Document Title	**Automatic Voltage Regulators** **VAR-002-WECC-2**
File Name	
Category	(X) Regional Reliability Standard ( ) Regional Criterion ( ) Policy ( ) Guideline ( ) Report or other ( ) Charter
Document date	
Adopted/approved by	
Date adopted/approved	
Custodian (entity responsible for maintenance and upkeep)	Standards
Stored/filed	Physical location: Web URL:
Previous name/number	This document is designed to update VAR-002-WECC-1 with “P81” conforming changes.
Status	(X) Version 2 For NERC/FERC Approval ( ) usable, minor formatting/editing required ( ) modification needed ( ) superseded by ( ) other _____ ( ) obsolete/archived)

Version	Date	Action	Change Highlights
1	April 16, 2008	Permanent replacement standard for VAR-STD-002a-1.	
1	October 28, 2008	Adopted by NERC Board of Trustees	
1	April 21, 2011	FERC Order issued approving VAR-002-WECC-1 (approval effective June 27, 2011; Effective Date: July 1, 2011)	
2	May 28, 2014	Approval by WECC Ballot Pool	Remove Requirement R2 and Measure M2 pursuant to FERC Paragraph 81.

Project Roadmap

Completed Actions	Completed Actions
1. SAR received	12-3-2013
2. SAR deemed Complete/Valid/Team Site created	12-3-2013
3. WSC approved the SAR	1-8-2014
4. WSC solicits / assigns a drafting team (DT)	1-8-2014
5. First DT meeting	2-25-2014
6. WSC approves posting	3-12-2014
7. Posting 1 WECC open 45-day	3-14-2014
8. Posting 1 WECC closed	4-28-2014
9. DT meets to respond to comments	5-1-2014
10. WSC approves for ballot	5-20-2014
11. Joint Session Noticed	5-22-2014
12. Ballot Pool open	5-28-2014
13. Joint Session	6-12-2014
14. Ballot Pool closed	6-19-2014
15. Ballot open	6-25-2014
16. Ballot closed	7-18-2014
17. WSC meets to approve forwarding to the WECC Board of Directors	7-24-2014
18. Sent to NERC with a request for 45-day posting	7-25-2014
19. Posting 1 NERC Open	
20. Documents posted for 30 days prior to WECC Board meeting / Placed on Board agenda	
21. Posting 1 NERC Closes	
22. Posting 1 NERC Responses Posted	
23. Board meets to approve	
24. Sent to NERC for NERC Board of Trustee and final disposition	

Background

WECC-0105 P81 Project VAR Redraft

In Phase 1 of the "P81" Project, a NERC team identified the following WECC-specific Requirement for modification; however, since the underlying document is a WECC Regional Reliability Standard, NERC is not empowered to directly change the document. In response, a regional team is required to draft the identified changes.

The following VAR-002-WECC-1, Automatic Voltage Regulator, Requirement R2 is identified as administrative in nature and should be addressed accordingly.

VAR-002-WECC-1, Requirement R2 states:

R2. Generator Operators and Transmission Operators shall have documentation identifying the number of hours excluded for each requirement in R1.1 through R1.10. [Violation Risk Factor: Low] [Time Horizon: Operations Assessment]

This Requirement is a call to "have documentation." In this Standard, requiring documentation does not add to or detract from the reliability of the grid; rather, having documentation is an element of verifying that a reliability-related task has been completed. As such, this Requirement is better suited for inclusion in the associated Measure.

Because the changes are administrative in nature, on January 8, 2014, the WECC Standards Committee assigned drafting of the proposed change to WECC staff. Proposed changes are to be processed under the WECC Reliability Standards Development Procedures. The motion was as follows:

A motion was made by Ms. Angela Small that was seconded by Ms. Crystal Musselman to assign the redraft of VAR-002-WECC-1, Requirement R2, and VAR-501-WECC-1, Requirement R2, to staff for further development in accordance with the Procedures. The motion carried by consensus." WSC Minutes 1-8-2014

Description of Current Document

The proposed redline below:

1) Moves the administrative substance of Requirement R2 into the Measure of R1, deleting Requirement R2.

2) Because there is no longer a Requirement R2, Measure M2 and the associated Compliance values are deleted.

3) To update the style of the document, the Compliance values are moved into a Compliance Table.

Implementation Plan

Definitions of Terms Used

This section includes all newly defined or revised terms used in the proposed document. Terms already defined in the Reliability Standards Glossary of Terms are not repeated here. New or revised definitions listed below become approved when the proposed document is approved. When the document becomes effective, these definitions will be removed from the document and added to the appropriate NERC or WECC Glossary.

None proposed.

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 — Shows Approval History and Summaryy of Changes in the Action Field

Version	Date	Action	Change Tracking
1	April 16, 2008	Permanent Replacement Standard for VAR-STD-002a-1	
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