UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

North American Electric Reliability Corporation	**)** **)**	**Docket No. _____**

JOINT PETITION OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION AND WESTERN ELECTRICITY COORDINATING COUNCIL FOR APPROVAL OF PROPOSED RELIABILITY STANDARD IRO-002-6

Steve Goodwill
Vice President, General Counsel, and
Corporate Secretary
Ruben Arredondo
Senior Legal Counsel
Western Electricity Coordinating Council
155 North 400 West, Suite 200
Salt Lake City, UT 84103
(801) 582-0353
sgoodwill@wecc.org
rarredondo@wecc.org

Counsel for the Western Electricity Coordinating Council

Lauren Perotti
Senior Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
lauren.perotti@nerc.net

Counsel for the North American Electric Reliability Corporation

May 30, 2019

TABLE OF CONTENTS

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

North American Electric Reliability Corporation	**)** **)**	**Docket No. _____**

JOINT PETITION OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION AND WESTERN ELECTRICITY COORDINATING COUNCIL FOR APPROVAL OF PROPOSED RELIABILITY STANDARD IRO-002-6

Pursuant to Section 215(d)(1) of the Federal Power Act ("FPA")[1] and Section 39.5[2] of the Federal Energy Regulatory Commission's ("FERC" or the "Commission") regulations, the North American Electric Reliability Corporation ("NERC")[3] and the Western Electricity Coordinating Council ("WECC") hereby submit proposed Reliability Standard IRO-002-6 Reliability Coordination – Monitoring and Analysis for Commission approval. Proposed Reliability Standard IRO-002-6 reflects the addition of a regional Variance containing additional requirements applicable to Reliability Coordinators providing service to entities in the Western Interconnection. None of the continent-wide requirements have been changed from currently effective Reliability Standard IRO-002-5.[4]

NERC and WECC request that the Commission approve proposed Reliability Standard IRO-002-6 (**Exhibit A**) as just, reasonable, not unduly discriminatory or preferential, and in the public interest. NERC and WECC also request approval of the associated implementation plan

---

1 16 U.S.C. § 824o (2018).

2 18 C.F.R. § 39.5 (2018).

3 The Commission certified NERC as the electric reliability organization ("ERO") in accordance with Section 215 of the FPA on July 20, 2006. *N. Am. Elec. Reliability Corp.*, 116 FERC ¶ 61,062 (2006).

4 The Commission approved currently effective Reliability Standard IRO-002-5 in 2017. *N. Am. Elec. Reliability Corp.*, Docket No. RD17-4-000 (Apr. 17, 2017) (delegated letter order).

(**Exhibit B**), and the associated Violation Risk Factors and Violation Severity Levels ("VSLs") (**Exhibit D**), as detailed in this petition. NERC and WECC further request that the Commission act to approve the proposed Reliability Standard so it may become effective on January 1, 2020 under the proposed implementation plan.

As required by Section 39.5(a)[5] of the Commission's regulations, this petition presents the technical basis and purpose of proposed Reliability Standard IRO-002-6, a summary of the development proceedings (**Section III.C** and **Exhibit E**), and a demonstration that the proposed Reliability Standard meets the criteria identified by the Commission in Order No. 672[6] (**Exhibit C**). Proposed Reliability Standard IRO-002-6 was approved by the WECC Board of Directors on March 6, 2019 and adopted by the NERC Board of Trustees on May 9, 2019.

I. SUMMARY

At present, only one Reliability Coordinator, Peak Reliability, provides services in the Western Interconnection (excepting Alberta). In July 2018, Peak Reliability announced that it would cease operations at the end of December 2019. Over the course of 2018 and 2019, several entities have indicated that they will seek certification to perform the Reliability Coordinator function in their respective footprints in the Western Interconnection.

As the Western Interconnection prepares to transition to an environment in which more than one Reliability Coordinator will be providing services, focused coordination of these Reliability Coordinators will be of critical importance. To promote coordination among these Reliability Coordinators and help ensure reliability in the Western Interconnection, WECC

---

5 18 C.F.R. § 39.5(a).

6 The Commission specified in Order No. 672 certain general factors it would consider when assessing whether a particular Reliability Standard is just and reasonable. *See Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards*, Order No. 672, 114 FERC¶ 61,104, at PP 262, 321-37 ("Order No. 672"), *order on reh'g*, Order No. 672-A, 114 FERC ¶ 61,328 (2006).

developed the proposed regional Variance reflected in proposed Reliability Standard IRO-002-6. The WECC Variance consists of two new requirements in the IRO-002 Reliability Standard. These requirements provide that each Reliability Coordinator providing services in the Western Interconnection shall: (1) coordinate with other Reliability Coordinators to develop a common Western Interconnection-wide method to determine the modeling and monitoring of elements necessary for providing situational awareness; and (2) use the common method.

The regional Variance reflected in proposed Reliability Standard IRO-002-6 would help ensure coordination and consistency between multiple Reliability Coordinators operating within the Western Interconnection in 2020 and beyond. The regional Variance adds requirements beyond those required by the continent-wide Reliability Standard and is necessary for reliability in the Western Interconnection. For these reasons, and as discussed more fully herein, NERC and WECC respectfully request the Commission approve proposed Reliability Standard IRO-002-6 and the associated elements. NERC and WECC further request that the Commission act to approve the proposed Reliability Standard so it may become effective on January 1, 2020, which is the first possible effective date under the proposed implementation plan. The following petition presents the justification for approval and supporting documentation.

II. NOTICES AND COMMUNICATIONS

Notices and communications with respect to this filing may be addressed to the following:[7]

Steve Goodwill*
Vice President, General Counsel, and
Corporate Secretary
Ruben Arredondo*
Senior Legal Counsel
Steve Rueckert*
Director of Standards
Western Electricity Coordinating Council
155 North 400 West, Suite 200
Salt Lake City, UT 84103
(801) 582-0353
sgoodwill@wecc.org
rarredondo@wecc.org
srueckert@wecc.org

Lauren Perotti*
Senior Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
lauren.perotti@nerc.net

III. BACKGROUND

The following background information is provided below: (a) an explanation of the regulatory framework for NERC and Regional Reliability Standards; (b) an explanation of the WECC Regional Reliability Standards development process; and (c) a summary of the development process for the proposed Reliability Standard.

A. Regulatory Framework

By enacting the Energy Policy Act of 2005,[8] Congress entrusted the Commission with the duties of approving and enforcing rules to ensure the reliability of the Nation's Bulk-Power System, and with the duties of certifying an ERO that would be charged with developing and

[7] Persons to be included on the Commission's service list are identified by an asterisk. NERC respectfully requests a waiver of Rule 203 of the Commission's regulations, 18 C.F.R. § 385.203, to allow the inclusion of more than two persons on the service list in this proceeding.

[8] 16 U.S.C. § 824o.

enforcing mandatory Reliability Standards, subject to Commission approval. Section 215(b)(1)[9] of the FPA states that all users, owners, and operators of the Bulk-Power System in the United States will be subject to Commission-approved Reliability Standards. Section 215(d)(5)[10] of the FPA authorizes the Commission to order the ERO to submit a new or modified Reliability Standard. Section 39.5(a)[11] of the Commission's regulations requires the ERO to file with the Commission for its approval each Reliability Standard that the ERO proposes should become mandatory and enforceable in the United States, and each modification to a Reliability Standard that the ERO proposes should be made effective.

The Commission has the regulatory responsibility to approve Reliability Standards that protect the reliability of the Bulk-Power System and to ensure that such Reliability Standards are just, reasonable, not unduly discriminatory or preferential, and in the public interest. Pursuant to Section 215(d)(2) of the FPA[12] and Section 39.5(c)[13] of the Commission's regulations, the Commission will give due weight to the technical expertise of the ERO with respect to the content of a Reliability Standard.

Similarly, the Commission approves regional differences proposed by Regional Entities, such as Regional Reliability Standards and Variances, if the regional difference is just, reasonable, not unduly discriminatory or preferential, and in the public interest.[14] In addition, Order No. 672 requires further criteria for regional differences. A regional difference from a continent-wide Reliability Standard must either be: (1) more stringent than the continent-wide Reliability

---

9 *Id*. § 824o(b)(1).

10 *Id*. § 824o(d)(5).

11 18 C.F.R. § 39.5(a).

12 16 U.S.C. § 824o(d)(2).

13 18 C.F.R. § 39.5(c)(1).

14 Section 215(d)(2) of the FPA and 18 C.F.R. § 39.5(a).

Standard, including a regional difference that addresses matters that the continent-wide Reliability Standard does not; or (2) necessitated by a physical difference in the Bulk-Power System.[15] The Commission must give due weight to the technical expertise of a Regional Entity, like WECC, that is organized on an Interconnection-wide basis with respect to a regional difference to be applicable within that Interconnection.[16]

B. WECC Regional Reliability Standards Development Process

The WECC regional Variance reflected in proposed Reliability Standard IRO-002-6 was developed in an open and fair manner and in accordance with the Commission-approved WECC Reliability Standards Development Procedures ("RSDP").[17] WECC's RSDP provides for reasonable notice and opportunity for public comment, due process, openness, and a balance of interests in developing Reliability Standards and thus addresses several of the Commission's criteria for approving Reliability Standards. The development process is open to any person or entity that is an interested stakeholder. WECC considers the comments of all stakeholders, and a vote of stakeholders and the WECC Board of Directors is required to approve a WECC regional Variance to a Reliability Standard. NERC posts each regional Variance developed by a Regional Entity for an additional comment period. The NERC Board of Trustees must adopt the regional Variance before it is submitted to the Commission for approval.

C. Development of the WECC Variance in Proposed Reliability Standard IRO-002-6

As further described in **Exhibit E** hereto, WECC developed the regional Variance in proposed Reliability Standard IRO-002-6 in accordance with the WECC RSDP. The drafting team

---

15 Order No. 672 at P 291.

16 *Id*. at P 344.

17 The currently-effective WECC RSDP was approved by the Commission on October 27, 2017. *See N. Am. Elec. Reliability Corp.*, Docket No. RR17-5-000 (Oct. 27, 2017) (unpublished letter order).

(**Exhibit F**) consisted of individuals with relevant expertise in the subject matter area and included representatives from Peak Reliability and several other entities that had expressed interest by that time in performing the Reliability Coordinator function in the Western Interconnection. On February 21, 2019, the WECC ballot body approved the regional Variance with a 100 percent affirmative vote at 89.7 percent quorum. The WECC Board of Directors approved the regional Variance on March 6, 2019. NERC posted the regional Variance for a 45-day comment period from March 7, 2019 through April 22, 2019. Commenters agreed that WECC's process was open, inclusive, balanced, transparent, and provided due process. The WECC regional Variance was added to the NERC IRO-002 Reliability Standard, and the new standard was assigned version number IRO-002-6. The NERC Board of Trustees adopted proposed Reliability Standard IRO-002-6 on May 9, 2019.

IV. JUSTIFICATION FOR APPROVAL

Due to the unique physical characteristics of the Bulk-Power System in the Western Interconnection, events in one part of the Interconnection within one Reliability Coordinator Area can have significant impacts in other parts of the system in other Reliability Coordinator Areas. These impacts can extend beyond the physical boundaries of the neighboring Reliability Coordinator Areas. As the Western Interconnection transitions from a single Reliability Coordinator environment to a multiple Reliability Coordinator environment, it is important that the Reliability Coordinators employ modeling and monitoring practices to address these unique situational awareness challenges and that there is an appropriate degree of consistency in modeling and monitoring strategies and approaches.

Proposed Reliability Standard IRO-002-6 contains a new regional Variance designed to promote coordination among multiple Reliability Coordinators providing services to entities

operating in the Western Interconnection. The regional Variance requires a single Interconnection-wide modeling and monitoring methodology, which creates an effective reliability baseline for each Reliability Coordinator for its Real-time Assessments and Operational Planning Analyses to address the unique challenges in the Western Interconnection. The modeling and monitoring requirements set forth in the Variance represent a more stringent set of requirements for Reliability Coordinators beyond those found in the continent-wide requirements. The purpose, applicability, and requirements of the regional Variance are discussed in more detail below.

A. Purpose and Applicability

The stated purpose of the WECC regional Variance in proposed Reliability Standard IRO-002-6 is to "to develop a methodology that creates models for performing Operational Planning Analyses and Real-time Assessments."[18] The WECC regional Variance is applicable to those Reliability Coordinators providing Reliability Coordinator services to entities operating within the Western Interconnection, regardless of where the Reliability Coordinator is physically located.

B. Proposed Requirements

The WECC regional Variance in proposed Reliability Standard IRO-002-6 contains two new requirements to help ensure that each Reliability Coordinator has sufficient operational awareness to maintain the reliability of its area. These requirements provide as follows:

> **D.A.7.** Each Reliability Coordinator shall, in coordination with other Reliability Coordinators, develop a common Interconnection-wide methodology to determine the modeling and monitoring of BES and non-BES Elements that are internal and external to its Reliability Coordinator Area, necessary for providing operational awareness of the impacts on Bulk Electric System Facilities within its Reliability Coordinator Area, including at a minimum:
>
> **D.A.7.1.** A method for development, maintenance, and periodic review of a Western Interconnection-wide reference model to serve as the

[18] *See* Exhibit A.

baseline from which Reliability Coordinator's operational models are derived;

D.A.7.2 The impacts of Inter-area oscillations;

D.A.7.3 A method to determine Contingencies included in analyses and assessments;

D.A.7.4 A method to determine Remedial Action Schemes included in analyses and assessments;

D.A.7.5 A method to determine forecast data included in analyses and assessments; and

D.A.7.6 A method for the validation and periodic review of the Reliability Coordinator's operational model for steady state and dynamic/oscillatory system response.

D.A.8. Each Reliability Coordinator shall use the methodology developed in D.A.7.

The proposed requirements provide a results-based approach to helping ensure that Reliability Coordinators model and monitor those Elements necessary in order to provide operational awareness with their areas. Requirement D.A.7 requires a common Interconnection-wide methodology that shall include, at a minimum, certain features deemed to be necessary for operational awareness of potential impacts on Facilities within its area. The list of required features includes impacts of Inter-area oscillations and methods to determine Contingencies, Remedial Action Schemes, and forecast data included in analyses and assessments. The methodology must also include a method for the development, maintenance, and review of an Interconnection-wide reference model to serve as a baseline and a method to validate and review the Reliability Coordinator's operational model for steady state and dynamic/oscillatory system response. Requirement D.A.8 requires each Reliability Coordinator to use the common methodology.

In developing the proposed requirements, WECC considered that the common methodology approach described above provided significant benefits over and above an approach that would require each Reliability Coordinator to use a single specified model, such as the

Western Interconnection model. The common methodology approach is consistent with NERC's results-based approach to Reliability Standards and provides an efficient and effective way of achieving the reliability objective of the Variance. Further, the proposed approach helps to ensure that only those essential modeling details are maintained, while allowing any unneeded data to be culled. The benefits of having Reliability Coordinator models that are no larger than necessary include: (1) enhanced performance of on-line applications; (2) reduced risk that data problems with Elements that are insensitive to the Reliability Coordinator footprint will cause convergence problems; (3) reduced risk that problems with Elements that are insensitive to the Reliability Coordinator footprint could cause false alarms or consume troubleshooting resources; and (4) reduced risk that errors from insensitive parts of the Interconnection could mask issues within the Reliability Coordinator footprint.

For these reasons, NERC respectfully requests that the Commission approve proposed Reliability Standard IRO-002-6.

C. Enforceability of Proposed Reliability Standard IRO-002-6

Proposed Reliability Standard IRO-002-6 includes VRFs and VSLs. The VSLs provide guidance on the way that NERC will enforce the requirements of the proposed Reliability Standard. The VRFs are one of several elements used to determine an appropriate sanction when the associated requirement is violated. The VRFs assess the impact to reliability of violating a specific requirement. The VRFs and VSLs for the continent-wide requirements have not been changed. As demonstrated in **Exhibit D**, the VRFs and VSLs for the two new requirements in the WECC regional Variance comport with NERC and Commission guidelines related to their assignment.

The proposed Reliability Standard also includes measures that support each requirement by clearly identifying what is required and how the requirement will be enforced. These measures help ensure that the requirements will be enforced in a clear, consistent, and non-preferential manner and without prejudice to any party.[19]

V. EFFECTIVE DATE

NERC respectfully requests that the Commission approve the proposed implementation plan, provided in **Exhibit B** hereto. NERC and WECC request that the Commission take action on the proposed Reliability Standard so it may become effective on January 1, 2020 under the proposed implementation plan. The proposed implementation plan provides that proposed Reliability Standard IRO-002-6 would become effective on the first day of the first quarter after regulatory approval, but no sooner than January 1, 2020. This implementation timeframe reflects consideration of the timeframes for the wind down of Peak Reliability and the start of operations for other Reliability Coordinators. This proposed timeline balances the need for prompt implementation of the WECC regional Variance while allowing sufficient time for the new Western Interconnection Reliability Coordinators to coordinate on the development of the required common methodology.

[19] Order No. 672 at P 327 ("There should be a clear criterion or measure of whether an entity is in compliance with a proposed Reliability Standard. It should contain or be accompanied by an objective measure of compliance so that it can be enforced and so that enforcement can be applied in a consistent and non-preferential manner.").

VI. CONCLUSION

For the reasons set forth above, NERC respectfully requests that the Commission approve:

- proposed Reliability Standard IRO-002-6 and the other associated elements, including the VRFs and VSLs, included in **Exhibit A** and
- the proposed implementation plan, included in **Exhibit B**.

Respectfully submitted,

/s/ Lauren Perotti

Steve Goodwill
Vice President, General Counsel, and
Corporate Secretary
Ruben Arredondo
Senior Legal Counsel
Western Electricity Coordinating Council
155 North 400 West, Suite 200
Salt Lake City, UT 84103
(801) 582-0353
sgoodwill@wecc.org
rarredondo@wecc.org

Counsel for the Western Electricity Coordinating Council

Lauren Perotti
Senior Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
lauren.perotti@nerc.net

Counsel for the North American Electric Reliability Corporation

Date: May 30, 2019

Exhibit A

Proposed Reliability Standard

Exhibit A

Proposed Reliability Standard IRO-002-6 Clean and Redline

A. Introduction

1. **Title:** **Reliability Coordination – Monitoring and Analysis**
2. **Number:** IRO-002-6
3. **Purpose:** To provide System Operators with the capabilities necessary to monitor and analyze data needed to perform their reliability functions.
4. **Applicability:**
   - **4.1. Functional Entities:**
     - **4.1.1.** Reliability Coordinators
5. **Effective Date:** See Implementation Plan

B. Requirements and Measures

R1. Each Reliability Coordinator shall have data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for it to perform its Operational Planning Analyses. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

M1. Each Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to, a document that lists its data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for it to perform its Operational Planning Analyses.

R2. Each Reliability Coordinator shall have data exchange capabilities, with redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, for the exchange of Real-time data with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing its Real-time monitoring and Real-time Assessments. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-time Operations]*

M2. Each Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to, system specifications, system diagrams, or other documentation that lists its data exchange capabilities, including redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, for the exchange of Real-time data with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, as specified in the requirement.

R3. Each Reliability Coordinator shall test its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days. If the test is unsuccessful, the Reliability Coordinator shall initiate action within two hours to restore redundant functionality. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

M3. Each Reliability Coordinator shall have, and provide upon request, evidence that it tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality, or experienced an event that demonstrated the redundant functionality; and if the test was unsuccessful, initiated action within two hours to restore redundant functionality as specified in Requirement R3. Evidence could include, but is not limited to: dated and time-stamped test records, operator logs, voice recordings, or electronic communications.

R4. Each Reliability Coordinator shall provide its System Operators with the authority to approve planned outages and maintenance of its telecommunication, monitoring and analysis capabilities. *[Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-time Operations]*

M4. 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 provided its System Operators with the authority to approve planned outages and maintenance of its telecommunication, monitoring and analysis capabilities.

R5. Each Reliability Coordinator shall monitor Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area. *[Violation Risk Factor: High] [Time Horizon: Real-Time Operations]*

M5. 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, or other equivalent evidence that will be used to confirm that it has monitored Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.

R6. Each Reliability Coordinator shall have monitoring systems that provide information utilized 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 infrastructure. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

M6. 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, SCADA data collection, or other equivalent evidence that will be used to confirm that it has monitoring systems consistent with the requirement.

C. Compliance

1. Compliance Monitoring Process

1.1. Compliance Enforcement Authority:

"Compliance Enforcement Authority" means NERC or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.

1.2. Evidence Retention:

The following evidence retention period(s) 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.

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

- The Reliability Coordinator shall retain its current, in force document and any documents in force for the current year and previous calendar year for Requirements R1, R2, and R4 and Measures M1, M2, and M4.
- The Reliability Coordinator shall retain evidence for Requirement R3 and Measure M3 for the most recent 12 calendar months, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.
- The Reliability Coordinator shall keep data or evidence for Requirements R5 and R6 and Measures M5 and M6 for the current calendar year and one previous calendar year.

1.3. Compliance Monitoring and Enforcement Program

As defined in the NERC Rules of Procedure, "Compliance Monitoring and Enforcement Program" 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.

Violation Severity Levels

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
R1.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with one applicable entity, or 5% or less of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with two applicable entities, or more than 5% or less than or equal to 10% of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with three applicable entities, or more than 10% or less than or equal to 15% of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with four or more applicable entities or greater than 15% of the applicable entities, whichever is greater.
R2.	N/A	N/A	The Reliability Coordinator had data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing Real-time monitoring and Real-time Assessments, but did not have redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, as specified in the requirement.	The Reliability Coordinator did not have data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing Real-time monitoring and Real-time Assessments as specified in the requirement.
R3.	The Reliability Coordinator tested its primary Control Center data exchange	The Reliability Coordinator tested its primary Control Center data exchange	The Reliability Coordinator tested its primary Control Center data exchange	The Reliability Coordinator tested its primary Control Center data exchange

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
	capabilities specified in Requirement R2 for redundant functionality, but did so more than 90 calendar days but less than or equal to 120 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 2 hours and less than or equal to 4 hours.	capabilities specified in Requirement R2 for redundant functionality, but did so more than 120 calendar days but less than or equal to 150 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 4 hours and less than or equal to 6 hours.	capabilities specified in Requirement R2 for redundant functionality, but did so more than 150 calendar days but less than or equal to 180 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 6 hours and less than or equal to 8 hours.	capabilities specified in Requirement R2 for redundant functionality, but did so more than 180 calendar days since the previous test; OR The Reliability Coordinator did not test its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, did not initiate action within 8 hours to restore the redundant functionality.
R4.	N/A	N/A	N/A	The Reliability Coordinator failed to provide its System Operator with the authority to approve planned outages and

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
				maintenance of its telecommunication, monitoring and analysis capabilities.
R5.	N/A	N/A	N/A	The Reliability Coordinator did not monitor Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.
R6.	N/A	N/A	N/A	The Reliability Coordinator did not have monitoring systems that provide information utilized by the Reliability Coordinator's operating personnel, giving particular emphasis to alarm management and awareness systems, automated data transfers, and synchronized

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
				information systems, over a redundant infrastructure.

D. Regional Variance

A. Regional Variance for the Western Electricity Coordinating Council Region

The following Interconnection-wide variance shall be applicable in the Western Electricity Coordinating Council (WECC) region.

Purpose
To develop a methodology that creates models for performing Operational Planning Analyses and Real-time Assessments.

Applicability
As used in this WECC Regional Variance, Reliability Coordinator is specific to those Reliability Coordinators providing Reliability Coordinator service(s) to entities operating within the Western Interconnection, regardless of where the Reliability Coordinator may be located.

Requirements and Measures

D.A.7. Each Reliability Coordinator shall, in coordination with other Reliability Coordinators, develop a common Interconnection-wide methodology to determine the modeling and monitoring of BES and non-BES Elements that are internal and external to its Reliability Coordinator Area, necessary for providing operational awareness of the impacts on Bulk Electric System Facilities within its Reliability Coordinator Area, including at a minimum: *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

- **D.A.7.1.** A method for development, maintenance, and periodic review of a Western Interconnection-wide reference model to serve as the baseline from which Reliability Coordinator's operational models are derived;
- **D.A.7.2.** The impacts of Inter-area oscillations;
- **D.A.7.3.** A method to determine Contingencies included in analyses and assessments;
- **D.A.7.4.** A method to determine Remedial Action Schemes included in analyses and assessments;
- **D.A.7.5.** A method to determine forecast data included in analyses and assessments; and
- **D.A.7.6.** A method for the validation and periodic review of the Reliability Coordinator's operational model for steady state and dynamic/oscillatory system response.

