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 RETIREMENT OF REGIONAL RELIABILITY STANDARD VAR-002-WECC-2

Sandy Mooy
Associate General Counsel
Ruben Arredondo
Senior Legal Counsel
Western Electricity Coordinating Council
155 North 400 West, Suite 200
Salt Lake City, Utah 84103-1114
(801) 582-0353
smooy@wecc.biz
rarredondo@wecc.biz

Counsel for the Western Electricity Coordinating Council

Shamai Elstein
Senior Counsel
Lauren A. Perotti
Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
(202) 644-8099– facsimile
shamai.elstein@nerc.net
lauren.perotti@nerc.net

Counsel for the North American Electric Reliability Corporation

March 7, 2018

TABLE OF CONTENTS

Exhibit A Mapping Document, Retirement of WECC Regional Reliability Standard VAR-002-WECC-2 Automatic Voltage Regulators

Exhibit B Implementation Plan

Exhibit C Complete Record of Retirement Development

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 RETIREMENT OF REGIONAL RELIABILITY STANDARD VAR-002-WECC-2

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 "Commission") regulations, the North American Electric Reliability Corporation ("NERC")[3] and the Western Electricity Coordinating Council ("WECC") respectfully request that the Commission approve the retirement of WECC Regional Reliability Standard VAR-002-WECC-2 Automatic Voltage Regulators (AVR).

The primary purpose of Regional Reliability Standard VAR-002-WECC-2 is to ensure that automatic voltage regulators on synchronous generators and condensers shall be kept in service and controlling voltage. As discussed below, experience with Regional Reliability Standard VAR-002-WECC-2 has shown that the reliability-related issues addressed in the regional standard are adequately addressed by the continent-wide Voltage and Reactive ("VAR") Reliability Standards and that retention of the regional standard would not provide additional benefits for reliability. The retirement of the regional standard will thus have no adverse effect on the reliability of the Bulk-Power System and is in the public interest.

---

1 16 U.S.C. § 824o (2012).

2 18 C.F.R. § 39.5 (2017).

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

I. NOTICES AND COMMUNICATIONS

Notices and communications with respect to this filing may be addressed to the following:[4]

Shamai Elstein*
Senior Counsel
Lauren A. Perotti*
Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
(202) 644-8099– facsimile
shamai.elstein@nerc.net
lauren.perotti@nerc.net

Sandy Mooy*
Associate General Counsel
Ruben Arredondo*
Senior Legal Counsel
Steve Rueckert*
Director of Standards
Western Electricity Coordinating Council
155 North 400 West, Suite 200
Salt Lake City, Utah 84103-1114
(801) 582-0353
smooy@wecc.biz
rarredondo@wecc.biz
steve@wecc.biz

II. BACKGROUND

A. Regulatory Framework

By enacting the Energy Policy Act of 2005,[5] Congress entrusted the Commission with the duties of approving and enforcing rules to ensure the reliability of the Bulk-Power System, and with the duties of certifying an ERO that would be charged with developing and enforcing mandatory Reliability Standards, subject to Commission approval. Section 215(b)(1)[6] 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)[7] of the FPA authorizes the Commission to order the ERO to submit a new or modified Reliability Standard. Section 39.5(a)[8] of the Commission's regulations requires the ERO to file with the Commission for its

[4] 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.

[5] 16 U.S.C. § 824o.

[6] *Id.* § 824o(b)(1).

[7] *Id.* § 824o(d)(5).

[8] 18 C.F.R. § 39.5(a).

approval each Reliability Standard that the ERO proposes should become mandatory and enforceable in the United States, each modification to a Reliability Standard that the ERO proposes should be made effective, and each Reliability Standard that the ERO proposes for retirement.

The Commission is vested with the regulatory responsibility to approve Reliability Standards that protect the reliability of the Bulk-Power System and to ensure that Reliability Standards are just, reasonable, not unduly discriminatory or preferential, and in the public interest. Pursuant to Section 215(d)(2) of the FPA[9] and Section 39.5(c)[10] 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 a Regional Reliability Standard proposed by a Regional Entity if the Regional Reliability Standard is just, reasonable, not unduly discriminatory or preferential, and in the public interest.[11] Order No. 672 provides additional criteria that a Regional Reliability Standard must satisfy. Specifically, a regional difference from a continent-wide Reliability Standard must either be: (1) more stringent than the continent-wide Reliability Standard (which includes a regional standard that addresses matters that the continent-wide Reliability Standard does not), or (2) necessitated by a physical difference in the Bulk-Power System.[12] The Commission must give due weight to the technical expertise of a

9 16 U.S.C. § 824o(d)(2).

10 18 C.F.R. § 39.5(c)(1).

11 16 U.S.C. § 824o(d)(2) and 18 C.F.R. § 39.5(a).

12 Order No. 672, *Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards*, FERC Stats. & Regs. ¶ 31,204, at P 291 ("Order No. 672"), *order on reh'g*, Order No. 672-A, FERC Stats. & Regs. ¶ 31,212 (2006).

Regional Entity, like WECC, that is organized on an Interconnection-wide basis with respect to a Regional Reliability Standard applicable within that Interconnection.[13]

WECC Reliability Standards are intended to apply only to registered entities in the Western Interconnection. WECC develops Regional Reliability Standards in accordance with its *Reliability Standards Development Procedures* ("RSDP").[14] Proposed WECC Regional Reliability Standards are subject to approval by NERC, as the ERO, and FERC before becoming mandatory and enforceable under Section 215 of the FPA.

B. Procedural History

This section provides a discussion of the development and approval of the standard being proposed for retirement, WECC Regional Reliability Standard VAR-002-WECC-2, as well as an overview of the standard development process for the proposed retirement of the regional standard.

1. Development and Approval of the WECC VAR Regional Reliability Standard

On June 8, 2007, the Commission approved WECC Regional Reliability Standard WECC-VAR-STD-002a-1 - Automatic Voltage Regulators as mandatory and enforceable on entities within the Western Interconnection.[15] This and other WECC regional standards were translations of existing reliability criteria under WECC's Reliability Management System ("RMS"). As noted in the Commission's order approving WECC-VAR-STD-002a-1, WECC developed the RMS predecessor to this standard based on its experience with a 1996 disturbance

---

[13] Order No. 672 at P 344.

[14] 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)) and is available at http://www.nerc.com/FilingsOrders/us/Regional%20Delegation%20Agreements%20DL/WECC%20RSDP_20171027.pdf.

[15] *Order Approving Regional Reliability Standards for the Western Interconnection and Directing Modifications*, 119 FERC ¶ 61,260 (2007).

caused by insufficient supply of reactive power from generators, including automatic voltage regulators that were not operating in voltage control mode. WECC determined that, as a result of this experience, there should be only very limited circumstances where a generator should remove its unit from automatic voltage regulation operation. The WECC standard was intended to be more stringent than the continent-wide VAR standards in place at that time.[16]

In 2011, the Commission issued Order No. 751 approving a revised version of the standard, VAR-002-WECC-1.[17] This standard consisted of two Requirements. Requirement R1 required Generator Operators[18] and Transmission Operators to have automatic voltage regulation in service and in automatic voltage control mode 98% of all operating hours for synchronous generators or synchronous condensers, and provided that entities may exclude hours for certain circumstances when calculating the 98% requirement. Requirement R2 required entities to maintain documentation identifying the number of hours excluded.[19]

The second of the two Requirements was later determined to be an administrative requirement and was eliminated in the currently-enforceable version of the standard, VAR-002-WECC-2.[20] The Commission approved VAR-002-WECC-2 on March 3, 2015, finding that the regional standard continued to be more stringent than its continent-wide counterpart.[21]

---

16 *Id.* at P 114.

17 Order No. 751, *Version One Regional Reliability Standards for Facilities Design, Connections, and Maintenance; Protection and Control; and Voltage and Reactive*, 135 FERC ¶ 61,061 (2011).

18 Unless otherwise designated, all capitalized terms shall have the meaning set forth in the *Glossary of Terms Used in NERC Reliability Standards*, *available at* http://www.nerc.com/files/Glossary_of_Terms.pdf.

19 Regional Reliability Standard VAR-002-WECC-1, available at http://www.nerc.com/files/VAR-002-WECC-1.pdf.

20 With the retirement of Requirement R2 in VAR-002-WECC-2, the Measure corresponding to Requirement R1 (M1.4.3) was revised to add information regarding the date of an outage to the documentation entities would keep in order to demonstrate compliance with the Requirement. The reporting Measure was originally included as a means of measurement and enforcement, and was not considered a requirement necessary to maintain reliability.

21 *Order Approving Two Regional Reliability Standards*, 150 FERC ¶ 61,164, at PP 11, 14 (2015) ("VAR-002-WECC-2 Approval Order").

2. Summary of VAR-002-WECC-2 Retirement History

In November 2016, a regional Standard Authorization Request ("SAR") was submitted to review WECC Regional Reliability Standard VAR-002-WECC-2 for potential retirement on the basis that the standard is duplicative of, and not more stringent than, the continent-wide VAR standards VAR-001-4.2 and VAR-002-4.1. In accordance with WECC's RSDP, the SAR was approved by the WECC Standards Committee on December 6, 2016.

Project WECC-0127 was initiated by WECC stakeholders to review the regional standard on the premise that, in light of changes made in the continent-wide VAR-002 standard and the addition of the WECC Regional Variance in the continent-wide VAR-001 standard, there was no longer a need for VAR-002-WECC-2. The standard drafting team for this project evaluated the regional standard and the relevant continent-wide standards and recommended that the regional standard be retired. In accordance with the WECC RSDP, the proposed retirement of VAR-002-WECC-2 was posted for a 45-day comment period from May 31, 2017 through July 18, 2017. The WECC Standards Committee approved a request for ballot by the WECC Ballot Pool on July 31, 2017. The ballot pool was open from August 30, 2017 through September 14, 2017, and the final ballot was held from September 21, 2017 through October 11, 2017. The proposed retirement achieved a 80.9% quorum and 100% approval.

In accordance with Section 312 of NERC's Rules of Procedure,[22] NERC posted the proposed retirement of VAR-002-WECC-2 for a 45-day comment period from November 3, 2017 through December 18, 2017. Commenters agreed that WECC's process was open, inclusive, balanced, transparent, and that due process was followed. The WECC Board of

[22] The NERC Rules of Procedure are available at http://www.nerc.com/AboutNERC/Pages/Rules-of-Procedure.aspx.

Directors approved the retirement of VAR-002-WECC-2 on December 6, 2017. The NERC Board of Trustees approved the retirement on February 8, 2018.

III. JUSTIFICATION FOR RETIREMENT

In 2015, the Commission approved Regional Reliability Standard VAR-002-WECC-2 on the grounds that it was more stringent than the then-effective continent-wide standard VAR-002-3.[23] Through its further analysis and experience with the standard, WECC has determined that VAR-002-WECC-2 is not in fact more stringent than the continent-wide standard when application of the various exceptions in the WECC regional standard is considered. As the reliability goal of maintaining voltage stability is addressed adequately in the two continent-wide VAR standards, WECC has determined that the regional standard should be retired. NERC and WECC respectfully request that the Commission approve its retirement.

A. In Practical Application, Regional Reliability Standard VAR-002-WECC-2 is Not More Stringent than the Continent-Wide VAR Reliability Standard VAR-002-4.1

Regional Reliability Standard VAR-002-WECC-2 Requirement R1 provides that "Generator Operators and Transmission Operators shall have [automatic voltage regulators] in service and in automatic voltage control mode 98% of all operating hours for synchronous generators or synchronous condensers," unless they are permitted to not run under any one of ten possible scenarios described in the standard.[24] In calculating compliance with the 98% requirement, entities may exclude the following hours:

- The synchronous generator or synchronous condenser operates for less than five percent of all hours during any calendar quarter (R1.1).
- Performing maintenance and testing up to a maximum of seven calendar days per calendar quarter (R1.2).

[23] *See* VAR-002-WECC-2 Approval Order at PP 11, 14.

[24] Regional Reliability Standard VAR-002-WECC-1 – Automatic Voltage Regulators, http://www.nerc.com/files/VAR-002-WECC-1.pdf.

- Automatic voltage regulator exhibits instability due to abnormal system configuration (R1.3).
- Due to component failure, the automatic voltage regulator may be out of service up to 60 consecutive days for repair per incident (R1.4).
- Due to a component failure, the automatic voltage regulator may be out of service up to one year provided the Generator Operator or Transmission Operator submits documentation identifying the need for time to obtain replacement parts and if required to schedule an outage (R1.5).
- Due to a component failure, the automatic voltage regulator may be out of service up to 24 months provided the Generator Operator or Transmission Operator submits documentation identifying the need for time for excitation system replacement (replace the automatic voltage regulator, limiters, and controls but not necessarily the power source and power bridge) and to schedule an outage (R1.6).
- The synchronous generator or synchronous condenser has not achieved Commercial Operation (R1.7).
- The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the automatic voltage regulator is unavailable for service (R1.8).
- The Reliability Coordinator directs Transmission Operator to operate the synchronous condenser, and the automatic voltage regulator is unavailable for service (R1.9).
- If the automatic voltage regulator exhibits instability due to operation of a load tap changer transformer in the area, the Transmission Operator may authorize the Generator Operator to operate the excitation system in modes other than automatic voltage control until the system configuration changes (R1.10).

Continent-wide Reliability Standard VAR-002-4.1 – Generator Operation for Maintaining Network Voltage Schedules sets forth the requirements applicable to Generator Operators and Generator Owners for providing the necessary reactive support and voltage control necessary to protect equipment and maintain reliable operations.[25] Reliability Standard VAR-002-4.1 Requirement R1 provides that each Generator Operator shall operate each

[25] Reliability Standard VAR-001-4.2 – Voltage and Reactive Control sets forth the requirements applicable to Transmission Operators (and Generator Operators within the Western Interconnection for the WECC regional variance) for scheduling, monitoring, and controlling Reactive Power resources to regulate voltage and Reactive Power flows for the reliable operation of the Bulk-Power System.

generator connected to the interconnected transmission system in the automatic voltage control mode (with its automatic voltage regulator in service and controlling voltage) unless: (1) it is instructed to operate in a different control mode by the Transmission Operator; (2) the generator is exempted by the Transmission Operator; (3) the Generator Operator has notified the Transmission Operator that the generator is being operated in start-up, shutdown, or testing mode pursuant to a Real-time communication or a procedure that was previously provided to the Transmission Operator; or (4) the Generator Operator has notified the Transmission Operator that the generator is not being operated in automatic voltage control mode or in the control mode that was instructed by the Transmission Operator for a reason other than start-up, shutdown, or testing.

In its order approving VAR-002-WECC-2, the Commission determined that the regional standard was more stringent than then-effective VAR-002-3. Specifically, the Commission determined that the exceptions in VAR-002-3, which are carried forward into currently-effective VAR-002-4.1, were broader than the ten exceptions in the regional standard, "particularly the exception [in VAR-002-3] allowing generator operators not to operate in automatic voltage control mode or in the control mode that was instructed by the transmission operator for a reason other than start-up, shutdown, or testing."[26] Therefore, the Commission approved the regional standard as consistent with its Order No. 672 regional standard approval criteria.[27]

WECC initially drafted the regional standard to reflect exactly the language of the RMS requirements. In petitioning for approval of the standard, WECC argued that, by identifying the specific circumstances where an automatic voltage regulator may be exempt from the requirement to be in service, the Regional Reliability Standard was more stringent than the

[26] VAR-002-WECC-2 Approval Order at P 14.

[27] *Id.* at P 11.

continent-wide standard. Because it was not practical to develop a list of all possible circumstances an automatic voltage regulator could be out of service, and to maintain consistency with its prior approach toward enforcement of the standard, WECC included a 98% run time requirement in the standard rather than a 100% run time requirement. WECC's further analysis of the regional standard, however, has demonstrated that the regional standard is not in fact more stringent than the continent-wide standard when practical application of the various exemptions is considered. By layering each of the regional standard's specific exemptions, an entity may remain compliant with the standard and yet have its automatic voltage regulator out of service for an indeterminate amount of time.

WECC's analysis of all ten VAR-002-WECC-2 exemptions has demonstrated that an application of eight of the ten exemptions (R1.1, R1.3, and R1.5 through R.10) could result in an automatic voltage regulator being out service 100% of the time (i.e., in operation for zero percent of the time), in some cases for up to two years. An entity using the Requirement R1.2 seven-day maintenance and testing exemption may end up also using other exemptions depending on the facts of the particular situation. The automatic voltage regulator may continue to be out of service beyond the seven-day maintenance and testing window due to instability (R1.3 and R1.10), component failure (R1.4, R1.5, and R1.6), or unavailability (R1.8 and R.9). Similarly, an entity using the 60-day "per incident" component failure exemption (R1.4) may continue to have its automatic voltage regulator out of service due to additional incidents or due to instability, component failure, or unavailability.[28]

Further, WECC has determined that while the VAR-002-WECC-2 exemptions were intended to be highly specific, certain undefined terms in the exemptions could be interpreted

[28] *See* Exhibit C, Technical Justification at 3-4.

broadly to further extend the time an automatic voltage regulator may be out of service. For example, neither Requirement R1.3 nor Requirement R1.10 define what constitutes "instability" allowing an automatic voltage regulator to be removed from service. The term "component" is not defined, even though component failure could result in an automatic voltage regulator being off for up to two years (*see* Requirement R1.6). Lastly, there is no criteria to define what may make an automatic voltage regulator "unavailable" under Requirements R1.8 and R1.9 and thus exempt from the requirement to be in service.

In light of these practical considerations, identified through WECC's experience with and further review of the standard, WECC has determined that the 98% run time requirement and exemptions in the regional standard can no longer be considered more stringent than the corresponding obligations and exemptions of the continent-wide standard and should not be retained on that basis.

B. The Retirement of the Regional Reliability Standard Would Have No Adverse Impact on Reliability

Retirement of Regional Reliability Standard VAR-002-WECC-2 would have no adverse impact on reliability. The continent-wide VAR Reliability Standards provide a flexible, results-oriented means of achieving the reliability goal of maintaining voltage stability and are sufficient to ensure reliable operations in the Western Interconnection without the need for a separate regional standard regarding automatic voltage regulators, as described in Exhibit A and below.

