



April 7, 2009

**VIA OVERNIGHT MAIL**

Ms. Erica Hamilton, Commission Secretary  
British Columbia Utilities Commission  
Box 250, 900 Howe Street  
Sixth Floor  
Vancouver, B.C.  
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Re: *North American Electric Reliability Corporation*

Dear Ms. Hamilton:

The North American Electric Reliability Corporation (“NERC”) hereby submits this notice of four proposed regional reliability standards of the Western Electricity

Coordinating Council (“WECC”):

- FAC-501-WECC-1 — Transmission Maintenance;
- PRC-004-WECC-1 — Protection System and Remedial Action Scheme Misoperation;
- VAR-002-WECC-1 — Automatic Voltage Regulators; and
- VAR-501-WECC-1 — Power System Stabilizer<sup>1</sup>

and five associated new definitions:

- **Functionally Equivalent Protection System (“FEPS”):** A Protection System that provides performance as follows:
  - Each Protection System can detect the same faults within the zone of protection and provide the clearing times and coordination needed to

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<sup>1</sup> FAC-501-WECC-1 Transmission Maintenance was formerly known as WECC-PRC-STD-005-1 (Transmission Maintenance); PRC-004-WECC-1 Protection System and Remedial Action Scheme Misoperation was formerly known as WECC-PRC-STD-001-1 (Certification of Protective Relay Applications and Settings) and WECC-PRC-STD-003-1 (Protective Relay and Remedial Action Scheme Misoperation); VAR-002-WECC-1 Automatic Voltage Regulators was formerly known as WECC-VAR-STD-002a-1 (Automatic Voltage Regulators); and VAR-501-WECC-1 Power System Stabilizer was formerly known as WECC-VAR-STD-002b-1 (Power System Stabilizers).

- comply with all Reliability Standards.
- Each Protection System may have different components and operating characteristics.
- **Functionally Equivalent RAS (“FERAS”):** A Remedial Action Scheme (“RAS”) that provides the same performance as follows:
  - Each RAS can detect the same conditions and provide mitigation to comply with all Reliability Standards.
  - Each RAS may have different components and operating characteristics.
- **Security-Based Misoperation:** A Misoperation caused by the incorrect operation of a Protection System or RAS. Security is a component of reliability and is the measure of a device’s certainty not to operate falsely.
- **Dependability-Based Misoperation:** Is the absence of a Protection System or RAS operation when intended. Dependability is a component of reliability and is the measure of a device’s certainty to operate when required.
- **Commercial Operation:** Achievement of this designation indicates that the Generator Operator or Transmission Operator of the synchronous generator or synchronous condenser has received all approvals necessary for operation after completion of initial start-up testing.

set forth in **Exhibit A** to this notice. The proposed NERC reliability standards were approved by the NERC Board of Trustees on October 29, 2008. .

NERC’s reliability standard notice consists the following:

- This transmittal letter;
- A table of contents for the entire notice;
- A narrative description explaining justifying the reliability standards;
- WECC Regional Reliability Standards:
  - FAC-501-WECC-1 Transmission Maintenance,
  - PRC-004-WECC-1 Protection System and Remedial Action Scheme Misoperation,
  - VAR-002-WECC-1 Automatic Voltage Regulators,
  - VAR-501-WECC-1 Power System Stabilizer (**Exhibit A**);
- The NERC Board of Trustees’ Resolution on the WECC Regional Reliability Standards (**Exhibit B**)
- The complete development record of the proposed regional reliability standards (**Exhibit C**); and
- The Standard Drafting Team rosters (**Exhibit D**).

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Please contact the undersigned if you have any questions.

Respectfully submitted,

/s/ Rebecca J. Michael

Rebecca J. Michael  
*Assistant General Counsel for North  
American Electric Reliability  
Corporation*

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**BEFORE THE  
BRITISH COLUMBIA UTILITIES COMMISSION  
OF THE PROVINCE OF BRITISH COLUMBIA**

**NORTH AMERICAN ELECTRIC                    )  
RELIABILITY CORPORATION                    )**

**NOTICE OF THE  
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION  
OF FOUR PROPOSED WESTERN ELECTRICITY COORDINATING  
COUNCIL REGIONAL RELIABILITY STANDARDS**

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April 7, 2009

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## I. INTRODUCTION

The North American Electric Reliability Corporation (“NERC”) hereby provides notice of four regional reliability standards:

