

Standard Development Timeline

This section is maintained by the drafting team during the development of the standard and will be removed when the standard is adopted by the NERC Board of Trustees (Board).

Description of Current Draft

Completed Actions	Date
Standards Committee approved Standard Authorization Request (SAR) for posting	08/19/15
SAR posted for comment	08/20/15 – 09/21/15
45-day formal comment period with additional ballot	06/19/20 – 08/26/20

Anticipated Actions	Date
10-day final ballot	April 2021
NERC Board adoption	May 2021

New or Modified Term(s) Used in NERC Reliability Standards

This section includes all new or modified terms used in the proposed standard that will be included in the *Glossary of Terms Used in NERC Reliability Standards* upon applicable regulatory approval. Terms used in the proposed standard that are already defined and are not being modified can be found in the *Glossary of Terms Used in NERC Reliability Standards*. The new or revised terms listed below will be presented for approval with the proposed standard. Upon Board adoption, this section will be removed.

Proposed Modified Term

System Operating Limit:

All Facility Ratings, System Voltage Limits, and stability limits, applicable to ~~The value (such as MW, Mvar, amperes, frequency or volts) that satisfies the most limiting of the prescribed operating criteria for a specified system configurations, used in Bulk Electric System operations for monitoring and assessing pre- and post-Contingency operating states. to ensure operation within acceptable reliability criteria. System Operating Limits are based upon certain operating criteria. These include, but are not limited to:~~

- ~~• Facility Ratings (applicable pre and post Contingency Equipment Ratings or Facility Ratings)~~
- ~~• transient stability ratings (applicable pre and post Contingency stability limits)~~
- ~~• voltage stability ratings (applicable pre and post Contingency voltage stability)~~
- ~~• system voltage limits (applicable pre and post Contingency voltage limits)~~

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All Facility Ratings, System Voltage Limits, and stability limits, applicable to specified System configurations, used in Bulk Electric System operations for monitoring and assessing pre- and post-Contingency operating states.

A. Introduction

1. **Title:** Reliability Coordinator Operational Analyses and Real-time Assessments
2. **Number:** IRO-008-~~23~~
3. **Purpose:** Perform analyses and assessments to prevent instability, uncontrolled separation, or Cascading.
4. **Applicability**
 - 4.1. Reliability Coordinator.
5. **Proposed Effective Date:**
See Implementation Plan.
6. **Background**
See Project 2014-03 [project page](#).

B. Requirements and Measures

- R1.** Each Reliability Coordinator shall perform an Operational Planning Analysis that will allow it to assess whether the planned operations for the next-day will exceed System Operating Limits (SOLs) and Interconnection Reliability Operating Reliability Limits (IROLs) within its Wide Area. [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*]
- M1.** Each Reliability Coordinator shall have evidence of a completed Operational Planning Analysis. Such evidence could include but is not limited to dated power flow study results.
- R2.** Each Reliability Coordinator shall have a coordinated Operating Plan(s) for next-day operations to address potential System Operating Limit (SOL) and Interconnection Reliability Operating Limit (IROL) exceedances identified as a result of its Operational Planning Analysis as performed in Requirement R1 while considering the Operating Plans for the next-day provided by its Transmission Operators and Balancing Authorities. [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*]
- M2.** Each Reliability Coordinator shall have evidence that it has a coordinated Operating Plan for next-day operations to address potential System Operating Limit (SOL) and Interconnection Reliability Operating Limit (IROL) exceedances identified as a result of the Operational Planning Analysis performed in Requirement R1 while considering the Operating Plans for the next-day provided by its Transmission Operators and Balancing Authorities. Such evidence could include but is not limited to plans for precluding operating in excess of each SOL and IROL that were identified as a result of the Operational Planning Analysis.