Reliability Standard VAR-001-4.2 – Voltage and Reactive Control requires the Transmission Operator to specify a system voltage schedule (Requirement R1) and to schedule sufficient reactive resources to regulate voltage levels under normal and Contingency conditions (Requirement R2). Whereas VAR-002-WECC-2 creates a static setting for automatic voltage regulators, thereby removing discretion from the Transmission Operator, VAR-001-4.2 allows

the Transmission Operator to attain the same reliability goal based on all the surrounding circumstances in real time. For example, although VAR-002-WECC-2 requires synchronous condensers to be in service and set to automatic voltage regulation mode, VAR-001-4.2 Requirement R3 and associated schedule-related requirements allow greater flexibility of operation while meeting the same reliability goal. By creating the voltage schedule, the Transmission Operator sets the reliability goal to be met without restricting the specific type of resource to be used. Stated differently, this approach is inclusive of VAR-002-WECC-2 without specifying how the goal is to be met. Reliability Standard VAR-001-4.2 also contains a Regional Variance for the Western Interconnection that supersedes continent-wide Requirements R4 and R5. This Regional Variance works to ensure that voltage levels are within limits to protect equipment during system disturbances in the Western Interconnection. When applied, this Variance does not allow the Transmission Operator to exempt the Generator Operator from operating its automatic voltage regulator; any generator not having a functioning automatic voltage regulator is required to work with its Transmission Operator to correct the issue. With the retirement of the VAR-002-WECC-2 standard, the more stringent approach to automatic voltage regulator operation is retained in the VAR-001-4.2 Regional Variance to ensure reliability in the Western Interconnection.

Reliability Standard VAR-002-4.1, as discussed above, addresses the Generator Operator's responsibilities to have automatic voltage regulators in service and controlling voltage. The continent-wide Reliability Standard provides benefits for reliability that are not otherwise reflected in the regional standard. For example, Reliability Standard VAR-002-4.1 requires ongoing communication with the Transmission Operator regarding automatic voltage regulator or reactive capability status (*see, e.g.*, VAR-002-4.1 Requirements R3 and R4) or when

the Generator Owner is unable to comply with a schedule (Requirement R2.2) and requires deployment of an alternate means to meet the reliability goal in the event there is a concern with the automatic voltage regulator (*see* Requirement R2.1).

For these reasons, retirement of the regional standard VAR-002-WECC-2 would have no adverse impact on reliability. Because compliance with VAR-002-WECC-2 is structured towards documentation, an entity may layer exemptions to build up to the 98% requirement to run an automatic voltage regulator, rather than keeping the equipment in service at all times. Its retirement would eliminate what has proven to be an administrative requirement to count hours that ultimately provides little additional benefit to reliability. Indeed, retiring the regional standard would benefit reliability in the Western Interconnection by focusing the in-service requirement on the performance of the automatic voltage regulator, rather than counting the hours each one is online.

For these reasons, NERC and WECC jointly submit that the retirement of Regional Reliability Standard VAR-002-WECC-2 would have no adverse impact on reliability and that the Commission should approve its retirement.

IV. EFFECTIVE DATE OF RETIREMENT

NERC and WECC respectfully request that the Commission approve the retirement of WECC Regional Reliability Standard VAR-002-WECC-2 to be effective as of the date of regulatory approval in accordance with the proposed implementation plan (Exhibit B).

V. CONCLUSION

For the reasons set forth above, NERC and WECC respectfully request that the Commission approve the proposed retirement of Regional Reliability Standard VAR-002-WECC-2, effective as proposed herein.

Respectfully submitted,

/s/ Lauren A. Perotti

Sandy Mooy
Associate General Counsel
Ruben Arredondo
Senior Legal Counsel
Western Electricity Coordinating Council
155 North 400 West, Suite 200
Salt Lake City, Utah 84103-1114
(801) 582-0353
smooy@wecc.biz
rarredondo@wecc.biz

Counsel for the Western Electricity Coordinating Council

Shamai Elstein
Senior Counsel
Lauren A. Perotti
Counsel
North American Electric Reliability Corporation
1325 G Street, N.W., Suite 600
Washington, D.C. 20005
(202) 400-3000
(202) 644-8099– facsimile
shamai.elstein@nerc.net
lauren.perotti@nerc.net

Counsel for the North American Electric Reliability Corporation

March 7, 2018

Exhibit A
Mapping Document, Retirement of WECC Regional Reliability Standard
VAR-002-WECC-2 Automatic Voltage Regulators

Tabular Representation

WECC-0127 VAR-002-WECC-2 Automatic Voltage Regulators Request to Retire

Tabular Crosswalk

Requirement R1

R1. Generator Operators and Transmission Operators shall have AVR in service and in automatic voltage control mode 98% of all operating hours for synchronous generators or synchronous condensers. Generator Operators and Transmission Operators may exclude hours for R1.1 through R1.10 to achieve the 98% requirement. [Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]

(Exceptions R1.1 through R1.10 are covered below.)

Analysis Table: Requirement R1 **Applicable Entities and Facilities Covered Elsewhere**		
WECC Standard	**NERC Standards**	**Narrative**
VAR-002-WECC-2 Applicability 4.1 Generator Operators 4.2 Transmission Operators that operate synchronous condensers 4.3 This VAR-002-WECC-2 Standard only applies to synchronous generators and synchronous condensers that are connected to the Bulk Electric System.	VAR-001-4.2 Applicability 4.1 Transmission Operators 4.2 Generator Operators within the Western Interconnection (for the WECC Variance) VAR-002-4.1 Applicability 4.1 Generator Operator 4.2 Generator Owner	The Applicable Entities of the WECC Standard are addressed in VAR-001-4.2 and VAR-002-4.1. Whereas VAR-002-WECC-2 specifically identifies generators and synchronous condensers as the applicable facilities, these specific assets need not be called out. Rather, by setting the voltage schedule as a results-oriented goal, the Transmission Operator can allow for an array of assets to deploy without confining the resources to a specific list.

Tabular Representation

WECC-0127 VAR-002-WECC-2 Automatic Voltage Regulators Request to Retire

Analysis Table: Requirement R1 **AVR in Service and Controlling – Covered Elsewhere**			
VAR-002-WECC-2	**VAR-002-4**	**VAR-001-4.1**	**Narrative**
Generator Operator and Transmission Operator	Generator Operator	Transmission Operator	
R1. Generator Operators and Transmission Operators shall have AVR in service and in automatic voltage control mode.	R1. The Generator Operator shall operate each generator connected to the interconnected transmission system (with its automatic voltage regulator (AVR) in service) in the automatic voltage control mode.	R1. Each Transmission Operator shall specify a system voltage schedule (which is either a range or a target value with an associated tolerance band) as part of its plan to operate within System Operating Limits and Interconnection Reliability Operating Limits.	The Generator Operator and the Transmission Operator's reliability tasks are addressed in VAR-002-4.1 and VAR-001-4.2. and its Regional Variance. By creating the voltage schedule, the Transmission Operator sets the reliability goal to be met without restricting the specific type of resource to be used. Restated, the VAR-01-4.2 approach is inclusive of VAR-002-WECC-2 without specifying "how" the goal is to be met.
		R2. Each Transmission Operator shall schedule sufficient reactive resources to regulate voltage levels under normal and Contingency conditions. (Various means are allowed.)	
		R3. Each Transmission Operator shall operate or direct the Real-Time operation of device to regulate transmission voltage and reactive flow as necessary.	

Analysis Table: Requirement R1 **Exceptions to the Rule – Covered Elsewhere**		
VAR-002-WECC-2	VAR-002-4.1	Narrative
General: AVR shall be in service 98% of the time, unless covered by one of ten exceptions.	General: AVR shall be in service 100% of the time, unless covered by an exception.	Because the VAR-002-WECC-2 list of exceptions can be compounded, the practical result is that the specific list of exceptions is not more stringent than the generalized exception offed in VAR-002-4.1. Thus, VAR-002-WECC-2 is not more stringent than VAR-002-4.1.
Exceptions: R1.1 through R1.10.	Exceptions: [When] the generator is being operated in start-up, shutdown, or testing mode pursuant to a real-time communication or a procedure that was previously provided to the Transmission Operator; or, (AKA: Start up, shutdown, or testing.) [When] the generator is not being operated in automatic voltage control mode or in the control mode that was instructed by the Transmission Operator for a reason other than start-up, or testing. (AKA: Other than start up, shutdown, or testing.)	
R1.1 The synchronous generator or synchronous condenser operates for less than five percent of all hours during any calendar quarter. R1.2. Performing maintenance and testing up to a maximum of	[R1.1] Other than start up, shutdown, or testing. [R1.2] Start up, shutdown, or testing.	

seven calendar days per calendar quarter.		
R1.3. AVR exhibits instability due to abnormal system configuration.	[R1.3] Other than start up, shutdown, or testing.	
R1.4. Due to component failure, the AVR may be out of service up to 60 consecutive days for repair per incident.	[R1.4] Other than start up, shutdown, or testing.	
R1.5. Due to a component failure, the AVR may be out of service up to one year provided the Generator Operator or Transmission Operator submits documentation identifying the need for time to obtain replacement parts and if required to schedule an outage.	[R1.5] Other than start up, shutdown, or testing.	
R1.6. Due to a component failure, the AVR may be out of service up to 24 months provided the Generator Operator or Transmission Operator submits documentation identifying the need for time for excitation system replacement (replace the AVR, limiters, and controls but not necessarily the power source and power bridge) and to schedule an outage.	[R1.6] Other than start up, shutdown, or testing.	
R1.7. The synchronous generator or synchronous condenser has not achieved Commercial Operation.		
R1.8. The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the AVR is unavailable for service.	[R1.7] Start up, shutdown, or testing.	
R1.9. The Reliability Coordinator directs Transmission Operator to operate the synchronous condenser,		

and the AVR is unavailable for service. R1.10. If AVR exhibits instability due to operation of a Load Tap Changer (LTC) transformer in the area, the Transmission Operator may authorize the Generator Operator to operate the excitation system in modes other than automatic voltage control until the system configuration changes.	[R1.8] Other than start up, shutdown, or testing. [R1.9] Other than start up, shutdown, or testing. [R1.10] Other than start up, shutdown, or testing.	

Exhibit B
Implementation Plan

Implementation Plan
WECC-0127 VAR-002-WECC-2
Request to Retire

Standard Authorization Request (SAR)[1]

WECC-0127 SAR

Approvals Required

- WECC Board of Directors December 6, 2017
- NERC Board of Trustees February 8, 2018
- FERC Pending

Applicability Section

4.1. Generator Operators

4.2. Transmission Operators that operate synchronous condensers

4.3. This VAR-002-WECC-2 Standard only applies to synchronous generators and synchronous condensers that are connected to the Bulk Electric System.

Conforming Changes to Other Standards

None are required.

Proposed Effective Date

Immediately on receipt of applicable regulatory approval.

Justification

The entirety of WECC VAR-002-WECC-2 should be retired because the reliability-related tasks are addressed elsewhere, specifically in VAR-002-4.1 and VAR-001-4.2.

Consideration of Early Compliance

The drafting team identified no adverse impacts to reliability should an entity opt for early compliance.

Required Retirements

The entire VAR-002-WECC-2 should be retired.

[1] This Implementation Plan was originally posted as part of the WECC-0127 VAR-002-WECC-2 Posting 1 Technical Justification document. It was removed from that document for purposes of NERC filing.

Exhibit C
Complete Record of Development

Steven Rueckert
Western Electricity Coordinating Council
155 North 400 West, Suite 200
Salt Lake City, Utah 84103

January 2, 2018

Subject: Notification of Completion
WECC-0127 VAR-002-WECC-2
Automatic Voltage Regulators (AVR)

To: Mat Bunch
North American Electric Reliability Corporation (NERC)
Manager of Standards Development, Standards
3353 Peachtree Rd. NE, North Tower – Suite 600
Atlanta, GA 30326

Dear Mat,

WECC is seeking approval by the NERC Board of Trustees – with subsequent disposition by the Federal Energy Regulatory Commission (FERC) – to retire VAR-002-WECC-2, Automatic Voltage Regulators in its entirety, immediately on receipt of applicable regulatory approval.

In accordance with the Western Electricity Coordinating Council's (WECC) Reliability Standards Development Procedures (Procedures), the WECC-0127 VAR-002-WECC-2, Automatic Voltage Regulators Drafting Team (DT) conducted a five-year review of the standard concluding the content of the standard is: 1) either covered in other NERC Standards, 2) not required for reliability, or 3) does not meet the minimum acceptable threshold for due process and clarity required in FERC Order 672.

Thank you for your assistance.

Sincerely,

Steven Rueckert
Director of Standards
Western Electricity Coordinating Council

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

WECC-0127 VAR-002-WECC-2 **Automatic Voltage Regulators** **Request to Retire**				
SAR – Standard Authorization Request Attachment A (1)				
Regional Reliability Standard(s) (Clean Existing) Attachment B (2)				
Project Roadmap Attachment C (3)				
Implementation Plan Attachment D (4)				
Technical Justification Attachment E (5)				
Regional Reliability Standard Submittal Request Attachment F (6)				
Order 672 Criteria Attachment G (7)				
Drafting Team Roster with Biographies Attachment H (8)				
Ballot Pool Members Attachment I (9)				
Final Ballot Results Attachment J (10)				
Minority Issues Attachment K (11)				
WECC Standards Committee Roster Attachment L (12)				
Responses to Comments – WECC Attachment M *Attachment M1 – Responses to Comments WECC* **(13)** *Attachment M2 – Responses to Comments NERC* **(14)**				
VAR-002-WECC-2 (Retirement)	Automatic Voltage Regulators	Standard Under Development	11/03/17 - 12/18/17	Info **(15)** VAR-002-WECC-2 (Retirement) **(16)** Submit Comments Technical Justification for Retirement **(17)** Unofficial Comment Form (Word) **(18)** Comments Received **(19)** Consideration of Comments **(20)**

Standard Authorization Request
WECC-0127 VAR-002-WECC-2
Request to Retire

This Standard Authorization request (SAR) was received on November 8, 2016, and deemed complete the same day. The SAR was vetted for approval during the December 2016 WECC Standards Committee meeting.

Introduction

This project is a request to retire WECC Regional Reliability Standard VAR-002-WECC-2, Automatic Voltage Regulators (AVR).

Requester Information

1. Provide your contact information and your alternates contact information:
    - Your First Name: David
    - Your Last Name: Lemmons
    - Your Email Address: david.f.lemmons@xcelenergy.com
    - Your Phone Number: (303) 628-2813
    - Organization Name: Public Service Company of Colorado
    - Alternates First Name: Todd
    - Alternates Last Name: Komaromy
    - Alternates Email Address: todd.komaromy@aps.com
    - Alternates Phone Number: (602) 250-5171

Type of Request

2. Specify the type of request: (select one)
    - Request to Retire a WECC Regional Reliability Standard (RRS)

Create, Modify or Retire a Document Questions

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

3. Requested Action: (select one)
    - Request to Retire a WECC Regional Reliability Standard (RRS)
4. Document Type: (select one)
    - WECC Regional Reliability Standard (RRS)
5. Issue: Specify what industry problem this request is trying to resolve.

    Due to changes made in VAR-002-4, Generator Operation for Maintaining Network Voltage Schedules (United States Enforcement Date May 29, 2015) and WECC Regional Variances in VAR-001-4.1, Voltage and Reactive Control (United States Enforcement Date November 13,

2015), there is no longer a need for VAR-002-WECC-2, Automatic Voltage Regulators (United States Enforcement Date April 1, 2015).[1]

Additionally, the compliance and reporting process used in VAR-002-WECC-2 should be considered Paragraph 81 material. For these reasons, we are recommending that the standard be retired.

6. Proposed Remedy: Specify how this request proposes to address the issue described.

   Retire WECC VAR-002-WECC-2 because it is redundant to NERC VAR-002-4.

7. Functions: Each function will be reviewed if affected.
   - Generator Operator
   - Transmission Operators

8. Detailed Description:

   The WECC RRS, VAR-002-WECC-2 requires that Generator Operators operate generators with automatic voltage regulators (AVR) in the automatic voltage mode (automatic) 98 percent of the time, excluding certain periods that qualify under the listed exemptions.

   The NERC Standard, VAR-002-4, requires that Generator Operators operate generators in AVR mode when connected to the Bulk Electric System, unless instructed otherwise by the Transmission Operator, or if the Generator Operator has notified the Transmission Operator that the AVR is not operating in the automatic mode either because the generator is operating below a level the AVR can operate or for another reason.

   These two requirements are duplicative. Originally, one argument for passing the WECC standard was that VAR-001-4.1 allowed Transmission Operators to exempt generators from operating the AVR in automatic mode. However, the WECC Regional Variance to VAR-001-4.1 has now removed that allowance for WECC Transmission Operators. This means the Transmission Operator cannot exempt generators from the requirement to operate the AVR in automatic.

   With the Regional Variance to VAR-001-4.1, arguably the WECC RRS is less stringent than the continent-wide standard since it only requires that AVRs operate in automatic mode 98 percent of the time as opposed to all of the time as required under the continent-wide standard.

   For these reasons, it is recommended that VAR-002-WECC-2 be retired.

9. Affected Reliability Principles: Which of the following reliability principles is MOST affected by this request? (select one)
   - **Reliability Principle 1** — *Interconnected bulk electric systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards.*

[1] During the development of this project, VAR-002-4, Generator Operation for Maintaining Network Voltage Schedules, was replaced with Version 4.1. VAR-001-4.1, Voltage and Reactive Control, was replaced with Version 4.2. Both standards have an effective date of September 26, 2017.

Document Information

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

10. Document Title: See Reference Uploads.

Reference Uploads

Please reference or upload any affected Standards, Regional Business Practices, Criterion, 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.

11. Provide additional comments (if needed)

    NERC VAR-001-4.1, Voltage and Reactive Control

    NERC VAR-002-4, Generator Operation for Maintaining Network Voltage Schedules

    WECC VAR-002-WECC-2, Automatic Voltage Regulators (AVR)

A. Introduction

1. Title: **Automatic Voltage Regulators (AVR)**

2. Number: VAR-002-WECC-2

3. Purpose: To ensure that Automatic Voltage Regulators on synchronous generators and condensers shall be kept in service and controlling voltage.

4. Applicability

4.1. Generator Operators

4.2. Transmission Operators that operate synchronous condensers

4.3. This VAR-002-WECC-2 Standard only applies to synchronous generators and synchronous condensers that are connected to the Bulk Electric System.

