assessments. **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.
Notes: ▪ When IRO-010-1 becomes effective, IRO-002-1 R2 should be retired. ▪ IRO-010-1 requires the Reliability Coordinator to develop and distribute a data specification to ensure that entities provide data as needed to support monitoring, analyses and assessments. The proposed requirements are more explicit than the associated requirement in IRO-002-0.	

Already Approved Standard (text in blue is recommended for retirement)	Proposed Replacement Requirement(s)
IRO-004-1 **R1.** Each Reliability Coordinator shall conduct next-day reliability analyses for its Reliability Coordinator Area to ensure that the Bulk Electric System can be operated reliably in anticipated normal and Contingency event conditions. The Reliability Coordinator shall conduct Contingency analysis studies to identify potential interface and other SOL and IROL violations, including overloaded transmission lines and transformers, voltage and stability limits, etc. **R2.** Each Reliability Coordinator shall pay particular attention to parallel flows to ensure one Reliability Coordinator Area does not place an unacceptable or undue Burden on an adjacent Reliability Coordinator Area.	**IRO-008-1** **R1.** Each Reliability Coordinator shall perform an 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.
Notes: ▪ When IRO-008-1 becomes effective, IRO-004-1 R1 and R2 should be retired. ▪ IRO-008 R1 requires the Reliability Coordinator to look at its 'Wide Area' rather than its 'Reliability Coordinator Area' in conducting its Operational Planning Analyses. ▪ IRO-004-1 R2 is not measurable and rather than retain it as the last remaining requirement in this standard, it should be retired when IRO-008 becomes effective.	

Already Approved Standard (text in blue is recommended for retirement)	**Proposed Replacement Requirement(s)**
IRO-004-1 **R3.** Each Reliability Coordinator shall, in conjunction with its Transmission Operators and Balancing Authorities, develop action plans that may be required, including reconfiguration of the transmission system, re-dispatching of generation, reduction or curtailment of Interchange Transactions, or reducing load to return transmission loading to within acceptable SOLs or IROLs. **R6.** If the results of these studies indicate potential SOL or IROL violations, the Reliability Coordinator shall direct its Transmission Operators, Balancing Authorities and Transmission Service Providers to take any necessary action the Reliability Coordinator deems appropriate to address the potential SOL or IROL violation.	**IRO-009-1** **R1.** For each IROL (in its Reliability Coordinator Area) that the Reliability Coordinator identifies ~~all IROLs identified~~ one or more days prior to the current day, ~~each~~ 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 shedding) that can be implemented in time to prevent exceeding those IROLs. **R2.** For each IROL (in its Reliability Coordinator Area) that the Reliability Coordinator identifies ~~that is identified~~ one or more days prior to the current day, ~~each~~ 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 shedding) to mitigate the magnitude and duration of exceeding that IROL such that the IROL is relieved within the IROL's T_v. **R3.** When an assessment of actual or expected system conditions predicts that an IROL in its Reliability Coordinator Area will be exceeded, the Reliability Coordinator shall implement one or more Operating Processes, Procedures, or Plans (not limited to the Operating Processes, Procedures, or Plans developed for Requirements R1) to prevent exceeding that IROL.
Notes: ▪ When IRO-009-1 becomes effective, IRO-004-1 R3 and R6 should be retired. ▪ IRO-009-1 R1 and R2 require the Reliability Coordinator to have plans to prevent and mitigate instances of exceeding IROLs – under some conditions, the Reliability Coordinator may not have time to 'coordinate' the development of these plans with all of its Transmission Operators and Balancing Authorities. ▪ IRO-009-1 R3 includes language that is more explicit than the language in IRO-004-1 R6: 'results of these studies' is not as specific as 'when an assessment of actual or expected system conditions'.	

Already Approved Standard (text in blue is recommended for retirement)	**Proposed Replacement Requirement(s)**

IRO-004-1

R4. Each Transmission Operator, Balancing Authority, Transmission Owner, Generator Owner, Generator Operator, and Load-Serving Entity in the Reliability Coordinator Area shall provide information required for system studies, such as critical facility status, Load, generation, operating reserve projections, and known Interchange Transactions. This information shall be available by 1200 Central Standard Time for the Eastern Interconnection and 1200 Pacific Standard Time for the Western Interconnection.