M.D.A.7. Each Reliability Coordinator will have evidence that it developed a common Western Interconnection-wide methodology, addressing modeling and

monitoring, in coordination with other Reliability Coordinators, that includes the features required in D.A.7.

D.A.8. Each Reliability Coordinator shall use the methodology developed in D.A.7. ([*Violation Risk Factor: High] [Time Horizon: Operations Planning*])

M.D.A.8. Each Reliability Coordinator will have evidence that it uses the methodology developed in D.A.7., as required in D.A.8. above.

Compliance

Evidence Retention:

- The Reliability Coordinator shall keep data or evidence for Requirements R5, R6, and the WECC Regional Variance, and Measures M5, M6, and the WECC Regional Variance for the current calendar year and one previous calendar year.

R #	Violation Severity Levels for the WECC Regional Variance			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
D.A.7.				The Reliability Coordinator did not develop the methodology as required in D.A.7.
D.A.8.				The Reliability Coordinator did not implement the methodology as required in D.A.8.

E. Associated Documents

The Implementation Plan and other project documents can be found on the project page.

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	November 1, 2006	Adopted by Board of Trustees	Revised
1	April 4, 2007	Replaced Levels of Non-compliance with the Feb 28, BOT approved Violation Severity Levels (VSLs) Corrected typographical errors in BOT approved version of VSLs	Revised to add missing measures and compliance elements
2	October 17, 2008	Adopted by NERC Board of Trustees	Deleted R2, M3 and associated compliance elements as conforming changes associated with approval of IRO-010-1. Revised as part of IROL Project
2	March 17, 2011	Order issued by FERC approving IRO-002-2 (approval effective 5/23/11)	FERC approval
2	February 24, 2014	Updated VSLs based on June 24, 2013 approval.	VSLs revised
3	July 25, 2011	Revised under Project 2006-06	Revised
3	August 4, 2011	Approved by Board of Trustees	Retired R1-R8 under Project 2006-06.
4	November 13, 2014	Approved by Board of Trustees	Revisions under Project 2014-03
4	November 19, 2015	FERC approved IRO-002-4. Docket No. RM15-16-000	FERC approval
5	February 9, 2017	Adopted by Board of Trustees	Revised
5	April 17, 2017	FERC letter Order approved IRO-002-5. Docket No. RD17-4-000	

6	May 9, 2019	Adopted by the NERC Board of Trustees	WECC Regional Variance

Rationale

During development of IRO-002-5, text boxes are embedded within the standard to explain the rationale for various parts of the standard. Upon Board adoption of IRO-002-5, the text from the rationale text boxes will be moved to this section.

Rationale text from the development of IRO-002-4 in Project 2014-03 follows. Additional information can be found on the Project 2014-03 project page.

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 Requirements:
The data exchange elements of Requirements R1 and R2 from approved IRO-002-2 have been added back into proposed IRO-002-4 in order to ensure that there is no reliability gap. The Project 2014-03 SDT found no proposed requirements in the current project that covered the issue. Voice communication is covered in proposed COM-001-2 but data communications needs to remain in IRO-002-4 as it is not covered in proposed COM-001-2. Staffing of communications and facilities in corresponding requirements from IRO-002-2 is addressed in approved PER-004-2, Requirement R1 and has been deleted from this draft.

Rationale for R2:
Requirement R2 from IRO-002-3 has been deleted because approved EOP-008-1, Requirement R1, part 1.6.2 addresses redundancy and back-up concerns for outages of analysis tools. New Requirement R4 (R6 in IRO-002-5) has been added to address NOPR paragraphs 96 and 97: *"…As we explain above, the reliability coordinator's obligation to monitor SOLs is important to reliability because a SOL can evolve into an IROL during deteriorating system conditions, and for potential system conditions such as this, the reliability coordinator's monitoring of SOLs provides a necessary backup function to the transmission operator…."*

Rationale for Requirements R1 and R2:
The proposed changes address directives for redundancy and diverse routing of data exchange capabilities (FERC Order No. 817 Para 47).

Redundant and diversely routed data exchange capabilities consist of data exchange infrastructure components (e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data) that will provide continued functionality despite failure

or malfunction of an individual component within the Reliability Coordinator's (RC) primary Control Center. Redundant and diversely routed data exchange capabilities preclude single points of failure in primary Control Center data exchange infrastructure from halting the flow of Real-time data. Requirement R2 does not require automatic or instantaneous fail-over of data exchange capabilities. Redundancy and diverse routing may be achieved in various ways depending on the arrangement of the infrastructure or hardware within the RC's primary Control Center.

The reliability objective of redundancy is to provide for continued data exchange functionality during outages, maintenance, or testing of data exchange infrastructure. For periods of planned or unplanned outages of individual data exchange components, the proposed requirements do not require additional redundant data exchange infrastructure components solely to provide for redundancy.

Infrastructure that is not within the RC's primary Control Center is not addressed by the proposed requirement.

Rationale for Requirement R3:
The revised requirement addresses directives for testing of data exchange capabilities used in primary Control Centers (FERC Order No. 817 Para 51).

A test for redundant functionality demonstrates that data exchange capabilities will continue to operate despite the malfunction or failure of an individual component (e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data). An entity's testing practices should, over time, examine the various failure modes of its data exchange capabilities. When an actual event successfully exercises the redundant functionality, it can be considered a test for the purposes of the proposed requirement.

Rationale for R4 (R6 in IRO-002-5):
The requirement was added back from approved IRO-002-2 as the Project 2014-03 SDT found no proposed requirements that covered the issues.

A. Introduction

1. **Title:** **Reliability Coordination – Monitoring and Analysis**

2. **Number:** IRO-002-6~~5~~

3. **Purpose:** To provide System Operators with the capabilities necessary to monitor and analyze data needed to perform their reliability functions.

4. **Applicability:**

   4.1. Functional Entities:

   4.1.1. Reliability Coordinators

5. **Effective Date:** See Implementation Plan

B. Requirements and Measures

R1. Each Reliability Coordinator shall have data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for it to perform its Operational Planning Analyses. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

M1. Each Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to, a document that lists its data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for it to perform its Operational Planning Analyses.

R2. Each Reliability Coordinator shall have data exchange capabilities, with redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, for the exchange of Real-time data with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing its Real-time monitoring and Real-time Assessments. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-time Operations]*

M2. Each Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to, system specifications, system diagrams, or other documentation that lists its data exchange capabilities, including redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, for the exchange of Real-time data with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, as specified in the requirement.

R3. Each Reliability Coordinator shall test its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days. If the test is unsuccessful, the Reliability Coordinator shall initiate action within two hours to restore redundant functionality. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

M3. Each Reliability Coordinator shall have, and provide upon request, evidence that it tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality, or experienced an event that demonstrated the redundant functionality; and if the test was unsuccessful, initiated action within two hours to restore redundant functionality as specified in Requirement R3. Evidence could include, but is not limited to: dated and time-stamped test records, operator logs, voice recordings, or electronic communications.

R4. Each Reliability Coordinator shall provide its System Operators with the authority to approve planned outages and maintenance of its telecommunication, monitoring and analysis capabilities. *[Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-time Operations]*

M4. 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 provided its System Operators with the authority to approve planned outages and maintenance of its telecommunication, monitoring and analysis capabilities.

R5. Each Reliability Coordinator shall monitor Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area. *[Violation Risk Factor: High] [Time Horizon: Real-Time Operations]*

M5. 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, or other equivalent evidence that will be used to confirm that it has monitored Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.

R6. Each Reliability Coordinator shall have monitoring systems that provide information utilized 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 infrastructure. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

M6. 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, SCADA data collection, or other equivalent evidence that will be used to confirm that it has monitoring systems consistent with the requirement.

C. Compliance

1. Compliance Monitoring Process

1.1. Compliance Enforcement Authority:

"Compliance Enforcement Authority" means NERC or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.

1.2. Evidence Retention:

The following evidence retention period(s) 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.

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

- The Reliability Coordinator shall retain its current, in force document and any documents in force for the current year and previous calendar year for Requirements R1, R2, and R4 and Measures M1, M2, and M4.
- The Reliability Coordinator shall retain evidence for Requirement R3 and Measure M3 for the most recent 12 calendar months, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.
- The Reliability Coordinator shall keep data or evidence for Requirements R5 and R6 and Measures M5 and M6 for the current calendar year and one previous calendar year.

1.3. Compliance Monitoring and Enforcement Program

As defined in the NERC Rules of Procedure, "Compliance Monitoring and Enforcement Program" 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.

Violation Severity Levels

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
R1.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with one applicable entity, or 5% or less of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with two applicable entities, or more than 5% or less than or equal to 10% of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with three applicable entities, or more than 10% or less than or equal to 15% of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with four or more applicable entities or greater than 15% of the applicable entities, whichever is greater.
R2.	N/A	N/A	The Reliability Coordinator had data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing Real-time monitoring and Real-time Assessments, but did not have redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, as specified in the requirement.	The Reliability Coordinator did not have data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing Real-time monitoring and Real-time Assessments as specified in the requirement.
R3.	The Reliability Coordinator tested its primary Control Center data exchange	The Reliability Coordinator tested its primary Control Center data exchange	The Reliability Coordinator tested its primary Control Center data exchange	The Reliability Coordinator tested its primary Control Center data exchange

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
	capabilities specified in Requirement R2 for redundant functionality, but did so more than 90 calendar days but less than or equal to 120 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 2 hours and less than or equal to 4 hours.	capabilities specified in Requirement R2 for redundant functionality, but did so more than 120 calendar days but less than or equal to 150 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 4 hours and less than or equal to 6 hours.	capabilities specified in Requirement R2 for redundant functionality, but did so more than 150 calendar days but less than or equal to 180 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 6 hours and less than or equal to 8 hours.	capabilities specified in Requirement R2 for redundant functionality, but did so more than 180 calendar days since the previous test; OR The Reliability Coordinator did not test its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, did not initiate action within 8 hours to restore the redundant functionality.
R4.	N/A	N/A	N/A	The Reliability Coordinator failed to provide its System Operator with the authority to approve planned outages and

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
				maintenance of its telecommunication, monitoring and analysis capabilities.
R5.	N/A	N/A	N/A	The Reliability Coordinator did not monitor Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.
R6.	N/A	N/A	N/A	The Reliability Coordinator did not have monitoring systems that provide information utilized by the Reliability Coordinator's operating personnel, giving particular emphasis to alarm management and awareness systems, automated data transfers, and synchronized

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
				information systems, over a redundant infrastructure.

~~2.~~D. Regional Variance~~s~~

A. Regional Variance for the Western Electricity Coordinating Council Region

The following Interconnection-wide variance shall be applicable in the Western Electricity Coordinating Council (WECC) region.

Purpose

To develop a methodology that creates models for performing Operational Planning Analyses and Real-time Assessments.

Applicability

As used in this WECC Regional Variance, Reliability Coordinator is specific to those Reliability Coordinators providing Reliability Coordinator service(s) to entities operating within the Western Interconnection, regardless of where the Reliability Coordinator may be located.

Requirements and Measures

D.A.7. Each Reliability Coordinator shall, in coordination with other Reliability Coordinators, develop a common Interconnection-wide methodology to determine the modeling and monitoring of BES and non-BES Elements that are internal and external to its Reliability Coordinator Area, necessary for providing operational awareness of the impacts on Bulk Electric System Facilities within its Reliability Coordinator Area, including at a minimum: *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

- **D.A.7.1.** A method for development, maintenance, and periodic review of a Western Interconnection-wide reference model to serve as the baseline from which Reliability Coordinator's operational models are derived;
- **D.A.7.2.** The impacts of Inter-area oscillations;
- **D.A.7.3.** A method to determine Contingencies included in analyses and assessments;
- **D.A.7.4.** A method to determine Remedial Action Schemes included in analyses and assessments;
- **D.A.7.5.** A method to determine forecast data included in analyses and assessments; and
- **D.A.7.6.** A method for the validation and periodic review of the Reliability Coordinator's operational model for steady state and dynamic/oscillatory system response.

M.D.A.7. Each Reliability Coordinator will have evidence that it developed a common Western Interconnection-wide methodology, addressing modeling and

monitoring, in coordination with other Reliability Coordinators, that includes the features required in D.A.7.

D.A.8. Each Reliability Coordinator shall use the methodology developed in D.A.7. ([*Violation Risk Factor: High] [Time Horizon: Operations Planning*])

M.D.A.8. Each Reliability Coordinator will have evidence that it uses the methodology developed in D.A.7., as required in D.A.8. above.

Compliance

Evidence Retention:

- The Reliability Coordinator shall keep data or evidence for Requirements R5, R6, and the WECC Regional Variance, and Measures M5, M6, and the WECC Regional Variance for the current calendar year and one previous calendar year.

R #	Violation Severity Levels for the WECC Regional Variance			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
D.A.7.				The Reliability Coordinator did not develop the methodology as required in D.A.7.
D.A.8.				The Reliability Coordinator did not implement the methodology as required in D.A.8.

~~None.~~

~~D.~~E. Associated Documents

The Implementation Plan and other project documents can be found on the project page.

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	November 1, 2006	Adopted by Board of Trustees	Revised
1	April 4, 2007	Replaced Levels of Non-compliance with the Feb 28, BOT approved Violation Severity Levels (VSLs) Corrected typographical errors in BOT approved version of VSLs	Revised to add missing measures and compliance elements
2	October 17, 2008	Adopted by NERC Board of Trustees	Deleted R2, M3 and associated compliance elements as conforming changes associated with approval of IRO-010-1. Revised as part of IROL Project
2	March 17, 2011	Order issued by FERC approving IRO-002-2 (approval effective 5/23/11)	FERC approval
2	February 24, 2014	Updated VSLs based on June 24, 2013 approval.	VSLs revised
3	July 25, 2011	Revised under Project 2006-06	Revised
3	August 4, 2011	Approved by Board of Trustees	Retired R1-R8 under Project 2006-06.
4	November 13, 2014	Approved by Board of Trustees	Revisions under Project 2014-03
4	November 19, 2015	FERC approved IRO-002-4. Docket No. RM15-16-000	FERC approval
5	February 9, 2017	Adopted by Board of Trustees	Revised
5	April 17, 2017	FERC letter Order approved IRO-002-5. Docket No. RD17-4-000	

6	May 9, 2019	Adopted by the NERC Board of Trustees.	WECC Regional Variance

~~Guidelines and Technical Basis~~

~~None~~

Rationale

During development of IRO-002-5, text boxes are embedded within the standard to explain the rationale for various parts of the standard. Upon Board adoption of IRO-002-5, the text from the rationale text boxes will be moved to this section.

Rationale text from the development of IRO-002-4 in Project 2014-03 follows. Additional information can be found on the Project 2014-03 project page.

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 Requirements:
The data exchange elements of Requirements R1 and R2 from approved IRO-002-2 have been added back into proposed IRO-002-4 in order to ensure that there is no reliability gap. The Project 2014-03 SDT found no proposed requirements in the current project that covered the issue. Voice communication is covered in proposed COM-001-2 but data communications needs to remain in IRO-002-4 as it is not covered in proposed COM-001-2. Staffing of communications and facilities in corresponding requirements from IRO-002-2 is addressed in approved PER-004-2, Requirement R1 and has been deleted from this draft.

Rationale for R2:
Requirement R2 from IRO-002-3 has been deleted because approved EOP-008-1, Requirement R1, part 1.6.2 addresses redundancy and back-up concerns for outages of analysis tools. New Requirement R4 (R6 in IRO-002-5) has been added to address NOPR paragraphs 96 and 97: *"…As we explain above, the reliability coordinator's obligation to monitor SOLs is important to reliability because a SOL can evolve into an IROL during deteriorating system conditions, and for potential system conditions such as this, the reliability coordinator's monitoring of SOLs provides a necessary backup function to the transmission operator…."*

Rationale for Requirements R1 and R2:
The proposed changes address directives for redundancy and diverse routing of data exchange capabilities (FERC Order No. 817 Para 47).

Redundant and diversely routed data exchange capabilities consist of data exchange infrastructure components (e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data) that will provide continued functionality despite failure

or malfunction of an individual component within the Reliability Coordinator's (RC) primary Control Center. Redundant and diversely routed data exchange capabilities preclude single points of failure in primary Control Center data exchange infrastructure from halting the flow of Real-time data. Requirement R2 does not require automatic or instantaneous fail-over of data exchange capabilities. Redundancy and diverse routing may be achieved in various ways depending on the arrangement of the infrastructure or hardware within the RC's primary Control Center.

The reliability objective of redundancy is to provide for continued data exchange functionality during outages, maintenance, or testing of data exchange infrastructure. For periods of planned or unplanned outages of individual data exchange components, the proposed requirements do not require additional redundant data exchange infrastructure components solely to provide for redundancy.

Infrastructure that is not within the RC's primary Control Center is not addressed by the proposed requirement.

Rationale for Requirement R3:
The revised requirement addresses directives for testing of data exchange capabilities used in primary Control Centers (FERC Order No. 817 Para 51).

A test for redundant functionality demonstrates that data exchange capabilities will continue to operate despite the malfunction or failure of an individual component (e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data). An entity's testing practices should, over time, examine the various failure modes of its data exchange capabilities. When an actual event successfully exercises the redundant functionality, it can be considered a test for the purposes of the proposed requirement.

Rationale for R4 (R6 in IRO-002-5):
The requirement was added back from approved IRO-002-2 as the Project 2014-03 SDT found no proposed requirements that covered the issues.

Exhibit B

Implementation Plan

Implementation Plan
WECC-0135 IRO-002-5
Reliability Coordination – Monitoring and Analysis
Request for WECC Regional Variance

Standards Authorization Request (SAR)

The original SAR is located here.

The SAR with expanded scope is located here.

Approvals Required

- WECC Board of Directors March 6, 2019
- NERC Board of Trustees May 9, 2019
- FERC Pending

Applicability

As used in this WECC Regional Variance, Reliability Coordinator is specific to those Reliability Coordinators providing Reliability Coordinator service(s) to entities operating within the Western Interconnection, regardless of where the Reliability Coordinator may be located.

Conforming Changes to Other Standards

No conforming changes to other standards are required.

Proposed Effective Date

The proposed effective date for the WECC Regional Variance is "The first day of the first quarter after regulatory approval, but no sooner than January 1, 2020."

Justification

A January 1, 2020 effective date allows time for the winding down of Peak Reliability, the start-up of other Reliability Coordinators, and creates a window during which the Reliability Coordinators may create the methodology required.

Consideration of Early Compliance

Earlier compliance should not be pursued. If an earlier effective date is imposed, the time window could encompass the active operation of multiple Reliability Coordinators for which a coordinated hand-off of responsibilities had not yet occurred. Further, as proposed the

effective allows the Reliability Coordinators a time window to create the required methodology. An earlier effective date may not accommodate that need.

Required Retirements

No other retirements are required to implement this project.

Exhibit C

Order No. 672 Criteria

Introduction

The North American Electric Reliability Corporation (NERC) is responsible for ensuring that the Reliability Standards, Violation Risk Factors (VRF), Violation Severity Levels (VSL), definitions, Variances, and Interpretations developed by drafting teams are developed in accordance with NERC processes. These standards must also meet NERC's benchmarks for Reliability Standards, as well as criteria for governmental approval.

In Federal Energy Regulatory Commission (FERC) Order No. 672,[1] FERC identified criteria that it will use to analyze proposed Reliability Standards for approval to ensure they are just, reasonable, not unduly discriminatory or preferential, and in the public interest. The discussion below identifies these factors, and explains how the proposed Reliability Standard meets or exceeds the criteria.

For purposes of this filing, the use of the term Reliability Standard is synonymous with Regional Variance, unless otherwise specified.

Designed for a Specific Goal

Proposed Reliability Standards must be designed to achieve a specified reliability goal.

The proposed Reliability Standard must address a reliability concern that falls within the requirements of Section 215 of the Federal Power Act. That is, it must provide for the reliable operation of Bulk-Power System facilities. It may not extend beyond reliable operation of such facilities or apply to other facilities. Such facilities include all those necessary for operating an interconnected electric energy transmission network, or any portion of that network, including control systems. The proposed Reliability Standard may apply to any design of planned additions or modifications of such facilities that is necessary to provide for reliable operation. It may also apply to Cybersecurity protection. Order No. 672 at P 321.

Further, NERC Reliability Standards are based on certain reliability principles that define the foundation of reliability for North American bulk power systems. Each Reliability Standard shall enable or support one or more of the reliability principles, thereby ensuring that each standard serves a

[1] FERC Order 672

purpose in support of reliability of the North American bulk power systems. Each Reliability Standard shall also be consistent with all of the reliability principles, thereby ensuring that no standard undermines reliability through an unintended consequence. NERC Reliability Principles[2]

The purpose of the proposed WECC Regional Variance is:

"To develop a methodology that creates models for performing Operational Planning Analyses and Real-time Assessments."

Of the eight NERC Reliability Principles, this standard addresses Reliability Principle 1, which states:

"Interconnected bulk power systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards."

Technically Sound

Proposed Reliability Standards must contain a technically sound method to achieve the goal.

The proposed Reliability Standard must be designed to achieve a specified reliability goal and must contain a technically sound means to achieve this goal. Although any person may propose a topic for a Reliability Standard to the Electric Reliability Organization (ERO), in the ERO's process, the specific proposed Reliability Standard should be developed initially by persons within the electric power industry and community with a high level of technical expertise and be based on sound technical and engineering criteria. It should be based on actual data and lessons learned from past operating incidents, where appropriate. The process for ERO approval of a proposed Reliability Standard should be fair and open to all interested persons. Order No. 672 at P 324.

Standard Development

This proposed Reliability Standard was developed using the NERC and Western Electricity Coordinating Council (WECC) Reliability Standards Development Procedures (Procedures) approved by FERC and in effect at each point in the process. Among other things, these processes include drafting of the standard by a drafting team composed of subject matter experts (SME); biographies of those SMEs are provided with this filing.

These processes also include repeated public iterative comment/response cycles whereby comments are received from the industry, and responses to those comments are provided by the drafting team.

Technically Sound

The proposed Regional Variance addresses the changing business climate wherein the Western Interconnection (WI) is transitioning from a single Reliability Coordinator (RC) located within the

[2] NERC Reliability Principles

footprint of the WI to an unspecified number of RCs potentially operating anywhere across the continent. To address this change, the proposed Regional Variance has two requirements. Each RC providing services in the WI shall coordinate with other RCs to (1) develop and (2) use "a common Interconnection-wide methodology to determine the modeling and monitoring of BES and non-BES Elements" necessary for providing operational awareness of the impacts on Bulk Electric System Facilities.

In keeping with NERC's goal to create performance-based standards, the proposed Regional Variance does not state how the RCs are to develop the methodology, nor does it state the required content.[3] These attributes are vested in the RCs directly, as the RC SMEs have the technical knowledge to address the myriad permutations of modeling and monitoring.

Applicability

Proposed Reliability Standards must be applicable to users, owners, and operators of the bulk power system, and not others.

The proposed Reliability Standard may impose a requirement on any user, owner, or operator of such facilities, but not on others. Order No. 672 at P 322.

The Applicability section of the proposed standard is as follows:

"As used in this WECC Regional Variance, Reliability Coordinator is specific to those Reliability Coordinators providing Reliability Coordinator service(s) to entities operating within the Western Interconnection, regardless of where the Reliability Coordinator may be located."

Clear and Unambiguous

Proposed Reliability Standards must be clear and unambiguous as to what is required and who is required to comply.

The proposed Reliability Standard should be clear and unambiguous regarding what is required and who is required to comply. Users, owners, and operators of the Bulk-Power System must know what they are required to do to maintain reliability. Order No. 672 at P 325.

Requirement D.R1 of the proposed Regional Variance requires the RC to develop a modeling and monitoring methodology that identifies internal and external Elements "necessary for providing operational awareness of the impacts of Bulk Electric System Facilities." In Posting 2 of the project, the

[3] "Performance-Based—defines a particular reliability objective or outcome to be achieved. In its simplest form, a results-based requirement has four components: who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome?" Results Based Standards, https://www.nerc.com/pa/Stand/Pages/ResultsBasedStandards.aspx.

drafting team grappled with the question as to what constitutes that which is "necessary" for inclusion. The drafting team's response to that concern is as follows:

> Finally, the drafting team [DT] recognizes that what constitutes "necessary" in [D.R1] is not specifically stated in the language of the [Regional Variance]. That was intentional. The DT was faced with the impossible task of defining the complete universe of what is "necessary" for each RC – present and future, known and unknown, and under all circumstances.
>
> Since that which is necessary for one RC may not be the same as that which is necessary for another RC; and, whereas that which is necessary for one RC may vary over time, the DT concluded the best forum for that determination was during the coordinated development of the methodology.