5. Effective Date: On the first day of the first quarter, after applicable regulatory approval.

B. Requirements

R1. Generator Operators and Transmission Operators shall have AVR in service and in automatic voltage control mode 98% of all operating hours for synchronous generators or synchronous condensers. Generator Operators and Transmission Operators may exclude hours for R1.1 through R1.10 to achieve the 98% requirement. *[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]*

R1.1. The synchronous generator or synchronous condenser operates for less than five percent of all hours during any calendar quarter.

R1.2. Performing maintenance and testing up to a maximum of seven calendar days per calendar quarter.

R1.3. AVR exhibits instability due to abnormal system configuration.

R1.4. Due to component failure, the AVR may be out of service up to 60 consecutive days for repair per incident.

R1.5. Due to a component failure, the AVR may be out of service up to one year provided the Generator Operator or Transmission Operator submits documentation identifying the need for time to obtain replacement parts and if required to schedule an outage.

R1.6. Due to a component failure, the AVR may be out of service up to 24 months provided the Generator Operator or Transmission Operator submits documentation identifying the need for time for excitation system replacement (replace the AVR, limiters, and controls but not necessarily the power source and power bridge) and to

schedule an outage.

R1.7. The synchronous generator or synchronous condenser has not achieved Commercial Operation.

R1.8. The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the AVR is unavailable for service.

R1.9. The Reliability Coordinator directs Transmission Operator to operate the synchronous condenser, and the AVR is unavailable for service.

R1.10. If AVR exhibits instability due to operation of a Load Tap Changer (LTC) transformer in the area, the Transmission Operator may authorize the Generator Operator to operate the excitation system in modes other than automatic voltage control until the system configuration changes.

C. Measures

M1. Generator Operators and Transmission Operators shall provide quarterly reports to the compliance monitor and have evidence for each synchronous generator and synchronous condenser of the following:

M1.1 The actual number of hours the synchronous generator or synchronous condenser was on line.

M1.2 The actual number of hours the AVR was out of service.

M1.3 The AVR in service percentage.

M1.4 If excluding AVR out of service hours as allowed in R1.1 through R1.10, provide:

M1.4.1 The number of hours excluded,

M1.4.2 The adjusted AVR in-service percentage,

M1.4.3 The date of the outage.

D. Compliance

1. Compliance Monitoring Process

1.1 Compliance Monitoring Responsibility
Compliance Enforcement Authority

1.2 Compliance Monitoring Period

Compliance Enforcement Authority may use one or more of the following methods to assess compliance:

- Reports submitted quarterly

- Spot check audits conducted anytime with 30 days notice

- Periodic audit as scheduled by the Compliance Enforcement Authority

- Investigations

- Other methods as provided for in the Compliance Monitoring Enforcement Program

The Reset Time Frame shall be a calendar quarter.

1.3 Data Retention

The Generator Operators and Transmission Operators shall keep evidence for Measures M1 for three years plus current year, or since the last audit, whichever is longer.

1.4 Additional Compliance Information

1.4.1 The sanctions shall be assessed on a calendar quarter basis.

1.4.2 If any of R1.2 through R1.9 continues from one quarter to another, the number of days accumulated will be the contiguous calendar days from the beginning of the incident to the end of the incident. For example, in R1.4 if the 60 day repair period goes beyond the end of a quarter, the repair period does not reset at the beginning of the next quarter.

1.4.3 When calculating the in-service percentages, do not include the time the AVR is out of service due to R1.1 through R1.10.

1.4.4 The standard shall be applied on a machine-by-machine basis (a Generator Operator or Transmission Operator can be subject to a separate sanction for each non-compliant synchronous generator and synchronous condenser).

E. Regional Differences

None

Table of Compliance Elements

R	Time Horizon	VRF	Violation Severity Levels			
			Lower VSL	Moderate VSL	High VSL	Severe VSL
R1	Operational Assessment	Medium	There shall be a Lower Level of non-compliance if AVR is in service less than 98% but at least 90% or more of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.	There shall be a Moderate Level of non-compliance if AVR is in service less than 90% but at least 80% or more of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.	There shall be a High Level of non-compliance if AVR is in service less than 80% but at least 70% or more of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.	There shall be a Severe Level of non-compliance if AVR is in service less than 70% of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.

Version History

Version	Date	Action	Change Tracking
1	April 16, 2008	Permanent Replacement Standard for VAR-STD-002a-1	
1	April 21, 2011	FERC Order issued approving VAR-002-WECC-1 (FERC approval effective June 27, 2011; Effective Date July 1, 2011)	
2	November 13, 2014	Adopted by NERC Board of Trustees	
2	March 3, 2015	FERC letter order approving VAR-002-WECC-2	

+-

Project Roadmap

	Actions	Proposed Date
1.	SAR Filed	6
2.	Drafting Team solicitation	November 21, 2016
3.	WSC approved the SAR	December 6, 2016
4.	Notice of DT Assignment	January 24, 2017
5.	Notice of DT Solicitation – Augmented	February 27, 2017
6.	DT meeting	March 2, 2017
7.	DT meeting	April 11, 2017
8.	DT meeting	April 18, 2017
9.	DT meeting	April 25, 2017
10.	DT meeting	May 25, 2017
11.	Posting 1 Comments Open	May 31, 2017
12.	Posting 1 Comments Closed (45-day)	July 18, 2017
13.	DT meets to answer Comments	July 27, 2017
14.	WSC approves for Ballot	July 31, 2017
15.	Notice of Ballot Pool Forming	August 23, 2017
16.	Ballot Pool Open	August 30, 2017
17.	Ballot Pool Close	September 14, 2017
18.	Standards Briefing	September 19, 2017
19.	Ballot Open	September 21, 2017
20.	Ballot Close	October 11, 2017
21.	NERC Posting for 45 days – Open	November 3, 2017
22.	WSC approves for WECC Board of Directors disposition	November 15, 2017
23.	WECC Board of Directors approval	December 6, 2017
24.	NERC Posting for 45 days – Closed	December 18, 2017
25.	NERC Board of Trustees approval	February 8, 2018
26.	FERC approval	TBD

Attachment D
Implementation Plan
WECC-0127 VAR-002-WECC-2
Request to Retire

Standard Authorization Request (SAR)[1]

WECC-0127 SAR

Approvals Required

- WECC Board of Directors December 6, 2017
- NERC Board of Trustees February 8, 2018
- FERC Pending

Applicability Section

4.1. Generator Operators

4.2. Transmission Operators that operate synchronous condensers

4.3. This VAR-002-WECC-2 Standard only applies to synchronous generators and synchronous condensers that are connected to the Bulk Electric System.

Conforming Changes to Other Standards

None are required.

Proposed Effective Date

Immediately on receipt of applicable regulatory approval.

Justification

The entirety of WECC VAR-002-WECC-2 should be retired because the reliability-related tasks are addressed elsewhere, specifically in VAR-002-4.1 and VAR-001-4.2.

Consideration of Early Compliance

The drafting team identified no adverse impacts to reliability should an entity opt for early compliance.

Required Retirements

The entire VAR-002-WECC-2 should be retired.

[1] This Implementation Plan was originally posted as part of the WECC-0127 VAR-002-WECC-2 Posting 1 Technical Justification document. It was removed from that document for purposes of NERC filing.

Cover Sheet

Technical Justification
Retirement of WECC Regional Reliability Standard
VAR-002-WECC-2
Automatic Voltage Regulators (AVR)

Attachment G: White Paper
Retirement of WECC Regional Reliability Standard
VAR-002-WECC-2
Automatic Voltage Regulators (AVR)

Subtitle

Author or Author Group

Date

155 North 400 West, Suite 200

Salt Lake City, Utah 84103-1114

Executive Summary

The WECC-0127, VAR-002-WECC-2, Automatic Voltage Regulators Drafting Team (DT) has reviewed NERC Standards, both in effect and those standards that are approved pending regulatory filing, and concluded that the substance of the WECC Regional Reliability Standard (RRS) [1] should be retired immediately and in its entirety because:

- The standard no longer meets either of the Federal Energy Regulatory Commission's (FERC) criteria for a Regional Reliability Standard.
- The standard falls short of Order 672 requirements for clarity and may obfuscate due process.
- The reliability-related substance is addressed in peripheral NERC Standards (VAR-002-4.1, Generator Operation for Maintaining Network Voltage Schedules and VAR-001-4.2 Voltage and Reactive Control).[2]
- Proposed retirement of Regional Reliability Standard VAR-002-WECC-2 and requiring the Generator Operator to comply with VAR-002-4.1 will have the Generator Operators providing Transmission Operators with procedures or other documents in real-time that inform the Transmission Operator of when an automatic voltage regulator (AVR) will be out-of-service such as:
    1) having the automatic voltage regulator in service at all times except during specific circumstances;
    2) maintaining AVR to stated criteria;
    3) installing and completing start-up testing of an automatic voltage regulator; and
    4) repairing or replacing an AVR within a specified time.[3]
- The proposed retirement of Regional Reliability Standard VAR-002-WECC-2 and following the requirements of VAR-002-4.1 improves on the existing regional Reliability Standard by focusing the in-service requirement on performance of the automatic voltage regulator rather than counting the hours they are online; stating the automatic voltage regulator policies and guidelines into the NERC Standard, and reducing administrative requirements with little benefit to reliability.

If the document is retired, the reliability-related substance is still addressed in peripheral NERC Standards.

[1] Unless otherwise specified, capitalized terms are those defined in the Glossary of Terms Used in NERC Reliability Standards, the NERC Functional Model, and the NERC Rules of Procedures.
[2] There was a version change from 4.1 to 4.2 during the development of this project.
[3] There was a version change from 4 to 4.1 during the development of this project.

Overview

The following narrative and crosswalk are offered in support of retiring the entire standard. This document is presented in three segments: 1) presentation in narrative form, 2) a tabular representation of the standard and how it is addressed in other NERC standards, and 3) inclusion of the standard proposed for retirement.[4]

If you have questions on the narrative, the DT encourages you to contact the DT chair, Mr. David Lemmons at (770) 407-7584, or WECC staff support Mr. W. Shannon Black at (503) 307-5782.

Development History of VAR-002-WECC-2

WECC filed the Version Zero of the standard after a "1996 disturbance, which was caused by insufficient supply of reactive power from generators, including automatic voltage regulators that were not operating in voltage control mode. Because of this experience, WECC determined that there should be only very limited circumstances where a generator should remove its unit from [Automatic Voltage Regulation Regulation] operation."[5]

On June 8, 2007, FERC approved eight WECC Regional Reliability Standards that apply in the Western Interconnection, including WECC-VAR-STD-002a-1 (Automatic Voltage Regulators) and WECC-VAR-STD-002b-1 (Power System Stabilizer). FERC subsequently approved revisions to both WECC-VAR-STD-002a-1 and WECC VAR-STD-002b-1, which were re-designated VAR-002-WECC-1 and VAR-501-WECC-1, respectively, in Order No. 751.

On March 15, 2012, FERC issued an order commonly known as the Find, Fix, and Track (FFT) Order in which Paragraph 81 suggested a review of all standards targeting retirement of redundant or otherwise unneeded requirements (AKA: P81). In response, NERC and WECC identified for retirement VAR-002-WECC-1, Requirement R2. Requirement R2 was retired resulting in VAR-002-WECC-2.

In reviewing VAR-002-WECC-2, the WECC-0127 DT determined that full retirement of the standard would be in order.

[4] A developmental roadmap and an implementation plan were included in the originally posted version of this document. They were removed from this document and presented to NERC/FERC as freestanding documents titled "WECC-0127 VAR-002-WECC-2 Request to Retire – Attachment E Project Roadmap" and "WECC-0127 VAR-002-WECC-2 Request to retire – Attachment F Implementation Plan."

[5] Order Approving Regional Reliability Standards for the Western Interconnection and Directing Modifications, Docket No. RR07-11-000, 119 FERC ¶ 61,260, (Issued June 8, 2007), P.114 (hereafter cited as RRS Order). An "automatic voltage regulator" is a device that continuously monitors the generator terminal voltage and changes the reactive power output as required to maintain (or regulate) the voltage within a pre-determined voltage range. For example, if a load increase causes a decline in system voltages and thereby the terminal voltage of a generator, the automatic voltage regulator will increase the generator's reactive output to raise the terminal voltage (RRS Order, Fn 86).

Criteria for Acceptance of a Regional Reliability Standard (RRS)

A regional difference from a continent-wide Reliability Standard must either be: (1) more stringent than the continent-wide Reliability Standard, or (2) necessitated by a physical difference in the Bulk-Power System.[6] VAR-002-WECC-2 fails both tests. Further, because the reliability goal of the RRS is addressed in VAR-002-4.1 and VAR-001-4.2, VAR-002-WECC-2 can be retired without incurring any negative impact to reliability. Lastly, the language of VAR-002-WECC-2 is so vague as to fail the FERC's Order 672 threshold by obfuscating due process.

VAR-002-WECC-2 is less stringent than VAR-002-4.1[7]

On March 3, 2015, the FERC approved VAR-002-WECC-2 on the premise that it was more stringent than its NERC counterpart, VAR-002-3.[8] The FERC's conclusion was based on the premise that VAR-002-WECC-2 "requires all synchronous generators to have their voltage regulator in service at all time with only exceptions for specified circumstances. . . [whereas] [t]he related NERC Reliability Standard. . . permits a generator to remove its automatic voltage regulator from service for additional reasons."[9] Although FERC's conclusion was accurate, analysis since VAR-002-WECC-2's inception shows that the applicable entity(s) could iteratively layer WECC's exceptions resulting in a standard no more stringent than VAR-002-3.

Further, the analysis shows the practical impact of VAR-002-WECC-2 is that the applicable entity simply ends up counting hours of operation without any mandate to deploy automatic voltage regulation should it not be in service. By contrast, VAR-002-4.1 requires remediation as well as implementation of alternative operation in the event AVR is not in service. Finally, VAR-002-WECC-2 falls short of the Order 672 criteria in that ambiguous wording obfuscates due process.

Compounding Exceptions

At first glance, the WECC standard appears to require AVR operation for 98 percent of all hours whereas the NERC standard requires AVR operation for 100 percent of all hours. Although the prima facie argument for retirement is met there, on closer examination, neither standard truly requires

[6] Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards, Order No. 672, FERC Stats. & Regs. 31,204, at P 291, order on reh'g, Order No. 672-A, FERC Stats. & Regs. ¶ 31,212 (2006).

[7] Approval Order, P14.

[8] Docket No. RD15-1-000, Order Approving Two Regional Reliability Standards, Issued March 3, 2015. Hereafter Approval Order.

[9] Approval Order P14.

operation for a specified number of hours; therefore, neither the WECC 98 percent threshold nor the NERC 100 percent threshold is greater when practical application is considered.

In VAR-002-WECC-2, the applicable entities are required to have AVR "in service and in automatic voltage control mode 98 percent of all operating hours," unless they are permitted not to run under any one-of-ten possible scenarios. A first glance this limited set of exceptions is more stringent than the broader allowance allowed by VAR-002-4.1; however, when practical application is considered the limited set of exceptions offered by WECC becomes equal to or greater than the set of exceptions allowed by VAR-002-4.1. As such, VAR-002-WECC-2 is not more stringent than VAR-002-4.1 and fails the first test for approval as a Regional Reliability Standard.

A review of all ten scenarios shows that an application of eight of the ten exemptions allows the AVR to be off 100 percent of the time, like VAR-002-4.1 (8760 hours per year), in some cases up to two years.

- In R1.1 no AVR is required if a unit only runs 43.8 hours per year.
- In R1.3 no AVR is required if there is "instability due to abnormal system configuration."
- In R1.5 no AVR is required if there is component failure with an explanation. (Up to two years.)
- In R1.6 no AVR is required if there is component failure with an explanation. (Up to two years.)
- In R1.7 no AVR is required if the unit is not commercially operational.
- In R1.8/9 no AVR is required if the unit is "unavailable."
- In R10 no AVR is required if there are issues with Load Tap Changer operations.

The 100 percent exception offered by these eight exemptions is no more stringent than VAR-002-4.1. Only in exceptions R1.2 and R1.4 is there an objective and quantifiable mandate to run AVR.

Under Requirement R1.2, an entity is arguably required to run for no less than 7912.8 hours annually.[10] The unit is exempt from operation when performing "maintenance and testing up to a maximum of seven calendar days per calendar quarter." However, if the seven-day maintenance and testing exemption is used up, depending on the precipitating fact pattern, the AVR might continue to be off due to instability (R1.3 and R1.10), due to component failure for up to two years (R1.4, R1.5, and R1.6), or simply because the unit was unavailable (R1.8 and R1.9). Depending on the precipitating fact pattern, the R1.2 exception could be compounded with many of the other exceptions resulting in no practical mandate to run AVR.

In like fashion, under Requirement R1.4, an entity is arguably required to run for no less than 7147.8 hours annually.[11] The unit is exempt from operation for "60 consecutive days for repair per incident."

[10] 8760 hours annual – ((7 calendar days X 24 hours =168 hours) X 4 quarters) = 672 hours exempted)) – (the 2-percent grace period allowed in the body of Requirement R1 (8760 X .02 = 175.2 hours)) = 7912.8 hours annually.

[11] 8760 hours annually – (60 days X 24 hours = 1440 hours) – (the 2-percent grace period allowed in the body of Requirement R1 (8760 X .02 = 175.2 hours)) = 7144.8 hours annually).

However, the additional qualifier "per incident" would allow the clock to reset on day 61, thereby defeating the purpose of the limited window requiring the AVR to be on. Even if the 61-day reset approach was not adopted, arguably the incident could be compounded with any number of the remaining exemptions resulting in a component not running at all (see R1.2 explanation). In short, Requirement R1.4 is no firmer in its mandate to run than the other Requirement R1 exemptions. Thus, it is no more stringent than the allowable exceptions of VAR-002-4.1. Because it is no more stringent it fails the first prong test for approval as a Regional Reliability Standard and should be retired.

VAR-002-4.1 carries a similarly vague exception to running in that Requirement R1 requires the applicable entity to operate its generator in AVR mode: 1) *except when* some other mode is called for by the Transmission Operator, 2) *except when* exempted by the Transmission Operator, or 3) *except when* the Generator Operator notifies the Transmission Operator that one of a specific number of exceptions has occurred. VAR-002-4.1's 100 percent requirement to run, though prima facie evidence of being more stringent than VAR-002-WECC-2, is further reduced each time: 1) the generator is being operated in start-up, shutdown, or testing mode, 2) the Transmission Operator exempts the AVR from running, or 3) the AVR is out-of-service.