R5. Each Reliability Coordinator shall share the results of its system studies, when conditions warrant or upon request, with other Reliability Coordinators and with Transmission Operators, Balancing Authorities, and Transmission Service Providers within its Reliability Coordinator Area. The Reliability Coordinator shall make study results available no later than 1500 Central Standard Time for the Eastern Interconnection and 1500 Pacific Standard Time for the Western Interconnection, unless circumstances warrant otherwise.

IRO-005-2

R2. Each Reliability Coordinator shall be aware of all Interchange Transactions that wheel through, source, or sink in its Reliability Coordinator Area, and make that Interchange Transaction information available to all Reliability Coordinators in the Interconnection.

IRO-010-1

R1. The Reliability Coordinator shall have a documented specification for data and information to build and maintain models to support Real-time monitoring, Operational Planning Analyses, and Real-time Assessments of its Reliability Coordinator Area to prevent instability, uncontrolled separation, and cascading outages. The specification shall include the following:

- **R1.1.** List of required data and information needed by the Reliability Coordinator to support Real-Time Monitoring, Operational Planning Analyses, and Real-Time Assessments.
- **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.

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.

IRO-008-1

R3. When a Reliability Coordinator determines that the results of an Operational Planning Analysis or Real-Time Assessment indicates the need for specific operational actions to prevent or mitigate an instance of exceeding an IROL, the Reliability Coordinator shall share its results with those entities that are expected to take those actions.

Notes:

- When IRO-008-1 and IRO-010-1 become effective, IRO-004-1 R4 and R5 should be retired.
- IRO-010-1 is based on the philosophy that the Reliability Coordinator needs to know, in advance, what data and information it needs and what data and information it needs to share. The periodicity for collecting the data is addressed in IRO-010-1 R1.3. Only a fraction of the reliability-related data needed by the Reliability Coordinator and shared by the Reliability Coordinator is addressed in IRO-004-1 R4. There are two different requirements in IRO-004-1 R5 – to share data with other Reliability Coordinators and for the Reliability Coordinator to share data with entities in its Reliability Coordinator Area. While the first part of IRO-004-1 R5 is replaced by the R3 in IRO-010-1 (requires Reliability Coordinators to provide data to other Reliability Coordinators), the second part of the requirement is replaced by IRO-008-1 R3 (requires the Reliability Coordinator to share the results of its analyses with entities within its Reliability Coordinator Area if those analyses meet certain conditions).
- When IRO-010-1 becomes effective, IRO-005-2 R2 should be retired. The e-tag system replaced the need for this requirement. In addition, if the Reliability Coordinator needs this information, the Reliability Coordinator can add this item to the list of data and information on its data specification under IRO-010 R1

Already Approved Standard (text in blue is recommended for retirement)	**Proposed Replacement Requirement(s)**
IRO-005-2 **R3.** As portions of the transmission system approach or exceed SOLs or IROLs, the Reliability Coordinator shall work with its Transmission Operators and Balancing Authorities to evaluate and assess any additional Interchange Schedules that would violate those limits. If a potential or actual IROL violation cannot be avoided through proactive intervention, the Reliability Coordinator shall initiate control actions or emergency procedures to relieve the violation without delay, and no longer than 30 minutes. The Reliability Coordinator shall ensure all resources, including load shedding, are available to address a potential or actual IROL violation. **R5.** Each Reliability Coordinator shall identify the cause of any potential or actual SOL or IROL violations. The Reliability Coordinator shall initiate the control action or emergency procedure to relieve the potential or actual IROL violation without delay, and no longer than 30 minutes. The Reliability Coordinator shall be able to utilize all resources, including load shedding, to address an IROL violation.	**IRO-009-1** **R1.** For each IROL (in its Reliability Coordinator Area) that the Reliability Coordinator identifies ~~all IROLs identified~~ one or more days prior to the current day, ~~each~~ 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 shedding) that can be implemented in time to prevent exceeding those IROLs. **R2.** For each IROL (in its Reliability Coordinator Area) that the Reliability Coordinator identifies ~~that is identified~~ one or more days prior to the current day, ~~each~~ 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 shedding) to mitigate the magnitude and duration of exceeding that IROL such that the IROL is relieved within the IROL's T_V. **R3.** When an assessment of actual or expected system conditions predicts that an IROL ~~in its Reliability Coordinator Area~~ will be exceeded, the Reliability Coordinator shall implement one or more Operating Processes, Procedures, or Plans (not limited to the Operating Processes, Procedures, or Plans developed for Requirements R1) to prevent exceeding that IROL. **R4.** When actual system conditions show that there is an instance of exceeding an IROL in its Reliability Coordinator Area, 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.