- R3.** Each Reliability Coordinator shall notify impacted entities identified in its Operating Plan(s) cited in Requirement R2 as to their role in such plan(s). *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*
- M3.** Each Reliability Coordinator shall have evidence that it notified impacted entities identified in its Operating Plan(s) cited in Requirement R2 as to their role in such plan(s). Such evidence could include, but is not limited to, dated operator logs, or e-mail records.
- R4.** Each Reliability Coordinator shall ensure that a Real-time Assessment is performed at least once every 30 minutes. *[Violation Risk Factor: High] [Time Horizon: Same-day Operations, Real-time Operations]*
- M4.** Each Reliability Coordinator shall have, and make available upon request, evidence to show it ensured that a Real-time Assessment is performed at least once every 30 minutes. This evidence could include but is not limited to dated computer logs showing times the assessment was conducted, dated checklists, or other evidence.
- R5.** Each Reliability Coordinator shall notify, in accordance with its SOL methodology, impacted Transmission Operators and Balancing Authorities within its Reliability Coordinator Area, and other impacted Reliability Coordinators as indicated in its Operating Plan, when the results of a Real-time Assessment indicate an actual or expected condition that results in, or could result in, a System Operating Limit (SOL) exceedance or an Interconnection Reliability Operating Limit (IROL) exceedance within its Wide Area. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-time Operations]*
- M5.** Each Reliability Coordinator shall make available upon request, evidence that it informed, in accordance with its SOL methodology impacted Transmission Operators and Balancing Authorities within its Reliability Coordinator Area, and other impacted Reliability Coordinators as indicated in its Operating Plan, of its actual or expected operations that result in, or could result in, a System Operating Limit (SOL) exceedance or an Interconnection Reliability Operating Limit (IROL) exceedance within its Wide Area. Such evidence could include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or other equivalent evidence. If such a situation has not occurred, the Reliability Coordinator may provide an attestation.
- R6.** Each Reliability Coordinator shall notify, in accordance with SOL methodology, impacted Transmission Operators and Balancing Authorities within its Reliability Coordinator Area, and other impacted Reliability Coordinators as indicated in its Operating Plan, when the System Operating Limit (SOL) exceedance or an Interconnection Reliability Operating Limit (IROL) exceedance identified in Requirement R5 has been prevented or mitigated. *[Violation Risk Factor: Medium] [Time Horizon: Same-Day Operations, Real-time Operations]*

- M6.** Each Reliability Coordinator shall make available upon request, evidence that it informed, in accordance with its SOL methodology impacted Transmission Operators and Balancing Authorities within its Reliability Coordinator Area, and other impacted Reliability Coordinators as indicated in its Operating Plan, when the System Operating Limit (SOL) exceedance or an Interconnection Reliability Operating Limit (IROL) exceedance identified in Requirement R5 has been prevented or mitigated. Such evidence could include but is not limited to dated operator logs, voice recordings or transcripts of voice recordings, electronic communications, or other equivalent evidence. If such a situation has not occurred, the Reliability Coordinator may provide an attestation.
- R7.** Each Reliability Coordinator shall use its SOL methodology when determining SOL exceedances for Real-time Assessments, Real-time monitoring, and Operational Planning Analysis. [Violation Risk Factor: Medium] [Time Horizon: Same-Day Operations, Real-time Operations, Operations Planning]
- M7.** Each Reliability Coordinator shall have, and provide upon request, evidence that it used its SOL methodology for determining SOL exceedances for Real-time Assessments, Real-time monitoring, and Operational Planning Analysis. Evidence could include, but is not limited to: Operating Plans, contingency sets, SOLs, alarming and study reporting thresholds, operator logs, voice recordings or other equivalent evidence.

C. Compliance

1. Compliance Monitoring Process

1.1. Compliance Enforcement Authority

As defined in the NERC Rules of Procedure, “Compliance Enforcement Authority” (CEA) means NERC or the Regional Entity in their respective roles of monitoring and enforcing compliance with the NERC Reliability Standards.

1.2. Compliance Monitoring and Assessment Processes

As defined in the NERC Rules of Procedure, “Compliance Monitoring and Assessment Processes” refers to the identification of the processes that will be used to evaluate data or information for the purpose of assessing performance or outcomes with the associated reliability standard.

1.3. Data Retention

The following evidence retention periods identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full time period since the last audit.

Each Reliability Coordinator shall keep data or evidence to show compliance for Requirements R1 through R3, R5, ~~and R6, and R7~~ and Measures M1 through M3, M5, ~~and M6, and M7~~ for a rolling 90-calendar days period for analyses, the most recent 90-calendar days for voice recordings, and 12 months for operating logs and e-mail records unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

Each Reliability Coordinator shall each keep data or evidence for Requirement R4 and Measure M4 for a rolling 30-calendar day period, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

If a Reliability Coordinator is found non-compliant, it shall keep information related to the non-compliance until found compliant or the time period specified above, whichever is longer.

The Compliance Enforcement Authority shall keep the last audit records and all requested and submitted subsequent audit records.