In short, like VAR-002-WECC-2, VAR-002-4.1 contains so many exceptions to the rule that neither the 98 percent nor the 100 percent threshold have a concrete numerical meaning. Neither threshold is better than the other. Ultimately, whether a unit is on or off will be completely fact specific under each of the standards. As such, the WECC Regional Reliability Standard is no more stringent that the NERC Standard, fails the Order 672 test, and should not be retained on that premise. Further blurring the line between the 98 percent and 100 percent thresholds, the language of VAR-002-WECC-2 is sufficiently ambiguous to either obfuscate due process or to create undefined discretionary powers for the applicable entities.

VAR-002-WECC-2 Obfuscates Due Process[12]

Per Order 672 at P325, the Regional 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.

[12] The Federal Energy Regulatory Commission (FERC) Order 740, Docket No. RM09-15-000, P23, noted that "in the Western Interconnection a significant number of transmission paths are voltage or frequency stability-limited, in contrast to other regions of the [BES] where transmission paths more often are thermally-limited. Disturbances resulting in a stability-limited transmission path overload, generally, must be responded to in a shorter time frame than a disturbance that results in a thermally-limited transmission path overload. [FERC has also noted] its understanding that this physical difference is one of the reasons for the need for certain provisions of regional Reliability Standards in the Western Interconnection."

No Criteria for Instability

In VAR-002-WECC-2, Requirements R1.3 and R.10 allows no AVR if the AVR exhibits "instability due to abnormal system configuration" (R1.3) or "instability due to operation of a Load Tap Changer" (R1.10). It should be noted that nowhere in the document is there an explanation of what constitutes "instability." Presumably, the operator decides based on its own criteria. If so, this means the operator has full discretion as to whether the AVR runs or not. Without precise boundaries, the requirement offers no due process but immense latitude.

No Criteria for Components

VAR-002-WECC-2, Requirements R1.4, R1.5, and R1.6 allow no AVR for up to two years (R1.5 at one year; R1.6 at two years) if a "component" fails. Like R1.3, what constitutes a component is not defined. The Glossary of Terms Used in NERC Reliability Standards adds no definitive insights as there, a component ranges from a generator, transmission line, circuit breaker, switch or electrical element (see Contingency). What is known about the component is that an Element may contain more than one component (see Element), an Interconnection contains many of them, they are part of a System that may include generation, transmission, and distribution "components" (see System), and from R1.6 we know the intended components may include replacing the AVR, limiters, and controls but not necessarily the power source and power bridge. In summary, like R1.3, the requirement is so vague as to obfuscate due process and provide the applicable entity with an immense amount of discretion.[13]

No Criteria for Unavailability

VAR-002-WECC-2, Requirements R1.8 and R1.9 require no AVR if the Transmission Operator directs the Generator Operator to operate the generator, and the AVR is "unavailable." There is no indication as to who makes that determination or under what circumstances that determination is made. Plainly defined, unavailable means not suitable for use. Without further definition, the operator could use any number of undefined criteria to conclude its equipment was "unavailable." What constitutes unavailable is so vast that it obfuscates due process and in practice creates in the applicable entity the ability to have AVR off for nearly any reason, so long as the reason is documented and the applicable entity counts the associated hours.

In short, if the applicable entity decides the unit is unstable, unavailable, or that an undefined component is not working well – there is no obligation to run AVR. When compared to the exemptions allowed in VAR-002-4.1, the analysis shows little if any distinction. Because there is no call for remediation in the event the AVR does not run, the practical result is a standard that counts hours.

[13] Per Order 672 at P324, a proposed Reliability Standard must contain a technically sound method to achieve the goal. VAR-002-WECC-2, exception R1. R1.1 requires no AVR if the unit runs for less than five percent of all hours during any calendar quarter. Of note, the drafting team found no technical support for the five percent threshold lending to the conclusion that it may be arbitrary.

Counting Hours vs. Ensuring Reliability

VAR-002-WECC-2 has only one requirement – that the Generator Operators and Transmission Operators have AVR in service and in AVR mode 98 percent of the time – unless otherwise exempted under any one or more of the ten allowed exemptions. Because compliance with the standard is structured toward documentation, in practice the applicable entity can work at building "up" to the 98 percent rather than keeping equipment in service 100 percent of the time. Compliance for the single requirement is to file reports that count hours – nothing more. VAR-002-WECC-2 has no mandate for remediation nor call for alternative means to support reliability if the AVR does not run.

By contrast, VAR-002-4.1 contains the additional benefit for reliability not otherwise contained in VAR-002-WECC-2. VAR-002-4.1, Requirement R2.1 requires deployment of an alternate means to meet the reliability goal in the event there is a concern with the AVR; no such deployment is required by the RRS. VAR-002-4.1, Requirement R2.2 requires the Generator Operator to explain to the Transmission Operator why it cannot comply with a schedule; no such communication is required by the RRS. VAR-002-4.1, Requirement R2.3 requires an alternative means to meet the requirement goal; the RRS does not. VAR-002-4.1, Requirement R3-R5 require reciprocal communication of events; the RRS requires no communication. VAR-002-4.1 requires that step-up transformer tap change(s) take place as needed; the RRS speaks of tap changes but creates no mandate to make the change(s). In each of these requirements, VAR-002-4.1 exceeds the reliability mandates of VAR-002-WECC-2.

In the event the stringency of the two standards was found to be essentially the same ("Run, except when you don't."), the drafting team argues that the scale of stringency should tip in favor of VAR-002-4.1 because the latter requires remedial action whereas VAR-002-WECC-2 does not.

Physical Difference in the Bulk-Power System

A Regional Reliability Standard may be approved when the standard is needed because of a unique physical difference in the Bulk-Power System. Although the drafting team continues to take note of the Western Interconnection's unique configuration and operational needs, the argument of unique physicality is not applicable to this case.

Covered Elsewhere

Although VAR-002-WECC-2 Requirement R1 requires the Transmission Operator to have AVR in service, VAR-002-4.1 has no reciprocal requirement for the Transmission Operator. However, the reliability goal is captured in VAR-001-4.2 – Voltage and Reactive Control. There, Requirements R1 and R2 require the Transmission Operator to specify a system voltage schedule (R1), and to schedule sufficient reactive resources to regulate voltage levels under normal and Contingency conditions. To the extent that VAR-001-4.2 requires the Transmission Operator to specify and schedule reactive resources such as AVR, R1 and R2 of VAR-001-4.1 meet the reliability goal of VAR-002-WECC-2 without specifying "how" the task is met (results oriented). Thus, if VAR-002-WECC-2 is retired, the reliability

task specific to the Transmission Operator remains intact in VAR-001-4.2. Similarly, VAR-002-4.1 covers the Generator Operator's requirements, unless otherwise exempted.

The drafting team noted that VAR-001-4.2 Requirement R3 requires the Transmission Operator to "operate or direct the Real-time operation of devices to regulate transmission voltage and reactive flow as necessary." Whereas VAR-002-WECC-2 creates a static setting for the AVR, thereby removing discretion from the operator, VAR-001-4.2 allows the operator to attain the same reliability goal based on all the surrounding circumstances in Real-time. For example, although VAR-002-WECC-2 requires synchronous condensers to have the AVR in service and in automatic voltage control mode, VAR-001-4.2 R3 and associated schedule-related requirements allow greater flexibility of operation while meeting the same reliability goal. This means that a specific listing of the synchronous condenser need not be retained in VAR-002-WECC-2 because VAR-001-4.2 allows the Transmission Operator to include it as needed in reactive power schedules.

Finally, in examining VAR-001-4.2, the drafting team notes that the obligations of the Transmission Operator are carried into the Regional Variance.

VAR-001-4.2 contains a WECC Regional Variance that supersedes NERC's Requirements R4 and R5. When applied, the variance does not allow the Transmission Operator to exempt the Generator Operator from operating its AVR; therefore, any generator not having a functioning AVR is required to work with the Transmission Operator to correct the issue. As such, if VAR-002-WECC-2 is retired, the more stringent approach taken in the variance is retained to ensure reliability.

Section 2: Tabular Crosswalk – Covered Elsewhere

Requirement R1

R1. Generator Operators and Transmission Operators shall have AVR in service and in automatic voltage control mode 98 percent of all operating hours for synchronous generators or synchronous condensers. Generator Operators and Transmission Operators may exclude hours for R1.1 through R1.10 to achieve the 98 percent requirement. [Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]

(Exceptions R1.1 through R1.10 are covered below.)

Analysis Table: Requirement R1

Applicable Entities and Facilities Covered Elsewhere

WECC Standard	NERC Standards	Narrative
VAR-002-WECC-2 Applicability 4.1 Generator Operators 4.2 Transmission Operators that operate synchronous condensers 4.3 This VAR-002-WECC-2 Standard only applies to synchronous generators and synchronous condensers that are connected to the Bulk Electric System.	VAR-001-4.2 Applicability 4.1 Transmission Operators 4.2 Generator Operators within the Western Interconnection (for the WECC Variance) VAR-002-4.1 Applicability 4.1 Generator Operator 4.2 Generator Owner	The Applicable Entities of the WECC Standard are addressed in VAR-001-4.2 and VAR-002-4.1. Whereas VAR-002-WECC-2 specifically identifies generators and synchronous condensers as the applicable facilities, these specific assets need not be called out. Rather, by setting the voltage schedule as a results-oriented goal, the Transmission Operator can allow for an array of assets to deploy without confining the resources to a specific list.

Analysis Table: Requirement R1

AVR in Service and Controlling – Covered Elsewhere

VAR-002-WECC-2	VAR-002-4	VAR-001-4.1	Narrative
Generator Operator and Transmission Operator	Generator Operator	Transmission Operator	
R1. Generator Operators and Transmission Operators shall have AVR in service and in automatic voltage control mode.	R1. The Generator Operator shall operate each generator connected to the interconnected transmission system (with its automatic voltage regulator (AVR) in service) in the automatic voltage control mode.	R1. Each Transmission Operator shall specify a system voltage schedule (which is either a range or a target value with an associated tolerance band) as part of its plan to operate within System Operating Limits and Interconnection Reliability Operating Limits.	The Generator Operator and the Transmission Operator's reliability tasks are addressed in VAR-002-4.1 and VAR-001-4.2. and the Regional Variance. By creating the voltage schedule, the Transmission Operator sets the reliability goal to be met without restricting the specific type of resource to be used. Restated, the VAR-01-4.2 approach is inclusive of VAR-002-WECC-2 without specifying "how" the goal is to be met.

VAR-002-WECC-2	VAR-002-4	VAR-001-4.1	Narrative
		R2. Each Transmission Operator shall schedule sufficient reactive resources to regulate voltage levels under normal and Contingency conditions. (Various means are allowed.)	
		R3. Each Transmission Operator shall operate or direct the Real-Time operation of device to regulate transmission voltage and reactive flow as necessary.	

Analysis Table: Requirement R1 **Exceptions to the Rule – Covered Elsewhere**		
VAR-002-WECC-2	**VAR-002-4.1**	**Narrative**
General: AVR shall be in service 98 percent of the time, unless covered by one of ten exceptions.	General: AVR shall be in service 100 percent of the time, unless covered by an exception.	Because the VAR-002-WECC-2 list of exceptions can be compounded, the practical result is that the specific list of exceptions is not more stringent than the generalized exception offed in VAR-002-4.1. Thus, VAR-002-WECC-2 is not more stringent than VAR-002-4.1.
Exceptions: R1.1 through R1.10.	Exceptions: [When] the generator is being operated in start-up, shutdown, or testing mode pursuant to a Real-time communication or a procedure that was previously provided to the Transmission Operator; or (AKA: Start up, shutdown, or testing.) [When] the generator is not being operated in automatic voltage control mode or in the control mode that was instructed by the Transmission Operator for a reason other than start-up, or testing. (AKA: Other than start up, shutdown, or testing.)	

VAR-002-WECC-2	VAR-002-4.1	Narrative
R1.1 The synchronous generator or synchronous condenser operates for less than five percent of all hours during any calendar quarter.	[R1.1] Other than start up, shutdown, or testing.	
R1.2. Performing maintenance and testing up to a maximum of seven calendar days per calendar quarter.	[R1.2] Start up, shutdown, or testing.	
R1.3. AVR exhibits instability due to abnormal system configuration.	[R1.3] Other than start up, shutdown, or testing.	
R1.4. Due to component failure, the AVR may be out of service up to 60 consecutive days for repair per incident.	[R1.4] Other than start up, shutdown, or testing.	
R1.5. Due to a component failure, the AVR may be out of service up to one year provided the Generator Operator or Transmission Operator submits documentation identifying the need for time to obtain replacement parts and if required to schedule an outage.	[R1.5] Other than start up, shutdown, or testing.	

VAR-002-WECC-2	VAR-002-4.1	Narrative
R1.6. Due to a component failure, the AVR may be out of service up to 24 months provided the Generator Operator or Transmission Operator submits documentation identifying the need for time for excitation system replacement (replace the AVR, limiters, and controls but not necessarily the power source and power bridge) and to schedule an outage.	[R1.6] Other than start up, shutdown, or testing.	
R1.7. The synchronous generator or synchronous condenser has not achieved Commercial Operation.	[R1.7] Start up, shutdown, or testing.	
R1.8. The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the AVR is unavailable for service.	[R1.8] Other than start up, shutdown, or testing.	
R1.9. The Reliability Coordinator directs Transmission Operator to operate the synchronous condenser, and the AVR is unavailable for service.	[R1.9] Other than start up, shutdown, or testing.	
R1.10. If AVR exhibits instability due to operation of a Load Tap Changer (LTC) transformer in the area, the Transmission Operator may	[R1.10] Other than start up, shutdown, or testing.	

VAR-002-WECC-2	VAR-002-4.1	Narrative
authorize the Generator Operator to operate the excitation system in modes other than automatic voltage control until the system configuration changes.		

Section 3: Existing Standard Proposed for Retirement

VAR-002-WECC-2

A. Introduction

1. Title: **Automatic Voltage Regulators (AVR)**

2. Number: VAR-002-WECC-2

3. Purpose: To ensure that Automatic Voltage Regulators on synchronous generators and condensers shall be kept in service and controlling voltage.

4. Applicability

4.1. Generator Operators

4.2. Transmission Operators that operate synchronous condensers

4.3. This VAR-002-WECC-2 Standard only applies to synchronous generators and synchronous condensers that are connected to the Bulk Electric System.

5. Effective Date: On the first day of the first quarter, after applicable regulatory approval.

B. Requirements

R1. Generator Operators and Transmission Operators shall have AVR in service and in automatic voltage control mode 98% of all operating hours for synchronous generators or synchronous condensers. Generator Operators and Transmission Operators may exclude hours for R1.1 through R1.10 to achieve the 98% requirement. *[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]*

R1.1. The synchronous generator or synchronous condenser operates for less than five percent of all hours during any calendar quarter.

R1.2. Performing maintenance and testing up to a maximum of seven calendar days per calendar quarter.

R1.3. AVR exhibits instability due to abnormal system configuration.

R1.4. Due to component failure, the AVR may be out of service up to 60 consecutive days for repair per incident.

R1.5. Due to a component failure, the AVR may be out of service up to one year provided the Generator Operator or Transmission Operator submits documentation identifying the need for time to obtain replacement parts and

if required to schedule an outage.

R1.6. Due to a component failure, the AVR may be out of service up to 24 months provided the Generator Operator or Transmission Operator submits documentation identifying the need for time for excitation system replacement (replace the AVR, limiters, and controls but not necessarily the power source and power bridge) and to schedule an outage.

R1.7. The synchronous generator or synchronous condenser has not achieved Commercial Operation.

R1.8. The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the AVR is unavailable for service.

R1.9. The Reliability Coordinator directs Transmission Operator to operate the synchronous condenser, and the AVR is unavailable for service.

R1.10. If AVR exhibits instability due to operation of a Load Tap Changer (LTC) transformer in the area, the Transmission Operator may authorize the Generator Operator to operate the excitation system in modes other than automatic voltage control until the system configuration changes.

C. Measures

M1. Generator Operators and Transmission Operators shall provide quarterly reports to the compliance monitor and have evidence for each synchronous generator and synchronous condenser of the following:

M1.1 The actual number of hours the synchronous generator or synchronous condenser was on line.

M1.2 The actual number of hours the AVR was out of service.

M1.3 The AVR in service percentage.

M1.4 If excluding AVR out of service hours as allowed in R1.1 through R1.10, provide:

M1.4.1 The number of hours excluded,

M1.4.2 The adjusted AVR in-service percentage,

M1.4.3 The date of the outage.

D. Compliance

1. Compliance Monitoring Process

1.1 Compliance Monitoring Responsibility

Compliance Enforcement Authority

1.2 Compliance Monitoring Period

Compliance Enforcement Authority may use one or more of the following methods to assess compliance:

- Reports submitted quarterly

- Spot check audits conducted anytime with 30 days notice

- Periodic audit as scheduled by the Compliance Enforcement Authority

- Investigations

- Other methods as provided for in the Compliance Monitoring Enforcement Program

The Reset Time Frame shall be a calendar quarter.

1.3 Data Retention

The Generator Operators and Transmission Operators shall keep evidence for Measures M1 for three years plus current year, or since the last audit, whichever is longer.

1.4 Additional Compliance Information

1.4.1 The sanctions shall be assessed on a calendar quarter basis.

1.4.2 If any of R1.2 through R1.9 continues from one quarter to another, the number of days accumulated will be the contiguous calendar days from the beginning of the incident to the end of the incident. For example, in R1.4 if the 60 day repair period goes beyond the end of a quarter, the repair period does not reset at the beginning of the next quarter.

1.4.3 When calculating the in-service percentages, do not include the time the AVR is out of service due to R1.1 through R1.10.

1.4.4 The standard shall be applied on a machine-by-machine basis (a Generator Operator or Transmission Operator can be subject to a separate sanction for each non-compliant synchronous generator and synchronous condenser).

E. Regional Differences

None

Table of Compliance Elements

R	Time Horizon	VRF	Violation Severity Levels			
			Lower VSL	Moderate VSL	High VSL	Severe VSL
R1	Operational Assessment	Medium	There shall be a Lower Level of non-compliance if AVR is in service less than 98% but at least 90% or more of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.	There shall be a Moderate Level of non-compliance if AVR is in service less than 90% but at least 80% or more of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.	There shall be a High Level of non-compliance if AVR is in service less than 80% but at least 70% or more of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.	There shall be a Severe Level of non-compliance if AVR is in service less than 70% of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.