In reaching this conclusion, the DT was also concerned that if "necessary" was defined in full, the final methodology would include more information than some RCs needed. The volume of data would slow computer processing and create the potential for models to go unsolved due to minutia (data noise). The solution was to require the RCs to coordinate their efforts and define what was necessary for each RC in that inclusive setting. Finally, the DT recognized that because the Regional Variance is forward-looking, the applicable RCs have not yet been identified. Rather than limit the reliability task to the knowledge base of the assigned DT, the Regional Variance will allow the full knowledge base of present and future RCs to be included in the development of the modeling and monitoring methodology.

Understandable Consequence

Proposed Reliability Standards must include clear and understandable consequences and a range of penalties (monetary and/or non-monetary) for a violation.

The possible consequences, including range of possible penalties, for violating a proposed Reliability Standard should be clear and understandable by those who must comply. Order No. 672 at P 326.

Violation Risk Factors (VRF) and Violation Severity Levels (VSL) were assigned for each of the two proposed requirements.

The VRFs for the proposed variance are as follows:

D.R1. *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

D.R2. *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

After reviewing the NERC Violation Risk Factors guidelines, the WECC-0135 Drafting Team set the VRF for both proposed requirements as "High."

The "High" rating was set because failure to complete the assigned task could "directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures."

The VSLs for the proposed variance are as follows:

D.R1. Severe

D.R2. Severe

The WECC-0135 DT set a "Severe" level because the assigned tasks are binary. It either must be performed or not; so, a graded level of severity is not warranted.

Measurability for Compliance

Proposed Reliability Standards must identify a clear and objective criterion or measure for compliance, so that it can be enforced in a consistent and non-preferential manner.

There should be a clear criterion or measure of whether an entity is in compliance with a proposed Reliability Standard. It should contain or be accompanied by an objective measure of compliance so that it can be enforced and so that enforcement can be applied in a consistent and non-preferential manner. Order No. 672 at P 327.

The measures for D.R1 and D.R2 are as follows:

D.M1. Each Reliability Coordinator will have evidence that it developed a common Western Interconnection-wide methodology, addressing modeling and monitoring, in coordination with other Reliability Coordinators, that includes the features required in D.R1.

D.M2. Each Reliability Coordinator will have evidence that it uses the methodology developed in D.R1, as required in D.R2. above.

Effective and Efficient

Proposed Reliability Standards should achieve a reliability goal effectively and efficiently - but does not necessarily have to reflect "best practices" without regard to implementation cost.

The proposed Reliability Standard does not necessarily have to reflect the optimal method, or "best practice," for achieving its reliability goal without regard to implementation cost or historical regional infrastructure design. It should however achieve its reliability goal effectively and efficiently. Order No. 672 at P 328.

During the two posting periods, no concerns were raised regarding implementation costs or historical regional infrastructure.

The proposed Regional Variance reaches its goals effectively and efficiently by using existing business practices. As of this filing, forums are already created and actively pursuing the tasks required in the variance.

Lowest Common Denominator

Proposed Reliability Standards cannot be "lowest common denominator," i.e., cannot reflect a compromise that does not adequately protect bulk power system reliability.

The proposed Reliability Standard must not simply reflect a compromise in the ERO's Reliability Standard development process based on the least effective North American practice — the so-called "lowest common denominator" — if such practice does not adequately protect Bulk-Power System reliability. Although the Commission will give due weight to the technical expertise of the ERO, we will not hesitate to remand a proposed Reliability Standard if we are convinced it is not adequate to protect reliability. Order No. 672 at P 329.

The proposed Regional Variance addresses an area not currently codified in NERC Standards.

Costs

Proposed Reliability Standards may consider costs to implement for smaller entities but not at consequence of less than excellence in operating system reliability.

A proposed Reliability Standard may take into account the size of the entity that must comply with the Reliability Standard and the cost to those entities of implementing the proposed Reliability Standard. However, the ERO should not propose a "lowest common denominator" Reliability Standard that would achieve less than excellence in operating system reliability solely to protect against reasonable expenses for supporting this vital national infrastructure. For example, a small owner or operator of the Bulk-Power System must bear the cost of complying with each Reliability Standard that applies to it. Order No. 672 at P 330.

During the development of the project, the industry raised no such concerns.

Continent-wide and Regional Variations

Proposed Reliability Standards must be designed to apply throughout North America to the maximum extent achievable with a single reliability standard while not favoring one area or approach.

A proposed Reliability Standard should be designed to apply throughout the interconnected North American Bulk-Power System, to the maximum extent this is achievable with a single Reliability Standard. The proposed Reliability Standard should not be based on a single geographic or regional model but should take into account geographic variations in grid characteristics, terrain, weather, and

other such factors; it should also take into account regional variations in the organizational and corporate structures of transmission owners and operators, variations in generation fuel type and ownership patterns, and regional variations in market design if these affect the proposed Reliability Standard. Order No. 672 at P 331.

In the Order 740 Remand at P4, the Commission states that:

"Reliability Standards that the ERO proposes to the Commission may include Reliability Standards that are proposed to the ERO by a Regional Entity… When the ERO reviews a regional Reliability Standard that would be applicable on an interconnection-wide basis and that has been proposed by a Regional Entity organized on an interconnection-wide basis, the ERO must rebuttably presume that the regional Reliability Standard is just, reasonable, not unduly discriminatory or preferential, and in the public interest. In turn, the Commission must give "due weight" to the technical expertise of the ERO and of a Regional Entity organized on an interconnection-wide basis."

Further, regional entities may propose Regional Reliability Standards that set more stringent reliability requirements than the NERC Reliability Standard or cover matters not covered by an existing NERC Reliability Standard. NERC Rules of Procedure, Section 312, Regional Reliability Standards.

The proposed Regional Variance is applicable only in the Western Interconnection.

The proposed Regional Variance covers matters not covered in an existing NERC Reliability Standard by requiring the development of an RC-coordinated methodology for Interconnection-wide system modeling and monitoring.

No Undue Negative Effect

Proposed reliability standards should cause no undue negative effect on competition or restriction of the grid.

As directed by section 215 of the FPA, the Commission itself will give special attention to the effect of a proposed Reliability Standard on competition. The ERO should attempt to develop a proposed Reliability Standard that has no undue negative effect on competition. Among other possible considerations, a proposed Reliability Standard should not unreasonably restrict available transmission capability on the Bulk-Power System beyond any restriction necessary for reliability and should not limit use of the Bulk-Power System in an unduly preferential manner. It should not create an undue advantage for one competitor over another. Order No. 672 at P 332.

The assigned drafting team does not foresee any negative impacts on competition resulting from the proposed Regional Variance.

During the development phase of this project, the industry raised no concerns regarding competition or restrictive use of the grid.

Implementation of New Requirements (Effective Date)

The implementation time for the proposed Reliability Standards must be reasonable.

In considering whether a proposed Reliability Standard is just and reasonable, the Commission will consider also the timetable for implementation of the new requirements, including how the proposal balances any urgency in the need to implement it against the reasonableness of the time allowed for those who must comply to develop the necessary procedures, software, facilities, staffing or other relevant capability. Order No. 672 at P 333.

In accordance with the WECC Reliability Standards Development Procedures, an implementation plan for the proposed Regional Variance was included with Posting 1 of this project. The Implementation Plan is included as Attachment F of this filing.

The proposed effective date for the WECC Regional Variance is "The first day of the first quarter after regulatory approval, but no sooner than January 1, 2020." A January 1, 2020 effective date allows time for the winding down of Peak Reliability (serving as the primary Interconnection RC until December 31, 2019), other RCs to start up, and creates a window during which the RCs may create the methodology required.

Earlier compliance should not be pursued. If an earlier effective date is imposed, the time window could encompass the active operation of multiple RCs for which a coordinated handoff of responsibilities had not yet occurred. As proposed, the effective date allows the RCs a period to create the required methodology. An earlier effective date may not accommodate that need. No other retirements are required.

Fair and Open Process

The Reliability Standard development process must be open and fair.

Further, in considering whether a proposed Reliability Standard meets the legal standard of review, we will entertain comments about whether the ERO implemented its Commission-approved Reliability Standard development process for the development of the particular proposed Reliability Standard in a proper manner, especially whether the process was open and fair. However, we caution that we will not be sympathetic to arguments by interested parties that choose, for whatever reason, not to participate in the ERO's Reliability Standard development process if it is conducted in good faith in accordance with the procedures approved by the Commission. Order No. 672 at P 334

WECC followed the WECC Reliability Standards Development Procedures (Procedures) approved by FERC in effect at the time of each step in the process.

In accordance with the Procedures, all drafting team meetings are open to the public.

All drafting team meetings were announced via the WECC Standards Email List for the period prescribed in the Procedures. Notice of the meetings was provided to NERC and posted on the WECC Calendar along with meeting minutes.

All meetings were supported by a telephone conference bridge associated with an on-line internet visual capability allowing all participants to see the document(s) as they were being developed. Further, this team held an open-mic Standards Briefing prior to balloting affording the industry an additional opportunity to have its questions addressed.

This project was posted twice for public comment at WECC.

Comments and the associated responses are currently posted on the WECC website, on the WECC-0135 project page, under the Submit and Review Comments accordion.[4] Response to Comments forms were provided with this filing.

In addition to posting under the WECC Procedures, this project was also posted by NERC for 45-days in accordance with NERC's Rules of Procedure and NERC's internal business practices.

Balanced with Other Vital Interests

Proposed Reliability Standards must balance with other vital public interests.

Finally, we understand that at times development of a proposed Reliability Standard may require that a particular reliability goal must be balanced against other vital public interests, such as environmental, social and other goals. We expect the ERO to explain any such balancing in its application for approval of a proposed Reliability Standard. Order No. 672 at P 335.

WECC is not aware of any other vital public interests. No such balancing concerns were raised or noted.

Consideration of Other Facts

Proposed Reliability Standards must consider any other relevant factors.

In considering whether a proposed Reliability Standard is just and reasonable, [FERC] will consider [several] general factors, as well as other factors that are appropriate for the particular Reliability Standard proposed. Order No. 672 at P 323.

WECC is not aware of any other general factors in need of consideration.

[4] https://www.wecc.org/Standards/Pages/WECC-0135.aspx

Exhibit D

Analysis of Violation Risk Factors and Violation Severity Levels

Violation Risk Factors

The Violation Risk Factors (VRF) for the proposed variance are as follows:

D.R1. *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

D.R2. *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

After reviewing the North American Electric Reliability Corporation (NERC) Violation Risk Factors guidelines, the WECC-0135 Drafting Team set the VRF for both proposed requirements as "High."

The "High" rating was set because failure to complete the assigned task could "directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures."[1]

Violation Severity Levels

The Violation Severity Levels (VSL) for the proposed variance are as follows:

D.R1. Severe

D.R2. Severe

The WECC-0135 DT set a "Severe" level because the assigned task is binary. It must either be performed or not performed. Thus, a graded level of severity is not warranted.

D.R #	Violation Severity Levels for the WECC Regional Variance			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
D.R1.				The Reliability Coordinator did not develop the methodology as required in D.R1.
D.R2.				The Reliability Coordinator did not implement the

[1] https://www.nerc.com/pa/Stand/Resources/Documents/Violation_Risk_Factors.pdf

D.R #	Violation Severity Levels for the WECC Regional Variance			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
				methodology as required in D.R2.

Exhibit E

Summary of Development History and Complete Record of Development

Summary of Development History

Summary of Development History

The development record for the WECC regional Variance reflected in proposed Reliability Standard IRO-002-6 is summarized below.

I. Overview of the Standard Drafting Team

When evaluating a proposed Reliability Standard, the Commission is expected to give "due weight" to the technical expertise of the ERO.[1] The technical expertise of the ERO is derived from the standard drafting team selected by the WECC Standards Committee to lead each project in accordance with Step 3 of the WECC Reliability Standards Development Procedures.[2] For this project, the standard drafting team consisted of industry experts, all with a diverse set of experiences. A roster of the Standard Drafting team members is included in **Exhibit F**.

II. Standard Development History

A. Standard Authorization Request

Project WECC-0135 IRO-002-5 RC – Monitoring and Analysis – Regional Variance was initiated on June 8, 2018 with receipt of a proposed Standards Authorization Request ("SAR"). The WECC Standards Committee formally approved the SAR on June 19, 2018.

B. First Posting – Comment Period

On October 5, 2018, the standard drafting team agreed by majority vote to post a proposed regional Variance to Reliability Standard IRO-002-5 for a 30-day comment period.[3]

---

[1] Section 215(d)(2) of the Federal Power Act; 16 U.S.C. § 824o(d)(2)

[2] (2018). The currently-effective WECC RSDP is available at http://www.nerc.com/FilingsOrders/us/Regional%20Delegation%20Agreements%20DL/WECC%20RSDP_20171027.pdf.

[3] Posting materials for this posting and subsequent postings are available on the WECC project page, https://www.wecc.org/Standards/Pages/WECC-0135.aspx.

The proposed Variance was posted for a 30-day comment period from October 9, 2018 through November 8, 2018.

C. Second Posting – Comment Period

The proposed regional Variance was posted for another 30-day public comment period from November 19, 2018 through December 19, 2018. On November 28, 2019, WECC extended the deadline for comments through January 2, 2019 to accommodate a modification to the Implementation Plan.

D. Final Ballot

On January 17, 2018, the WECC Standards Committee approved the proposed regional Variance to Reliability Standard IRO-002-5 to be posted for ballot. The ballot pool opened on January 22, 2019 and closed on February 5, 2019. WECC held a standards briefing on February 6, 2019. The ballot was open from February 7, 2019 through February 21, 2019. Twenty-nine individuals joined the ballot pool. Twenty-six votes were cast, providing quorum at 89.7 percent. The standard obtained 25 affirmative votes which was 100 percent of the weighted segment vote.

E. WECC Board of Directors Approval

On March 6, 2019, the WECC Board of Directors approved the proposed regional Variance to Reliability Standard IRO-002-5.[4]

F. NERC Comment Period and Board of Trustees Adoption

NERC posted the proposed regional Variance to Reliability Standard IRO-002-5 for a 45-day public comment period from March 7, 2019 through April 22, 2019. Following the posting period, the proposed Variance was added to the IRO-002 Reliability Standard and assigned

[4] *See* https://www.wecc.org/Administrative/March%20Board%20Meeting%20Book.pdf.

version number IRO-002-6.The NERC Board of Trustees adopted proposed Reliability Standard IRO-002-6 on May 9, 2019.

Complete Record of Development

WECC
Electric Reliability and Security for the West

Steven Rueckert
WECC Director of Standards
April 30, 2019

Ms. Nasheema Santos

NERC Reliability Standards Department

North American Electric Reliability Corporation

3353 Peachtree Rd. NE, North Tower—Suite 600

Atlanta, GA 30326

Subject: WECC-0135 IRO-002-5 Reliability Coordination—Monitoring and Analysis

Request for Regional Variance

Dear Nasheema,

WECC is seeking approval by the NERC Board of Trustees, with subsequent disposition by the Federal Energy Regulatory Commission (FERC), to approve a WECC Regional Variance to IRO-002-5 Reliability Coordination—Monitoring and Analysis.[1]

The proposed Regional Variance requires Reliability Coordinators (RC) serving the Western Interconnection: 1) to develop a common Interconnection-wide methodology to determine the modeling and monitoring of elements necessary for providing operational awareness, and 2) to use the methodology.

The proposed variance passed with a 100 percent weighted approval.

Sincerely,

Steven Rueckert

WECC Director of Standards

[1] If approved, the variance will be added to proposed standard IRO-002-6 as part of the ongoing NERC Project 2018-03 Standards Efficiency Retirements.

For documentation support please contact W. Shannon Black, at (503) 307-5782.

WECC-0135 IRO-002-5 Reliability Coordination (RC)—Monitoring and Analysis Request for Regional Variance (RV)
SAR—Standard Authorization Request Attachment A (1)
Regional Reliability Standard(s) (Clean Existing) Attachment B (2)
Regional Reliability Standard(s) (Clean Proposed) Attachment C1 (3)
Regional Reliability Standard(s) (Clean Proposed) Attachment C2 (4)
Regional Reliability Standard(s) (Existing redlined to Proposed) Attachment D (5)
Project Roadmap Attachment E (6)
Implementation Plan Attachment F (7)
VRF & VSL Justification Attachment G (8)
Regional Reliability Standard Submittal Request Attachment H (9)
Order 672 Criteria Attachment I (10)
Drafting Team Roster with Biographies Attachment J (11)
Ballot Pool Members Attachment K (12)
Final Ballot Results Attachment L (13)
Minority Issues Attachment M (14)
WECC Standards Committee Roster Attachment N (15)
Response to Comments Posting One WECC Attachment O1 (16)
Response to Comments Posting Two WECC Attachment O2 (17)
Response to Comments Posting One NERC – Attachment O3 (18)

IRO-002-5 (WECC Variance)	Reliability Coordination – Monitoring and Analysis			Info (19) IRO-002-5 Regional Variance* (20) *Will be added to proposed standard

	(WECC Variance)	Standard Under Development	3/7/2019 – 4/22/2019	IRO-002-6 (part of the ongoing Project 2018-03 Standards Efficiency Retirements, post final ballot) Submit Comments Comments Received **(21)** Unofficial Comment Form (Word) **(22)**

Electric Reliability and Security for the West

Response to Comments
Posting 1 Response to Comments
WECC-0135 IRO-002-5
RC—Monitoring and Analysis—RV

Posting 1

The WECC-0135 IRO-002-5, Reliability Coordination—Monitoring and Analysis, Request for WECC Regional Variance (RV) Drafting Team (DT) thanks everyone who submitted comments on the proposed document.

Posting

This project was posted for a 30-day public comment period from October 9 through November 8, 2018.

WECC distributed the notice for the posting on October 5, 2018. The DT asked stakeholders to provide feedback on the proposed document through a standardized electronic template. Five comments were received on this posting. To facilitate comments, WECC received a redline version of the posting from four entities. Those redline documents are posted on the WECC-0135 homepage under the "Submit and Review Comments" accordion.

Location of Comments

All comments received on the project can be viewed in their original format on the WECC-0135 project page under the "Submit and Review Comments" accordion.

Methodology vs. Model Mandate

The proposed WECC RV addresses a paradigm in which multiple Reliability Coordinators (RC) provide RC service(s) within the Western Interconnection, regardless of the RC's geographic location.

RCs require information in the Real-time horizon to ensure the reliability of their RC Areas. The foundation of the Real-time task(s) occurs during the Operations Planning horizon during which RCs engage in the coordinated exchange of information with neighboring RCs.

Two primary approaches were considered for this project: 1) a requirement that all RCs use a single, mandated model, and 2) a requirement that all affected RCs create a coordinated methodology to meet the reliability goal. The DT opted for the second approach.

The DT opted for the methodology approach over the model mandate for the following reasons:

- The methodology approach is a better match for NERC's direction that standards should be results-based as opposed to mandating how the result should be reached. (See NERC's Results-Based Reliability Standard Development Guidance.)
- Requiring use of a specified model may preclude use of a superior model causing a default to the lowest common denominator. (FERC Order 672, para. 329.)
- Requiring use of a specified model may diminish due process in that changes to the model could occur outside the standards-development process. (FERC Order 672 at para. 334.)
- If the WECC RV mandated use of a single model "or its successor" until the validity of "its successor" could be determined, compliance would be in question.
- The methodology approach conforms with FERC direction in that it allows for the WECC RV to consider "implementation cost [and] historical regional infrastructure design," while achieving the reliability objective "effectively and efficiently." (FERC Order 672, para. 328 and 330)

Common Methodology

The goal of the common methodology is to ensure that essential modelling details are maintained that provide an RC with a wide-area view while permitting any unneeded data to be culled. The benefits of ensuring that the RC models are no larger than necessary include: 1) significantly enhanced performance of on-line applications such as Transient Stability Analysis, 2) reduced risk that data problems with elements that are insensitive to the RC footprint will cause convergence problems, 3) reduced risk that problems with elements that are insensitive to the RC footprint could cause false alarms or consume troubleshooting resources, and 4) reduced risk that errors from insensitive parts of the Interconnection could mask issues within the RC footprint.

Changes in Response to Comment

Purpose

A Purpose statement was added as follows: "To develop a methodology that creates models for performing Operational Planning Analysis and Real-time Assessment." The intent is to clarify the purpose for the variance.

Applicability

The word "operating" was inserted into the Applicability section.

Requirement RX1

- The general syntax was addressed.
- The word "all" was deleted from Posting 1, RX1.

- Reference to Operational Planning Analysis and Real-time Assessment were deleted from Posting 1, RX1 eliminating ambiguity as to the time horizon in which the requirement was to take place. (See the Purpose statement.)
- Posting 1, Parts 1.1.1 through 1.1.3 were deleted as unnecessary.
- Posting 1 RX1, 1.1.4 reference to inter-area oscillations was retained as Posting 2, RX1 1.2.
- Posting 2, RX1., 1.1 was added creating a requirement to establish a baseline reference model.
- The defined term "Elements" was adopted.
- Posting 2, RX1, 1.3-1.5, adjusted syntax and added the phrase "analysis and assessment" for consistency.
- The Measure for Posting 2, RX1 was adjusted to reflect the above changes.

Requirement RX2

- The word "implement" was deleted in favor of "use."
- The phrase "modeling and monitoring" was deleted as redundant.
- The word "described" was deleted in favor of "developed."
- The Measure for Posting 2, RX2 was adjusted to reflect the above changes.

Violation Severity Levels and Violation Risk Factors

Violation Severity Levels (VSL) and Violation Risk Factors (VRF) were added.

Compliance

Compliance components were added.

Minority View

Numerous structural and syntax changes were not adopted.

The drafting team did not adopt proposed changes:

- That would further prescribe how the monitoring of oscillation should occur. The drafting team opted to retain the methodology approach that meets the results-based concept rather than defining what must be done.
- That would delete Posting 1, RX1., 1.5 because its inclusion creates a mandate specific to the RC that is not present in MOD-33.
- To adopt a dispute resolution clause requiring that all RCs agree.
- To adopt inclusion of "voltage" because RX1 addresses stability time frames as opposed to stability types.

Effective Date

The proposed effective date is no earlier than January 1, 2020. A full implementation plan was posted with Posting 2.

Action Plan

On November 19, 2018, the WECC-0135 IRO-002-5, Reliability Coordination—Monitoring and Analysis, Request for WECC Regional Variance Drafting Team agreed by majority vote to post Posting 2 of the project for a 30-day comment period.

The posting period will open November 19, 2018, and close December 19, 2018. The drafting team will meet on December 20, 2018, from 10:00 a.m. to noon and December 21, 2018, from 10:00 a.m. to noon MST to respond to comments received.

Once the posting opens, comments can be submitted using the green survey buttons located on the "Submit and Review Comments" accordion of the WECC-0135.

If you have questions regarding the posting, please contact W. Shannon Black, at (503) 307 5782.

Contacts and Appeals

If you feel your comment has been omitted or overlooked, please contact W. Shannon Black, WECC Consultant, at (503) 307-5782. In addition, there is a WECC Reliability Standards appeals process.