1.4. Additional Compliance Information

None

Table of Compliance Elements

R#	Time Horizons	VRF	Violation Severity Levels			
			Lower VSL	Moderate VSL	High VSL	Severe VSL
R1	Operations Planning	Medium	N/A	N/A	N/A	The Reliability Coordinator did not perform an Operational Planning Analysis allowing it to assess whether its planned operations for the next-day within its Wide Area will exceed any of its System Operating Limits (SOLs) and Interconnection Reliability Operating Reliability Limits (IROLs).
R2	Operations Planning	Medium	N/A	N/A	N/A	The Reliability Coordinator did not have a coordinated Operating Plan(s) for next-day operations to address potential System Operating Limit (SOL) and Interconnection Reliability Operating Limit (IROL) exceedances identified as a result of its Operational Planning Analysis as performed in Requirement R1 while considering the Operating Plans for the next-day provided by its Transmission Operators and Balancing

R#	Time Horizons	VRF	Violation Severity Levels			
			Lower VSL	Moderate VSL	High VSL	Severe VSL
						Authorities.
<p>For the Requirement R3 and R5 VSLs, the intent of the SDT is to start with the Severe VSL first and then to work your way to the left until you find the situation that fits. In this manner, the VSL will not be discriminatory by size. If a Reliability Coordinator has just one affected reliability entity to inform, the intent is that that situation would be a Severe violation</p>						
R3	Operations Planning	Medium	The Reliability Coordinator did not notify one impacted entity or 5% or less of the impacted entities whichever is greater identified in its Operating Plan(s) as to their role in that plan(s).	The Reliability Coordinator did not notify two impacted entities or more than 5% and less than or equal to 10% of the impacted entities whichever is greater, identified in its Operating Plan(s) as to their role in that plan(s).	The Reliability Coordinator did not notify three impacted entities or more than 10% and less than or equal to 15% of the impacted entities whichever is greater, identified in its Operating Plan(s) as to their role in that plan(s).	The Reliability Coordinator did not notify four or more impacted entities or more than 15% of the impacted entities identified in its Operating Plan(s) as to their role in that plan(s).
R4	Same-day Operations, Real-time	High	For any sample 24-hour period within the 30-day retention	For any sample 24-hour period within the 30-day retention period,	For any sample 24-hour period within the 30-day retention	For any sample 24-hour period within the 30-day retention period, the Reliability Coordinator’s Real-time

R#	Time Horizons	VRF	Violation Severity Levels			
			Lower VSL	Moderate VSL	High VSL	Severe VSL
	Operations		period, the Reliability Coordinator’s Real-time Assessment was not conducted for one 30-minute period within that 24-hour period.	the Reliability Coordinator’s Real-time Assessment was not conducted for two 30-minute periods within that 24-hour period.	period, the Reliability Coordinator’s Real-time Assessment was not conducted for three 30-minute periods within that 24-hour period.	Assessment was not conducted for three or more 30-minute periods within that 24-hour period.
R5	Same-Day Operations, Real-time Operations	High	The Reliability Coordinator did not notify, <u>in accordance with its SOL methodology</u> one impacted Transmission Operator or Balancing Authority within its Reliability Coordinator Area or 5% or less of the impacted	The Reliability Coordinator did not notify, <u>in accordance with its SOL methodology</u> two impacted Transmission Operators and Balancing Authorities within its Reliability Coordinator Area or more than 5% and less than or equal to 10% of	The Reliability Coordinator did not notify, <u>in accordance with its SOL methodology</u> three impacted Transmission Operators and Balancing Authorities within its Reliability Coordinator Area or more than 10% and	The Reliability Coordinator did not notify , <u>notify, in accordance with its SOL methodology</u> four or more impacted Transmission Operators and Balancing Authorities within its Reliability Coordinator Area or more than 15% of the impacted Transmission Operators and Balancing Authorities within its Reliability Coordinator Area identified in the Operating Plan(s) as to their role in the plan(s). OR The Reliability Coordinator did not notify the other impacted

R#	Time Horizons	VRF	Violation Severity Levels			
			Lower VSL	Moderate VSL	High VSL	Severe VSL
			Transmission Operators and Balancing Authorities within its Reliability Coordinator Area whichever is greater, when the results of its Real-time Assessment indicate an actual or expected condition that results in, or could result in, a System Operating Limit (SOL) <u>exceedance</u> or <u>an</u> Interconnection Reliability Operating Limit (IROL)	the impacted Transmission Operators and Balancing Authorities within its Reliability Coordinator Area whichever is greater, when the results of its Real-time Assessment indicate an actual or expected condition that results in, or could result in, a System Operating Limit (SOL) <u>exceedance</u> or <u>an</u> Interconnection Reliability Operating Limit (IROL) exceedance within its Wide Area.	less than or equal to 15% of the impacted Transmission Operators and Balancing Authorities within its Reliability Coordinator Area whichever is greater, when the results of its Real-time Assessment indicate an actual or expected condition that results in, or could result in, a System Operating Limit (SOL) <u>exceedance</u> or <u>an</u> Interconnection	Reliability Coordinators, as indicated in its Operating Plan, when the results of its Real-time Assessment indicate an actual or expected condition that results in, or could result in, a System Operating Limit (SOL) <u>exceedance</u> or <u>an</u> Interconnection Reliability Operating Limit (IROL) exceedance within its Wide Area.