Version History

Version	Date	Action	Change Tracking
1	April 16, 2008	Permanent Replacement Standard for VAR-STD-002a-1	
1	April 21, 2011	FERC Order issued approving VAR-002-WECC-1 (FERC approval effective June 27, 2011; Effective Date July 1, 2011)	
2	November 13, 2014	Adopted by NERC Board of Trustees	
2	March 3, 2015	FERC letter order approving VAR-002-WECC-2	

Regional Reliability Standard Submittal Request
Attachment F

Region:	**Western Electricity Coordinating Council**
Regional Standard Number:	**VAR-002-WECC-2**
Regional Standard Title:	**Automatic Voltage Regulators (AVR)**
Date Submitted:	**March 2, 2018**
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: VAR-002-WECC-2
- ☐ Interpret an Existing Standard
- ☐ Approval of a new standard
- ☐ Revision of an existing standard
- ☐ 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)):

December 6, 2017, Board of Directors / Board Resolution

Resolved, that the Western Electricity Coordinating Council (WECC) Board of Directors (Board), acting upon the recommendation of the WECC Standards Committee at the meeting of the Board on December 6, 2017, hereby retires Regional Reliability Standards –

- PRC-004-WECC-2, Protection System and Remedial Action Scheme Misoperation, and

• VAR-002-WECC-2, Automatic Voltage Regulators	
[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:	This is a request to retire WECC Regional Reliability Standard VAR-002-WECC-2, Automatic Voltage Regulators (AVR). See detail that follows.
Concise statement of the justification of the request:	The WECC-0127, VAR-002-WECC-2, Automatic Voltage Regulators Drafting Team (DT) reviewed NERC Standards, both in effect and those standards that are approved pending regulatory filing, concluding that VAR-002-WECC-2 should be retired immediately and in its entirety because: • The reliability content of VAR-002-WECC-2 is addressed in other NERC Standards (VAR-002-4.1, Generator Operation for Maintaining Network Voltage Schedules and VAR-001-4.2 Voltage and Reactive Control). • The standard does not meet either of the Federal Energy Regulatory Commission's (FERC) criteria for a Regional Reliability Standard in that it neither covers unique subject matter nor are its requirements any more stringent than those required by NERC. • The standard falls short of Order 672 requirements for clarity and may obfuscate due process in that it: 1) is ambiguous as to what constitutes "instability," 2) is ambiguous as to the "components" to which it applies, and 3) is ambiguous as to what constitutes "unavailability."

	• Retirement of VAR-002-WECC-2 with a default to VAR-002-4.1, Generator Operation for Maintaining Network Voltage Schedules and VAR-001-4.2 Voltage and Reactive Control improves upon VAR-002-WECC-2 by focusing the in-service requirement on actual operational performance of the automatic voltage regulator as opposed to merely counting how many hours the equipment is in use.

Not used

A response to FERC Order 672 Criteria to analyze proposed Reliability Standards for approval to ensure they are just, reasonable, not unduly discriminatory or preferential, and in the public interest is not provided because the entire standard is proposed for retirement.

Attachment H

Drafting Team Roster
WECC-0127 VAR-002-WECC-2
Request to Retire

Below please find a biographical snapshot for the members of the WECC-0127 VAR-002-WECC-2, Automatic Voltage Regulators (AVR), Request to Retire Drafting Team.

Name	**Background**
Todd Komaromy Arizona Public Service	Mr. Komaromy co-authored the WECC-0127 Standard Authorization Request (SAR). Having spent time as a Senior Associate, with 8 years of law firm experience in the large law firms of Squire Patton Boggs and Snell & Wilmer, the practice of administrative law and statutory interpretation before Federal Agencies was core to his work. Development of precise technical language and associated explanations was part and parcel to these efforts. Mr. Komaromy also holds an electrical engineering degree with 14 years' experience, in the Technical Writing, Fossil Generation, Lobbying, Contracts, Intellectual Property, Transmission/Distribution, and Compliance arenas. Mr. Komaromy currently serves in a corporate capacity as the AZPS Manager of NERC Regulatory Compliance, responsible for leading the planning, development, implementation and maintenance of the compliance framework for reliability standards. Included in these duties is providing expertise, guidance and management of AZPS's VAR-002 reporting for both the continental and regional standards. Mr. Komaromy has a Bachelor of Science degree in Electrical Engineering from The Ohio State University, MBA and a Juris Doctor degree from the Sandra Day O'Conner College of Law - Arizona State University.

David Lemmons	Mr. Lemmons began his career in the electric industry with Southwestern Public Service Company (SPS) in Amarillo, Texas, in 1989. He spent eight years in the rates and regulation department where he performed rate of return analyses, designed rates and worked with other regulatory issues. In 1997, Mr. Lemmons transferred to the energy trading department during the merger between SPS and Public Service Company of Colorado (PSCo). In this capacity, with Xcel Energy and its predecessor, New Century Energies, he analyzed the electric system loads and resources for day-ahead and real-time operations and trading — working with generation and fuel procurement to ensure resources were ready and available to serve loads. In 2001, Mr. Lemmons took the position of Senior Manager, Market Operations, representing Xcel Energy at electric reliability, RTO development and system operation meetings throughout the United States, as well as providing support for state and Federal regulatory proceedings. Mr. Lemmons has chaired the WECC-0083 BAL-002-WECC-1 Standard Drafting Team, the NERC Project 2007-12 Standard Drafting team and is a team member on the NERC Project 2010-14.1 Standard Drafting Team. In 2013, Mr. Lemmons took his current position, Senior Consultant, Standards Policy and Compliance. In this position, Mr. Lemmons is responsible for working with power plants to ensure compliance with Reliability Standards, train plant operators as needed and to represent Xcel Energy generation in the development of new standards. He holds a Master of Science degree in finance and economics from West Texas A&M University.
Israel Perez Salt River Project	Mr. Perez is a Mechanical Engineer and has worked at Salt River Project (SRP) for over 10 years. The first three years focused on completing numerous engineering projects as a rotational engineer in SRP's generation fleet. In 2009, Mr. Perez accepted a permanent position at an SRP generating facility and spent the next six years project managing plant overhauls, budgeting contracts & services, and developing to a Senior Engineer position as a Turbine Engineer.

	In 2015, Mr. Perez joined SRP's Electric Reliability Compliance department in the Operations and Planning team. In this position, Mr. Perez is responsible to work with SRP's responsible departments to ensure compliance with all O&P Reliability Standards.
Shane Kronebusch	Mr. Kronebusch is the Lead Electrical Engineer and Subject Matter Expert for excitation systems, protection and hydro governors and unit controls for L&S Electric, Inc. He has over 27 years of experience in the utility industry. Prior to joining, L&S Electric in 2010, Mr. Kronebusch' s responsibilities included coordinating and preforming WECC testing of generation assets as an employee of BC Hydro Generation Engineering and Maintenance Services. He was responsible for commissioning of both new and rehabilitated units ranging in size from 30MW to 500MW. Mr. Kronebusch was tasked as a subject matter expert for exciters and governors as part of the BC Hydro Equipment Health Rating program. Mr. Kronebusch first became involved with WECC testing after the July and August 1996 system disturbances that initiated the testing program. He has been a member of the WECC Control Work Group since 2006.

Attachment I
Ballot Pool Members
WECC-0127 VAR-002-WECC-2
Request to Retire

WECC-0127 VAR-002-WECC-2 Ballot Pool

Title	Company	Sector	Vote	Comments	Created By
WECC-0127	Arizona Public Service Company	Distribution	Yes		Michelle Amarantos
WECC-0127	Arizona Public Service Company	Marketers and Brokers	Yes		Linda Henrickson
WECC-0127	Arizona Public Service Company	Generation	Yes		Nicholas Kirby
WECC-0127	Arizona Public Service Company	System Coordination	Yes		Vivian Vo
WECC-0127	Arizona Public Service Company	Transmission	Yes		Gary Nolan
WECC-0127	Avista Corporation	Generation	Yes		Glen Farmer
WECC-0127	Avista Corporation	Marketers and Brokers	Yes		Scott Kinney
WECC-0127	Balancing Authority of Northern California	System Coordination	Yes		Joe Tarantino
WECC-0127	Black Hills Corporation	Generation	Yes		Sheila Suurmeier
WECC-0127	Bonneville Power Administration	Distribution	Yes		Rebecca Berdahl

Title	Company	Sector	Vote	Comments	Created By
WECC-0127	Bonneville Power Administration	Marketers and Brokers	Yes		Andrew Meyers
WECC-0127	Bonneville Power Administration	Transmission	Yes		Kammy Rogers-Holliday
WECC-0127	Bonneville Power Administration	System Coordination	Yes		Francis Halpin
WECC-0127	British Columbia Hydro & Power Authority	System Coordination	Yes		Patricia Robertson
WECC-0127	British Columbia Hydro & Power Authority	Transmission	Yes		Patricia Robertson
WECC-0127	British Columbia Hydro & Power Authority	Distribution			Hootan Jarollahi
WECC-0127	British Columbia Hydro & Power Authority	Generation			Helen Hamilton Harding
WECC-0127	California Independent System Operator	System Coordination	Yes		Richard Vine
WECC-0127	California Independent System Operator	Transmission	Yes		Richard Vine
WECC-0127	Gridforce Energy Management, LLC	System Coordination			David Blackshear

Title	Company	Sector	Vote	Comments	Created By
WECC-0127	Idaho Power Company	System Coordination	Yes		Laura Nelson
WECC-0127	Idaho Power Company	Generation	Yes		Laura Nelson
WECC-0127	Idaho Power Company	Distribution	Yes		Laura Nelson
WECC-0127	Idaho Power Company	Transmission	Yes		Laura Nelson
WECC-0127	Los Angeles Department of Water and Power	System Coordination			Pjoy Chua
WECC-0127	Los Angeles Department of Water and Power	Generation			Pjoy Chua
WECC-0127	Los Angeles Department of Water and Power	Distribution			Pjoy Chua
WECC-0127	Los Angeles Department of Water and Power	Transmission			Pjoy Chua
WECC-0127	Los Angeles Department of Water and Power	Marketers and Brokers			Pjoy Chua
WECC-0127	Northern California Power Agency	Generation	Yes		Marty Hostler
WECC-0127	Northern California Power Agency	Generation	Yes		Marty Hostler

Title	Company	Sector	Vote	Comments	Created By
WECC-0127	Northern California Power Agency	Marketers and Brokers	Yes		Marty Hostler
WECC-0127	NV Energy	Generation	Yes		Kevin Salsbury
WECC-0127	NV Energy	System Coordination	Yes		Kevin Salsbury
WECC-0127	NV Energy	Distribution	Yes		Kevin Salsbury
WECC-0127	NV Energy	Transmission	Yes		Kevin Salsbury
WECC-0127	Platte River Power Authority	Marketers and Brokers	Yes		Sabrina Martz
WECC-0127	Platte River Power Authority	Generation	Yes		Tyson Archie
WECC-0127	Platte River Power Authority	Transmission	Yes		Jeff Landis
WECC-0127	Platte River Power Authority	System Coordination			Matthew Thompson
WECC-0127	Powerex, Inc.	Marketers and Brokers			Gordon Dobson-Mack
WECC-0127	Public Service Company of Colorado (Xcel Energy)	System Coordination	Yes		Robert Staton
WECC-0127	Public Service Company of Colorado (Xcel Energy)	Generation	Yes		Robert Staton

Title	Company	Sector	Vote	Comments	Created By
WECC-0127	Public Service Company of Colorado (Xcel Energy)	Transmission	Yes		Robert Staton
WECC-0127	Public Utility District No. 1 of Snohomish County	Generation	Yes		Franklin Lu
WECC-0127	Public Utility District No. 1 of Snohomish County	Distribution	Yes		Franklin Lu
WECC-0127	Public Utility District No. 1 of Snohomish County	Transmission	Yes		Franklin Lu
WECC-0127	Public Utility District No. 1 of Snohomish County	Marketers and Brokers	Yes		Franklin Lu
WECC-0127	Public Utility District No. 2 of Grant County	System Coordination	Yes		LeRoy Patterson
WECC-0127	Public Utility District No. 2 of Grant County	Generation	Yes		LeRoy Patterson
WECC-0127	Public Utility District No. 2 of Grant County	Distribution	Yes		LeRoy Patterson
WECC-0127	Public Utility District No. 2 of Grant County	Transmission	Yes		LeRoy Patterson

Title	Company	Sector	Vote	Comments	Created By
WECC-0127	Public Utility District No. 2 of Grant County	Marketers and Brokers	Yes		LeRoy Patterson
WECC-0127	Puget Sound Energy, Inc.	Generation	Yes		Eleanor Ewry
WECC-0127	Puget Sound Energy, Inc.	Marketers and Brokers	Yes		Lynda Kupfer
WECC-0127	Puget Sound Energy, Inc.	System Coordination			Theresa Rakowsky
WECC-0127	Puget Sound Energy, Inc.	Distribution			Theresa Rakowsky
WECC-0127	Puget Sound Energy, Inc.	Transmission			Theresa Rakowsky
WECC-0127	Sacramento Municipal Utility District	System Coordination	Yes		Joe Tarantino
WECC-0127	Sacramento Municipal Utility District	Generation	Yes		Joe Tarantino
WECC-0127	Sacramento Municipal Utility District	Distribution	Yes		Joe Tarantino
WECC-0127	Sacramento Municipal Utility District	Transmission	Yes		Joe Tarantino
WECC-0127	Sacramento Municipal Utility District	Marketers and Brokers	Yes		Joe Tarantino
WECC-0127	Salt River Project	Marketers and Brokers			Bobby Olsen
WECC-0127	Salt River Project	Generation	Yes		Kevin Nielsen
WECC-0127	Salt River Project	Distribution	Yes		Rudy Navarro

Title	Company	Sector	Vote	Comments	Created By
WECC-0127	San Diego Gas & Electric	System Coordination	Yes		Bridget Silvia
WECC-0127	San Diego Gas & Electric	Generation	Yes		Jerome Gobby
WECC-0127	San Diego Gas & Electric	Distribution	Yes		ANNIE RUIZ
WECC-0127	San Diego Gas & Electric	Transmission	Yes		Martine Blair
WECC-0127	Seattle City Light	Transmission	Yes		Hao Li
WECC-0127	Seattle City Light	Marketers and Brokers	Yes		Charles Freeman
WECC-0127	Southern California Edison Company	System Coordination	Yes		Romel Aquino
WECC-0127	Southern California Edison Company	Distribution	Yes		Steven Mavis
WECC-0127	Southern California Edison Company	Transmission	Yes		Steven Mavis
WECC-0127	Southern California Edison Company	Generation	Yes		Thomas Rafferty
WECC-0127	Southern Power Company	Generation	Yes		William D (Bill) Shultz
WECC-0127	Tacoma Power	System Coordination	Yes		Twila Hofer
WECC-0127	Tacoma Power	Generation	Yes		Karen Hedlund

Title	Company	Sector	Vote	Comments	Created By
WECC-0127	Tacoma Power	Transmission	Yes		Joseph Wilson
WECC-0127	Tacoma Power	Distribution	Yes		Chad Edinger
WECC-0127	Tacoma Power	Marketers and Brokers	Yes		Todd Lloyd
WECC-0127	Tri-State Generation & Transmission - Reliability	System Coordination	Yes		Tracy Sliman
WECC-0127	Tri-State Generation & Transmission - Reliability	Transmission	Yes		Tracy Sliman
WECC-0127	Tri-State Generation & Transmission - Reliability	Distribution			Janelle Gill
WECC-0127	Tri-State Generation & Transmission - Reliability	Generation			Mark Stein
WECC-0127	Western Area Power Administration	System Coordination	Yes		Patrick Harwood

Attachment J
Final Ballot Results
WECC-0127 VAR-002-WECC-2
Request to Retire

Ballot Name: **WECC-0127 VAR-002-WECC-2 Automatic Voltage Regulator Request to Retire**

The project requests complete retirement of VAR-002-WECC-2 on receipt of applicable regulatory approval.

Ballot Pool Open: 08/30/2017
Ballot Pool Closed: 09/14/2017
Ballot Opened: 09/19/2017
Ballot Closed: 10/11/2017
Total Ballot Pool: 89
Total Votes: 72
Quorum: 80.9%
Weighted Votes: 100.0%
Ballot Results: The request to retire VAR-002-WECC-2 was approved by the WECC-0127 Ballot Pool.

Voting Sectors	Total In Ballot Pool	Votes Non-Abstain	Sector Weight	Yes Votes	Weighted Segment Vote	No Votes	Abstain	Total Votes for Quorum	Didn't Vote
Distribution	15	11	1	11	100.0%	0	0	11	4
End User Representative	0	0	0	0	0.0%	0	0	0	0
Generation	21	18	1	18	100.0%	0	0	18	3
Marketers and Brokers	14	11	1	11	100.0%	0	0	11	3
Other Non-Registered	0	0	0	0	0.0%	0	0	0	0
State and Provincial Representatives	0	0	0	0	0.0%	0	0	0	0
System Coordination	19	15	1	15	100.0%	0	0	15	4
Transmission	20	17	1	17	100.0%	0	0	17	3
Totals	89	72	5	72	**100.0%**	0	0	72	17

Attachment K
Minority Issues
WECC-0127 VAR-002-WECC-2
Request to Retire

Following a ballot period from September 21 through October 11, 2017, the WECC Ballot Pool approved retirement of WECC-0127 VAR-002-WECC-2 Automatic Voltage Regulators.

Development Phase Comments – Minority Opinion

Comment Response Forms and comments received during the development phase of this project are included with this filing as Attachment R1.

This project was posted for comment on one occasion. The drafting team reviewed and considered all comments received. The following minority opinions were expressed by the industry during the development phase but were not accepted by the drafting team.

- *There were no minority opinions. This project received only one comment; that comment was in support of immediate retirement. This project was approved with a 100-percent affirmative ballot and no abstentions.*

Ballot Phase Comments - Minority Opinion

The WECC Reliability Standards Development Procedures (Procedures) do not require a drafting team to respond to comments provided during the balloting phase of a project.

During the balloting phase, the following minority opinions were expressed by the Ballot Pool.