Notes:

- When IRO-009-1 becomes effective, IRO-005-2 R3, and R5 should be retired.
- IRO-005 R3 can lead the Reliability Coordinator to believe it has up to 30 minutes to relieve an IROL violation – but some IROLs have a T_v that is much shorter than 30 minutes.
- IRO-005 R5 can lead the Compliance Enforcement Authority to believe that the Reliability Coordinator has information to see all SOLs, and this is not always true. Every facility in the Transmission Operator's area has a System Operating Limit, but the Reliability Coordinator isn't required to see all these limits and may not have information to determine the cause of instances of exceeding these limits.

Already Approved Standard (text in blue is recommended for deletion)	**Proposed Replacement Requirement(s)**
IRO-005-2 **R9.** 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, ~~IROL,~~ 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.	**IRO-009-1** **R1.** For each IROL (in its Reliability Coordinator Area) that the Reliability Coordinator identifies ~~all IROLs identified~~ one or more days prior to the current day, ~~each~~ 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 shedding) that can be implemented in time to prevent exceeding those IROLs. **R2.** For each IROL (in its Reliability Coordinator Area) that the Reliability Coordinator identifies ~~that is identified~~ one or more days prior to the current day, ~~each~~ 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 shedding) to mitigate the magnitude and duration of exceeding that IROL such that the IROL is relieved within the IROL's T_V. **R3.** When an assessment of actual or expected system conditions predicts that an IROL in its Reliability Coordinator Area will be exceeded, the Reliability Coordinator shall implement one or more Operating Processes, Procedures, or Plans (not limited to the Operating Processes, Procedures, or Plans developed for Requirements R1) to prevent exceeding that IROL. **R4.** When actual system conditions show that there is an instance of exceeding an IROL in its Reliability Coordinator Area, 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.

Notes:

- When IRO-009-1 becomes effective, IRO-005-2 R9 should be modified.
- IRO-005 R9 includes two requirements – one for coordinating outages, and one for coordinating the mitigation of IROLs and other limits. IRO-009-1 includes requirements to have and execute action plans to prevent and mitigate instances of exceeding IROLs.

Already Approved Standard (text in blue is recommended for deletion)	Proposed Replacement Requirement(s)
IRO-005-2 **R13.** Each Reliability Coordinator shall ensure that all Transmission Operators, Balancing Authorities, Generator Operators, Transmission Service Providers, Load-Serving Entities, and Purchasing-Selling Entities operate to prevent the likelihood that a disturbance, action, or non-action in its Reliability Coordinator Area will result in a SOL or IROL violation in another area of the Interconnection. In instances where there is a difference in derived limits, the Reliability Coordinator and its 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.	**IRO-009-1** **R1.** For each IROL (in its Reliability Coordinator Area) that the Reliability Coordinator identifies ~~all IROLs identified~~ one or more days prior to the current day, ~~each~~ 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 shedding) that can be implemented in time to prevent exceeding those IROLs. **R2.** For each IROL (in its Reliability Coordinator Area) that the Reliability Coordinator identifies ~~that is identified~~ one or more days prior to the current day, ~~each~~ 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 shedding) to mitigate the magnitude and duration of exceeding that IROL such that the IROL is relieved within the IROL's T_v. **R3.** When an assessment of actual or expected system conditions predicts that an IROLin its Reliability Coordinator Area will be exceeded, the Reliability Coordinator shall implement one or more Operating Processes, Procedures, or Plans (not limited to the Operating Processes, Procedures, or Plans developed for Requirements R1) to prevent exceeding that IROL. **R4.** When actual system conditions show that there is an instance of exceeding an IROL in its Reliability Coordinator Area, 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. **R5.** If unanimity cannot be reached on the value for an IROL or its Tv, all Reliability Coordinators who monitor that Facility (or group of Facilities) shall, without delay, use the most conservative of the values (the value with the least impact on reliability) under consideration.