R#	Time Horizons	VRF	Violation Severity Levels			
			Lower VSL	Moderate VSL	High VSL	Severe VSL
			exceedance within its Wide Area.		Reliability Operating Limit (IROL) exceedance within its Wide Area.	
R6	Same-Day Operations, Real-time Operations	Medium	The Reliability Coordinator did not notify, <u>in accordance with its SOL methodology</u> one impacted Transmission Operator or Balancing Authority within its Reliability Coordinator Area or 5% or less of the impacted Transmission Operators and Balancing Authorities	The Reliability Coordinator did not notify, <u>in accordance with its SOL methodology</u> two impacted Transmission Operators or Balancing Authorities within its Reliability Coordinator Area or more than 5% and less than or equal to 10% of the impacted Transmission Operators and Balancing	The Reliability Coordinator did not notify, <u>in accordance with its SOL methodology</u> three impacted Transmission Operators or Balancing Authorities within its Reliability Coordinator Area or more than 10% and less than or equal to 15% of the impacted Transmission	The Reliability Coordinator did not notify , <u>notify, in accordance with its SOL methodology</u> four or more impacted Transmission Operators or Balancing Authorities within its Reliability Coordinator Area or more than 15% of the impacted Transmission Operators and Balancing Authorities within its Reliability Coordinator Area when the System Operating Limit (SOL) <u>exceedance</u> or <u>an</u> Interconnection Reliability Operating Limit (IROL) exceedance identified in Requirement R5 was prevented or mitigated. OR The Reliability Coordinator did not notify four or more other

R#	Time Horizons	VRF	Violation Severity Levels			
			Lower VSL	Moderate VSL	High VSL	Severe VSL
			within its Reliability Coordinator Area whichever is greater, when the System Operating Limit (SOL) <u>exceedance</u> or <u>an</u> Interconnection Reliability Operating Limit (IROL) exceedance identified in Requirement R5 was prevented or mitigated. OR The Reliability Coordinator did not notify one other impacted Reliability Coordinator as	Authorities within its Reliability Coordinator Area whichever is greater, when the System Operating Limit (SOL) <u>exceedance</u> or <u>an</u> Interconnection Reliability Operating Limit (IROL) exceedance identified in Requirement R6 was prevented or mitigated. OR The Reliability Coordinator did not notify two other impacted Reliability Coordinators as indicated in its Operating Plan	Operators and Balancing Authorities within its Reliability Coordinator Area whichever is greater, when the System Operating Limit (SOL) <u>exceedance</u> or <u>an</u> Interconnection Reliability Operating Limit (IROL) exceedance identified in Requirement R5 was prevented or mitigated. OR The Reliability Coordinator did not notify three	impacted Reliability Coordinators as indicated in its Operating Plan when the System Operating Limit (SOL) <u>exceedance</u> or <u>an</u> Interconnection Reliability Operating Limit (IROL) exceedance identified in Requirement R5 was prevented or mitigated.

R#	Time Horizons	VRF	Violation Severity Levels			
			Lower VSL	Moderate VSL	High VSL	Severe VSL
			indicated in its Operating Plan when the when the System Operating Limit (SOL) <u>exceedance</u> or <u>an</u> Interconnection Reliability Operating Limit (IROL) exceedance identified in Requirement R5 was prevented or mitigated.	when the System Operating Limit (SOL) <u>exceedance</u> or <u>an</u> Interconnection Reliability Operating Limit (IROL) exceedance identified in Requirement R5 was prevented or mitigated.	other impacted Reliability Coordinators as indicated in its Operating Plan when the System Operating Limit (SOL) <u>exceedance</u> or <u>an</u> Interconnection Reliability Operating Limit (IROL) exceedance identified in Requirement R5 was prevented or mitigated.	
<u>R7</u>	<u>Same-Day Operations,</u> <u>Real-time Operations</u>	<u>Medium</u>				<u>The Reliability Coordinator failed to use its SOL methodology when determining SOL exceedances for Real-time Assessments, Real-time Monitoring, and Operational Planning Analysis.</u>