- *There were no minority opinions. This project received only one comment; that comment was in support of immediate retirement. This project was approved with a 100-percent affirmative ballot and no abstentions.*

Attachment L
WECC Standards Committee Roster
WECC-0127 VAR-002-WECC-2
Request to Retire

The following individuals are those assigned to the WECC Standards Committee as of October 1, 2017.

Sector	Name	Organization
1 Transmission	Dana Cabbell	Southern California Edison Company
2 Generation	Gary Nolan	Arizona Public Service Company
3 Marketers and Brokers	Tanner Brier	Bonneville Power Administration
4 Distribution	Warren Rust	Colorado Springs Utilities
5 System Coordination	Joseph Tarantino	Sacramento Muni. Utility District
6 End User Representative	Caitlin Liotiris	Utah Assoc. of Energy Users
7 State and Provincial	Vacant	Vacant
8 Other Non-Registered Entities	Crystal Musselman	Proven Compliance Solutions
Board of Directors	Joe McArthur	Non-Affiliate Director / WSC Chair

Attachment M1
WECC Posting 1 Response to Comments

WECC-0127 VAR-002-WECC-2
Request to Retire

Posting 1

The WECC-0127 VAR-002-WECC-2, Automatic Voltage Regulators (AVR), Request to Retire Drafting Team (DT) thanks everyone who submitted comments on the proposed document.

Posting

This document was posted for a 45-day public comment period from May 31 through July 18, 2017.

On May 25, 2017, WECC distributed notice of the posting via the Standards Email List.

The DT asked stakeholders to provide feedback on the proposed document through a standardized electronic template. WECC received comments from one entity as shown in the following table.

Location of Comments

All comments received on the document can be viewed in their original format on the WECC-0127 project page under the "Submit and Review Comments" accordion.

Changes in Response to Comment

In response to comments received in Posting 1 the drafting team made no further changes to the document.

Minority View

There were no minority concerns. The sole respondent was in support of the drafting team's efforts.

Implementation Plan

The Reliability Standards Development Procedures (Procedures) require that an implementation plan be posted with at least one posting of the project. The proposed date for retirement is immediately upon receipt of regulatory approval. The drafting teams reports that no further actions are necessary for retirement.

Action Plan

On July 27, the WECC-0127 VAR-002-WECC-2, Automatic Voltage Regulator Drafting Team agreed to forward the document to WECC Standards Committee (WSC) with a request for ballot.

No further postings are anticipated.

Contacts and Appeals

If you feel your comment has been omitted or overlooked, please contact W. Shannon Black, WECC Consultant. In addition, the WECC Reliability Standards Appeals Process can be found in the Reliability Standards Development Procedures.

WECC Standards Comment Table

Commenter		Organization
1	Laura Nelson	Idaho Power Company

Index to Questions, Comments, and Responses

Question

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

1. Response Summary

Summary Consideration:	See summary in the preamble of this document.		
Commenter / Comment			**Response**
Idaho Power Company			Idaho Power agrees with the drafting team's justification and decision to retire VAR-002-WECC-2.
The drafting team appreciates Idaho's continued involvement in the standards development process.			

Attachment M2
Responses to Comments NERC

WECC-0127 VAR-002-WECC-2
Request to Retire
November 3 through December 18, 2017

Posting 1

The WECC-0127 VAR-002-WECC-2, Automatic Voltage Regulators, Request to Retire Drafting Team (DT) thanks everyone who submitted comments on the proposed project.

Posting

This document was posted for a 45-day public comment period at the North American Electricity Reliability Corporation (NERC) from November 3 through December 18, 2017.

On November 3, 2017, NERC distributed notice of the posting via the NERC Standards Announcements email exploder.

NERC received comments from six entities as shown in the following table.

Location of Comments

All comments received on the project can be viewed in their original format on the WECC-0127 project page under the "Submit and Review Comments" accordion. Additionally, the raw data provided to WECC by NERC in support of this filing is appended to this response form.

Changes in Response to Comment

No changes were made to the project based on the comments received during this posting.

Minority View

There were no minority concerns.

Effective Date and Implementation Plan

The Reliability Standards Development Procedures (Procedures) require that an implementation plan be posted with at least one posting of the project. The proposed date for retirement is immediately upon receipt of regulatory approval. The drafting team reports that no further actions are necessary for retirement.

Comment Report Form for VAR-002-WECC-2

Action Plan

As of January 10, 2018, this project is awaiting filing at NERC.

Contacts and Appeals

If you feel your comment has been omitted or overlooked, please contact W. Shannon Black, WECC Consultant. In addition, the WECC Reliability Standards Appeals Process can be found in the Reliability Standards Development Procedures.

Comment Report Form for VAR-002-WECC-2

WECC Standards Comment Table

Commenter		Organization
1	Aaron Cavanaugh	Bonneville Power Administration (BPA)
2	John Tolo	Tucson Electric Power Company (TEP)
3	Laurie Williams	PNM Resources - Public Service Company of New Mexico (PNM)
4	Sandra Shaffer	Berkshire Hathaway – PacifiCorp (PAC)
5	Glen Farmer	Avista
6	Michelle Amarantos	Arizona Public Service Company (APS)

Index to Questions, Comments, and Responses

Questions

1. Do you agree the development of the Regional Reliability Standard met the “Open” criteria as outlined above? If “No”, please explain in the comment area below:

2. Do you agree the development of the Regional Reliability Standard met the “Inclusive” criteria as outlined above? If “No”, please explain in the comment area below:

3. Do you agree the development of the Regional Reliability Standard met the “Balanced” criteria as outlined above? If “No”, please explain in the comment area below:

4. Do you agree the development of the Regional Reliability Standard met the “Due Process” criteria as outlined above? If “No”, please explain in the comment area below:

5. Do you agree the development of the Regional Reliability Standard met the “Transparent” criteria as outlined above? If “No”, please explain in the comment area below:

Comment Report Form for VAR-002-WECC-2

1. Response Summary

Summary Consideration:	See summary in the preamble of this document.		
Commenter / Comment			**Response**
The WECC-0127 VAR-002-WECC-2, Automatic Voltage Regulators, Request to Retire Drafting Team thanks each party for their continued support and dedication to the standards development process. All respondents answered in the affirmative on all questions. There were no minority opinions nor were there requests for modification. No changes were made to the project.			

Raw Data provided by NERC Comment Report

Project Name:	Regional Reliability Standard (WECC) | VAR-002-WECC-2 Retirement
Comment Period Start Date:	11/3/2017
Comment Period End Date:	12/18/2017
Associated Ballots:	

There were 6 sets of responses, including comments from approximately 6 different people from approximately 6 companies representing 4 of the Industry Segments as shown in the table on the following pages.

Comment Report Form for VAR-002-WECC-2

Questions

1. Do you agree the development of the Regional Reliability Standard met the "Open" criteria as outlined above? If "No", please explain in the comment area below:

2. Do you agree the development of the Regional Reliability Standard met the "Inclusive" criteria as outlined above? If "No", please explain in the comment area below:

3. Do you agree the development of the Regional Reliability Standard met the "Balanced" criteria as outlined above? If "No", please explain in the comment area below:

4. Do you agree the development of the Regional Reliability Standard met the "Due Process" criteria as outlined above? If "No", please explain in the comment area below:

5. Do you agree the development of the Regional Reliability Standard met the "Transparent" criteria as outlined above? If "No", please explain in the comment area below:

Comment Report Form for VAR-002-WECC-2

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region

Comment Report Form for VAR-002-WECC-2

1. Do you agree the development of the Regional Reliability Standard met the "Open" criteria as outlined above? If "No", please explain in the comment area below:	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

2. Do you agree the development of the Regional Reliability Standard met the "Inclusive" criteria as outlined above? If "No", please explain in the comment area below:	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

3. Do you agree the development of the Regional Reliability Standard met the "Balanced" criteria as outlined above? If "No", please explain in the comment area below:	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

4. Do you agree the development of the Regional Reliability Standard met the "Due Process" criteria as outlined above? If "No", please explain in the comment area below:	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

5. Do you agree the development of the Regional Reliability Standard met the "Transparent" criteria as outlined above? If "No", please explain in the comment area below:	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Regional Reliability Standards Announcement

Western Electricity Coordinating Council
FAC-501-WECC-2, PRC-004-WECC-2, and VAR-002-WECC-2

Comment period open through December 18, 2017

Now Available

The Western Electricity Coordinating Council (WECC) has requested NERC to post the following proposed Regional Reliability Standards for industry review and comment as permitted by the NERC Rules of Procedure:

- **FAC-501-WECC-2 - Transmission Maintenance**
- **PRC-004-WECC-2 - Protection System and Remedial Action Scheme Misoperation (Retirement)**
- **VAR-002-WECC-2 - Automatic Voltage Regulators (Retirement)**

Commenting
Use the Standards Balloting and Commenting System (SBS) to submit comments. If you experience any difficulties using the electronic forms, contact Mat Bunch. The forms must be submitted by **8 p.m. Eastern, Monday, December 18, 2017.** Unofficial Word versions of the comment forms are 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. Although the technical aspects of this Regional Reliability Standard have been vetted through WECC's Regional Standards development process, the final approval process for a Regional Reliability Standard requires NERC publicly to notice and request comment on the criteria outlined in the unofficial comment forms.

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

For more information or assistance, contact Standards Developer, Mat Bunch (via email) or at (404) 446-9785.

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

A. Introduction

1. Title: **Automatic Voltage Regulators (AVR)**

2. Number: VAR-002-WECC-2

3. Purpose: To ensure that Automatic Voltage Regulators on synchronous generators and condensers shall be kept in service and controlling voltage.

4. Applicability

4.1. Generator Operators

4.2. Transmission Operators that operate synchronous condensers

4.3. This VAR-002-WECC-2 Standard only applies to synchronous generators and synchronous condensers that are connected to the Bulk Electric System.

5. Effective Date: On the first day of the first quarter, after applicable regulatory approval.

B. Requirements

R1. Generator Operators and Transmission Operators shall have AVR in service and in automatic voltage control mode 98% of all operating hours for synchronous generators or synchronous condensers. Generator Operators and Transmission Operators may exclude hours for R1.1 through R1.10 to achieve the 98% requirement. *[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]*

R1.1. The synchronous generator or synchronous condenser operates for less than five percent of all hours during any calendar quarter.

R1.2. Performing maintenance and testing up to a maximum of seven calendar days per calendar quarter.

R1.3. AVR exhibits instability due to abnormal system configuration.

R1.4. Due to component failure, the AVR may be out of service up to 60 consecutive days for repair per incident.

R1.5. Due to a component failure, the AVR may be out of service up to one year provided the Generator Operator or Transmission Operator submits documentation identifying the need for time to obtain replacement parts and if required to schedule an outage.

R1.6. Due to a component failure, the AVR may be out of service up to 24 months provided the Generator Operator or Transmission Operator submits documentation identifying the need for time for excitation system replacement (replace the AVR, limiters, and controls but not necessarily the power source and power bridge) and to

schedule an outage.

R1.7. The synchronous generator or synchronous condenser has not achieved Commercial Operation.

R1.8. The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the AVR is unavailable for service.

R1.9. The Reliability Coordinator directs Transmission Operator to operate the synchronous condenser, and the AVR is unavailable for service.

R1.10. If AVR exhibits instability due to operation of a Load Tap Changer (LTC) transformer in the area, the Transmission Operator may authorize the Generator Operator to operate the excitation system in modes other than automatic voltage control until the system configuration changes.

C. Measures

M1. Generator Operators and Transmission Operators shall provide quarterly reports to the compliance monitor and have evidence for each synchronous generator and synchronous condenser of the following:

M1.1 The actual number of hours the synchronous generator or synchronous condenser was on line.

M1.2 The actual number of hours the AVR was out of service.

M1.3 The AVR in service percentage.

M1.4 If excluding AVR out of service hours as allowed in R1.1 through R1.10, provide:

M1.4.1 The number of hours excluded,

M1.4.2 The adjusted AVR in-service percentage,

M1.4.3 The date of the outage.

D. Compliance

1. Compliance Monitoring Process

1.1 Compliance Monitoring Responsibility
Compliance Enforcement Authority

1.2 Compliance Monitoring Period

Compliance Enforcement Authority may use one or more of the following methods to assess compliance:

- Reports submitted quarterly

- Spot check audits conducted anytime with 30 days notice

- Periodic audit as scheduled by the Compliance Enforcement Authority

- Investigations

- Other methods as provided for in the Compliance Monitoring Enforcement Program

The Reset Time Frame shall be a calendar quarter.

1.3 Data Retention

The Generator Operators and Transmission Operators shall keep evidence for Measures M1 for three years plus current year, or since the last audit, whichever is longer.

1.4 Additional Compliance Information

1.4.1 The sanctions shall be assessed on a calendar quarter basis.

1.4.2 If any of R1.2 through R1.9 continues from one quarter to another, the number of days accumulated will be the contiguous calendar days from the beginning of the incident to the end of the incident. For example, in R1.4 if the 60 day repair period goes beyond the end of a quarter, the repair period does not reset at the beginning of the next quarter.

1.4.3 When calculating the in-service percentages, do not include the time the AVR is out of service due to R1.1 through R1.10.

1.4.4 The standard shall be applied on a machine-by-machine basis (a Generator Operator or Transmission Operator can be subject to a separate sanction for each non-compliant synchronous generator and synchronous condenser).

E. Regional Differences

None

Table of Compliance Elements

R	Time Horizon	VRF	Violation Severity Levels			
			Lower VSL	Moderate VSL	High VSL	Severe VSL
R1	Operational Assessment	Medium	There shall be a Lower Level of non-compliance if AVR is in service less than 98% but at least 90% or more of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.	There shall be a Moderate Level of non-compliance if AVR is in service less than 90% but at least 80% or more of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.	There shall be a High Level of non-compliance if AVR is in service less than 80% but at least 70% or more of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.	There shall be a Severe Level of non-compliance if AVR is in service less than 70% of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.

Version History

Version	Date	Action	Change Tracking
1	April 16, 2008	Permanent Replacement Standard for VAR-STD-002a-1	
1	April 21, 2011	FERC Order issued approving VAR-002-WECC-1 (FERC approval effective June 27, 2011; Effective Date July 1, 2011)	
2	November 13, 2014	Adopted by NERC Board of Trustees	
2	March 3, 2015	FERC letter order approving VAR-002-WECC-2	

Cover Sheet

Technical Justification
Retirement of WECC Regional Reliability Standard
VAR-002-WECC-2
Automatic Voltage Regulators (AVR)

White Paper
Retirement of WECC Regional Reliability Standard VAR-002-WECC-2 Automatic Voltage Regulators (AVR)

155 North 400 West, Suite 200F

Salt Lake City, Utah 84103-1114

WESTERN ELECTRICITY COORDINATING COUNCIL

Developed as WECC-0127

Attachment G
Technical Justification

WECC-0127 VAR-002-WECC-2
Automatic Voltage Regulators

Executive Summary

The WECC-0127, VAR-002-WECC-2, Automatic Voltage Regulators Drafting Team (DT) has reviewed NERC Standards, both in effect and those standards that are approved pending regulatory filing, and concluded that the substance of WECC Regional Reliability Standard (RRS) [1] should be retired immediately and in its entirety because:

- The standard does not meet either of the Federal Energy Regulatory Commission's (Commission) criteria for a Regional Reliability Standard.
- The standard falls short of Order 672 requirements for clarity and may obfuscate due process.
- The reliability-related substance is addressed in peripheral NERC Standards (VAR-002-4, Generator Operation for Maintaining Network Voltage Schedules and VAR-001-4.1 Voltage and Reactive Control).
- Proposed retirement of Regional Reliability Standard VAR-002-WECC-2 and requiring the generator operate to comply with VAR-002-4 will have the generator operators providing transmission operators with procedures or other documents in real-time that inform the transmission operator of when an automatic voltage regulator will be out-of-service such as: 1) having the Automatic Voltage Regulator (AVR) in service at all times except during specific circumstances, 2) maintaining AVR to stated criteria, 3) installing and completing start-up testing of an automatic voltage regulator; and 4) repairing or replacing a AVR within a specified time period.
- The retiring of the proposed Regional Reliability Standard VAR-002-WECC-2 and following the requirements of VAR-002-4 improves upon the existing regional Reliability Standard by focusing the in-service requirement on performance of the automatic voltage regulator rather than counting the hours they are online; stating the automatic voltage regulator policies and guidelines into the NERC standard, and reducing administrative requirements with little benefit to reliability.

If the document is retired, the reliability-related substance is still addressed in peripheral NERC Standards.

Overview

The following narrative and crosswalk are offered in support of retiring the entire standard. This document is presented in three segments: 1) presentation in narrative form, 2) a tabular representation

[1] Unless otherwise specified, capitalized terms are those defined in the NERC Glossary of Terms Used in Reliability Standards, the NERC Functional Model, and the NERC Rules of Procedures.

of the standard and how it is addressed in other NERC standards, and 3) inclusion of the standard proposed for retirement.[2]

If you have questions on the narrative, the DT encourages you to contact the DT chair, Mr. David Lemmons at (770) 407-7584, or WECC staff support Mr. W. Shannon Black at (503) 307-5782.

Development History of VAR-002-WECC-2

WECC filed the original Version Zero of the standard after a "1996 disturbance, which was caused by insufficient supply of reactive power from generators, including automatic voltage regulators that were not operating in voltage control mode. Because of this experience, WECC determined that there should be only very limited circumstances where a generator should remove its unit from [Automatic Voltage Regulation] operation."[3]

On June 8, 2007, the Commission approved eight WECC Regional Reliability Standards that apply in the Western Interconnection, including WECC-VAR-STD-002a-1 (Automatic Voltage Regulators) and WECC-VAR-STD-002b-1 (Power System Stabilizer). The Commission subsequently approved revisions to both WECC-VAR-STD-002a-1 and WECC VAR-STD-002b-1, which were re-designated VAR-002-WECC-1 and VAR-501-WECC-1, respectively, in Order No. 751.

On March 15, 2012, the Commission issued an order commonly known as the Find, Fix, and Track (FFT) Order in which Paragraph 81 suggested a review of all standards targeting retirement of redundant or otherwise unneeded requirements (AKA: P81). In response, NERC and WECC identified for retirement VAR-002-WECC-1, Requirement R2. Requirement R2 was retired resulting in VAR-002-WECC-2.

In reviewing VAR-002-WECC-2, the WECC-0127 DT determined that full retirement of the standard would be in order.