Commenter		Organization
1	Alan Wahlstrom	Southwest Power Pool (SPP)
2	Robert Cummins	North American Electric Reliability Corporation (NERC)
3	Saad Malik	Peak Reliability Coordinator (Peak)
4	Adrian Andreoiu / Gordon Dobson-Mack	BC Hydro/Powerex
5	Andrea Jessup	Bonneville Power Administration (BPA)

Index to Questions, Comments, and Responses

Question

1. The Drafting Team welcomes comments on all aspects of the document.

1. The Drafting Team welcomes comments on all aspects of the document.

Summary Consideration: See summary in the preamble of this document.	
Commenter	**Comment**
SPP	Suggested changes: **Applicability** As used in this WECC Regional Variance, Reliability Coordinator is specific to those Reliability Coordinators providing Reliability Coordinator service(s) to *entities operating* within the Western Interconnection, regardless of where the Reliability Coordinator may be located. **Requirement and Measures** RX1. Each Reliability Coordinator shall, in coordination with all [AW1] other Reliability Coordinators, jointly develop and implement a common Interconnection-wide modeling and monitoring methodology that all Reliability Coordinators will use to perform Operational Planning Analysis and Real-time Assessments, to include at a minimum, the following: [AW1] This may be problematic if Canadian entities bow out. Which standard would Canadian entities follow if not this one? 1.1 A method [MH2] to determine impacts (both Bulk Electric System (BES) and non-BES facilities) from internal and external systems on its Reliability Coordinator Area, to include: [MH2] It is self-evident why an RC would have a method for monitoring. In Rx1.1 "required for awareness: should be deleted. 1.1.1 Facility Ratings and thermal limits; 1.1.2 Steady state voltage limits; 1.1.3 Transient and steady state stability; and

	1.1.4 Inter-area oscillations[AW3]. [AW3] The standard has left the interpretation on what constitutes monitoring oscillation or transient to the regulatory groups. There should be some language that allows the Reliability Coordinator to determine how it should monitor oscillations and transients. This can be done through the standard or the methodology 1.2 A method to determine Contingencies included in the analysis and assessments. 1.3 A method to determine Remedial Action Schemes included in the analysis and assessments. 1.4 A method to determine Forecast data included in the analysis and assessments. [AW4] [AW4] R1.5 addresses model validation for steady state and dynamic oscillatory system response. This requirement conflicts with Mod-33 which already address model validation for Steady- State and Dynamic System Models Suggested addition: 1.6 A resolution process specifying any change to the methodology must be agreed to by all Reliability Coordinators. MX1. Each Reliability Coordinator shall provide evidence of a jointly developed, implemented and coordinated Interconnection-wide modeling and monitoring methodology, as specified in RX1. Evidence may include, but is not limited to, a dated and acknowledged copy of the jointly developed, implemented and coordinated Interconnection-wide modeling and monitoring methodology, as specified in RX1[AW5] [AW5] In Measure MX1 "joint correspondence between the Reliability Coordinators addressing the content of RX1" is vague and could be interpreted as any language in which the methodology was discussed between RC's. MX1 could state "Each RC shall have a dated methodology."

Response

The DT adopted the following changes:

Applicability:

As used in this WECC Regional Variance, Reliability Coordinator is specific to those Reliability Coordinators providing Reliability Coordinator service(s) to entities ***operating*** within the Western Interconnection, regardless of where the Reliability Coordinator may be located. (Accepted "operating"; emphasis added.)

Requirement and Measures

1) Implementation

SPP's suggestion that "implementation" be added to the first requirement resulting in deletion of the proposed second requirement was not adopted. To accept the change would create two requirements in a single requirement. This approach conflicts with standards drafting conventions.

2) All

SPP suggests deleting the word "all" from the requirement to avoid the appearance of non-compliance if any one or more RCs does not jointly participate in the development of the methodology. The DT adopted the suggestion to delete the word "all".

3) Jointly

The DT did not adopt inclusion of the word "jointly" as to do so adds ambiguity and conflicts with standards drafting conventions that discourage the use of adverbs. This convention is in place because adverbs are interpreted from the standpoint of the reader and may lead to varying interpretations of the same language. For example, in the sentence "The aircraft moved swiftly", what constitutes "swiftly" is entirely dependent on all the surrounding circumstances.

4) Prepositional Changes to the Predicate

Although SPP's suggestions are sound, the DT opted to eliminate the tailing phrase of the requirement to avoid confusion. As proposed in Posting 1, the phrase included multiple time horizons during which the task would be completed. By adjusting the phrase, the confusion is eliminated.

5) Proposed changes Posting 1, RX1, 1.1

SPP's suggestions were largely adopted while incorporating additional changes suggested by NERC, Peak and the drafting team. The new language (Posting 2, RX1, 1.2) is as follows:

"1.2 A method to determine impacts of Elements of the Bulk Electric System (BES) and non-BES facilities, from internal and external systems on its Reliability Coordinator's Area, that considers the impact to each of the following:"

6) Interpretation of 1.1.4

The construction of Posting 1, Requirement 1.1.4 was intentional. The DT agrees with SPP that, as drafted, the requirement leaves open what constitutes monitoring of inter-area oscillations. This allows the RC "to determine how it should monitor oscillations and transients" (SPP).

The body of the requirement calls for creation of a methodology; it does not call for detailing "how" the methodology will be implemented. That should be left to the learned discretion of the RCs as they develop the methodology.

7) Syntax change and addition of "included in the analysis and assessments"

This change was adopted in Posting 1, RX1. 1.2, 1.3 and 1.4.

8) Defined Term "Forecast" in Posting 1, RX1. 1.4

The capitalized use of Forecast in Posting 1 RX1. 1.4 was not used because it is not a defined term in the NERC Glossary of Terms Used in Reliability Standards.

9) Proposed deletion of 1.5

The DT opted to retain Posting 1, RX1. 1.5 as it creates a mandate specific to the RC that is not present in MOD-33.

10) Proposed Inclusion of 1.6

SPP suggests including a 1.6 to require a resolution process specifying that any change to the methodology must be agreed to by all Reliability Coordinators. For the same reason the DT adopted SPPs suggestion to delete "all" from the body of the requirement, mandating "all" in a proposed 1.6 is problematic.

10) Proposed Changes to the Measure

Although the DT did not adopt the specific changes offered by SPP, changes were made to the Measure to reflect the newly drafted Requirement.

Commenter	Comment
NERC, Robert Cummins	The following comments are summarized from a redline version of Posting 1 provided by Mr. Cummins. The redline is available for review on the WECC-0135 Project Page on the Submit and Review Comments accordion. The

	provided electronic portal for submitting comments was not used. 1) Add the phrase "in the Interconnection" to RX1. 2) Include a new 1.1 to serve as a baseline. Proposed language: A methodology for development and maintenance of an Interconnection -wide model to act as the common starting point for all Reliability Coordinators in the Interconnection including frequency of updating that model. 3) Add the following in (existing) Requirement 1.1. "(…and non-BES elements)". 4) With rapid changes in resource mix and location of those resources, the critical contingencies and the oscillatory behavior will often change. That change in criticality must be constantly reviewed. To clarify existing 1.2, Mr. Cummins suggested the following changes: "A method for determining Contingencies required for inclusion in Operational Planning Analysis and Real-time Assessment. (Existing 1.2 would add on 1.2.1 "Critical Contingency determination must be reviewed annually."
Response	
1) Interconnection Adding "in the Interconnection" was not adopted as it is addressed in the Applicability section. 2) Include a new Posting 1, RX1. 1.1 to serve as a base line. After considering NERC's suggestion the following changes were adopted: **RX1.** 1.1. A methodology for development, maintenance, and periodic review of an Interconnection-wide reference model to serve as the baseline from which Reliability Coordinator's operational models are derived. 3) Posting 1, RX1. 1.2 – Elements	

The defined term Elements was added to read as follows: "…impacts of Elements of the Bulk Electric System (BES)…"

4) Posting 1, RX1. 1.2 clarification

NERC suggests attaching the phrase "in the Operational Planning Analysis and the Real-time assessment" for determining Contingencies. If the language is adopted, it creates a slippery slope begging why the condition is applied solely to Contingencies and not, for example, to Remedial Action Schemes. To avoid adopting an artificial distinction, the team opted not to adopt the language.

5) Addition of Posting 1, RX1. 1.2.1

NERC's suggestion adds ambiguity in that what constitutes "critical" will vary based on all the surrounding circumstances.

Commenter	Comment
Peak	The following comments are summarized from a redline version of Posting 1 provided by Peak. The redline is available for review on the WECC-0135 Project Page on the Submit and Review Comments accordion. The provided electronic portal for submitting comments was not used. Peak finds the double inclusion of "include" in RX1 and "to include" in RX1.1 confusing. Peak's concern is that the second inclusion could be interpreted to mean that RCs are required to include the actual Facility Ratings, thermal limits, voltage limits, etc. in the Interconnection-wide methodology. Peak believes the intent was for the RC to consider those elements when determining the impact of internal/external systems. However, as drafted the language could be interpreted differently. Peak suggests the following corrective language: **1.1** A method to determine ***SOL and IROL exceedances due to*** impacts ~~(both Bulk Electric System (BES) and non-BES facilities)~~ from internal and external systems on its Reliability Coordinator's Area (**to both Bulk Electric System (BES) and non-BES facilities),** ~~to include~~ by taking into account:

Response
1) Changes to existing Posting 1, RX1 1.1 After considering Peak's suggestion, eliminated the double use of "include" and adopted the following change appearing as Posting 2, RX1. 1.2: **"1.2** A method to determine impacts of Elements of the Bulk Electric System (BES) and non-BES facilities, from internal and external systems on its Reliability Coordinator's Area, that considers the impact to each of the following:"

Commenter	Comment
BC Hydro/Powerex	The following comments are submitted on behalf of BC Hydro and Powerex. The Drafting Team welcomes comments on all aspects of the document. BC Hydro and Powerex are supportive of this draft version that enables the Reliability Coordinators (RC) offering reliability coordination services in the WECC Region to develop a common methodology for modelling and monitoring the Western Interconnection. BC Hydro and Powerex believe that the common methodology approach strikes an appropriate balance between ensuring that RCs model and monitor elements that could impact their RC footprint without requiring each RC to model BES elements that are insensitive to their RC footprint. The primary reason BC Hydro and Powerex believe RCs should have the right to cull insensitive elements from their energy management system (EMS) model is that the size of the model will adversely impact an RC's ability to run critical on-line applications, such as real-time Transient Stability Analysis (TSA): a 15,000-bus model will require substantially more time to calculate real-time transient stability limits than a 7,500-bus model would require. This will be particularly important to RCs whose footprints are sensitive and vulnerable to transient and voltage stability issues as they will want to recalculate transient and voltage stability limits multiple times an hour. Delays in running

	these numerically and computationally intensive processes will naturally mean that fewer limits can be calculated in the same amount of time, thereby potentially adversely impacting the reliability of the power system. Furthermore, BC Hydro and Powerex believe it is imperative for RCs to have the option to cull insensitive BES elements from their EMS models because this will: a) Reduce the risk of data problems with elements that are insensitive to the RC footprint causing convergence problems that prevent advanced applications from being run and thereby rendering the results of the applications (e.g. limits and limit violations) unavailable for longer periods of time; b) Reduce the risk that problems with elements that are insensitive to the RC footprint could cause spurious alarms or consume troubleshooting resources; c) Reduce risk that errors from insensitive parts of a full WECC model could mask issues within the RC footprint; and, d) Avoid the additional maintenance and licensing costs associated with an unnecessarily large EMS model. In addition, BC Hydro and Powerex suggest re-wording of the language of Requirement RX2 and associated Measure MX2 as follows: •In RX2, replace "as described" with "developed" for consistency with the requirement RX1; and •In MX2, replace "used" with "implemented" for consistency with the requirement RX2.
Response	
The drafting team appreciates BC Hydro's/Powerex' participation in the standards development process. In considering changes to Posting 1 RX2, the team opted for a combination of BC/Powerex' suggestion and that of NERC. The team adopted the word "developed" to reflect Requirement RX1	

and complemented that with the word "uses", as suggested by NERC to indicate that the reliability task is ongoing and not merely used at some point in the past. The resultant wording is as follows:

RX2. Each Reliability Coordinator shall use the methodology ***developed*** in RX1. ([Violation Risk Factor: High] [Time Horizon: Operations Planning]) (Emphasis added)

MX2. Each RC will have evidence that it ***uses*** the methodology ***developed*** in RX1, as required in RX2 above. (Emphasis added.)

Commenter	Comment
BPA	BPA did not respond to Posting 1 via the provided electronic portal; however, BPA did provide a suggested redline to WECC via email. The proposed redline can be found on the WECC-0135 Project Page on the Submit and Review Comments accordion. In summary, BPA suggested: 1) A change in language and task from that of developing a method to that of developing criteria; 2) Inclusion of "voltage"; and, 3) Change the body of proposed RX1 to as follows: **RX1.** Each Reliability Coordinator shall, in coordination with all other Reliability Coordinators, develop common Interconnection-wide modeling standards, that all Reliability Coordinators will use for performing Operational Planning Analysis and Real-time Assessments, to include at a minimum:

Response

1) Posting 1, RX1 1.1 Criteria for Developing

After consideration of BPA's suggestion, the team opted not to adopt the change from mandating development of a "method" in favor of developing a "criteria." Assuming the criteria were developed, as proposed by BPA there is no mandate to use it. By retaining the "method" approach, the RCs developing the method will, by default, be required to include the criteria contained in the method. The methodology is a broader construct that will include the criteria. Limiting the requirement to criteria alone could be overly constricting.

2) Voltage

The drafting team did not include "voltage" because the requirement as drafted addresses stability time frames as opposed to stability types.

3) Restructuring

The team found BPA's proposed restructuring as a viable alternative to Posting 1; however, the team further concluded that the restructuring added no significant clarity. As to inclusion of a mandate to develop (more) "modeling standards" within an existing standard, the team concluded that the proposal would introduce undue ambiguity to the requirement; therefore, the proposal was not adopted.

Electric Reliability and Security for the West

Attachment A

Standard Authorization Request

W. Shannon Black

WECC Consultant, Standards Processes

This Standard Authorization Request (SAR) was received on June 8, 2018 and deemed complete the same day. The SAR was approved by the WECC Standards Committee (WSC) on June 19, 2018.

The scope of the SAR was modified by the WSC on September 20, 2018. (See section on Modified Scope.)

Introduction

This project is a request to add a Regional Variance (RV) to IRO-002-5, Reliability Coordination—Monitoring and Analysis.

Requester Information

Provide your contact information and your alternate's contact information:

Primary contact

- First name: W. Shannon
- Last name: Black
- Email: sblack@wecc.org
- Phone: (503) 307-5782
- Organization name: WECC

Alternate

- First name: Steven
- Last name: Rueckert
- Email: srueckert@wecc.org
- Phone: (801) 883-6878

Type of Request

Specify the type of request: (select one)

- Request for Regional Variance

Create, Modify, or Retire a Document Questions

Provide information for your request to create, modify, or retire the document.

Requested Action (select one)

- Request for Regional Variance

Document Type (select one)

- NERC Standard

Issue

Specify what industry problem this request is trying to resolve.

In IRO-002-5, Reliability Coordination—Monitoring and Analysis, requirement R5 states:

> **R5.** Each Reliability Coordinator shall monitor Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area. [*Violation Risk Factor: High*] [*Time Horizon: Real-Time Operations*]

Due to the unique physical characteristics of the Bulk Power System in the Western Interconnection, events in one part of the Interconnection can have significant impacts in other parts of the system. It is unknown how many Reliability Coordinators (RC) there will be in the Western Interconnection and what the potential RC Area footprints will be. However, it is highly likely that events in one RC's Area will impact facilities in another RC's Area.

This SAR seeks an Regional Variance to R5 requiring each RC within the Western Interconnection to:

1. Model the entire Interconnection as part of its monitoring and identification processes; and
2. Include specific types of Remedial Action Schemes (RAS) in its processes.

Consideration should be given to:

1. Requiring the use of a single, common model covering the Western Interconnection; and
2. Inclusion (or exclusion) of specific types of RASs, such as wide-area and local-area RASs, as discussed in the WECC Remedial Action Scheme Design Guide, January 2017.

Proposed Remedy

Specify how this request will address the issue.

This SAR would add a WECC RV to ensure coordination and consistent review between multiple RCs within the Western Interconnection.

Applicable Entities

Each function will be reviewed if affected.

- Reliability Coordinators

Detailed Description

See 5 above.

Affected Reliability Principles

Which of the following reliability principles is MOST affected by this request? (select one)

- **Reliability Principle #7 –** *The reliability of the interconnected bulk power system shall be assessed, monitored, and maintained on a wide-area basis.*

Modified Scope

The following is an excerpt from the WSC meeting minutes on September 20, 2018.

Request for Standard Authorization Approval (SAR)—Scope Adjustment

On September 11, 2018, the WECC-0135 IRO-002-5, Reliability Coordination—Monitoring and Analysis, Request for Regional Variance Drafting Team concluded that the scope of the existing SAR required adjustment.

The drafting team raised concerns that requiring each Reliability Coordinator to model the entire Interconnection may not be necessary to ensure or enhance reliability, and may diminish reliability. As an alternative, the team sought authorization to broaden the scope of the SAR to allow, at minimum, any one or a combination of the following: 1) no change, 2) allow each Reliability Coordinator flexibility in how the Interconnection would be modeled, 3) require each Reliability Coordinator to use an Interconnection-wide model, 4) consideration to draft a geographic-specific variance applicable only to the United States, and/or, 5) that position best considered by the subject matter experts assigned.

The team has set September 21, 2018, as the deadline to reach consensus on a drafting approach.

On a motion from Mr. Gary Nolan, the WSC agreed to expand the scope of the WECC-0135 SAR as requested.

Document Information

Specify the document title, document number, and affected section regarding the request.

See 5 above.

Reference Uploads

Please reference or upload any affected standards, regional business practices, criteria, policies, white papers, technical reports, or other relevant documents. If this request is based on a conflict of law, please include a copy of—or accessible reference to—the specific law or regulatory mandate in conflict.

NA

Provide additional comments (if needed).

NA

A. Introduction

1. **Title:** **Reliability Coordination – Monitoring and Analysis**

2. **Number:** IRO-002-5

3. **Purpose:** To provide System Operators with the capabilities necessary to monitor and analyze data needed to perform their reliability functions.

4. **Applicability:**

   4.1. Functional Entities:

   4.1.1. Reliability Coordinators

5. **Effective Date:** See Implementation Plan

B. Requirements and Measures

R1. Each Reliability Coordinator shall have data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for it to perform its Operational Planning Analyses. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

M1. Each Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to, a document that lists its data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for it to perform its Operational Planning Analyses.

R2. Each Reliability Coordinator shall have data exchange capabilities, with redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, for the exchange of Real-time data with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing its Real-time monitoring and Real-time Assessments. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-time Operations]*

M2. Each Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to, system specifications, system diagrams, or other documentation that lists its data exchange capabilities, including redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, for the exchange of Real-time data with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, as specified in the requirement.

R3. Each Reliability Coordinator shall test its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days. If the test is unsuccessful, the Reliability Coordinator shall

initiate action within two hours to restore redundant functionality. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

M3. Each Reliability Coordinator shall have, and provide upon request, evidence that it tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality, or experienced an event that demonstrated the redundant functionality; and if the test was unsuccessful, initiated action within two hours to restore redundant functionality as specified in Requirement R3. Evidence could include, but is not limited to: dated and time-stamped test records, operator logs, voice recordings, or electronic communications.

R4. Each Reliability Coordinator shall provide its System Operators with the authority to approve planned outages and maintenance of its telecommunication, monitoring and analysis capabilities. *[Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-time Operations]*

M4. 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 provided its System Operators with the authority to approve planned outages and maintenance of its telecommunication, monitoring and analysis capabilities.

R5. Each Reliability Coordinator shall monitor Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area. *[Violation Risk Factor: High] [Time Horizon: Real-Time Operations]*

M5. 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, or other equivalent evidence that will be used to confirm that it has monitored Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.

R6. Each Reliability Coordinator shall have monitoring systems that provide information utilized 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 infrastructure. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

M6. 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, SCADA data collection, or other equivalent evidence that will be used to confirm that it has monitoring systems consistent with the requirement.

C. Compliance

1. Compliance Monitoring Process

1.1. Compliance Enforcement Authority:

"Compliance Enforcement Authority" means NERC or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.

1.2. Evidence Retention:

The following evidence retention period(s) 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.

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

- The Reliability Coordinator shall retain its current, in force document and any documents in force for the current year and previous calendar year for Requirements R1, R2, and R4 and Measures M1, M2, and M4.
- The Reliability Coordinator shall retain evidence for Requirement R3 and Measure M3 for the most recent 12 calendar months, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.
- The Reliability Coordinator shall keep data or evidence for Requirements R5 and R6 and Measures M5 and M6 for the current calendar year and one previous calendar year.

1.3. Compliance Monitoring and Enforcement Program

As defined in the NERC Rules of Procedure, "Compliance Monitoring and Enforcement Program" 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.

Violation Severity Levels

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
R1.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with one applicable entity, or 5% or less of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with two applicable entities, or more than 5% or less than or equal to 10% of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with three applicable entities, or more than 10% or less than or equal to 15% of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with four or more applicable entities or greater than 15% of the applicable entities, whichever is greater.
R2.	N/A	N/A	The Reliability Coordinator had data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing Real-time monitoring and Real-time Assessments, but did not have redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, as specified in the requirement.	The Reliability Coordinator did not have data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing Real-time monitoring and Real-time Assessments as specified in the requirement.
R3.	The Reliability Coordinator tested its primary Control	The Reliability Coordinator tested its primary Control	The Reliability Coordinator tested its primary Control	The Reliability Coordinator tested its primary Control

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
	Center data exchange capabilities specified in Requirement R2 for redundant functionality, but did so more than 90 calendar days but less than or equal to 120 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 2 hours and less than or equal to 4 hours.	Center data exchange capabilities specified in Requirement R2 for redundant functionality, but did so more than 120 calendar days but less than or equal to 150 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 4 hours and less than or equal to 6 hours.	Center data exchange capabilities specified in Requirement R2 for redundant functionality, but did so more than 150 calendar days but less than or equal to 180 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 6 hours and less than or equal to 8 hours.	Center data exchange capabilities specified in Requirement R2 for redundant functionality, but did so more than 180 calendar days since the previous test; OR The Reliability Coordinator did not test its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, did not initiate action within 8 hours to restore the redundant functionality.

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
R4.	N/A	N/A	N/A	The Reliability Coordinator failed to provide its System Operator with the authority to approve planned outages and maintenance of its telecommunication, monitoring and analysis capabilities.
R5.	N/A	N/A	N/A	The Reliability Coordinator did not monitor Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.
R6.	N/A	N/A	N/A	The Reliability Coordinator did not have monitoring systems that provide information utilized by the Reliability Coordinator's operating

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
				personnel, giving particular emphasis to alarm management and awareness systems, automated data transfers, and synchronized information systems, over a redundant infrastructure.

D. Regional Variances

None.

E. Associated Documents

The Implementation Plan and other project documents can be found on the project page.

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	November 1, 2006	Adopted by Board of Trustees	Revised
1	April 4, 2007	Replaced Levels of Non-compliance with the Feb 28, BOT approved Violation Severity Levels (VSLs) Corrected typographical errors in BOT approved version of VSLs	Revised to add missing measures and compliance elements
2	October 17, 2008	Adopted by NERC Board of Trustees	Deleted R2, M3 and associated compliance elements as conforming changes associated with approval of IRO-010-1. Revised as part of IROL Project
2	March 17, 2011	Order issued by FERC approving IRO-002-2 (approval effective 5/23/11)	FERC approval
2	February 24, 2014	Updated VSLs based on June 24, 2013 approval.	VSLs revised
3	July 25, 2011	Revised under Project 2006-06	Revised
3	August 4, 2011	Approved by Board of Trustees	Retired R1-R8 under Project 2006-06.
4	November 13, 2014	Approved by Board of Trustees	Revisions under Project 2014-03
4	November 19, 2015	FERC approved IRO-002-4. Docket No. RM15-16-000	FERC approval
5	February 9, 2017	Adopted by Board of Trustees	Revised

5	April 17, 2017	FERC letter Order approved IRO-002-5. Docket No. RD17-4-000	

Guidelines and Technical Basis

None

Rationale

During development of IRO-002-5, text boxes are embedded within the standard to explain the rationale for various parts of the standard. Upon Board adoption of IRO-002-5, the text from the rationale text boxes will be moved to this section.

Rationale text from the development of IRO-002-4 in Project 2014-03 follows. Additional information can be found on the Project 2014-03 project page.

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 Requirements:
The data exchange elements of Requirements R1 and R2 from approved IRO-002-2 have been added back into proposed IRO-002-4 in order to ensure that there is no reliability gap. The Project 2014-03 SDT found no proposed requirements in the current project that covered the issue. Voice communication is covered in proposed COM-001-2 but data communications needs to remain in IRO-002-4 as it is not covered in proposed COM-001-2. Staffing of communications and facilities in corresponding requirements from IRO-002-2 is addressed in approved PER-004-2, Requirement R1 and has been deleted from this draft.

Rationale for R2:
Requirement R2 from IRO-002-3 has been deleted because approved EOP-008-1, Requirement R1, part 1.6.2 addresses redundancy and back-up concerns for outages of analysis tools. New Requirement R4 (R6 in IRO-002-5) has been added to address NOPR paragraphs 96 and 97: *"…As we explain above, the reliability coordinator's obligation to monitor SOLs is important to reliability because a SOL can evolve into an IROL during deteriorating system conditions, and for potential system conditions such as this, the reliability coordinator's monitoring of SOLs provides a necessary backup function to the transmission operator…."*

Rationale for Requirements R1 and R2:
The proposed changes address directives for redundancy and diverse routing of data exchange capabilities (FERC Order No. 817 Para 47).