Notes:

- When IRO-009-1 becomes effective, IRO-005-2 R13 should be revised.
- IRO-005 R13 has two requirements – one to direct actions to ensure SOLs and IROLs are not exceeded, and one requirement to operate to the most limiting parameter in situations where there is disagreement on a limit. The first requirement in IRO-015 R13 assumes that the Reliability Coordinator can see all System Operating Limits, and this is not always true. The Reliability Coordinator is responsible for seeing IROLs and controlling operations within its Reliability Coordinator Area so as to prevent instances of exceeding IROLs.
- The second part of IRO-005 R13 requires entities to operate to the most limiting parameter when there is a difference in derived limits. This should be revised so that it is not applicable to the Reliability Coordinator – IRO-009-1 R5 has a similar requirement that is applicable totally to the Reliability Coordinator and focused solely on IROLs.

Already Approved Standard (text in blue is recommended for deletion or retirement – the red text is an addition to the text that already exists in the requirement)	**Proposed Replacement Requirement(s)**
IRO-005-2 **R14.** Each Reliability Coordinator shall make known to Transmission Service Providers within its Reliability Coordinator Area, SOLs or IROLs within its wide-area view. The Transmission Service Providers shall respect ~~these~~ **SOLs** ~~or~~ and IROLs in accordance with filed tariffs and regional Total Transfer Calculation and Available Transfer Calculation processes. **R16.** Each Reliability Coordinator shall confirm reliability assessment results and determine the effects within its own and adjacent Reliability Coordinator Areas. The Reliability Coordinator shall discuss options to mitigate potential or actual SOL or IROL violations and take actions as necessary to always act in the best interests of the Interconnection at all times. **R17.** When an IROL or SOL is exceeded, the Reliability Coordinator shall evaluate the local and wide-area impacts, both real-time and post-contingency, and determine if the actions being taken are appropriate and sufficient to return the system to within IROL in thirty minutes. If the actions being taken are not appropriate or sufficient, the Reliability Coordinator shall direct the Transmission Operator, Balancing Authority, Generator Operator, or Load-Serving Entity to return the system to within IROL or SOL.	**IRO-009-1** **R3.** When an assessment of actual or expected system conditions predicts that an IROL ~~-~~ in its Reliability Coordinator Area will be exceeded, the Reliability Coordinator shall implement one or more Operating Processes, Procedures, or Plans (not limited to the Operating Processes, Procedures, or Plans developed for Requirements R1) to prevent exceeding that IROL. **R4.** When actual system conditions show that there is an instance of exceeding an IROL in its Reliability Coordinator Area, 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.

Notes:

- When IRO-009-1 becomes effective, IRO-005-2 R14 should be modified and R16 and R17 should be retired.
- IRO-005-2 R14 part 1 should be retired and part 2 should be modified as it is not correct. Notifying the Transmission Service Provider of SOLs and IROLs is already addressed under FAC-014 R5.1. The Transmission Service Provider should respect both SOLs and IROLs – R14 implies that the Transmission Service Provider may respect 'either' SOLs or IROLs.
- IRO-005 R16 is a mix of requirements and the Missing Measures and Compliance Elements drafting team determined that, as written, R16 is too vague to be measured. The intent of this requirement is duplicated more clearly in IRO-008 and IRO-009.
- IRO-005 R17 can lead the Reliability Coordinator to believe it has up to 30 minutes to relieve an IROL violation – but some IROLs have a T_v that is much shorter than 30 minutes.

Already Approved Standard (text in blue is recommended for deletion)	Proposed Replacement Requirement(s)
TOP-003-0 **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 ~~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. ~~The Reliability Coordinator shall establish the outage reporting requirements.~~	**IRO-010-1** **R1.** The Reliability Coordinator shall have a documented specification for data and information to build and maintain models to support Real-time monitoring, Operational Planning Analyses, and Real-time Assessments of its Reliability Coordinator Area to prevent instability, uncontrolled separation, and cascading outages. The specification shall include the following: **R1.1.** List of required data and information needed by the Reliability Coordinator to support Real-Time Monitoring, Operational Planning Analyses, and Real-Time Assessments. **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. **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.
Notes: ▪ ~~-~~When IRO-010-1 becomes effective, TOP-003-0 R1.2 should be modified. The certification process should include a requirement for the Reliability Coordinator to have a procedure for coordinating outages that includes identification of reliability-related lead times. ▪ IRO-010-1 requires the Reliability Coordinator to provide data to other Reliability Coordinators in accordance with the data specifications it has received from those other Reliability Coordinators. Daily outage data is one of the types of data that is expected to be identified on the Reliability Coordinator's documented data specification since this is data needed to maintain real-time models.	