Criteria for Acceptance of a Regional Reliability Standard (RRS)

[2] A developmental roadmap and an implementation plan were included in the originally posted version of this document. They were removed from this document and presented to NERC/FERC as freestanding documents titled "WECC-0127 VAR-002-WECC-2 Request to Retire – Attachment E Project Roadmap" and "WECC-0127 VAR-002-WECC-2 Request to retire – Attachment F Implementation Plan".

[3] Order Approving Regional Reliability Standards for the Western Interconnection and Directing Modifications, Docket No. RR07-11-000, 119 FERC ¶ 61,260, (Issued June 8, 2007), P.114. (hereafter cited as RRS Order.) An "automatic voltage regulator" is a device that continuously monitors the generator terminal voltage and changes the reactive power output as required to maintain (or regulate) the voltage within a pre-determined voltage range. For example, if a load increase causes a decline in system voltages and thereby the terminal voltage of a generator, the automatic voltage regulator will increase the generator's reactive output to raise the terminal voltage. RRS Order, Fn 86.

A regional difference from a continent-wide Reliability Standard must either be: (1) more stringent than the continent-wide Reliability Standard, or (2) necessitated by a physical difference in the Bulk-Power System.[4] VAR-002-WECC-2 fails both tests. Further, because the reliability goal of the RRS is addressed in VAR-002-4 and VAR-001-4.1, VAR-002-WECC-2 can be retired without incurring any negative impact to reliability. Lastly, the language of VAR-002-WECC-2 is so amorphous as to fail the Commission's Order 672 threshold by obfuscating due process.

VAR-002-WECC-2 is less stringent than VAR-002-4[5]

On March 3, 2015, the Commission approved VAR-002-WECC-2 on the premise that it was more stringent than its NERC counterpart, VAR-002-3.[6] The Commission's conclusion was based on the premise that VAR-002-WECC-2 "requires all synchronous generators to have their voltage regulator in service at all time with only exceptions for specified circumstances … [whereas] [t]he related NERC Reliability Standard…permits a generator to remove its automatic voltage regulator from service for additional reasons."[7] Although the Commission's conclusion was accurate, analysis since VAR-002-WECC-2's inception shows that the applicable entity(s) can iteratively layer WECC's exceptions resulting in a standard no more stringent than VAR-002-3.

Further, the analysis shows the practical impact of VAR-002-WECC-2 is that the applicable entity simply ends up counting hours of operation without any mandate to deploy Automatic Voltage Regulation should it not be in service. By contrast, VAR-002-4 requires remediation as well as implementation of alternative operation in the event AVR is not in service. Finally, VAR-002-WECC-2 falls short of the Order 672 criteria in that ambiguous verbiage obfuscates due process.

Compounding Exceptions

At first glance, the WECC standard appears to require AVR operation for 98% of all hours whereas the NERC standard requires AVR operation for 100% of all hours. Although the prima facie argument for retirement is met there, on closer examination, neither standard truly requires operation for a specified

[4] Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards, Order No. 672, FERC Stats. & Regs. 31,204, at P 291, order on reh'g, Order No. 672-A, FERC Stats. & Regs. ¶ 31,212 (2006).
[5] Approval Order, P14.
[6] Docket No. RD15-1-000, Order Approving Two Regional Reliability Standards, Issued March 3, 2015. Hereafter Approval Order.
[7] Approval Order P14.

number of hours; therefore, neither the WECC 98% threshold nor the NERC 100% threshold is greater when practical application is considered.

In VAR-002-WECC-2, the applicable entities are required to have AVR "in service and in automatic voltage control mode 98% of all operating hours", unless they are permitted not to run under any one of ten possible scenarios. A first glance this limited set of exceptions is more stringent than the broader allowance allowed by VAR-002-4; however, when practical application is considered the limited set of exceptions offered by WECC becomes equal to or greater than the set of exceptions allowed by VAR-002-4. As such, VAR-002-WECC-2 is not more stringent than VAR-002-4 and fails the first test for approval as a Regional Reliability Standard.

A review of all ten scenarios shows that an application of eight of the ten exemptions allows the AVR to be off 100% of the time, like VAR-002-4 (8760 hours per year), in some cases up to two years.

- In R1.1 no AVR is required if a unit only runs 43.8 hours per year.
- In R1.3 no AVR is required if there is "instability due to abnormal system configuration."
- In R1.5 no AVR is required if there is component failure with an explanation. (Up to two years.)
- In R1.6 no AVR is required if there is component failure with an explanation. (Up to two years.)
- In R1.7 no AVR is required if the unit is not commercially operational.
- In R1.8/9 no AVR is required if the unit is "unavailable."
- In R10 no AVR is required if there are issues with Load Tap Changer operations.

The 100% exception offered by these eight exemptions is no more stringent than VAR-002-4. Only in exceptions R1.2 and R1.4 is there an objective and quantifiable mandate to run AVR.

Under Requirement R1.2, an entity is arguably required to run for no less than 7912.8 hours annually.[8] The unit is exempt from operation when performing "maintenance and testing up to a maximum of seven calendar days per calendar quarter." However, if the 7-day maintenance and testing exemption is used up, depending on the precipitating fact pattern, the AVR might continue to be off due to instability (R1.3 and R1.10), due to component failure for up to two years (R1.4, R1.5, and R1.6), or simply because the unit was unavailable (R1.8 and R1.9). Depending on the precipitating fact pattern, the R1.2 exception could be compounded with many of the other exceptions resulting in no practical mandate to run AVR.

[8] 8760 hours annual – ((7 calendar days X 24 hours =168 hours) X 4 quarters) = 672 hours exempted)) – (the two percent grace period allowed in the body of Requirement R1 (8760 X .02 = 175.2 hours)) = 7912.8 hours annually.

In like fashion, under Requirement R1.4, an entity is arguably required to run for no less than 7147.8 hours annually.[9] The unit is exempt from operation for "60 consecutive days for repair per incident." However, the additional qualifier "per incident" would allow the clock to reset on day 61 thereby defeating the purpose of the limited window requiring the AVR to be on. Even if the 61-day reset approach was not adopted, arguably the incident could be compounded with any number of the remaining exemptions resulting in a component not running at all (see R1.2 explanation). In short, Requirement R1.4 is no more firm in its mandate to run than the other Requirement R1 exemptions. Thus, it is no more stringent than the allowable exceptions of VAR-002-4. Because it is no more stringent it fails the first prong test for approval as a Regional Reliability Standard and should be retired.

VAR-002-4 carries a similar amorphous exception to running in that Requirement R1 requires the applicable entity to operate its generator in AVR mode: 1) *except when* some other mode is called for by the Transmission Operator, 2) *except when* exempted by the Transmission Operator, or, 3) *except when* the Generator Operator notifies the Transmission Operator that one of a specific number of exceptions has occurred. VAR-002-4's 100% requirement to run, though prima facie evidence of being more stringent than VAR-002-WECC-2, is further whittled down each time: 1) the generator is being operated in start-up, shutdown, or testing mode, 2) the Transmission Operator exempts the AVR from running, or, 3) the AVR is out-of-service.

In short, like VAR-002-WECC-2, VAR-002-4 contains so many exceptions to the rule that neither the 98% nor the 100% threshold have a concrete numerical meaning. Neither threshold is better than the other. Ultimately, whether a unit is on or off will be completely fact specific under each of the standards. As such, the WECC Regional Reliability Standard is no more stringent that the NERC Standard, fails the Order 672 test, and should not be retained on that premise. Further blurring the line between the 98% and 100% thresholds, the language of VAR-002-WECC-2 is sufficiently ambiguous to either obfuscate due process on the one hand or to create undefined discretionary powers for the applicable entities on the other.

VAR-002-WECC-2 Obfuscates Due Process[10]

[9] 8760 hours annually – (60 days X 24 hours = 1440 hours) – (the two percent grace period allowed in the body of Requirement R1 (8760 X .02 = 175.2 hours)) = 7144.8 hours annually).

[10] The Federal Energy Regulatory Commission (FERC) Order 740, Docket No. RM09-15-000, P23, noted that "in the Western Interconnection a significant number of transmission paths are voltage or frequency stability-limited, in contrast to other regions of the [BES] where transmission paths more often are thermally-limited. Disturbances resulting in a stability-limited transmission path overload, generally, must be responded to in a shorter time frame than a disturbance that results in a thermally-limited transmission path overload. [FERC has also noted] its understanding that this physical difference is one of the reasons for the need for certain provisions of regional Reliability Standards in the Western Interconnection."

Per Order 672 at P325, the Regional 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.

No Criteria for Instability

In VAR-002-WECC-2, Requirements R1.3 and R.10 requires no AVR if the AVR exhibits "instability due to abnormal system configuration" (R1.3) or "instability due to operation of a Load Tap Changer" (R1.10). It should be noted that nowhere in the document is there an explanation of what constitutes "instability". Presumably, the operator decides based on its own criteria. If so, this means the operator has full discretion as to whether the AVR runs of not. Without precise boundaries, the requirement offers no due process on the one hand and immense latitude on the other.

No Criteria for Components

VAR-002-WECC-2, Requirements R1.4, R1.5 and R1.6 require no AVR for up to two years (R1.5 at one year; R1.6 at two years) if a "component" fails. Like R1.3, what constitutes a component is not defined. The NERC Glossary of Terms Used in Reliability Standards adds no definitive insights as there, a component ranges from a generator, transmission line, circuit breaker, switch or electrical element (see Contingency). What is known about the component is that an Element may contain more than one component (see Element), an Interconnection contains many of them, they are part of a System that may include generation, transmission, and distribution "components" (see System), and from R1.6 we know the intended components may include replacing the AVR, limiters, and controls but not necessarily the power source and power bridge. In sum, like R1.3, the requirement is so vague as to obfuscate due process on the one hand and provide the applicable entity with an immense amount of discretion on the other.[11]

No Criteria for Unavailability

VAR-002-WECC-2, Requirements R1.8 and R1.9 require no AVR if the Transmission Operator directs the Generator Operator to operate the generator, and the AVR is "unavailable." There is no indication as to who makes that determination or under what circumstances that determination is made. Plainly defined, unavailable means not suitable for use. Without further definition, the operator could use any

[11] Per Order 672 at P324, a proposed reliability standard must contain a technically sound method to achieve the goal. VAR-002-WECC-2, exception R1. R1.1 requires no AVR if the unit runs for less than five percent of all hours during any calendar quarter. Of note, the drafting team found no technical support for the five percent threshold lending to the conclusion that it may be arbitrary.

number of undefined criteria to conclude its equipment was "unavailable." What constitutes unavailable is so vast that it obfuscates due process and in practice creates in the applicable entity the ability to have AVR off for nearly any reason, so long as the reason is documented and the applicable entity counts the associated hours.

In short, if the applicable entity decides the unit is unstable, unavailable, or that an undefined component is not working well – there is no obligation to run AVR. When compared to the exemptions allowed in VAR-002-4 the analysis shows little if any distinction. Because there is no call for remediation in the event the AVR does not run, the practical result is a standard that counts hours.

Counting Hours vs. Ensuring Reliability

VAR-002-WECC-2 has only one requirement – that the Generator Operators and Transmission Operators have AVR in service and in AVR mode 98% of the time – unless otherwise exempted under any one or more of the ten allowed exemptions. Because compliance with the standard is structured towards documentation, in practice the applicable entity can work at building "up" to the 98% rather than keeping equipment in service 100% of the time. Compliance for the single requirement is to file reports that count hours – nothing more. VAR-002-WECC-2 has no mandate for remediation nor call for alternative means to support reliability if the AVR does not run.

By contrast, VAR-002-4 contains the additional benefit for reliability not otherwise contained in VAR-002-WECC-2. VAR-002-4, Requirement R2.1 requires deployment of an alternate means to meet the reliability goal in the event there is a concern with the AVR; no such deployment is required by the RRS. VAR-002-4, Requirement R2.2 requires the Generator Operator to explain to the Transmission Operator why it cannot comply with a schedule; no such communication is required by the RRS. VAR-002-4, Requirement R2.3 requires an alternative means to meet the requirement goal; the RRS does not. VAR-002-4, Requirement R3-R5 require reciprocal communication of events; the RRS requires no communication. VAR-002-4 requires that step-up transformer tap change(s) take place as needed; the RRS speaks of tap changes by creates no mandate to make the change(s). In each of these requirements, VAR-002-4 exceeds the reliability mandates of VAR-002-WECC-2.

In the event the stringency of the two standards was found to be essentially the same ("Run, except when you don't."), the drafting team argues that the scale of stringency should tip in favor of VAR-002-4 because the latter requires remedial action whereas VAR-002-WECC-2 does not.

Physical Difference in the Bulk-Power System

A Regional Reliability Standard may be approved when the standard is needed because of a unique physical difference in the Bulk-Power System. Although the drafting team continues to take note of the

Western Interconnection's unique configuration and operational needs, the argument of unique physicality is not applicable to this case.

Covered Elsewhere

Although VAR-002-WECC-2 Requirement R1 requires the Transmission Operator to have AVR in service, VAR-002-4 has no reciprocal requirement for the Transmission Operator; however, the reliability goal is captured in VAR-001-4.1 – Voltage and Reactive Control. There, Requirements R1 and R2 require the Transmission Operator to specify a system voltage schedule (R1), and to schedule sufficient reactive resources to regulate voltage levels under normal and Contingency conditions. To the extent that VAR-001-4.1 requires the Transmission Operator to specify and schedule reactive resources such as AVR, R1 and R2 of VAR-001-4.1 meet the reliability goal of VAR-002-WECC-2 without specifying "how" the task is met (results oriented). Thus, if VAR-002-WECC-2 is retired, the reliability task specific to the Transmission Operator remains intact in VAR-001-4.1. Similarly, VAR-002-4 covers the Generator Operator's requirements, unless otherwise exempted.

The drafting team noted that VAR-001-4.1 Requirement R3 requires the Transmission Operator to "operate or direct the Real-time operation of devices to regulate transmission voltage and reactive flow as necessary." Whereas VAR-002-WECC-2 creates a static setting for AVR thereby removing discretion from the operator, VAR-001-4.1 allows the operator to attain the same reliability goal based on all the surrounding circumstances in real-time. For example, although VAR-002-WECC-2 requires synchronous condensers to be in service and set to AVR mode, VAR-001-4.1 R3 and associated schedule-related requirements allow greater flexibility of operation while meeting the same reliability goal. This means that a specific listing of the synchronous condenser need not be retained in VAR-002-WECC-2 because VAR-001-4.1 allows the Transmission Operator to include it as needed in reactive power schedules.

Finally, in examining VAR-001-4.1, the drafting team notes that the obligations of the Transmission Operator are carried in to the Regional Variance.

VAR-001-4.1 contains a WECC Regional Variance that supersedes NERC's Requirements R4 and R5. When applied, the variance does not allow the Transmission Operator to exempt the Generator Operator from operating its AVR; therefore, any generator not having a functioning AVR is required to work with the Transmission Operator to correct the issue. As such, if VAR-002-WECC-2 is retired the more stringent approach taken in the variance is retained to ensure reliability.

Section 2: Tabular Crosswalk – Covered Elsewhere

Requirement R1

R1. Generator Operators and Transmission Operators shall have AVR in service and in automatic voltage control mode 98% of all operating hours for synchronous generators or synchronous condensers. Generator Operators and Transmission Operators may exclude hours for R1.1 through R1.10 to achieve the 98% requirement. [Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]

(Exceptions R1.1 through R1.10 are covered below.)

Analysis Table: Requirement R1

Applicable Entities and Facilities Covered Elsewhere

WECC Standard	NERC Standards	Narrative
VAR-002-WECC-2 Applicability 4.1 Generator Operators 4.2 Transmission Operators that operate synchronous condensers 4.3 This VAR-002-WECC-2 Standard only applies to synchronous generators and synchronous condensers that are connected to the Bulk Electric System.	VAR-001-4.1 Applicability 4.1 Transmission Operators 4.2 Generator Operators within the Western Interconnection (for the WECC Variance) VAR-002-4 Applicability 4.1 Generator Operator 4.2 Generator Owner	The Applicable Entities of the WECC Standard are addressed in VAR-001-4.1 and VAR-002-4. Whereas VAR-002-WECC-2 specifically identifies generators and synchronous condensers as the applicable facilities, these specific assets need not be called out. Rather, by setting the voltage schedule as a results-oriented goal, the Transmission Operator can allow for an array of assets to deploy without confining the resources to a specific list.

Attachment G
Technical Justification

WECC-0127 VAR-002-WECC-2
Automatic Voltage Regulators

WESTERN ELECTRICITY COORDINATING COUNCIL

Developed as WECC-0127

Analysis Table: Requirement R1

AVR in Service and Controlling – Covered Elsewhere

VAR-002-WECC-2	VAR-002-4	VAR-001-4.1	Narrative
Generator Operator and Transmission Operator	Generator Operator	Transmission Operator	
R1. Generator Operators and Transmission Operators shall have AVR in service and in automatic voltage control mode.	R1. The Generator Operator shall operate each generator connected to the interconnected transmission system (with its automatic voltage regulator (AVR) in service) in the automatic voltage control mode.	R1. Each Transmission Operator shall specify a system voltage schedule (which is either a range or a target value with an associated tolerance band) as part of its plan to operate within System Operating Limits and Interconnection Reliability Operating Limits.	The Generator Operator and the Transmission Operator's reliability tasks are addressed in VAR-002-4 and VAR-001-4.1. and its Regional Variance. By creating the voltage schedule, the Transmission Operator sets the reliability goal to be met without restricting the specific type of resource to be used. Restated, the VAR-01-4.1 approach is inclusive of VAR-002-WECC-2 without specifying "how" the goal is to be met.
		R2. Each Transmission Operator shall schedule sufficient reactive resources to regulate voltage levels under normal and	

		Contingency conditions. (Various means are allowed.)	
		R3. Each Transmission Operator shall operate or direct the Real-Time operation of device to regulate transmission voltage and reactive flow as necessary.	