Redundant and diversely routed data exchange capabilities consist of data exchange infrastructure components (e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data) that will provide continued functionality despite failure

or malfunction of an individual component within the Reliability Coordinator's (RC) primary Control Center. Redundant and diversely routed data exchange capabilities preclude single points of failure in primary Control Center data exchange infrastructure from halting the flow of Real-time data. Requirement R2 does not require automatic or instantaneous fail-over of data exchange capabilities. Redundancy and diverse routing may be achieved in various ways depending on the arrangement of the infrastructure or hardware within the RC's primary Control Center.

The reliability objective of redundancy is to provide for continued data exchange functionality during outages, maintenance, or testing of data exchange infrastructure. For periods of planned or unplanned outages of individual data exchange components, the proposed requirements do not require additional redundant data exchange infrastructure components solely to provide for redundancy.

Infrastructure that is not within the RC's primary Control Center is not addressed by the proposed requirement.

Rationale for Requirement R3:
The revised requirement addresses directives for testing of data exchange capabilities used in primary Control Centers (FERC Order No. 817 Para 51).

A test for redundant functionality demonstrates that data exchange capabilities will continue to operate despite the malfunction or failure of an individual component (e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data). An entity's testing practices should, over time, examine the various failure modes of its data exchange capabilities. When an actual event successfully exercises the redundant functionality, it can be considered a test for the purposes of the proposed requirement.

Rationale for R4 (R6 in IRO-002-5):
The requirement was added back from approved IRO-002-2 as the Project 2014-03 SDT found no proposed requirements that covered the issues.

Electric Reliability and Security for the West

Attachment C1
Clean Proposed as Posted
WECC-0135 IRO-002-5
RC - Monitoring and Analysis - RV

Overview

As the Western Interconnection moves to a multi-Reliability Coordinator (RC) environment, focused coordination of those RCs will become critical. This filing is designed to ensure coordination between each of those RCs by creating a WECC Regional Variance (RV) to IRO-002-5, Reliability Coordination – Monitoring and Analysis (RCMA).

This filing does not change any part of the underlying standard. Only the proposed RV and the associated compliance components will be offered for comment. Proposed changes to the existing body of the standard will not be considered.

Once finalized, the proposed language will be renumbered per NERC's numbering nomenclature for RVs and inserted into the existing standard (RCMA). An example of a WECC RV can be seen in VAR-001-4.1 — Voltage and Reactive Control Compliance, Section D Regional Variances.

The following language is offered for comment as the proposed RV, Posting 2.

Purpose

To develop a methodology that creates models for performing Operational Planning Analyses and Real-time Assessments.

Proposed Regional Variance

Applicability

As used in this WECC Regional Variance, Reliability Coordinator is specific to those Reliability Coordinators providing Reliability Coordinator service(s) to entities operating within the Western Interconnection, regardless of where the Reliability Coordinator may be located.

Requirement and Measures

RX1. Each Reliability Coordinator shall, in coordination with other Reliability Coordinators, develop a common Interconnection-wide methodology to determine the modeling and monitoring of BES and non-BES Elements that are internal and external to its Reliability Coordinator Area, necessary for providing operational awareness of the impacts on Bulk Electric System Facilities within its Reliability Coordinator Area, including at a minimum: *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

1.1. A method for development, maintenance, and periodic review of a Western Interconnection-wide reference model to serve as the baseline from which Reliability Coordinator's operational models are derived;

1.2 The impacts of Inter-area oscillations;

1.3 A method to determine Contingencies included in analyses and assessments;

1.4 A method to determine Remedial Action Schemes included in analyses and assessments;

1.5 A method to determine forecast data included in analyses and assessments; and

1.6 A method for the validation and periodic review of the Reliability Coordinator's operational model for steady state and dynamic/oscillatory system response.

MX1. Each Reliability Coordinator will have evidence that it developed a common Western Interconnection-wide methodology, addressing modeling and monitoring, in coordination with other Reliability Coordinators, that includes the features required in RX1.

RX2. Each Reliability Coordinator shall use the methodology developed in RX1. *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

MX2. Each Reliability Coordinator will have evidence that it uses the methodology developed in RX1, as required in RX2 above.

Compliance

A. Compliance

1.2 Evidence Retention:

- The Reliability Coordinator shall keep data or evidence for Requirements R5, R6, and the WECC Regional Variance, and Measures M5, M6, and the WECC Regional Variance for the current calendar year and one previous calendar year.

R #	Violation Severity Levels for the WECC Regional Variance			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
RX1				The Reliability Coordinator did not develop the methodology as required in RX1.

R #	Violation Severity Levels for the WECC Regional Variance			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
RX2				The Reliability Coordinator did not implement the methodology as required in RX2.

A. Introduction

1. **Title:** **Reliability Coordination – Monitoring and Analysis**

2. **Number:** IRO-002-6

3. **Purpose:** To provide System Operators with the capabilities necessary to monitor and analyze data needed to perform their reliability functions.

4. **Applicability:**

   4.1. Functional Entities:

   4.1.1. Reliability Coordinators

5. **Effective Date:** See Implementation Plan

B. Requirements and Measures

R1. Each Reliability Coordinator shall have data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for it to perform its Operational Planning Analyses. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

M1. Each Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to, a document that lists its data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for it to perform its Operational Planning Analyses.

R2. Each Reliability Coordinator shall have data exchange capabilities, with redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, for the exchange of Real-time data with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing its Real-time monitoring and Real-time Assessments. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-time Operations]*

M2. Each Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to, system specifications, system diagrams, or other documentation that lists its data exchange capabilities, including redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, for the exchange of Real-time data with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, as specified in the requirement.

R3. Each Reliability Coordinator shall test its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days. If the test is unsuccessful, the Reliability Coordinator shall initiate action within two hours to restore redundant functionality. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

M3. Each Reliability Coordinator shall have, and provide upon request, evidence that it tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality, or experienced an event that demonstrated the redundant functionality; and if the test was unsuccessful, initiated action within two hours to restore redundant functionality as specified in Requirement R3. Evidence could include, but is not limited to: dated and time-stamped test records, operator logs, voice recordings, or electronic communications.

R4. Each Reliability Coordinator shall provide its System Operators with the authority to approve planned outages and maintenance of its telecommunication, monitoring and analysis capabilities. *[Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-time Operations]*

M4. 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 provided its System Operators with the authority to approve planned outages and maintenance of its telecommunication, monitoring and analysis capabilities.

R5. Each Reliability Coordinator shall monitor Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area. *[Violation Risk Factor: High] [Time Horizon: Real-Time Operations]*

M5. 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, or other equivalent evidence that will be used to confirm that it has monitored Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.

R6. Each Reliability Coordinator shall have monitoring systems that provide information utilized 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 infrastructure. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

M6. 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, SCADA data collection, or other equivalent evidence that will be used to confirm that it has monitoring systems consistent with the requirement.

C. Compliance

1. Compliance Monitoring Process

1.1. Compliance Enforcement Authority:

"Compliance Enforcement Authority" means NERC or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.

1.2. Evidence Retention:

The following evidence retention period(s) 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.

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

- The Reliability Coordinator shall retain its current, in force document and any documents in force for the current year and previous calendar year for Requirements R1, R2, and R4 and Measures M1, M2, and M4.
- The Reliability Coordinator shall retain evidence for Requirement R3 and Measure M3 for the most recent 12 calendar months, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.
- The Reliability Coordinator shall keep data or evidence for Requirements R5 and R6 and Measures M5 and M6 for the current calendar year and one previous calendar year.

1.3. Compliance Monitoring and Enforcement Program

As defined in the NERC Rules of Procedure, "Compliance Monitoring and Enforcement Program" 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.

Violation Severity Levels

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
R1.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with one applicable entity, or 5% or less of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with two applicable entities, or more than 5% or less than or equal to 10% of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with three applicable entities, or more than 10% or less than or equal to 15% of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with four or more applicable entities or greater than 15% of the applicable entities, whichever is greater.
R2.	N/A	N/A	The Reliability Coordinator had data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing Real-time monitoring and Real-time Assessments, but did not have redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, as specified in the requirement.	The Reliability Coordinator did not have data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing Real-time monitoring and Real-time Assessments as specified in the requirement.
R3.	The Reliability Coordinator tested its primary Control Center data exchange	The Reliability Coordinator tested its primary Control Center data exchange	The Reliability Coordinator tested its primary Control Center data exchange	The Reliability Coordinator tested its primary Control Center data exchange

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
	capabilities specified in Requirement R2 for redundant functionality, but did so more than 90 calendar days but less than or equal to 120 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 2 hours and less than or equal to 4 hours.	capabilities specified in Requirement R2 for redundant functionality, but did so more than 120 calendar days but less than or equal to 150 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 4 hours and less than or equal to 6 hours.	capabilities specified in Requirement R2 for redundant functionality, but did so more than 150 calendar days but less than or equal to 180 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 6 hours and less than or equal to 8 hours.	capabilities specified in Requirement R2 for redundant functionality, but did so more than 180 calendar days since the previous test; OR The Reliability Coordinator did not test its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, did not initiate action within 8 hours to restore the redundant functionality.
R4.	N/A	N/A	N/A	The Reliability Coordinator failed to provide its System Operator with the authority to approve planned outages and

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
				maintenance of its telecommunication, monitoring and analysis capabilities.
R5.	N/A	N/A	N/A	The Reliability Coordinator did not monitor Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.
R6.	N/A	N/A	N/A	The Reliability Coordinator did not have monitoring systems that provide information utilized by the Reliability Coordinator's operating personnel, giving particular emphasis to alarm management and awareness systems, automated data transfers, and synchronized

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
				information systems, over a redundant infrastructure.

D. Regional Variance

A. Regional Variance for the Western Electricity Coordinating Council Region

The following Interconnection-wide variance shall be applicable in the Western Electricity Coordinating Council (WECC) region.

Purpose
To develop a methodology that creates models for performing Operational Planning Analyses and Real-time Assessments.

Applicability
As used in this WECC Regional Variance, Reliability Coordinator is specific to those Reliability Coordinators providing Reliability Coordinator service(s) to entities operating within the Western Interconnection, regardless of where the Reliability Coordinator may be located.

Requirements and Measures

D.A.7. Each Reliability Coordinator shall, in coordination with other Reliability Coordinators, develop a common Interconnection-wide methodology to determine the modeling and monitoring of BES and non-BES Elements that are internal and external to its Reliability Coordinator Area, necessary for providing operational awareness of the impacts on Bulk Electric System Facilities within its Reliability Coordinator Area, including at a minimum: *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

- **D.A.7.1.** A method for development, maintenance, and periodic review of a Western Interconnection-wide reference model to serve as the baseline from which Reliability Coordinator's operational models are derived;
- **D.A.7.2** The impacts of Inter-area oscillations;
- **D.A.7.3** A method to determine Contingencies included in analyses and assessments;
- **D.A.7.4** A method to determine Remedial Action Schemes included in analyses and assessments;
- **D.A.7.5** A method to determine forecast data included in analyses and assessments; and
- **D.A.7.6** A method for the validation and periodic review of the Reliability Coordinator's operational model for steady state and dynamic/oscillatory system response.

M.D.A.7. Each Reliability Coordinator will have evidence that it developed a common Western Interconnection-wide methodology, addressing modeling and

monitoring, in coordination with other Reliability Coordinators, that includes the features required in D.A.7.

D.A.8. Each Reliability Coordinator shall use the methodology developed in D.A.7. ([*Violation Risk Factor: High] [Time Horizon: Operations Planning*])

M.D.A.8. Each Reliability Coordinator will have evidence that it uses the methodology developed in D.A.7., as required in D.A.8. above.

Compliance

Evidence Retention:

- The Reliability Coordinator shall keep data or evidence for Requirements R5, R6, and the WECC Regional Variance, and Measures M5, M6, and the WECC Regional Variance for the current calendar year and one previous calendar year.

R #	Violation Severity Levels for the WECC Regional Variance			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
D.A.7.				The Reliability Coordinator did not develop the methodology as required in D.A.7.
D.A.8.				The Reliability Coordinator did not implement the methodology as required in D.A.8.

E. Associated Documents

The Implementation Plan and other project documents can be found on the project page.

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	November 1, 2006	Adopted by Board of Trustees	Revised
1	April 4, 2007	Replaced Levels of Non-compliance with the Feb 28, BOT approved Violation Severity Levels (VSLs) Corrected typographical errors in BOT approved version of VSLs	Revised to add missing measures and compliance elements
2	October 17, 2008	Adopted by NERC Board of Trustees	Deleted R2, M3 and associated compliance elements as conforming changes associated with approval of IRO-010-1. Revised as part of IROL Project
2	March 17, 2011	Order issued by FERC approving IRO-002-2 (approval effective 5/23/11)	FERC approval
2	February 24, 2014	Updated VSLs based on June 24, 2013 approval.	VSLs revised
3	July 25, 2011	Revised under Project 2006-06	Revised
3	August 4, 2011	Approved by Board of Trustees	Retired R1-R8 under Project 2006-06.
4	November 13, 2014	Approved by Board of Trustees	Revisions under Project 2014-03
4	November 19, 2015	FERC approved IRO-002-4. Docket No. RM15-16-000	FERC approval
5	February 9, 2017	Adopted by Board of Trustees	Revised
5	April 17, 2017	FERC letter Order approved IRO-002-5. Docket No. RD17-4-000	

6			WECC Regional Variance

Rationale

During development of IRO-002-5, text boxes are embedded within the standard to explain the rationale for various parts of the standard. Upon Board adoption of IRO-002-5, the text from the rationale text boxes will be moved to this section.

Rationale text from the development of IRO-002-4 in Project 2014-03 follows. Additional information can be found on the Project 2014-03 project page.

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 Requirements:
The data exchange elements of Requirements R1 and R2 from approved IRO-002-2 have been added back into proposed IRO-002-4 in order to ensure that there is no reliability gap. The Project 2014-03 SDT found no proposed requirements in the current project that covered the issue. Voice communication is covered in proposed COM-001-2 but data communications needs to remain in IRO-002-4 as it is not covered in proposed COM-001-2. Staffing of communications and facilities in corresponding requirements from IRO-002-2 is addressed in approved PER-004-2, Requirement R1 and has been deleted from this draft.

Rationale for R2:
Requirement R2 from IRO-002-3 has been deleted because approved EOP-008-1, Requirement R1, part 1.6.2 addresses redundancy and back-up concerns for outages of analysis tools. New Requirement R4 (R6 in IRO-002-5) has been added to address NOPR paragraphs 96 and 97: *"…As we explain above, the reliability coordinator's obligation to monitor SOLs is important to reliability because a SOL can evolve into an IROL during deteriorating system conditions, and for potential system conditions such as this, the reliability coordinator's monitoring of SOLs provides a necessary backup function to the transmission operator…."*

Rationale for Requirements R1 and R2:
The proposed changes address directives for redundancy and diverse routing of data exchange capabilities (FERC Order No. 817 Para 47).

Redundant and diversely routed data exchange capabilities consist of data exchange infrastructure components (e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data) that will provide continued functionality despite failure

or malfunction of an individual component within the Reliability Coordinator's (RC) primary Control Center. Redundant and diversely routed data exchange capabilities preclude single points of failure in primary Control Center data exchange infrastructure from halting the flow of Real-time data. Requirement R2 does not require automatic or instantaneous fail-over of data exchange capabilities. Redundancy and diverse routing may be achieved in various ways depending on the arrangement of the infrastructure or hardware within the RC's primary Control Center.

The reliability objective of redundancy is to provide for continued data exchange functionality during outages, maintenance, or testing of data exchange infrastructure. For periods of planned or unplanned outages of individual data exchange components, the proposed requirements do not require additional redundant data exchange infrastructure components solely to provide for redundancy.

Infrastructure that is not within the RC's primary Control Center is not addressed by the proposed requirement.

Rationale for Requirement R3:
The revised requirement addresses directives for testing of data exchange capabilities used in primary Control Centers (FERC Order No. 817 Para 51).

A test for redundant functionality demonstrates that data exchange capabilities will continue to operate despite the malfunction or failure of an individual component (e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data). An entity's testing practices should, over time, examine the various failure modes of its data exchange capabilities. When an actual event successfully exercises the redundant functionality, it can be considered a test for the purposes of the proposed requirement.

Rationale for R4 (R6 in IRO-002-5):
The requirement was added back from approved IRO-002-2 as the Project 2014-03 SDT found no proposed requirements that covered the issues.

A. Introduction

1. **Title:** **Reliability Coordination – Monitoring and Analysis**

2. **Number:** IRO-002-~~5~~6

3. **Purpose:** To provide System Operators with the capabilities necessary to monitor and analyze data needed to perform their reliability functions.

4. **Applicability:**

   4.1. Functional Entities:

   4.1.1. Reliability Coordinators

5. **Effective Date:** See Implementation Plan

B. Requirements and Measures

R1. Each Reliability Coordinator shall have data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for it to perform its Operational Planning Analyses. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

M1. Each Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to, a document that lists its data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for it to perform its Operational Planning Analyses.

R2. Each Reliability Coordinator shall have data exchange capabilities, with redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, for the exchange of Real-time data with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing its Real-time monitoring and Real-time Assessments. *[Violation Risk Factor: High] [Time Horizon: Same-Day Operations, Real-time Operations]*

M2. Each Reliability Coordinator shall have, and provide upon request, evidence that could include, but is not limited to, system specifications, system diagrams, or other documentation that lists its data exchange capabilities, including redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, for the exchange of Real-time data with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, as specified in the requirement.

R3. Each Reliability Coordinator shall test its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days. If the test is unsuccessful, the Reliability Coordinator shall initiate action within two hours to restore redundant functionality. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

M3. Each Reliability Coordinator shall have, and provide upon request, evidence that it tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality, or experienced an event that demonstrated the redundant functionality; and if the test was unsuccessful, initiated action within two hours to restore redundant functionality as specified in Requirement R3. Evidence could include, but is not limited to: dated and time-stamped test records, operator logs, voice recordings, or electronic communications.

R4. Each Reliability Coordinator shall provide its System Operators with the authority to approve planned outages and maintenance of its telecommunication, monitoring and analysis capabilities. *[Violation Risk Factor: High] [Time Horizon: Operations Planning, Same-Day Operations, Real-time Operations]*

M4. 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 provided its System Operators with the authority to approve planned outages and maintenance of its telecommunication, monitoring and analysis capabilities.

R5. Each Reliability Coordinator shall monitor Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area. *[Violation Risk Factor: High] [Time Horizon: Real-Time Operations]*

M5. 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, or other equivalent evidence that will be used to confirm that it has monitored Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.

R6. Each Reliability Coordinator shall have monitoring systems that provide information utilized 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 infrastructure. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

M6. 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, SCADA data collection, or other equivalent evidence that will be used to confirm that it has monitoring systems consistent with the requirement.

C. Compliance

1. Compliance Monitoring Process

1.1. Compliance Enforcement Authority:

"Compliance Enforcement Authority" means NERC or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.

1.2. Evidence Retention:

The following evidence retention period(s) 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.

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

- The Reliability Coordinator shall retain its current, in force document and any documents in force for the current year and previous calendar year for Requirements R1, R2, and R4 and Measures M1, M2, and M4.
- The Reliability Coordinator shall retain evidence for Requirement R3 and Measure M3 for the most recent 12 calendar months, with the exception of operator logs and voice recordings which shall be retained for a minimum of 90 calendar days.
- The Reliability Coordinator shall keep data or evidence for Requirements R5 and R6 and Measures M5 and M6 for the current calendar year and one previous calendar year.

1.3. Compliance Monitoring and Enforcement Program

As defined in the NERC Rules of Procedure, "Compliance Monitoring and Enforcement Program" 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.

Violation Severity Levels

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
R1.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with one applicable entity, or 5% or less of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with two applicable entities, or more than 5% or less than or equal to 10% of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with three applicable entities, or more than 10% or less than or equal to 15% of the applicable entities, whichever is greater.	The Reliability Coordinator did not have data exchange capabilities for performing its Operational Planning Analyses with four or more applicable entities or greater than 15% of the applicable entities, whichever is greater.
R2.	N/A	N/A	The Reliability Coordinator had data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing Real-time monitoring and Real-time Assessments, but did not have redundant and diversely routed data exchange infrastructure within the Reliability Coordinator's primary Control Center, as specified in the requirement.	The Reliability Coordinator did not have data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for performing Real-time monitoring and Real-time Assessments as specified in the requirement.
R3.	The Reliability Coordinator tested its primary Control Center data exchange	The Reliability Coordinator tested its primary Control Center data exchange	The Reliability Coordinator tested its primary Control Center data exchange	The Reliability Coordinator tested its primary Control Center data exchange

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
	capabilities specified in Requirement R2 for redundant functionality, but did so more than 90 calendar days but less than or equal to 120 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 2 hours and less than or equal to 4 hours.	capabilities specified in Requirement R2 for redundant functionality, but did so more than 120 calendar days but less than or equal to 150 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 4 hours and less than or equal to 6 hours.	capabilities specified in Requirement R2 for redundant functionality, but did so more than 150 calendar days but less than or equal to 180 calendar days since the previous test; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, initiated action to restore the redundant functionality in more than 6 hours and less than or equal to 8 hours.	capabilities specified in Requirement R2 for redundant functionality, but did so more than 180 calendar days since the previous test; OR The Reliability Coordinator did not test its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality; OR The Reliability Coordinator tested its primary Control Center data exchange capabilities specified in Requirement R2 for redundant functionality at least once every 90 calendar days but, following an unsuccessful test, did not initiate action within 8 hours to restore the redundant functionality.
R4.	N/A	N/A	N/A	The Reliability Coordinator failed to provide its System Operator with the authority to approve planned outages and

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
				maintenance of its telecommunication, monitoring and analysis capabilities.
R5.	N/A	N/A	N/A	The Reliability Coordinator did not monitor Facilities, the status of Remedial Action Schemes, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.
R6.	N/A	N/A	N/A	The Reliability Coordinator did not have monitoring systems that provide information utilized by the Reliability Coordinator's operating personnel, giving particular emphasis to alarm management and awareness systems, automated data transfers, and synchronized

R #	Violation Severity Levels			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
				information systems, over a redundant infrastructure.

D. Regional ~~Variances~~Variance

~~None.~~

A. Regional Variance for the Western Electricity Coordinating Council Region

The following Interconnection-wide variance shall be applicable in the Western Electricity Coordinating Council (WECC) region.

Purpose

To develop a methodology that creates models for performing Operational Planning Analyses and Real-time Assessments.

Applicability

As used in this WECC Regional Variance, Reliability Coordinator is specific to those Reliability Coordinators providing Reliability Coordinator service(s) to entities operating within the Western Interconnection, regardless of where the Reliability Coordinator may be located.

Requirements and Measures

D.A.7. Each Reliability Coordinator shall, in coordination with other Reliability Coordinators, develop a common Interconnection-wide methodology to determine the modeling and monitoring of BES and non-BES Elements that are internal and external to its Reliability Coordinator Area, necessary for providing operational awareness of the impacts on Bulk Electric System Facilities within its Reliability Coordinator Area, including at a minimum: *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

- **D.A.7.1.** A method for development, maintenance, and periodic review of a Western Interconnection-wide reference model to serve as the baseline from which Reliability Coordinator's operational models are derived;
- **D.A.7.2** The impacts of Inter-area oscillations;
- **D.A.7.3** A method to determine Contingencies included in analyses and assessments;
- **D.A.7.4** A method to determine Remedial Action Schemes included in analyses and assessments;
- **D.A.7.5** A method to determine forecast data included in analyses and assessments; and
- **D.A.7.6** A method for the validation and periodic review of the Reliability Coordinator's operational model for steady state and dynamic/oscillatory system response.

M.D.A.7. Each Reliability Coordinator will have evidence that it developed a common Western Interconnection-wide methodology, addressing modeling and

monitoring, in coordination with other Reliability Coordinators, that includes the features required in D.A.7.

D.A.8. Each Reliability Coordinator shall use the methodology developed in D.A.7. ([*Violation Risk Factor: High] [Time Horizon: Operations Planning*])

M.D.A.8. Each Reliability Coordinator will have evidence that it uses the methodology developed in D.A.7., as required in D.A.8. above.

Compliance

Evidence Retention:

- The Reliability Coordinator shall keep data or evidence for Requirements R5, R6, and the WECC Regional Variance, and Measures M5, M6, and the WECC Regional Variance for the current calendar year and one previous calendar year.

R #	Violation Severity Levels for the WECC Regional Variance			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
D.A.7.				The Reliability Coordinator did not develop the methodology as required in D.A.7.
D.A.8.				The Reliability Coordinator did not implement the methodology as required in D.A.8.

E. Associated Documents

The Implementation Plan and other project documents can be found on the project page.