D. Regional Variances

None

E. Interpretations

None

F. Associated Documents

Operating Plan - An Operating Plan includes general Operating Processes and specific Operating Procedures. It may be an overview document which provides a prescription for an Operating Plan for the next-day, or it may be a specific plan to address a specific SOL or IROL exceedance identified in the Operational Planning Analysis (OPA). Consistent with the NERC definition, Operating Plans can be general in nature, or they can be specific plans to address specific reliability issues. The use of the term Operating Plan in the revised TOP/IRO standards allows room for both. An Operating Plan references processes and procedures, including electronic data exchange, which are available to the System Operator on a daily basis to allow the operator to reliably address conditions which may arise throughout the day. It is valid for tomorrow, the day after, and the day after that. Operating Plans should be augmented by temporary operating guides which outline prevention/mitigation plans for specific situations which are identified day-to-day in an OPA or a Real-time Assessment (RTA). As the definition in the Glossary of Terms states, a restoration plan is an example of an Operating Plan. It contains all the overarching principles that the System Operator needs to work his/her way through the restoration process. It is not a specific document written for a specific blackout scenario but rather a collection of tools consisting of processes, procedures, and automated software systems that are available to the operator to use in restoring the system. An Operating Plan can in turn be looked upon in a similar manner. It does not contain a prescription for the specific set-up for tomorrow but contains a treatment of all the processes, procedures, and automated software systems that are at the operator's disposal. The existence of an Operating Plan, however, does not preclude the need for creating specific action plans for specific SOL or IROL exceedances identified in the OPA. When a Reliability Coordinator performs an OPA, the analysis may reveal instances of possible SOL or IROL exceedances for pre- or post-Contingency conditions. In these instances, Reliability Coordinators are expected to ensure that there are plans in place to prevent or mitigate those SOLs or IROLs, should those operating conditions be encountered the next day. The Operating Plan may contain a description of the process by which specific prevention or mitigation plans for day-to-day SOL or IROL exceedances identified in the OPA are handled and communicated. This approach could alleviate any potential administrative burden associated with perceived requirements for continual day-to-day updating of "the Operating Plan document" for compliance purposes.

Version History

Version	Date	Action	Change Tracking
1	October 17, 2008	Adopted by NERC Board of Trustees	
1	March 17, 2011	Order issued by FERC approving IRO-008-1 (approval effective 5/23/11)	
1	February 28, 2014	Updated VSLs and VRF's based on June 24, 2013 approval.	
2	November 13, 2014	Adopted by NERC Board of Trustees	Revisions under Project 2014-03
2	November 19, 2015	FERC approved IRO-008-2. Docket No. RM15-16-000. Order No. 817	
<u>3</u>	<u>TBD</u>	<u>Adopted by NERC Board of Trustees</u>	<u>Revisions under Project 2015-09</u>

Note: The Guidelines and Technical Basis section has not been revised as part of Project 2019-02. A separate technical rationale document has been created to cover Project 2019-02 revisions. Future edits to this section will be conducted through the Technical Rationale for Reliability Standards Project and the Standards Drafting Process.

Guidelines and Technical Basis

Rationale:

~~During development of this standard, text boxes were embedded within the standard to explain the rationale for various parts of the standard. Upon BOT approval, the text from the rationale text boxes was moved to this section.~~

~~Changes made to the proposed definitions were made in order to respond to issues raised in NOPR paragraphs 55, 73, and 74 dealing with analysis of SOLs in all time horizons, questions on Protection Systems and Special Protection Systems in NOPR paragraph 78, and recommendations on phase angles from the SW Outage Report (recommendation 27). The intent of such changes is to ensure that Real-time Assessments contain sufficient details to result in an appropriate level of situational awareness. Some examples include: 1) analyzing phase angles which may result in the implementation of an Operating Plan to adjust generation or curtail transactions so that a Transmission facility may be returned to service, or 2) evaluating the impact of a modified Contingency resulting from the status change of a Special Protection Scheme from enabled/in-service to disabled/out-of-service.~~

Rationale for R1:

~~Revised in response to NOPR paragraph 96 on the obligation of Reliability Coordinators to monitor SOLs. Measure M1 revised for consistency with TOP 003-3, Measure M1.~~

Rationale for R2 and R3:

~~Requirements added in response to IERP and SW Outage Report recommendations concerning the coordination and review of plans.~~

Rationale for R5 and R6:

~~In Requirements R5 and R6 the use of the term ‘impacted’ and the tie to the Operating Plan where notification protocols will be set out should minimize the volume of notifications.~~