Analysis Table: Requirement R1 **Exceptions to the Rule – Covered Elsewhere**		
VAR-002-WECC-2	VAR-002-4	Narrative
General: AVR shall be in service 98% of the time, unless covered by one of ten exceptions.	General: AVR shall be in service 100% of the time, unless covered by an exception.	Because the VAR-002-WECC-2 list of exceptions can be compounded, the practical result is that the specific list of exceptions is not more stringent than the generalized exception offed in VAR-002-4. Thus, VAR-002-WECC-2 is not more stringent than VAR-002-4.
Exceptions: R1.1 through R1.10.	Exceptions: [When] the generator is being operated in start-up, shutdown, or testing mode pursuant to a real-time communication or a procedure that was previously provided to the Transmission Operator; or, (AKA: Start up, shutdown, or testing.) [When] the generator is not being operated in automatic voltage control mode or in the control mode that was instructed by the Transmission Operator for a reason other than start-up, or testing.	

	(AKA: Other than start up, shutdown, or testing.)	
R1.1 The synchronous generator or synchronous condenser operates for less than five percent of all hours during any calendar quarter.	[R1.1] Other than start up, shutdown, or testing.	
R1.2. Performing maintenance and testing up to a maximum of seven calendar days per calendar quarter.	[R1.2] Start up, shutdown, or testing.	
R1.3. AVR exhibits instability due to abnormal system configuration.	[R1.3] Other than start up, shutdown, or testing.	
R1.4. Due to component failure, the AVR may be out of service up to 60 consecutive days for repair per incident.	[R1.4] Other than start up, shutdown, or testing.	
R1.5. Due to a component failure, the AVR may be out of service up to one year provided the Generator Operator or Transmission Operator submits documentation identifying the need for time to obtain replacement parts and if required to schedule an outage.	[R1.5] Other than start up, shutdown, or testing.	

R1.6. Due to a component failure, the AVR may be out of service up to 24 months provided the Generator Operator or Transmission Operator submits documentation identifying the need for time for excitation system replacement (replace the AVR, limiters, and controls but not necessarily the power source and power bridge) and to schedule an outage.	[R1.6] Other than start up, shutdown, or testing.	
R1.7. The synchronous generator or synchronous condenser has not achieved Commercial Operation.	[R1.7] Start up, shutdown, or testing.	
R1.8. The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the AVR is unavailable for service.	[R1.8] Other than start up, shutdown, or testing.	
R1.9. The Reliability Coordinator directs Transmission Operator to operate the synchronous condenser, and the AVR is unavailable for service.	[R1.9] Other than start up, shutdown, or testing.	
R1.10. If AVR exhibits instability due to operation of a Load Tap Changer (LTC) transformer in the area, the Transmission Operator may authorize the Generator Operator to operate the	[R1.10] Other than start up, shutdown, or testing.	

excitation system in modes other than automatic voltage control until the system configuration changes.		

Section 3: Existing Standard Proposed for Retirement

VAR-002-WECC-2

A. Introduction

1. Title: **Automatic Voltage Regulators (AVR)**

2. Number: VAR-002-WECC-2

3. Purpose: To ensure that Automatic Voltage Regulators on synchronous generators and condensers shall be kept in service and controlling voltage.

4. Applicability

4.1. Generator Operators

4.2. Transmission Operators that operate synchronous condensers

4.3. This VAR-002-WECC-2 Standard only applies to synchronous generators and synchronous condensers that are connected to the Bulk Electric System.

5. Effective Date: On the first day of the first quarter, after applicable regulatory approval.

B. Requirements

R1. Generator Operators and Transmission Operators shall have AVR in service and in automatic voltage control mode 98% of all operating hours for synchronous generators or synchronous condensers. Generator Operators and Transmission Operators may exclude hours for R1.1 through R1.10 to achieve the 98% requirement. *[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]*

R1.1. The synchronous generator or synchronous condenser operates for less than five percent of all hours during any calendar quarter.

R1.2. Performing maintenance and testing up to a maximum of seven calendar days per calendar quarter.

R1.3. AVR exhibits instability due to abnormal system configuration.

R1.4. Due to component failure, the AVR may be out of service up to 60 consecutive days for repair per incident.

R1.5. Due to a component failure, the AVR may be out of service up to one year provided the Generator Operator or Transmission Operator submits

documentation identifying the need for time to obtain replacement parts and if required to schedule an outage.

R1.6. Due to a component failure, the AVR may be out of service up to 24 months provided the Generator Operator or Transmission Operator submits documentation identifying the need for time for excitation system replacement (replace the AVR, limiters, and controls but not necessarily the power source and power bridge) and to schedule an outage.

R1.7. The synchronous generator or synchronous condenser has not achieved Commercial Operation.

R1.8. The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the AVR is unavailable for service.

R1.9. The Reliability Coordinator directs Transmission Operator to operate the synchronous condenser, and the AVR is unavailable for service.

R1.10. If AVR exhibits instability due to operation of a Load Tap Changer (LTC) transformer in the area, the Transmission Operator may authorize the Generator Operator to operate the excitation system in modes other than automatic voltage control until the system configuration changes.

C. Measures

M1. Generator Operators and Transmission Operators shall provide quarterly reports to the compliance monitor and have evidence for each synchronous generator and synchronous condenser of the following:

M1.1 The actual number of hours the synchronous generator or synchronous condenser was on line.

M1.2 The actual number of hours the AVR was out of service.

M1.3 The AVR in service percentage.

M1.4 If excluding AVR out of service hours as allowed in R1.1 through R1.10, provide:

M1.4.1 The number of hours excluded,

M1.4.2 The adjusted AVR in-service percentage,

M1.4.3 The date of the outage.

D. Compliance

1. Compliance Monitoring Process

1.1 Compliance Monitoring Responsibility

Compliance Enforcement Authority

1.2 Compliance Monitoring Period

Compliance Enforcement Authority may use one or more of the following methods to assess compliance:

- Reports submitted quarterly

- Spot check audits conducted anytime with 30 days notice

- Periodic audit as scheduled by the Compliance Enforcement Authority

- Investigations

- Other methods as provided for in the Compliance Monitoring Enforcement Program

The Reset Time Frame shall be a calendar quarter.

1.3 Data Retention

The Generator Operators and Transmission Operators shall keep evidence for Measures M1 for three years plus current year, or since the last audit, whichever is longer.

1.4 Additional Compliance Information

1.4.1 The sanctions shall be assessed on a calendar quarter basis.

1.4.2 If any of R1.2 through R1.9 continues from one quarter to another, the number of days accumulated will be the contiguous calendar days from the beginning of the incident to the end of the incident. For example, in R1.4 if the 60 day repair period goes beyond the end of a quarter, the repair period does not reset at the beginning of the next quarter.

1.4.3 When calculating the in-service percentages, do not include the time the AVR is out of service due to R1.1 through R1.10.

1.4.4 The standard shall be applied on a machine-by-machine basis (a

Generator Operator or Transmission Operator can be subject to a separate sanction for each non-compliant synchronous generator and synchronous condenser).

E. Regional Differences

None

Table of Compliance Elements

R	Time Horizon	VRF	Violation Severity Levels			
			Lower VSL	Moderate VSL	High VSL	Severe VSL
R1	Operational Assessment	Medium	There shall be a Lower Level of non-compliance if AVR is in service less than 98% but at least 90% or more of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.	There shall be a Moderate Level of non-compliance if AVR is in service less than 90% but at least 80% or more of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.	There shall be a High Level of non-compliance if AVR is in service less than 80% but at least 70% or more of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.	There shall be a Severe Level of non-compliance if AVR is in service less than 70% of all hours during which the synchronous generating unit or synchronous condenser is on line for each calendar quarter.

Attachment G
Technical Justification

WECC-0127 VAR-002-WECC-2
Automatic Voltage Regulators

Version History

Version	Date	Action	Change Tracking
1	April 16, 2008	Permanent Replacement Standard for VAR-STD-002a-1	
1	April 21, 2011	FERC Order issued approving VAR-002-WECC-1 (FERC approval effective June 27, 2011; Effective Date July 1, 2011)	
2	November 13, 2014	Adopted by NERC Board of Trustees	
2	March 3, 2015	FERC letter order approving VAR-002-WECC-2	

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Unofficial Comment Form

Regional Reliability Standard – Retirement
VAR-002-WECC-2

DO NOT use this form for submitting comments. Use the electronic form to submit comments on the proposed retirement of the Regional Reliability Standard **VAR-002-WECC-2 – Automatic Voltage Regulators**. The electronic form must be submitted by **8 p.m. Eastern, Monday, December 18, 2017.**

Documents and information about this project are available on the WECC's Standards Under Development page. If you have questions, contact Standards Developer, Mat Bunch (via email) or at (404) 446-9785.

Background Information

The WECC drafting team recommends the retirement of Regional Reliability Standard VAR-002-WECC-2 due to the following:

- The standard does not meet the FERC criteria for a Regional Reliability Standard;
- The standard does not meet FERC Order No. 672 requirements for clarity; and
- The reliability-related substance is addressed in other continent-wide NERC Standards (VAR-002-4 and VAR-001-4.1); and
- Other issues cited in the technical justification document.

NERC Criteria for Developing or Modifying a Regional Reliability Standard

Regional Reliability Standard shall be: (1) a regional reliability standard that is more stringent than the continent-wide reliability standard, including a regional standard that addresses matters that the continent-wide reliability standard does not; or (2) a regional reliability standard that is necessitated by a physical difference in the bulk power system. Regional reliability standards shall provide for as much uniformity as possible with reliability standards across the interconnected bulk power system of the North American continent. Regional reliability standards, when approved by FERC and applicable authorities in Mexico and Canada, shall be made part of the body of NERC reliability standards and shall be enforced upon all applicable bulk power system owners, operators, and users within the applicable area, regardless of membership in the region.

The approval process for a regional reliability standard requires NERC to publicly notice and request comment on the proposed standard. Comments shall be permitted only on the following criteria (technical aspects of the standard are vetted through the regional standards development process):

> **Open** — Regional reliability standards shall provide that any person or entity that is directly and materially affected by the reliability of the bulk power system within the regional entity shall be able to participate in the development and approval of reliability standards. There shall be no undue financial barriers to participation. Participation shall not be conditional upon membership

in the regional entity, a regional entity or any organization, and shall not be unreasonably restricted on the basis of technical qualifications or other such requirements.

Inclusive — Regional reliability standards shall provide that any person with a direct and material interest has a right to participate by expressing an opinion and its basis, having that position considered, and appealing through an established appeals process, if adversely affected.

Balanced — Regional reliability standards shall have a balance of interests and shall not be dominated by any two-interest categories and no single-interest category shall be able to defeat a matter.

Due Process — Regional reliability standards shall provide for reasonable notice and opportunity for public comment. At a minimum, the standard shall include public notice of the intent to develop a standard, a public comment period on the proposed standard, due consideration of those public comments, and a ballot of interested stakeholders.

Transparent — All actions material to the development of regional reliability standards shall be transparent. All standards development meetings shall be open and publicly noticed on the regional entity's Web site.

Review the revised the Regional Reliability Standard regional standard and answer the following questions.

1. Do you agree the development of the Regional Reliability Standard met the "Open" criteria as outlined above? If "No", please explain in the comment area below:

   ☐ Yes
   ☐ No
   Comments:

2. Do you agree the development of the Regional Reliability Standard met the "Inclusive" criteria as outlined above? If "No", please explain in the comment area below:

   ☐ Yes
   ☐ No
   Comments:

3. Do you agree the development of the Regional Reliability Standard met the "Balanced" criteria as outlined above? If "No", please explain in the comment area below:

   ☐ Yes
   ☐ No
   Comments:

4. Do you agree the development of the Regional Reliability Standard met the “Due Process” criteria as outlined above? If “No”, please explain in the comment area below:

   ☐ Yes
   ☐ No
   Comments:

5. Do you agree the development of the Regional Reliability Standard met the “Transparent” criteria as outlined above? If “No”, please explain in the comment area below:

   ☐ Yes
   ☐ No
   Comments:

Comment Report

Project Name:	Regional Reliability Standard (WECC) | VAR-002-WECC-2 Retirement
Comment Period Start Date:	11/3/2017
Comment Period End Date:	12/18/2017
Associated Ballots:	

There were 6 sets of responses, including comments from approximately 6 different people from approximately 6 companies representing 4 of the Industry Segments as shown in the table on the following pages.

Questions

1. Do you agree the development of the Regional Reliability Standard met the "Open" criteria as outlined above? If "No", please explain in the comment area below:

2. Do you agree the development of the Regional Reliability Standard met the "Inclusive" criteria as outlined above? If "No", please explain in the comment area below:

3. Do you agree the development of the Regional Reliability Standard met the "Balanced" criteria as outlined above? If "No", please explain in the comment area below:

4. Do you agree the development of the Regional Reliability Standard met the "Due Process" criteria as outlined above? If "No", please explain in the comment area below:

5. Do you agree the development of the Regional Reliability Standard met the "Transparent" criteria as outlined above? If "No", please explain in the comment area below:

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region

1. Do you agree the development of the Regional Reliability Standard met the “Open” criteria as outlined above? If “No”, please explain in the comment area below:	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

2. Do you agree the development of the Regional Reliability Standard met the "Inclusive" criteria as outlined above? If "No", please explain in the comment area below:
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Glen Farmer - Avista - Avista Corporation - 1,3,5

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC

Answer	Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

3. Do you agree the development of the Regional Reliability Standard met the “Balanced” criteria as outlined above? If “No”, please explain in the comment area below:	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

4. Do you agree the development of the Regional Reliability Standard met the "Due Process" criteria as outlined above? If "No", please explain in the comment area below:	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

5. Do you agree the development of the Regional Reliability Standard met the “Transparent” criteria as outlined above? If “No”, please explain in the comment area below:	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Attachment R2
Responses to Comments NERC

WECC-0127 VAR-002-WECC-2
Request to Retire
November 3 through December 18, 2017

Posting 1

The WECC-0127 VAR-002-WECC-2, Automatic Voltage Regulators, Request to Retire Drafting Team (DT) thanks everyone who submitted comments on the proposed project.

Posting

This document was posted for a 45-day public comment period at the North American Electricity Reliability Corporation (NERC) from November 3 through December 18, 2017.

On November 3, 2017, NERC distributed notice of the posting via the NERC Standards Announcements email exploder.

NERC received comments from six entities as shown in the following table.

Location of Comments

All comments received on the project can be viewed in their original format on the WECC-0127 project page under the "Submit and Review Comments" accordion. Additionally, the raw data provided to WECC by NERC in support of this filing is appended to this response form.

Changes in Response to Comment

No changes were made to the project based on the comments received during this posting.

Minority View

There were no minority concerns.

Effective Date and Implementation Plan

The Reliability Standards Development Procedures (Procedures) require that an implementation plan be posted with at least one posting of the project. The proposed date for retirement is immediately upon receipt of regulatory approval. The drafting team reports that no further actions are necessary for retirement.

Comment Report Form for WECC-0127

Action Plan

As of January 10, 2018, this project is awaiting filing at NERC.

Contacts and Appeals

If you feel your comment has been omitted or overlooked, please contact W. Shannon Black, WECC Consultant. In addition, the WECC Reliability Standards Appeals Process can be found in the Reliability Standards Development Procedures.

Comment Report Form for WECC-0127

WECC Standards Comment Table

Commenter		Organization
1	Aaron Cavanaugh	Bonneville Power Administration (BPA)
2	John Tolo	Tucson Electric Power Company (TEP)
3	Laurie Williams	PNM Resources - Public Service Company of New Mexico (PNM)
4	Sandra Shaffer	Berkshire Hathaway – PacifiCorp (PAC)
5	Glen Farmer	Avista
6	Michelle Amarantos	Arizona Public Service Company (APS)

Index to Questions, Comments, and Responses

Questions

1. Do you agree the development of the Regional Reliability Standard met the “Open” criteria as outlined above? If “No”, please explain in the comment area below:

2. Do you agree the development of the Regional Reliability Standard met the “Inclusive” criteria as outlined above? If “No”, please explain in the comment area below:

3. Do you agree the development of the Regional Reliability Standard met the “Balanced” criteria as outlined above? If “No”, please explain in the comment area below:

4. Do you agree the development of the Regional Reliability Standard met the “Due Process” criteria as outlined above? If “No”, please explain in the comment area below:

5. Do you agree the development of the Regional Reliability Standard met the “Transparent” criteria as outlined above? If “No”, please explain in the comment area below:

Comment Report Form for WECC-0127

1. Response Summary

Summary Consideration:	See summary in the preamble of this document.		
Commenter / Comment			**Response**
The WECC-0127 VAR-002-WECC-2, Automatic Voltage Regulators, Request to Retire Drafting Team thanks each party for their continued support and dedication to the standards development process. All respondents answered in the affirmative on all questions. There were no minority opinions nor were there requests for modification. No changes were made to the project.			

Raw Data provided by NERC Comment Report

Project Name:	Regional Reliability Standard (WECC) | VAR-002-WECC-2 Retirement
Comment Period Start Date:	11/3/2017
Comment Period End Date:	12/18/2017
Associated Ballots:	

There were 6 sets of responses, including comments from approximately 6 different people from approximately 6 companies representing 4 of the Industry Segments as shown in the table on the following pages.

Comment Report Form for WECC-0127

Questions

1. Do you agree the development of the Regional Reliability Standard met the "Open" criteria as outlined above? If "No", please explain in the comment area below:

2. Do you agree the development of the Regional Reliability Standard met the "Inclusive" criteria as outlined above? If "No", please explain in the comment area below:

3. Do you agree the development of the Regional Reliability Standard met the "Balanced" criteria as outlined above? If "No", please explain in the comment area below:

4. Do you agree the development of the Regional Reliability Standard met the "Due Process" criteria as outlined above? If "No", please explain in the comment area below:

5. Do you agree the development of the Regional Reliability Standard met the "Transparent" criteria as outlined above? If "No", please explain in the comment area below:

Comment Report Form for WECC-0127

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region

Comment Report Form for WECC-0127

1. Do you agree the development of the Regional Reliability Standard met the "Open" criteria as outlined above? If "No", please explain in the comment area below:	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

2. Do you agree the development of the Regional Reliability Standard met the "Inclusive" criteria as outlined above? If "No", please explain in the comment area below:	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

3. Do you agree the development of the Regional Reliability Standard met the "Balanced" criteria as outlined above? If "No", please explain in the comment area below:	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

4. Do you agree the development of the Regional Reliability Standard met the "Due Process" criteria as outlined above? If "No", please explain in the comment area below:	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

5. Do you agree the development of the Regional Reliability Standard met the "Transparent" criteria as outlined above? If "No", please explain in the comment area below:	
John Tolo - Unisource - Tucson Electric Power Co. - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1,3	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	