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	November 1, 2006	Adopted by Board of Trustees	Revised
1	April 4, 2007	Replaced Levels of Non-compliance with the Feb 28, BOT approved Violation Severity Levels (VSLs) Corrected typographical errors in BOT approved version of VSLs	Revised to add missing measures and compliance elements
2	October 17, 2008	Adopted by NERC Board of Trustees	Deleted R2, M3 and associated compliance elements as conforming changes associated with approval of IRO-010-1. Revised as part of IROL Project
2	March 17, 2011	Order issued by FERC approving IRO-002-2 (approval effective 5/23/11)	FERC approval
2	February 24, 2014	Updated VSLs based on June 24, 2013 approval.	VSLs revised
3	July 25, 2011	Revised under Project 2006-06	Revised
3	August 4, 2011	Approved by Board of Trustees	Retired R1-R8 under Project 2006-06.
4	November 13, 2014	Approved by Board of Trustees	Revisions under Project 2014-03
4	November 19, 2015	FERC approved IRO-002-4. Docket No. RM15-16-000	FERC approval
5	February 9, 2017	Adopted by Board of Trustees	Revised
5	April 17, 2017	FERC letter Order approved IRO-002-5. Docket No. RD17-4-000	

~~Guidelines and Technical Basis~~

~~None~~

6			WECC Regional Variance

Rationale

During development of IRO-002-5, text boxes are embedded within the standard to explain the rationale for various parts of the standard. Upon Board adoption of IRO-002-5, the text from the rationale text boxes will be moved to this section.

Rationale text from the development of IRO-002-4 in Project 2014-03 follows. Additional information can be found on the Project 2014-03 project page.

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 Requirements:
The data exchange elements of Requirements R1 and R2 from approved IRO-002-2 have been added back into proposed IRO-002-4 in order to ensure that there is no reliability gap. The Project 2014-03 SDT found no proposed requirements in the current project that covered the issue. Voice communication is covered in proposed COM-001-2 but data communications needs to remain in IRO-002-4 as it is not covered in proposed COM-001-2. Staffing of communications and facilities in corresponding requirements from IRO-002-2 is addressed in approved PER-004-2, Requirement R1 and has been deleted from this draft.

Rationale for R2:
Requirement R2 from IRO-002-3 has been deleted because approved EOP-008-1, Requirement R1, part 1.6.2 addresses redundancy and back-up concerns for outages of analysis tools. New Requirement R4 (R6 in IRO-002-5) has been added to address NOPR paragraphs 96 and 97: *"…As we explain above, the reliability coordinator's obligation to monitor SOLs is important to reliability because a SOL can evolve into an IROL during deteriorating system conditions, and for potential system conditions such as this, the reliability coordinator's monitoring of SOLs provides a necessary backup function to the transmission operator…."*

Rationale for Requirements R1 and R2:
The proposed changes address directives for redundancy and diverse routing of data exchange capabilities (FERC Order No. 817 Para 47).

Redundant and diversely routed data exchange capabilities consist of data exchange infrastructure components (e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data) that will provide continued functionality despite failure

or malfunction of an individual component within the Reliability Coordinator's (RC) primary Control Center. Redundant and diversely routed data exchange capabilities preclude single points of failure in primary Control Center data exchange infrastructure from halting the flow of Real-time data. Requirement R2 does not require automatic or instantaneous fail-over of data exchange capabilities. Redundancy and diverse routing may be achieved in various ways depending on the arrangement of the infrastructure or hardware within the RC's primary Control Center.

The reliability objective of redundancy is to provide for continued data exchange functionality during outages, maintenance, or testing of data exchange infrastructure. For periods of planned or unplanned outages of individual data exchange components, the proposed requirements do not require additional redundant data exchange infrastructure components solely to provide for redundancy.

Infrastructure that is not within the RC's primary Control Center is not addressed by the proposed requirement.

Rationale for Requirement R3:
The revised requirement addresses directives for testing of data exchange capabilities used in primary Control Centers (FERC Order No. 817 Para 51).

A test for redundant functionality demonstrates that data exchange capabilities will continue to operate despite the malfunction or failure of an individual component (e.g., switches, routers, servers, power supplies, and network cabling and communication paths between these components in the primary Control Center for the exchange of system operating data). An entity's testing practices should, over time, examine the various failure modes of its data exchange capabilities. When an actual event successfully exercises the redundant functionality, it can be considered a test for the purposes of the proposed requirement.

Rationale for R4 (R6 in IRO-002-5):
The requirement was added back from approved IRO-002-2 as the Project 2014-03 SDT found no proposed requirements that covered the issues.

Electric Reliability and Security for the West

Attachment E

Project Roadmap

WECC-0135 IRO-002-5

RC—Monitoring and Analysis—RV

Project Roadmap

Actions		Proposed Date
1.	Standard Authorization Request (SAR) Filed	June 8, 2018
2.	WECC Standards Committee (WSC) approved the SAR	June 19, 2018
3.	Drafting Team (DT) Solicitation	June 19, 2018
4.	DT Initial Roster Approved	July 19, 2018
5.	DT Meeting	August 28, 2018
6.	DT Meeting	September 11, 2018
7.	DT Meeting	September 14, 2019
8.	DT Meeting	September 18, 2018
9.	DT meeting	September 21, 2018
10.	DT meeting	September 28, 2018
11.	DT Meeting	October 5, 2018
12.	Posting 1 – Open	October 9, 2018
13.	DT Meeting	November 2, 2018
14.	Posting 2 – Closed	November 8, 2018
15.	DT Meeting	November 9, 2018
16.	DT Meeting	November 16, 2018
17.	Posting 2 – Open	November 19, 2018
18.	Posting 2 – Closed	December 19, 2018

19.	DT Meeting	January 11, 2019
20.	WSC Approved for Ballot	January 17, 2019
21.	Ballot Pool – Open	January 22, 2019
22.	Ballot Pool – Closed	February 5, 2019
23.	Standards Briefing	February 6, 2019
24.	Ballot – Open	February 7, 2019
25.	Ballot - Closed	February 21, 2019
26.	WSC approves forwarding to the WECC Board of Directors (BOD) with a request for approval	March 5, 2019
27.	BOD approves for NERC/FERC disposition	March 6, 2019

Anticipated Actions		Proposed Date
28.	Filed at NERC	TBD
29.	NERC Board of Trustees Approves	TBD
30.	NERC files at FERC	TBD
31.	FERC Approves	TBD

Implementation Plan

Standards Authorization Request (SAR)

The original SAR is located here. The SAR with expanded scope is located here. Documentation templates have been updated for final filing.

Approvals Required

- WECC Board of Directors March 6, 2019
- NERC Board of Trustees Pending
- FERC Pending

Applicability

As used in this WECC Regional Variance, Reliability Coordinator is specific to those Reliability Coordinators providing Reliability Coordinator service(s) to entities operating within the Western Interconnection, regardless of where the Reliability Coordinator may be located.

Conforming Changes to Other Standards

No conforming changes to other standards are required.

Proposed Effective Date

The proposed effective date for the WECC Regional Variance is "The first day of the first quarter after regulatory approval, but no sooner than January 1, 2020."

Justification

A January 1, 2020, effective date allows time for the winding-down of Peak Reliability, the start-up of other Reliability Coordinators, and creates a window during which the Reliability Coordinators may create the methodology required.

Consideration of Early Compliance

Earlier compliance should not be pursued. If an earlier effective date is imposed, the time window could encompass the active operation of multiple Reliability Coordinators for which a coordinated

handoff of responsibilities had not yet occurred. Further, as proposed, the effective date allows the Reliability Coordinators time to create the required methodology. An earlier effective date may not accommodate that need.

Required Retirements

No other retirements are required.

Violation Risk Factors

The Violation Risk Factors (VRF) for the proposed variance are as follows:

D.R1. *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

D.R2. *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

After reviewing the North American Electric Reliability Corporation (NERC) Violation Risk Factors guidelines, the WECC-0135 Drafting Team set the VRF for both proposed requirements as "High."

The "High" rating was set because failure to complete the assigned task could "directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures."[1]

Violation Severity Levels

The Violation Severity Levels (VSL) for the proposed variance are as follows:

D.R1. Severe

D.R2. Severe

The WECC-0135 DT set a "Severe" level because the assigned task is binary. It must either be performed or not performed. Thus, a graded level of severity is not warranted.

D.R #	Violation Severity Levels for the WECC Regional Variance			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
D.R1.				The Reliability Coordinator did not develop the methodology as required in D.R1.
D.R2.				The Reliability Coordinator did not implement the

[1] https://www.nerc.com/pa/Stand/Resources/Documents/Violation_Risk_Factors.pdf

D.R #	Violation Severity Levels for the WECC Regional Variance			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
				methodology as required in D.R2.

Regional Reliability Standard Submittal
Request Attachment H

Region:	**Western Electricity Coordinating Council**
Regional Standard Number:	**IRO-002-5**
Regional Standard Title:	**Reliability Coordination – Monitoring and Analysis – Request for Regional Variance**
Date Submitted:	**April 30, 2019**
Regional Contact Name:	**Steven Rueckert**
Regional Contact Title:	**Director of Standards**
Regional Contact Telephone Number:	**(801) 883-6878**

Request (check all that apply):

- ☐ Retirement of WECC Regional Reliability Standard
- ☐ Interpret an Existing Standard
- ☐ Approval of a new standard
- ☒ Addition of WECC Regional Variance to IRO-002-5.
- ☐ Withdrawal of an existing standard
- ☐ Urgent Action

Has this action been approved by your Board of Directors:

- ☒ Yes
- ☐ No

(If no please indicate date standard action is expected along with the current status (e.g., third comment period with anticipated board approval on mm/dd/year)):

March 6, 2019, Board of Directors Resolution:

Board Resolution

Item 2. Motion: Regional Variance to IRO-002-5

Resolved, that the WECC Board of Directors, acting upon the recommendation of the WECC Standards Committee (WSC) at the meeting of the Board on March 6, 2019, hereby approves the WECC Regional Variance to NERC Reliability Standard IRO-002-5, Reliability Coordination—Monitoring and Analysis, as presented and attached hereunto. Result: Approved
[Note: The purpose of the remaining questions is to provide NERC with the information needed to file the regional standard(s) with FERC. The information provided may to a large degree be used verbatim. It is extremely important for the entity submitting this form to provide sufficient detail that clearly delineates the scope and justification of the request.]

Concise statement of the basis and purpose (scope) of request:	Due to the unique physical characteristics of the Bulk Power System in the Western Interconnection, events in one part of the Interconnection can have significant impacts in other parts of the system. As WECC moves into a new business environment transitioning from a single Reliability Coordinator (RC) to multiple RCs, coordinated monitoring and modeling of the Western Interconnection will become crucial. The requested Regional Variance ensures that coordination.
Concise statement of the justification of the request:	See above.

Electric Reliability and Security for the West

Attachment I
Order 672 Criteria
WECC-0135 IRO-002-5
RC—Monitoring and Analysis—RV

Introduction

The North American Electric Reliability Corporation (NERC) is responsible for ensuring that the Reliability Standards, Violation Risk Factors (VRF), Violation Severity Levels (VSL), definitions, Variances, and Interpretations developed by drafting teams are developed in accordance with NERC processes. These standards must also meet NERC's benchmarks for Reliability Standards, as well as criteria for governmental approval.

In Federal Energy Regulatory Commission (FERC) Order No. 672,[1] FERC identified criteria that it will use to analyze proposed Reliability Standards for approval to ensure they are just, reasonable, not unduly discriminatory or preferential, and in the public interest. The discussion below identifies these factors, and explains how the proposed Reliability Standard meets or exceeds the criteria.

For purposes of this filing, the use of the term Reliability Standard is synonymous with Regional Variance, unless otherwise specified.

Designed for a Specific Goal

Proposed Reliability Standards must be designed to achieve a specified reliability goal.

The proposed Reliability Standard must address a reliability concern that falls within the requirements of Section 215 of the Federal Power Act. That is, it must provide for the reliable operation of Bulk-Power System facilities. It may not extend beyond reliable operation of such facilities or apply to other facilities. Such facilities include all those necessary for operating an interconnected electric energy transmission network, or any portion of that network, including control systems. The proposed Reliability Standard may apply to any design of planned additions or modifications of such facilities that is necessary to provide for reliable operation. It may also apply to Cybersecurity protection. Order No. 672 at P 321.

Further, NERC Reliability Standards are based on certain reliability principles that define the foundation of reliability for North American bulk power systems. Each Reliability Standard shall enable or support one or more of the reliability principles, thereby ensuring that each standard serves a

[1] FERC Order 672

purpose in support of reliability of the North American bulk power systems. Each Reliability Standard shall also be consistent with all of the reliability principles, thereby ensuring that no standard undermines reliability through an unintended consequence. NERC Reliability Principles[2]

The purpose of the proposed WECC Regional Variance is:

"To develop a methodology that creates models for performing Operational Planning Analyses and Real-time Assessments."

Of the eight NERC Reliability Principles, this standard addresses Reliability Principle 1, which states:

"Interconnected bulk power systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards."

Technically Sound

Proposed Reliability Standards must contain a technically sound method to achieve the goal.

The proposed Reliability Standard must be designed to achieve a specified reliability goal and must contain a technically sound means to achieve this goal. Although any person may propose a topic for a Reliability Standard to the Electric Reliability Organization (ERO), in the ERO's process, the specific proposed Reliability Standard should be developed initially by persons within the electric power industry and community with a high level of technical expertise and be based on sound technical and engineering criteria. It should be based on actual data and lessons learned from past operating incidents, where appropriate. The process for ERO approval of a proposed Reliability Standard should be fair and open to all interested persons. Order No. 672 at P 324.

Standard Development

This proposed Reliability Standard was developed using the NERC and Western Electricity Coordinating Council (WECC) Reliability Standards Development Procedures (Procedures) approved by FERC and in effect at each point in the process. Among other things, these processes include drafting of the standard by a drafting team composed of subject matter experts (SME); biographies of those SMEs are provided with this filing.

These processes also include repeated public iterative comment/response cycles whereby comments are received from the industry, and responses to those comments are provided by the drafting team.

Technically Sound

The proposed Regional Variance addresses the changing business climate wherein the Western Interconnection (WI) is transitioning from a single Reliability Coordinator (RC) located within the

[2] NERC Reliability Principles

footprint of the WI to an unspecified number of RCs potentially operating anywhere across the continent. To address this change, the proposed Regional Variance has two requirements. Each RC providing services in the WI shall coordinate with other RCs to (1) develop and (2) use "a common Interconnection-wide methodology to determine the modeling and monitoring of BES and non-BES Elements" necessary for providing operational awareness of the impacts on Bulk Electric System Facilities.

In keeping with NERC's goal to create performance-based standards, the proposed Regional Variance does not state how the RCs are to develop the methodology, nor does it state the required content.[3] These attributes are vested in the RCs directly, as the RC SMEs have the technical knowledge to address the myriad permutations of modeling and monitoring.

Applicability

Proposed Reliability Standards must be applicable to users, owners, and operators of the bulk power system, and not others.

The proposed Reliability Standard may impose a requirement on any user, owner, or operator of such facilities, but not on others. Order No. 672 at P 322.

The Applicability section of the proposed standard is as follows:

"As used in this WECC Regional Variance, Reliability Coordinator is specific to those Reliability Coordinators providing Reliability Coordinator service(s) to entities operating within the Western Interconnection, regardless of where the Reliability Coordinator may be located."

Clear and Unambiguous

Proposed Reliability Standards must be clear and unambiguous as to what is required and who is required to comply.

The proposed Reliability Standard should be clear and unambiguous regarding what is required and who is required to comply. Users, owners, and operators of the Bulk-Power System must know what they are required to do to maintain reliability. Order No. 672 at P 325.

Requirement D.R1 of the proposed Regional Variance requires the RC to develop a modeling and monitoring methodology that identifies internal and external Elements "necessary for providing operational awareness of the impacts of Bulk Electric System Facilities." In Posting 2 of the project, the

[3] "Performance-Based—defines a particular reliability objective or outcome to be achieved. In its simplest form, a results-based requirement has four components: who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome?" Results Based Standards, https://www.nerc.com/pa/Stand/Pages/ResultsBasedStandards.aspx.

drafting team grappled with the question as to what constitutes that which is "necessary" for inclusion. The drafting team's response to that concern is as follows:

> Finally, the drafting team [DT] recognizes that what constitutes "necessary" in [D.R1] is not specifically stated in the language of the [Regional Variance]. That was intentional. The DT was faced with the impossible task of defining the complete universe of what is "necessary" for each RC – present and future, known and unknown, and under all circumstances.
>
> Since that which is necessary for one RC may not be the same as that which is necessary for another RC; and, whereas that which is necessary for one RC may vary over time, the DT concluded the best forum for that determination was during the coordinated development of the methodology.

In reaching this conclusion, the DT was also concerned that if "necessary" was defined in full, the final methodology would include more information than some RCs needed. The volume of data would slow computer processing and create the potential for models to go unsolved due to minutia (data noise). The solution was to require the RCs to coordinate their efforts and define what was necessary for each RC in that inclusive setting. Finally, the DT recognized that because the Regional Variance is forward-looking, the applicable RCs have not yet been identified. Rather than limit the reliability task to the knowledge base of the assigned DT, the Regional Variance will allow the full knowledge base of present and future RCs to be included in the development of the modeling and monitoring methodology.

Understandable Consequence

Proposed Reliability Standards must include clear and understandable consequences and a range of penalties (monetary and/or non-monetary) for a violation.

The possible consequences, including range of possible penalties, for violating a proposed Reliability Standard should be clear and understandable by those who must comply. Order No. 672 at P 326.

Violation Risk Factors (VRF) and Violation Severity Levels (VSL) were assigned for each of the two proposed requirements.

The VRFs for the proposed variance are as follows:

D.R1. *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

D.R2. *([Violation Risk Factor: High] [Time Horizon: Operations Planning])*

After reviewing the NERC Violation Risk Factors guidelines, the WECC-0135 Drafting Team set the VRF for both proposed requirements as "High."

The "High" rating was set because failure to complete the assigned task could "directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures."

The VSLs for the proposed variance are as follows:

D.R1. Severe

D.R2. Severe

The WECC-0135 DT set a "Severe" level because the assigned tasks are binary. It either must be performed or not; so, a graded level of severity is not warranted.

Measurability for Compliance

Proposed Reliability Standards must identify a clear and objective criterion or measure for compliance, so that it can be enforced in a consistent and non-preferential manner.

There should be a clear criterion or measure of whether an entity is in compliance with a proposed Reliability Standard. It should contain or be accompanied by an objective measure of compliance so that it can be enforced and so that enforcement can be applied in a consistent and non-preferential manner. Order No. 672 at P 327.

The measures for D.R1 and D.R2 are as follows:

D.M1. Each Reliability Coordinator will have evidence that it developed a common Western Interconnection-wide methodology, addressing modeling and monitoring, in coordination with other Reliability Coordinators, that includes the features required in D.R1.

D.M2. Each Reliability Coordinator will have evidence that it uses the methodology developed in D.R1, as required in D.R2. above.

Effective and Efficient

Proposed Reliability Standards should achieve a reliability goal effectively and efficiently - but does not necessarily have to reflect "best practices" without regard to implementation cost.

The proposed Reliability Standard does not necessarily have to reflect the optimal method, or "best practice," for achieving its reliability goal without regard to implementation cost or historical regional infrastructure design. It should however achieve its reliability goal effectively and efficiently. Order No. 672 at P 328.

During the two posting periods, no concerns were raised regarding implementation costs or historical regional infrastructure.

The proposed Regional Variance reaches its goals effectively and efficiently by using existing business practices. As of this filing, forums are already created and actively pursuing the tasks required in the variance.

Lowest Common Denominator

Proposed Reliability Standards cannot be "lowest common denominator," i.e., cannot reflect a compromise that does not adequately protect bulk power system reliability.

The proposed Reliability Standard must not simply reflect a compromise in the ERO's Reliability Standard development process based on the least effective North American practice — the so-called "lowest common denominator" — if such practice does not adequately protect Bulk-Power System reliability. Although the Commission will give due weight to the technical expertise of the ERO, we will not hesitate to remand a proposed Reliability Standard if we are convinced it is not adequate to protect reliability. Order No. 672 at P 329.

The proposed Regional Variance addresses an area not currently codified in NERC Standards.

Costs

Proposed Reliability Standards may consider costs to implement for smaller entities but not at consequence of less than excellence in operating system reliability.

A proposed Reliability Standard may take into account the size of the entity that must comply with the Reliability Standard and the cost to those entities of implementing the proposed Reliability Standard. However, the ERO should not propose a "lowest common denominator" Reliability Standard that would achieve less than excellence in operating system reliability solely to protect against reasonable expenses for supporting this vital national infrastructure. For example, a small owner or operator of the Bulk-Power System must bear the cost of complying with each Reliability Standard that applies to it. Order No. 672 at P 330.

During the development of the project, the industry raised no such concerns.

Continent-wide and Regional Variations

Proposed Reliability Standards must be designed to apply throughout North America to the maximum extent achievable with a single reliability standard while not favoring one area or approach.

A proposed Reliability Standard should be designed to apply throughout the interconnected North American Bulk-Power System, to the maximum extent this is achievable with a single Reliability Standard. The proposed Reliability Standard should not be based on a single geographic or regional model but should take into account geographic variations in grid characteristics, terrain, weather, and

other such factors; it should also take into account regional variations in the organizational and corporate structures of transmission owners and operators, variations in generation fuel type and ownership patterns, and regional variations in market design if these affect the proposed Reliability Standard. Order No. 672 at P 331.

In the Order 740 Remand at P4, the Commission states that:

"Reliability Standards that the ERO proposes to the Commission may include Reliability Standards that are proposed to the ERO by a Regional Entity… When the ERO reviews a regional Reliability Standard that would be applicable on an interconnection-wide basis and that has been proposed by a Regional Entity organized on an interconnection-wide basis, the ERO must rebuttably presume that the regional Reliability Standard is just, reasonable, not unduly discriminatory or preferential, and in the public interest. In turn, the Commission must give "due weight" to the technical expertise of the ERO and of a Regional Entity organized on an interconnection-wide basis."

Further, regional entities may propose Regional Reliability Standards that set more stringent reliability requirements than the NERC Reliability Standard or cover matters not covered by an existing NERC Reliability Standard. NERC Rules of Procedure, Section 312, Regional Reliability Standards.

The proposed Regional Variance is applicable only in the Western Interconnection.

The proposed Regional Variance covers matters not covered in an existing NERC Reliability Standard by requiring the development of an RC-coordinated methodology for Interconnection-wide system modeling and monitoring.

No Undue Negative Effect

Proposed reliability standards should cause no undue negative effect on competition or restriction of the grid.

As directed by section 215 of the FPA, the Commission itself will give special attention to the effect of a proposed Reliability Standard on competition. The ERO should attempt to develop a proposed Reliability Standard that has no undue negative effect on competition. Among other possible considerations, a proposed Reliability Standard should not unreasonably restrict available transmission capability on the Bulk-Power System beyond any restriction necessary for reliability and should not limit use of the Bulk-Power System in an unduly preferential manner. It should not create an undue advantage for one competitor over another. Order No. 672 at P 332.

The assigned drafting team does not foresee any negative impacts on competition resulting from the proposed Regional Variance.

During the development phase of this project, the industry raised no concerns regarding competition or restrictive use of the grid.

Implementation of New Requirements (Effective Date)

The implementation time for the proposed Reliability Standards must be reasonable.

In considering whether a proposed Reliability Standard is just and reasonable, the Commission will consider also the timetable for implementation of the new requirements, including how the proposal balances any urgency in the need to implement it against the reasonableness of the time allowed for those who must comply to develop the necessary procedures, software, facilities, staffing or other relevant capability. Order No. 672 at P 333.

In accordance with the WECC Reliability Standards Development Procedures, an implementation plan for the proposed Regional Variance was included with Posting 1 of this project. The Implementation Plan is included as Attachment F of this filing.

The proposed effective date for the WECC Regional Variance is "The first day of the first quarter after regulatory approval, but no sooner than January 1, 2020." A January 1, 2020 effective date allows time for the winding down of Peak Reliability (serving as the primary Interconnection RC until December 31, 2019), other RCs to start up, and creates a window during which the RCs may create the methodology required.

Earlier compliance should not be pursued. If an earlier effective date is imposed, the time window could encompass the active operation of multiple RCs for which a coordinated handoff of responsibilities had not yet occurred. As proposed, the effective date allows the RCs a period to create the required methodology. An earlier effective date may not accommodate that need. No other retirements are required.

Fair and Open Process

The Reliability Standard development process must be open and fair.