Already Approved Standard (text in blue is recommended for retirement)	Proposed Replacement Requirement(s)
TOP-005-1 **R1**. Each Transmission Operator and Balancing Authority shall provide its Reliability Coordinator with the operating data that the Reliability Coordinator requires to perform operational reliability assessments and to coordinate reliable operations within the Reliability Coordinator Area. **R1.1** Each Reliability Coordinator shall identify the data requirements from the list in Attachment 1-TOP-005-0 "Electric System Reliability Data" and any additional operating information requirements relating to operation of the bulk power system within the Reliability Coordinator Area.	**IRO-010-1** **R1.** The Reliability Coordinator shall have a documented specification for data and information to build and maintain models to support Real-time monitoring, Operational Planning Analyses, and Real-time Assessments of its Reliability Coordinator Area to prevent instability, uncontrolled separation, and cascading outages. The specification shall include the following: **R1.1**. List of required data and information needed by the Reliability Coordinator to support Real-Time Monitoring, Operational Planning Analyses, and Real-Time Assessments. **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. **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.

Notes:

- When IRO-010-1 becomes effective, TOP-005-1 R1 and R1.1 should be retired.
- Under IRO-010-1 each Reliability Coordinator must document what data and information it needs and entities must provide that data. The data needed by the Reliability Coordinator is needed for more than just reliability assessments – some of the data is used for real-time monitoring. Several entities, beyond the Transmission Operator and Balancing Authority (the only responsible entities identified in R1 of TOP-005-1) have data and information needed by the Reliability Coordinator.

Already Approved Standard	Proposed Replacement
TOP-005-1 Attachment 1-TOP-005-0 - Electric System Reliability Data This Attachment lists the types of data that ~~Reliability Coordinators,~~ Balancing Authorities, and Transmission Operators are expected to provide, and are expected to share with ~~each~~ 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.	~~New Technical Reference – in accordance with FERC Order 693, add the following to this list:~~ ~~▪operational status of special protection systems~~ ~~▪operational status of power system stabilizers~~ **IRO-010-1** **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.

Notes:

- When IRO-010-1 becomes effective, 'Attachment 1-TOP-005-0 Electric System Reliability Data' should be ~~translated into a Technical Reference. This data is only a partial list of data and information that the Reliability Coordinator needs to support reliable operations~~modified to omit the reference to the Reliability Coordinator. The Reliability Coordinator's requirement to share data with other Reliability Coordinators is addressed in IRO-010-1 R3. ~~The reference should include the operational status of special protection systems and the operational status of power system stabilizers to comply with one of the FERC directives in Order 693.~~

Already Approved Standard (text in blue is recommended for deletion)	Proposed Replacement Requirement(s)
TOP-006-1 **R4.** Each ~~Reliability Coordinator,~~ 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.	**IRO-010-1** **R1.** The Reliability Coordinator shall have a documented specification for data and information to build and maintain models to support Real-time monitoring, Operational Planning Analyses, and Real-time Assessments of its Reliability Coordinator Area to prevent instability, uncontrolled separation, and cascading outages. The specification shall include the following: **R1.1.** List of required data and information needed by the Reliability Coordinator to support Real-Time Monitoring, Operational Planning Analyses, and Real-Time Assessments. **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. **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.
Notes: ▪ When IRO-010-1 becomes effective, TOP-006-1 R4 should be modified. ▪ The information identified in TOP-006-1 R4 is not inclusive, and is addressed more globally for the Reliability Coordinator in IRO-010-1 R1 and R3.	

Functions that Must Comply with the Requirements in the Standards

Standard	Functions that Must Comply With the Requirements							
	Reliability Coordinator	Balancing Authority	Interchange Authority	Transmission Operator	Transmission Owner	Generator Owner	Generator Operator	Load Serving Entity
IRO-008-1 Analyses & Assessments	X							
IRO-009-1 Actions to Operate within IROLs	X							
IRO-010-1 Data Specification & Collection	X	X	X	X	X	X	X	X

Effective Dates

In those jurisdictions where no regulatory approval is required, the standards shall all 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 standards shall all 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.