Further, in considering whether a proposed Reliability Standard meets the legal standard of review, we will entertain comments about whether the ERO implemented its Commission-approved Reliability Standard development process for the development of the particular proposed Reliability Standard in a proper manner, especially whether the process was open and fair. However, we caution that we will not be sympathetic to arguments by interested parties that choose, for whatever reason, not to participate in the ERO's Reliability Standard development process if it is conducted in good faith in accordance with the procedures approved by the Commission. Order No. 672 at P 334

WECC followed the WECC Reliability Standards Development Procedures (Procedures) approved by FERC in effect at the time of each step in the process.

In accordance with the Procedures, all drafting team meetings are open to the public.

All drafting team meetings were announced via the WECC Standards Email List for the period prescribed in the Procedures. Notice of the meetings was provided to NERC and posted on the WECC Calendar along with meeting minutes.

All meetings were supported by a telephone conference bridge associated with an on-line internet visual capability allowing all participants to see the document(s) as they were being developed. Further, this team held an open-mic Standards Briefing prior to balloting affording the industry an additional opportunity to have its questions addressed.

This project was posted twice for public comment at WECC.

Comments and the associated responses are currently posted on the WECC website, on the WECC-0135 project page, under the Submit and Review Comments accordion.[4] Response to Comments forms were provided with this filing.

In addition to posting under the WECC Procedures, this project was also posted by NERC for 45-days in accordance with NERC's Rules of Procedure and NERC's internal business practices.

Balanced with Other Vital Interests

Proposed Reliability Standards must balance with other vital public interests.

Finally, we understand that at times development of a proposed Reliability Standard may require that a particular reliability goal must be balanced against other vital public interests, such as environmental, social and other goals. We expect the ERO to explain any such balancing in its application for approval of a proposed Reliability Standard. Order No. 672 at P 335.

WECC is not aware of any other vital public interests. No such balancing concerns were raised or noted.

Consideration of Other Facts

Proposed Reliability Standards must consider any other relevant factors.

In considering whether a proposed Reliability Standard is just and reasonable, [FERC] will consider [several] general factors, as well as other factors that are appropriate for the particular Reliability Standard proposed. Order No. 672 at P 323.

WECC is not aware of any other general factors in need of consideration.

[4] https://www.wecc.org/Standards/Pages/WECC-0135.aspx

Electric Reliability and Security for the West

Attachment J
Drafting Team Roster
WECC-0135 IRO-002-5
RC—Monitoring and Analysis—RV

Drafting Team Roster

Below please find a biographical snapshot for the members of the WECC-0135 IRO-002-5 Reliability Coordination Monitoring and Analysis, Request for WECC Regional Variance Drafting Team.[1]

Name	Biography
Djordje Atanackovic, BC Hydro	Mr. Djordje Atanackovic received his Ph.D. in electrical engineering from McGill University, Canada. In 2001, he joined British Columbia (BC) Hydro, supporting real-time Energy Management System (EMS) network applications. Before joining BC Hydro, Dr. Atanackovic was with Canadian Aviation Electronics and Société national de Conseil-Lavalin, working on the development of EMS and Distribution Management System advanced-network applications. He is currently Engineering Division Manager of BC Hydro's Real-time Systems department in Transmission and Distribution System Operations. Dr. Atanackovic is a senior member of the Institute of Electrical and Electronics Engineers (IEEE) and has authored 30 technical papers in the field of power system operations, planning, and control.
Sean Erickson, Western Area Power Administration	Mr. Erickson is a Senior Power Operations Specialist at the Western Area Power Administration. His qualifications include: • Two years of experience as a WECC Reliability Coordinator (2009–2011); • Two years of experience as a WECC Reliability Coordination Operations Engineer (2007–2009); • Four years of experience as an Operations Engineer (2011–2015); • Serving as the Transmission Alternate on the WECC Operating Committee, as well as the WECC Ballot Body representative for both WECC and NERC;

[1] The following individuals were approved by the WECC Standards Committee (WSC) on July 19, 2018, via an Action without a Meeting: Atanackovic, Howell, Miller, Malik. The following individuals were approved by the WSC on August 7, 2018: Erickson, Shafeei, Subakti.

	• Previous member of the WECC Performance Work Group during the BAL-001 field trial evaluations; • Previous member of the Path Operator Task Force (POTF) (post-September 8, 2011, NERC/FERC findings and mitigation regarding path operations) and the POTF Implementation Team for the operational adoption of the POTF findings; and • Contributor to retiring TOP-007-WECC-1a, System Operating Limits.
Vic Howell, Peak Reliability (Peak)	• Currently serving as Manager of Modeling and Operations Support Engineering at Peak Reliability. • Served as chair of WECC-0111 to retire TOP-007-WECC-1a. • Currently serving as chair of NERC Project 2015-09—Establish and Communicate System Operating Limits. • Currently serving on NERC Methods for Establishing Interconnection Reliability Operating Limits (IROL) Task Force (MEITF). • Served on the WECC Path Operator Task Force. Served as vice chair of WECC Path Operator Implementation Task Force (POITF). • Developed Peak's System Operating Limit (SOL) Methodology for the Operations Horizon. • Very knowledgeable of Reliability Coordinator (RC) functions, operations, and modeling; as well as NERC Reliability Standards and standards-development processes.
Saal Malik, Peak Reliability	Current Position: Director of Engineering, Peak Reliability • 20 years overall industry experience • Nine years of experience with WECC-RC and now Peak in Operations Planning and Real-time Operations • Experience with development/maintenance of following advanced applications: 1. State Estimator, 2. Contingency Analysis, 3. Remedial Action Scheme (RAS) modeling and monitoring, 4. Voltage Stability, 5. Transient Stability, and 6. Synchro-phasor applications.

	• Extensive experience with operations coordination, training, NERC compliance activities, SOL/IROL management, and system-monitoring activities • Participated in the following drafting teams: 1. Team Chair: NERC Project 2009-02 "Real-time Monitoring and Analysis Capabilities," 2. Team Member: NERC Project 2016-01 "Modifications to TOP and IRO Standards," and 3. Team Member: NERC Compliance Guideline for Real-time Assessments
Timothy Miller, Southwest Power Pool (SPP)	Tim Miller is SPP's Manager of Modeling and Data Integrity. In this role, he has responsibility for the modeling and support of the models used in SPP's real-time operations. His qualifications include: • Member of North American Electric Reliability Corporation (NERC) Energy Management System (EMS) Working Group since 2016. Active participant and presenter at Annual Situational Awareness Conferences. • Member of North American Transmission Forum (NATF) EMS Modeling Working Group and NATF Modeling Practices Working Group since 2016. • 13 years of experience building, validating, and using power system models in various formats for both operational and long-term planning use. Highly skilled in node-breaker modeling, maintenance, validation, model management, and real-time support of EMS advanced network applications. • Model building and maintenance experience includes SPP's efficient model process that we use to consume models from neighboring parties, including: Midcontinent Independent System Operator (MISO), American Electric Power, and other SPP members and neighbors. • Application support experience includes the development of SPP's model validation processes, which have successfully satisfied NERC Standard Requirements, Statement on Standards for Attestation Engagements (SSAE) 16 audit standards, and internal business controls for many years.

Phillip Shafeei, Colorado Springs Utility (CSU)	Mr. Shafeei holds a Bachelor of Electrical Engineering and Master of Engineering degree in Electric Power System Engineering from Rensselaer Polytechnic Institute, Troy, NY. From 2012 to the present, Mr. Shafeei worked for the Colorado Springs Utility (CSU) as a Principle Power Systems Engineer covering such issues as tariff rate design and development of NERC Standards (MOD/TOP/FAC). Mr. Shafeei manages power system studies, winter/summer seasons, Total Transfer Capability (TCC), outage studies (approve-deny), weekly/next-day studies and model validations, and the EMS model and studies. Mr. Shafeei attends the Peak RC and WECC Board of Director meetings and was a member of the Peak RC alternative funding. From 2002 to 2012, he served at the New York Independent System Operator (NYISO) as Senior Engineer addressing feasibility studies, system impact studies, consultant interface, power flow analytics; and managed the NERC Interchange Distribution Calendar (IDC) internal to NYISO, NYISO representative in IDC, SDX, and Distribution Factor Working Group (DFWG). Mr. Shafeei was the NYISO representative in the Northwest Power and Conservation Council (NPCC) working groups, Control Performance Working Group, and System Operational Tools Working Group. Mr. Shafeei has 10 years of experience with industry training, data collection and modeling, and interface with the North American Energy Standards Board. Mr. Shafeei is experienced in distribution design, distribution management systems, SCADA, power quality, distribution planning, and relay coordination.
Dede Subakti, California Independent System Operator	Mr. Subakti is responsible for all operations engineering support and services in California Independent System Operator (CAISO). This includes performing resource adequacy, seasonal operating studies, outage coordination studies, day-ahead reliability analysis, real-time operations engineering analysis, and developing operating procedures and tools, along with other engineering needs, to support the system operations of the CAISO Balancing Area and Transmission Grid. Prior to joining the CAISO, Mr. Subakti was with Open Access Technology International, Inc. (OATI), where he managed project development for various transmission system applications including Inter-Control Center Communication Protocol implementation, Open Access Same-Time Information System automation, scheduling application, Total Transfer

	Capability (TTC) and Available Transfer Capacity (ATC) calculation, congestion management processes, and transmission settlement applications for Transmission Service Providers in both the Western and Eastern Interconnections. Mr. Subakti spent much of his career as Manager of Regional Operations Engineer for the Midwest ISO (MISO), where he managed the Real-time Operations Engineers that support MISO's control room operation. Mr. Subakti is regularly involved in NERC and WECC efforts in both Reliability Standards development and subcommittee's efforts supporting operations of the Interconnection. He was involved in the NERC MOD-A, EOP Standard Drafting Team, the FAC Periodic Review Team, and the associated standard drafting team. Mr. Subakti is a licensed Professional Engineer with the State of Minnesota and a certified NERC System Operator. He received his Master of Business Administration from the Carlson School of Management at the University of Minnesota and Master of Electrical Engineering with emphasis in power systems from the Iowa State University where he also earned his Bachelor of Science in electrical engineering.

Ballot Pool Members

Title	Company	Sector	Vote	Comments	Created By
WECC-0135	Western Area Power Administration	Electricity Brokers, Aggregators, and Marketers	Yes	0	Timothy Vigil
WECC-0135	Bonneville Power Administration	Transmission Owners	Yes	0	Kammy Rogers Holliday
WECC-0135	Public Service Company of Colorado (Xcel Energy)	Transmission Owners	Yes	0	Robert Staton
WECC-0135	Public Service Company of Colorado (Xcel Energy)	Load-Serving Entities (LSE)	Yes	0	Robert Staton
WECC-0135	Public Service Company of New Mexico	Electric Generators	Yes	0	Laurie Williams
WECC-0135	Public Service Company of New Mexico	Transmission Owners	Yes	0	Laurie Williams
WECC-0135	Public Service Company of New Mexico	Load-Serving Entities (LSE)	Yes	0	Laurie Williams
WECC-0135	Public Service Company of New Mexico	Electricity Brokers,	Yes	0	Laurie Williams

		Aggregators, and Marketers			
WECC-0135	Avista Corporation	Electricity Brokers, Aggregators, and Marketers	Abstain	Using a common model instead of a common methodology seems for appropriate.	Scott Kinney
WECC-0135	British Columbia Hydro & Power Authority	Electric Generators	Yes	0	Adrian Andreoiu
WECC-0135	British Columbia Hydro & Power Authority	Transmission Dependent Utilities (TDU)	Yes	0	Adrian Andreoiu
WECC-0135	British Columbia Hydro & Power Authority	Transmission Owners	Yes	0	Adrian Andreoiu
WECC-0135	British Columbia Hydro & Power Authority	Load-Serving Entities (LSE)	Yes	0	Adrian Andreoiu
WECC-0135	Powerex, Inc.	Electricity Brokers, Aggregators, and Marketers	Yes	0	Gordon Dobson Mack
WECC-0135	Sacramento Municipal Utility District	Electric Generators	Yes	0	Joe Tarantino
WECC-0135	Sacramento Municipal Utility District	Transmission Dependent Utilities (TDU)	Yes	0	Joe Tarantino
WECC-0135	Sacramento Municipal Utility District	Transmission Owners	Yes	0	Joe Tarantino

WECC-0135	Sacramento Municipal Utility District	Load-Serving Entities (LSE)	Yes	0	Joe Tarantino
WECC-0135	Sacramento Municipal Utility District	Electricity Brokers, Aggregators, and Marketers	Yes	0	Joe Tarantino
WECC-0135	Balancing Authority of Northern California	Transmission Owners	Yes	0	Joe Tarantino
WECC-0135	Balancing Authority of Northern California	Electricity Brokers, Aggregators, and Marketers	Yes	0	Joe Tarantino
WECC-0135	California Independent System Operator	Regional Transmission Organizations (RTOs) and Independent System Operators (ISO)	Yes	0	Richard Vine
WECC-0135	California Independent System Operator	Electricity Brokers, Aggregators, and Marketers	Yes	0	Richard Vine
WECC-0135	Western Area Power Administration	Transmission Owners	Yes	0	sean er
WECC-0135	Bonneville Power Administration	Load-Serving Entities (LSE)	Yes	0	Rebecca Berdahl
WECC-0135	Bonneville Power Administration	Electricity Brokers, Aggregators, and Marketers	Yes	0	Andrew Meyers

WECC-0135	Public Service Company of Colorado (Xcel Energy)	Electric Generators	0	0	Gerry Huitt
WECC-0135	Southern California Edison Company	Electric Generators	0	0	Selene Willis
WECC-0135	Southern California Edison Company	Load-Serving Entities (LSE)	0	0	Romel Aquino

WECC

Electric Reliability and Security for the West

Attachment L

Final Ballot Results

WECC-0135 IRO-002-5

RC—Monitoring—RV

Ballot Name:	WECC-0135 IRO-002-5, Reliability Coordination - Monitoring and Analysis, Request for Regional Variance		
Overview:	The project requires Reliability Coordinators (RC) serving the Western Interconnection to : 1) develop a common, Interconnection-wide methodology to determine the modeling and monitoring of elements necessary for providing operational awareness, and 2) use the methodology.		
Ballot Pool Open:	01/22/2019	Ballot Pool Closed:	02/05/2019
Ballot Opened:	02/07/2019	Ballot Closed:	02/21/2019
Total Ballot Pool:	29	Total Votes:	26
Quorum:	89.7%	Weighted Votes:	100%
Ballot Results:	Pass		

Voting Sectors	Total in Ballot Pool	In-Pool Affiliates Excluded	Votes Non-Abstain	Sector Weight	Yes Votes	Weighted Segment Vote	No Votes	Abstain	Total Votes for Quorum	Did Not Vote
Transmission Owners	7		7	0.7	7	70.0%	0	0	7	0
Regional Transmission Organizations (RTO) and Independent System Operators (ISO)	1		1	0.1	1	10.0%	0	0	1	0
Load-Serving Entities (LSE)	6		5	0.5	5	50.0%	0	0	5	1
Transmission Dependent Utilities (TDU)	2		2	0.2	2	20.0%	0	0	2	0
Electric Generators	5		3	0.3	3	30.0%	0	0	3	2
Electricity Brokers, Aggregators, and Marketers	8		7	0.7	7	70.0%	0	1	8	0
Large Electricity End Users	0		0	0	0	0.0%	0	0	0	0
Small Electricity Users	0		0	0	0	0.0%	0	0	0	0
Federal, State, Provincial Regulatory, other Gov. Entities	0		0	0	0	0.0%	0	0	0	0
Regional Entities	0		0	0	0	0.0%	0	0	0	0
Totals	29	0	25	2.5	25	100.0%	0	1	26	3

Minority Issues

Although this project passed with a 100 percent affirmative ballot, in Postings 1 and 2, minority issues were raised and addressed.

Methodology vs. Model Mandate

At the start, the WECC-0135 Drafting Team (DT) was faced with the decision whether to mandate use of a single named West-wide model or allow for the more practical use of a modeling and monitoring methodology developed in an inclusive and coordinated environment. The DT chose the latter.

The DT chose the methodology approach because:

- It is a better match for NERC's direction that standards should be results-based as opposed to mandating how the result should be reached (see NERC's Results-Based Reliability Standard Development Guidance).
- Requiring use of a specified model may preclude use of a better model, causing a default to the lowest common denominator (FERC Order 672, para. 329).
- Requiring use of a specified model may diminish due process in that changes to the model could occur outside the standards development process (FERC Order 672, para. 334).
- If the WECC Regional Variance (RV) mandated use of a single model "or its successor," until the validity of "its successor" could be determined, compliance would be in question.
- The methodology approach conforms with FERC direction in that it allows for the WECC RV to consider "implementation cost [and] historical regional infrastructure design," while "effectively and efficiently" achieving the reliability objective (FERC Order 672, para. 328 and 330).

The goal of the common methodology is to ensure that essential modelling details are maintained that provide a Reliability Coordinator (RC) with a wide-area view while permitting unneeded data to be culled. The benefits of ensuring that the RC models are no larger than necessary include: 1) significantly enhanced performance of on-line applications such as Transient Stability Analysis, 2) reduced risk that data problems with elements that are insensitive to the RC footprint will cause convergence problems, 3) reduced risk that problems with elements that are insensitive to the RC

footprint could cause false alarms or consume troubleshooting resources, and 4) reduced risk that errors from insensitive parts of the Interconnection could mask issues within the RC footprint.

Miscellaneous Posting 1

In Posting 1, the DT did not adopt proposed changes:

- That would further prescribe how the monitoring of oscillation should occur. The DT chose to keep the methodology approach that meets the results-based concept.
- That would delete Posting 1, D.R1, 1.5 because its inclusion creates a mandate specific to the RC that is not present in MOD-33.
- To adopt a dispute resolution clause requiring that all RCs agree.
- To adopt inclusion of "voltage" because D.R1 addresses stability time frames as opposed to stability types.

Miscellaneous Posting 2

In Posting 2, the DT did not adopt proposed changes:

- To inclusively define the bounds of what is "necessary" in D.R1.

The Southwest Power Pool (SPP) raised concerns that inclusion of the word "necessary" in Requirement D.R1 could cause confusion in the auditing process (not in execution of the requirement). The term was kept after the team concluded its inclusion was neutral as to the Measure but added valuable descriptive bounds to the reliability task. The team further concluded that, although use of the word was not ideal, complete delineation of all features "necessary" for the monitoring and modeling methodology was not practical to include in a Regional Variance.

In its response, the DT encouraged the industry to engage in the Reliability Standards Audit Worksheet development process as described in the NERC Reliability Standard Audit Worksheet (RSAW) Review and Revision Process (effective March 1, 2018). In all cases, the Regional Entity should rely on the language in the Reliability Standard itself, not the language in the RSAW, to determine compliance with the Reliability Standard.[1]

Numerous structural and syntactic changes were not adopted.

[1]https://www.nerc.com/pa/comp/Reliability%20Standard%20Audits%20Worksheets%20DL/NERC%20Reliability%20Standard%20Audit%20Worksheet%20(RSAW)%20Review%20and%20Revision%20Process.pdf

Electric Reliability and Security for the West

Attachment N
WECC Standards Committee Roster
WECC-0135 IRO-002-5
RC—Monitoring and Analysis—RV

WECC Standards Committee Roster

The following individuals are those assigned to the WECC Standards Committee as of March 5, 2019.

Sunitha Kothapalli, Puget Sound Energy ..... SVS 1 Transmission

Robert Sullivan, California Independent System Operator..... SVS 2 RTO/ISO[1]

Dana Cabbell, Southern California Edison ..... SVS 3 LSE[2]

Marty Hostler, Northern California Power Agency ..... SVS 4 TDU[3]

Gary Nolan, Arizona Public Service ..... SVS 5 Generators

Joe Tarantino, Sacramento Municipal Utility District ..... SVS 6 Broker/Aggregator/Marketers

Caitlin Liotiris, Utah Association of Energy Users ..... SVS 7 Large Electricity End Users

Crystal Musselman, Proven Compliance Solutions ..... SVS 8 Small Electricity Users

Davy Zhuang, British Columbia Utilities Commission ..... SVS 9 Gov. Entities

Steven Rueckert, WECC ..... SVS 10 Regional Entities

James Avery, Chair..... Non-Affiliated Director

[1] Regional Transmission Organization/Independent System Operator
[2] Load-Serving Entity
[3] Transmission Dependent Utilities

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Consideration of Comments

Project Name:	WECC-0135 Regional Variance | IRO-002-5
Comment Period Start Date:	3/7/2019
Comment Period End Date:	4/22/2019
Associated Ballots:	

There was one set of responses, including comments from approximately three different people from one company representing three of the Industry Segments as shown in the table on the following pages.

All comments submitted can be reviewed in their original format on the project page.

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process. If you feel there has been an error or omission, you can contact the Senior Director of Standards and Education, Howard Gugel (via email) or at (404) 446-9693.

If you have any questions regarding the WECC Reliability Standards Development Procedures or this project, please contact WECC Consultant, W. Shannon Black at (503) 307-5782.

Questions

1. Do you agree the proposed variance was developed in a fair and open process, using the associated Regional Reliability Standards Development Procedure?

2. Does the proposed variance pose an adverse impact to reliability or commerce in a neighboring region or interconnection?

3. Does the proposed variance pose a serious and substantial threat to public health, safety, welfare, or national security?

4. Does the proposed variance pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?

5. Does the proposed variance meet at least one of the following criteria?

- **The proposed variance has more specific criteria for the same requirements covered in a continent-wide standard.**
- **The proposed variance has requirements that are not included in the corresponding continent-wide reliability standard.**
- **The proposed regional difference is necessitated by a physical difference in the bulk power system.**

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
BC Hydro and Power Authority	Adrian Andreoiu	1,3,5	WECC	BC Hydro	Hootan Jarollahi	BC Hydro and Power Authority	3	WECC
					Helen Hamilton Harding	BC Hydro and Power Authority	5	WECC
					Adrian Andreoiu	BC Hydro and Power Authority	1	WECC

1. Do you agree the proposed variance was developed in a fair and open process, using the associated Regional Reliability Standards Development Procedure?	
Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

2. Does the proposed variance pose an adverse impact to reliability or commerce in a neighboring region or interconnection?	
Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

3. Does the proposed variance pose a serious and substantial threat to public health, safety, welfare, or national security?	
Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

4. Does the proposed variance pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?	
Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

5. Does the proposed variance meet at least one of the following criteria?

- **The proposed variance has more specific criteria for the same requirements covered in a continent-wide standard.**
- **The proposed variance has requirements that are not included in the corresponding continent-wide reliability standard.**
- **The proposed regional difference is necessitated by a physical difference in the bulk power system.**

Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Electric Reliability and Security for the West

Attachment O2
Posting Two Response to Comments
WECC-0135 IRO-002-5
RC—Monitoring and Analysis—RV

Posting 2

The WECC-0135 IRO-002-5, Reliability Coordination—Monitoring and Analysis, Request for WECC Regional Variance (RV) Drafting Team (DT) thanks everyone who submitted comments on the proposed document.

Posting

This project was posted for public comment from November 28, 2018, through January 2, 2019.

WECC distributed the notice for the posting on November 28, 2018.[1] The DT asked stakeholders to provide feedback on the proposed document through a standardized electronic template. One comment was received on this posting.

Location of Comments

All comments received on the project can be viewed in their original format on the WECC-0135 project page under the "Submit and Review Comments" accordion.

Method vs. Model Mandate

The proposed WECC RV addresses a condition in which multiple Reliability Coordinators (RC) provide RC service(s) within the Western Interconnection, regardless of the RC's geographic location.

Two primary approaches where considered for this project: 1) a requirement that all RCs use a single, mandated model, and 2) a requirement that all affected RCs create a coordinated method to meet the reliability goal. The DT chose the second approach. (For more detail, refer to WECC-0135 Posting 1, Response to Comments, posted on the WECC-0135 project page at the "Submit and Review Comments" accordion.)

Changes in Response to Comment

After consideration of Southwest Power Pool's (SPP) comment, the DT chose to make no further changes to the project.

[1] Notice of Posting 2 was originally dispatched on November 19, 2018, with a closing date of December 19, 2018. On November 28, 2018, notice was dispatched extending the closing date to January 2, 2019.

Minority View

The project requires RCs serving the Western Interconnection: 1) to develop a common, Interconnection-wide method to determine the modeling and monitoring of elements "necessary" for operational awareness, and 2) to use the method.

SPP raised concerns that inclusion of the word "necessary" in Requirement RX1 could cause confusion in the auditing process (not in execution of the requirement). The term was retained after the team concluded its inclusion was neutral as to the Measure, but added descriptive bounds to the reliability task. Although use of the word was not ideal, naming all "necessary" features for the monitoring and modeling method was not practical.

The drafting team also encouraged the industry to engage in the Reliability Standards Audit Worksheet (RSAW) development process as described in the NERC RSAW Review and Revision Process (effective: March 1, 2018). In all cases, the Regional Entity should rely on the language in the Reliability Standard itself, and not on the language in the RSAW to determine compliance with the Reliability Standard.[2]

Effective Date

The proposed effective date for the RV is "The first day of the first quarter after regulatory approval, but no sooner than January 1, 2020."

Action Plan

A January 1, 2020, effective date gives time for Peak Reliability to wind down, for other RCs to start up, and creates a window during which the RCs may create the method required.

On January 11, 2019, the WECC-0135 IRO-002-5, Reliability Coordination—Monitoring and Analysis, Request for WECC Regional Variance Drafting Team (DT) agreed by majority vote to forward the project to the WECC Standards Committee (WSC) with a request for ballot. The WSC is targeted to meet during the week of January 14, 2019.

If you have questions regarding the posting, please contact W. Shannon Black at (503) 307 5782.

Contacts and Appeals

If you feel your comment has been omitted or overlooked, please contact W. Shannon Black, WECC Consultant, at (503) 307-5782. In addition, there is a WECC Reliability Standards appeals process.

Commenter		Organization
1	Alan Wahlstrom	Southwest Power Pool (SPP)

[2] https://www.nerc.com/pa/comp/Reliability%20Standard%20Audits%20Worksheets%20DL/NERC%20Reliability%20Standard%20Audit%20Worksheet%20(RSAW)%20Review%20and%20Revision%20Process.pdf

Index to Questions, Comments, and Responses

Question

1. The Drafting Team welcomes comments on all aspects of the document.

1. The Drafting Team welcomes comments on all aspects of the document.

Summary Consideration: See summary in the preamble of this document.	
Commenter	**Comment**
Southwest Power Pool	In Requirement 1 the statement "necessary for providing operational awareness of the impacts on BES Facilities within its RC Area, including at a minimum", we believe the word necessary could prove to be contradictory. What the RC's deem as necessary and what the Regional Entity deem as necessary could conflict. Our recommendation is to strike the word necessary and rewrite the statement to say, "to provide operational awareness of the impacts on BES Facilities within its RC Area, including at a minimum". The RC's will determine what is necessary in their methodology.
Response	
The DT appreciates SPP's suggestion. In RX1, it is the impacted RCs that develop the modeling and monitoring methodology that includes a specified minimum content. Thereafter, RX2 requires the RC to implement the methodology. Nowhere in the proposed Regional Variance (RV) is the Regional Entity (RE) required to act, participate or opine; thus, any potential conflict between the RE and the RC is moot – as to the tasks for performance under the RV. That said, a good business practice would suggest that the RE should be consulted and/or included in the development of the methodology due to the RE's ability to access, distill, coordinate, and share a breadth of information not always directly accessible by the RC. But, that is not required in the proposed RV. The final determination of what is "necessary" falls to the RCs. Alternatively, in its role as the enforcement entity, the RE may determine the nature of what constitutes acceptable evidence of compliance. If this is SPP's concern, SPP and each applicable RC is encouraged to directly engage the enforcement activity to assist in drafting the associated Reliability Standard Audit Worksheet. Finally, the drafting team recognizes that what constitutes "necessary" in RX1 is not specifically stated in the language of the RV. That was intentional. The DT was faced with the impossible task of defining the complete universe of what is "necessary" for each RC – present and future, known and unknown, and under all circumstances.	

Since that which is necessary for one RC may not be the same as that which is necessary for another RC; and, whereas that which is necessary for one RC may vary over time, the DT concluded the best forum for that determination was during the coordinated development of the methodology.

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Consideration of Comments

Project Name:	WECC-0135 Regional Variance | IRO-002-5
Comment Period Start Date:	3/7/2019
Comment Period End Date:	4/22/2019
Associated Ballots:	

There was one set of responses, including comments from approximately three different people from one company representing three of the Industry Segments as shown in the table on the following pages.

All comments submitted can be reviewed in their original format on the project page.

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process. If you feel there has been an error or omission, you can contact the Senior Director of Standards and Education, Howard Gugel (via email) or at (404) 446-9693.

If you have any questions regarding the WECC Reliability Standards Development Procedures or this project, please contact WECC Consultant, W. Shannon Black at (503) 307-5782.

Questions

1. Do you agree the proposed variance was developed in a fair and open process, using the associated Regional Reliability Standards Development Procedure?

2. Does the proposed variance pose an adverse impact to reliability or commerce in a neighboring region or interconnection?

3. Does the proposed variance pose a serious and substantial threat to public health, safety, welfare, or national security?

4. Does the proposed variance pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?

5. Does the proposed variance meet at least one of the following criteria?

- **The proposed variance has more specific criteria for the same requirements covered in a continent-wide standard.**
- **The proposed variance has requirements that are not included in the corresponding continent-wide reliability standard.**
- **The proposed regional difference is necessitated by a physical difference in the bulk power system.**

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
BC Hydro and Power Authority	Adrian Andreoiu	1,3,5	WECC	BC Hydro	Hootan Jarollahi	BC Hydro and Power Authority	3	WECC
					Helen Hamilton Harding	BC Hydro and Power Authority	5	WECC
					Adrian Andreoiu	BC Hydro and Power Authority	1	WECC

1. Do you agree the proposed variance was developed in a fair and open process, using the associated Regional Reliability Standards Development Procedure?	
Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

2. Does the proposed variance pose an adverse impact to reliability or commerce in a neighboring region or interconnection?	
Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

3. Does the proposed variance pose a serious and substantial threat to public health, safety, welfare, or national security?	
Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

4. Does the proposed variance pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?	
Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

5. Does the proposed variance meet at least one of the following criteria?

- **The proposed variance has more specific criteria for the same requirements covered in a continent-wide standard.**
- **The proposed variance has requirements that are not included in the corresponding continent-wide reliability standard.**
- **The proposed regional difference is necessitated by a physical difference in the bulk power system.**

Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Regional Reliability Standards Announcement

Western Electricity Coordinating Council
IRO-002-5 | WECC Variance

Comment Period Open through April 22, 2019

Now Available

The Western Electricity Coordinating Council (WECC) requested that NERC post the WECC Regional Variance for **IRO-002-5 - Reliability Coordination – Monitoring and Analysis** for industry review and comment in accordance with the NERC Rules of Procedure.

Background

As the Western Interconnection moves to a multi-Reliability Coordinator (RC) environment, focused coordination of those RCs will become critical. WECC developed a proposed Regional Variance to NERC Reliability Standard IRO-002-5 - Reliability Coordination - Monitoring and Analysis to ensure coordination between each of those RCs.

The proposed Variance does not change any of the continent-wide Requirements. The WECC Board of Directors adopted the proposed Variance on March 6, 2019.

Prior to NERC Board adoption, the proposed Variance will be inserted into proposed Reliability Standard IRO-002-6, which is currently being balloted as part of the ongoing Project 2018-03 Standards Efficiency Retirements project.

The standard was posted twice for comment by WECC, most recently from November 28, 2018 – January 2, 2019 and the comments received can be viewed here.

Commenting

Use the electronic form to submit comments. If you experience any difficulties in using the electronic form, contact Nasheema Santos. The form must be submitted by **8 p.m. Eastern, Monday, April 22, 2019.** An unofficial Word version of the comment form is posted on the Regional Reliability Standards Under Development page.

Regional Reliability Standards Development Process

Section 300 of NERC's Rules of Procedures of the Electric Reliability Organization governs the regional reliability standards development process.

Documents and information about this project are available on the WECC's Standards Under Development page.

For more information or assistance, contact Senior Reliability Standards Analyst, Nasheema Santos (via email) or at (404) 446-2564.

North American Electric Reliability Corporation
3353 Peachtree Rd, NE
Suite 600, North Tower
Atlanta, GA 30326
404-446-2560 | www.nerc.com

Electric Reliability and Security for the West

WECC-0135 IRO-002-5 Reliability Coordination—Monitoring and Analysis Regional Variance

Overview

As the Western Interconnection moves to a multi-Reliability Coordinator (RC) environment, focused coordination of those RCs will become critical. This filing is designed to ensure coordination between each of those RCs by creating a WECC Regional Variance (RV) to NERC Reliability Standard IRO-002-5, Reliability Coordination—Monitoring and Analysis (RCMA).

This filing does not change any part of the underlying standard. Only the proposed RV and the associated compliance components will be offered for comment. Proposed changes to the existing body of the standard will not be considered.

Once finalized, the proposed language will be renumbered per NERC's numbering nomenclature for RVs and inserted into the existing standard. An example of a WECC RV can be seen in VAR-001-4.1—Voltage and Reactive Control Compliance, Section D Regional Variances.

Purpose

To develop a methodology that creates models for performing Operational Planning Analyses and Real-time Assessments.

Applicability

As used in this WECC Regional Variance, Reliability Coordinator is specific to those Reliability Coordinators providing Reliability Coordinator service(s) to entities operating within the Western Interconnection, regardless of where the Reliability Coordinator may be located.

Requirement and Measures

RX1. Each Reliability Coordinator shall, in coordination with other Reliability Coordinators, develop a common Interconnection-wide methodology to determine the modeling and monitoring of BES and non-BES Elements that are internal and external to its Reliability Coordinator Area, necessary for providing operational awareness of the impacts on Bulk Electric System Facilities within its Reliability Coordinator Area, including at a minimum: ([Violation Risk Factor: High] [Time Horizon: Operations Planning])

1.1. A method for development, maintenance, and periodic review of a Western Interconnection-wide reference model to serve as the baseline from which Reliability Coordinator's operational models are derived;

1.2 The impacts of Inter-area oscillations;

1.3 A method to determine Contingencies included in analyses and assessments;

1.4 A method to determine Remedial Action Schemes included in analyses and assessments;

1.5 A method to determine forecast data included in analyses and assessments; and

1.6 A method for the validation and periodic review of the Reliability Coordinator's operational model for steady state and dynamic/oscillatory system response.

MX1. Each Reliability Coordinator will have evidence that it developed a common Western Interconnection-wide methodology, addressing modeling and monitoring, in coordination with other Reliability Coordinators, that includes the features required in RX1.

RX2. Each Reliability Coordinator shall use the methodology developed in RX1. ([Violation Risk Factor: High] [Time Horizon: Operations Planning])

MX2. Each Reliability Coordinator will have evidence that it uses the methodology developed in RX1, as required in RX2 above.

Compliance

A. Compliance

1.2 Evidence Retention:

- The Reliability Coordinator shall keep data or evidence for Requirements R5, R6, and the WECC Regional Variance, and Measures M5, M6, and the WECC Regional Variance for the current calendar year and one previous calendar year.

R #	Violation Severity Levels for the WECC Regional Variance			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
RX1				The Reliability Coordinator did not develop the methodology as required in RX1.
RX2				The Reliability Coordinator did not implement the methodology as required in RX2.

Comment Report

Project Name:	WECC Regional Variance | IRO-002-5
Comment Period Start Date:	3/7/2019
Comment Period End Date:	4/22/2019
Associated Ballots:	

There were 1 sets of responses, including comments from approximately 4 different people from approximately 1 companies representing 3 of the Industry Segments as shown in the table on the following pages.

Questions

1. Do you agree the proposed variance was developed in a fair and open process, using the associated Regional Reliability Standards Development Procedure?

2. Does the proposed variance pose an adverse impact to reliability or commerce in a neighboring region or interconnection?

3. Does the proposed variance pose a serious and substantial threat to public health, safety, welfare, or national security?

4. Does the proposed variance pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?

5. Does the proposed variance meet at least one of the following criteria?

- **The proposed variance has more specific criteria for the same requirements covered in a continent-wide standard.**
- **The proposed variance has requirements that are not included in the corresponding continent-wide reliability standard.**
- **The proposed regional difference is necessitated by a physical difference in the bulk power system.**

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
BC Hydro and Power Authority	Adrian Andreoiu	1,3,5	WECC	BC Hydro	Hootan Jarollahi	BC Hydro and Power Authority	3	WECC
					Helen Hamilton Harding	BC Hydro and Power Authority	5	WECC
					Adrian Andreoiu	BC Hydro and Power Authority	1	WECC

1. Do you agree the proposed variance was developed in a fair and open process, using the associated Regional Reliability Standards Development Procedure?	
Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

2. Does the proposed variance pose an adverse impact to reliability or commerce in a neighboring region or interconnection?	
Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

3. Does the proposed variance pose a serious and substantial threat to public health, safety, welfare, or national security?	
Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

4. Does the proposed variance pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?	
Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

5. Does the proposed variance meet at least one of the following criteria?

- **The proposed variance has more specific criteria for the same requirements covered in a continent-wide standard.**
- **The proposed variance has requirements that are not included in the corresponding continent-wide reliability standard.**
- **The proposed regional difference is necessitated by a physical difference in the bulk power system.**

Adrian Andreoiu - BC Hydro and Power Authority - 1,3,5, Group Name BC Hydro	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Unofficial Comment Form

WECC Regional Variance – IRO-002-5

DO NOT use this form for submitting comments. Use the electronic form to submit comments on Regional Reliability Standard **IRO-002-5 – Reliability Coordination – Monitoring and Analysis (WECC Variance)**. Comments must be submitted by **8 p.m. Eastern, Monday, April 22, 2019.**

The Regional Reliability Standards Under Development page contains documents and information about this project. If you have questions, contact Nasheema Santos (via email).

Background Information

As the Western Interconnection moves to a multi-Reliability Coordinator (RC) environment, focused coordination of those RCs will become critical. WECC developed a proposed Regional Variance to NERC Reliability Standard IRO-002-5, Reliability Coordination—Monitoring and Analysis to ensure coordination between each of those RCs.

The proposed Variance does not change any of the continent-wide Requirements. The WECC Board of Directors adopted the proposed Variance on March 6, 2019.

Prior to NERC Board adoption, the Variance will be inserted into proposed Reliability Standard IRO-002-6, which is currently being balloted as part of the ongoing Project 2018-03 Standards Efficiency Retirements project.

The standard was posted twice for comment, most recently from November 19, 2018 – January 2, 2019 and the comments received can be viewed here.

Any variance from a NERC Reliability Standard Requirement that is proposed to apply to responsible entities within a Regional Entity organized on an Interconnection-wide basis shall be considered an Interconnection-wide Variance and shall be developed through that Regional Entity's NERC-approved regional Reliability Standards development procedure. While an Interconnection-wide Variance may be developed through the associated Regional Entity standards development process, Regional Entities are encouraged to work collaboratively with existing continent-wide drafting team to reduce potential conflicts between the two efforts. An Interconnection-wide Variance from a NERC Reliability Standard that is determined by NERC to be just, reasonable, and not unduly discriminatory or preferential, and in the public interest, and consistent with other applicable standards of governmental authorities shall be made part of the associated NERC Reliability Standard. NERC shall rebuttably presume that an Interconnection-wide Variance from a NERC Reliability Standard that is developed, in accordance with a standards development procedure approved by NERC, by a Regional Entity organized on an Interconnection-wide basis, is just, reasonable, and not unduly discriminatory or preferential, and in the public interest.

NERC is publicly noticing and requesting comment on the proposed WECC Variance. Comments shall be permitted only on the following criteria (technical aspects of the Variance are vetted through the regional standards development process):

Unfair or Closed Process – The Variance was not developed in a fair and open process that provided an opportunity for all interested parties to participate. Although a NERC-approved regional reliability standards development procedure shall be presumed to be fair and open, objections could be raised regarding the implementation of the procedure.

Adverse Reliability or Commercial Impact on Other Interconnections – The Variance would have a significant adverse impact on reliability or commerce in other interconnections.

Deficient Standard – The Variance fails to provide a level of reliability of the bulk power system such that the Variance would be likely to cause a serious and substantial threat to public health, safety, welfare, or national security.

Adverse Impact on Competitive Markets within the Interconnection – The Variance would create a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability.

Questions

1. **Do you agree the proposed Variance was developed in a fair and open process, using the associated Regional Reliability Standards Development Procedure?**

   ☐ Yes
   ☐ No
   Comments:

2. **Does the proposed Variance pose an adverse impact to reliability or commerce in a neighboring region or interconnection?**

   ☐ Yes
   ☐ No
   Comments:

3. **Does the proposed Variance pose a serious and substantial threat to public health, safety, welfare, or national security?**

   ☐ Yes
   ☐ No
   Comments:

4. **Does the proposed Variance pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?**

   ☐ Yes
   ☐ No
   Comments:

5. **Does the proposed Variance meet at least one of the following criteria?**

   - **The proposed variance has more specific criteria for the same requirements covered in a continent-wide standard.**
   - **The proposed variance has requirements that are not included in the corresponding continent-wide reliability standard.**
   - **The proposed regional difference is necessitated by a physical difference in the bulk power system.**

   ☐ Yes
   ☐ No
   Comments:

Exhibit F

Standard Drafting Team Roster

WECC
Electric Reliability and Security for the West

Drafting Team Roster

Below please find a biographical snapshot for the members of the WECC-0135 IRO-002-5 Reliability Coordination Monitoring and Analysis, Request for WECC Regional Variance Drafting Team.[1]

Name	Biography
Djordje Atanackovic, BC Hydro	Mr. Djordje Atanackovic received his Ph.D. in electrical engineering from McGill University, Canada. In 2001, he joined British Columbia (BC) Hydro, supporting real-time Energy Management System (EMS) network applications. Before joining BC Hydro, Dr. Atanackovic was with Canadian Aviation Electronics and Société national de Conseil-Lavalin, working on the development of EMS and Distribution Management System advanced-network applications. He is currently Engineering Division Manager of BC Hydro's Real-time Systems department in Transmission and Distribution System Operations. Dr. Atanackovic is a senior member of the Institute of Electrical and Electronics Engineers (IEEE) and has authored 30 technical papers in the field of power system operations, planning, and control.
Sean Erickson, Western Area Power Administration	Mr. Erickson is a Senior Power Operations Specialist at the Western Area Power Administration. His qualifications include: • Two years of experience as a WECC Reliability Coordinator (2009–2011); • Two years of experience as a WECC Reliability Coordination Operations Engineer (2007–2009); • Four years of experience as an Operations Engineer (2011–2015); • Serving as the Transmission Alternate on the WECC Operating Committee, as well as the WECC Ballot Body representative for both WECC and NERC;

[1] The following individuals were approved by the WECC Standards Committee (WSC) on July 19, 2018, via an Action without a Meeting: Atanackovic, Howell, Miller, Malik. The following individuals were approved by the WSC on August 7, 2018: Erickson, Shafeei, Subakti.

	• Previous member of the WECC Performance Work Group during the BAL-001 field trial evaluations; • Previous member of the Path Operator Task Force (POTF) (post-September 8, 2011, NERC/FERC findings and mitigation regarding path operations) and the POTF Implementation Team for the operational adoption of the POTF findings; and • Contributor to retiring TOP-007-WECC-1a, System Operating Limits.
Vic Howell, Peak Reliability (Peak)	• Currently serving as Manager of Modeling and Operations Support Engineering at Peak Reliability. • Served as chair of WECC-0111 to retire TOP-007-WECC-1a. • Currently serving as chair of NERC Project 2015-09—Establish and Communicate System Operating Limits. • Currently serving on NERC Methods for Establishing Interconnection Reliability Operating Limits (IROL) Task Force (MEITF). • Served on the WECC Path Operator Task Force. Served as vice chair of WECC Path Operator Implementation Task Force (POITF). • Developed Peak's System Operating Limit (SOL) Methodology for the Operations Horizon. • Very knowledgeable of Reliability Coordinator (RC) functions, operations, and modeling; as well as NERC Reliability Standards and standards-development processes.
Saal Malik, Peak Reliability	Current Position: Director of Engineering, Peak Reliability • 20 years overall industry experience • Nine years of experience with WECC-RC and now Peak in Operations Planning and Real-time Operations • Experience with development/maintenance of following advanced applications: 1. State Estimator, 2. Contingency Analysis, 3. Remedial Action Scheme (RAS) modeling and monitoring, 4. Voltage Stability, 5. Transient Stability, and 6. Synchro-phasor applications.

	• Extensive experience with operations coordination, training, NERC compliance activities, SOL/IROL management, and system-monitoring activities • Participated in the following drafting teams: 1. Team Chair: NERC Project 2009-02 "Real-time Monitoring and Analysis Capabilities," 2. Team Member: NERC Project 2016-01 "Modifications to TOP and IRO Standards," and 3. Team Member: NERC Compliance Guideline for Real-time Assessments
Timothy Miller, Southwest Power Pool (SPP)	Tim Miller is SPP's Manager of Modeling and Data Integrity. In this role, he has responsibility for the modeling and support of the models used in SPP's real-time operations. His qualifications include: • Member of North American Electric Reliability Corporation (NERC) Energy Management System (EMS) Working Group since 2016. Active participant and presenter at Annual Situational Awareness Conferences. • Member of North American Transmission Forum (NATF) EMS Modeling Working Group and NATF Modeling Practices Working Group since 2016. • 13 years of experience building, validating, and using power system models in various formats for both operational and long-term planning use. Highly skilled in node-breaker modeling, maintenance, validation, model management, and real-time support of EMS advanced network applications. • Model building and maintenance experience includes SPP's efficient model process that we use to consume models from neighboring parties, including: Midcontinent Independent System Operator (MISO), American Electric Power, and other SPP members and neighbors. • Application support experience includes the development of SPP's model validation processes, which have successfully satisfied NERC Standard Requirements, Statement on Standards for Attestation Engagements (SSAE) 16 audit standards, and internal business controls for many years.

Phillip Shafeei, Colorado Springs Utility (CSU)	Mr. Shafeei holds a Bachelor of Electrical Engineering and Master of Engineering degree in Electric Power System Engineering from Rensselaer Polytechnic Institute, Troy, NY. From 2012 to the present, Mr. Shafeei worked for the Colorado Springs Utility (CSU) as a Principle Power Systems Engineer covering such issues as tariff rate design and development of NERC Standards (MOD/TOP/FAC). Mr. Shafeei manages power system studies, winter/summer seasons, Total Transfer Capability (TCC), outage studies (approve-deny), weekly/next-day studies and model validations, and the EMS model and studies. Mr. Shafeei attends the Peak RC and WECC Board of Director meetings and was a member of the Peak RC alternative funding. From 2002 to 2012, he served at the New York Independent System Operator (NYISO) as Senior Engineer addressing feasibility studies, system impact studies, consultant interface, power flow analytics; and managed the NERC Interchange Distribution Calendar (IDC) internal to NYISO, NYISO representative in IDC, SDX, and Distribution Factor Working Group (DFWG). Mr. Shafeei was the NYISO representative in the Northwest Power and Conservation Council (NPCC) working groups, Control Performance Working Group, and System Operational Tools Working Group. Mr. Shafeei has 10 years of experience with industry training, data collection and modeling, and interface with the North American Energy Standards Board. Mr. Shafeei is experienced in distribution design, distribution management systems, SCADA, power quality, distribution planning, and relay coordination.
Dede Subakti, California Independent System Operator	Mr. Subakti is responsible for all operations engineering support and services in California Independent System Operator (CAISO). This includes performing resource adequacy, seasonal operating studies, outage coordination studies, day-ahead reliability analysis, real-time operations engineering analysis, and developing operating procedures and tools, along with other engineering needs, to support the system operations of the CAISO Balancing Area and Transmission Grid. Prior to joining the CAISO, Mr. Subakti was with Open Access Technology International, Inc. (OATI), where he managed project development for various transmission system applications including Inter-Control Center Communication Protocol implementation, Open Access Same-Time Information System automation, scheduling application, Total Transfer

	Capability (TTC) and Available Transfer Capacity (ATC) calculation, congestion management processes, and transmission settlement applications for Transmission Service Providers in both the Western and Eastern Interconnections. Mr. Subakti spent much of his career as Manager of Regional Operations Engineer for the Midwest ISO (MISO), where he managed the Real-time Operations Engineers that support MISO's control room operation. Mr. Subakti is regularly involved in NERC and WECC efforts in both Reliability Standards development and subcommittee's efforts supporting operations of the Interconnection. He was involved in the NERC MOD-A, EOP Standard Drafting Team, the FAC Periodic Review Team, and the associated standard drafting team. Mr. Subakti is a licensed Professional Engineer with the State of Minnesota and a certified NERC System Operator. He received his Master of Business Administration from the Carlson School of Management at the University of Minnesota and Master of Electrical Engineering with emphasis in power systems from the Iowa State University where he also earned his Bachelor of Science in electrical engineering.