- FAC-501-WECC-1 Transmission Maintenance;
- PRC-004-WECC-1 Protection System and Remedial Action Scheme Misoperation;
- VAR-002-WECC-1 Automatic Voltage Regulators; and
- VAR-501-WECC-1 Power System Stabilizer<sup>2</sup>

and five associated new definitions of the following terms, which are identified below:

- Functionally Equivalent Protection System (“FEPS”)
- Functionally Equivalent RAS (“FERAS”)
- Security-Based Misoperation
- Dependability-Based Misoperation
- Commercial Operation

proposed by the Western Electricity Coordinating Council (“WECC”) to be in effect only within the Western Interconnection. These standards and definitions correct the deficiencies that the Federal Energy Regulatory Commission (“FERC”) identified in its June 8, 2007 Order approving the earlier, currently effective version of these regional reliability standards.<sup>3</sup>

On October 29, 2008, the NERC Board of Trustees approved the four regional reliability standards proposed by WECC that are the subject of this filing. **Exhibit A** to this filing sets forth the proposed WECC regional reliability standards. **Exhibit B** is the NERC Board of Trustees’ resolution to approve the proposed WECC regional reliability

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<sup>2</sup> FAC-501-WECC-1 Transmission Maintenance was formerly known as WECC-PRC-STD-005-1 (Transmission Maintenance); PRC-004-WECC-1 Protection System and Remedial Action Scheme Misoperation was formerly known as WECC-PRC-STD-001-1 (Certification of Protective Relay Applications and Settings) and WECC-PRC-STD-003-1 (Protective Relay and Remedial Action Scheme Misoperation); VAR-002-WECC-1 Automatic Voltage Regulators was formerly known as WECC-VAR-STD-002a-1 (Automatic Voltage Regulators); and VAR-501-WECC-1 Power System Stabilizer was formerly known as WECC-VAR-STD-002b-1 (Power System Stabilizers).

<sup>3</sup> *Order Approving Regional Reliability Standards for the Western Interconnection and Directing Modifications*, 119 FERC ¶ 61,260 (“June 8, 2007 Order”) (2007).

standards. **Exhibit C** contains the record of development for the proposed WECC regional reliability standards that includes WECC's approval process prior to submitting the proposed standard to NERC, WECC's submittal request to NERC for evaluation, NERC's response and evaluation of the proposed regional reliability standards, and the comments received during the industry-wide comment period NERC held on the proposed WECC standards. **Exhibit D** includes WECC's standard drafting team rosters.

NERC filed these regional reliability standards with FERC on February 9, 2009, and is also filing these standards with the Minister of Energy of the Province of Alberta..

## **II. NOTICES AND COMMUNICATIONS**

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

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## **III. BACKGROUND**

### **a. Regional Reliability Standards Development Procedure**

NERC develops reliability standards in accordance with Section 300 (Reliability Standards Development) of its Rules of Procedure and the NERC *Reliability Standards Development Procedure*, which is incorporated into the Rules of Procedure as Appendix 3A.

Further, Section 311 enables a Regional Entity to develop regional reliability standards that are to be recognized and made part of NERC reliability standards. To do so, a Regional Entity may request NERC to approve a Regional Entity Reliability Standards Development Procedure. The WECC Standards Development Process is included as Exhibit C of the Delegation Agreement between NERC and WECC. Section 312 states that “NERC shall rebuttably presume that a regional reliability standard developed, in accordance with a regional reliability standards development process approved by NERC, by a regional entity organized on an interconnection-wide basis, is just, reasonable, and not unduly discriminatory or preferential, and in the public interest, and consistent with such other applicable standards of governmental authorities.”

Section 312 also establishes other factors for the NERC Board of Trustees to consider in acting on a request to approve proposed regional standards. The NERC Board of Trustees must consider the Regional Entity’s request, NERC’s recommendation for action on the regional reliability standard, any unresolved stakeholder comments, and the Regional Entity’s consideration of the comments in determining whether to approve the regional reliability standard as a NERC reliability standard.<sup>4</sup>

On June 10, 2008 WECC submitted a request to NERC to approve, (i) FAC-501-WECC-1 Transmission Maintenance, (ii) PRC-004-WECC-1 Protection System and Remedial Action Scheme Misoperation, (iii) VAR-002-WECC-1 Automatic Voltage Regulators, (iv) VAR-501-WECC-1 Power System Stabilizer, and (v) five associated definitions of the following terms: Functionally Equivalent Protection System (FEPS), Functionally Equivalent RAS (FERAS), Security-Based Misoperation, Dependability-Based Misoperation, and Commercial Operation that are the subject of this petition.

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<sup>4</sup> NERC Rules of Procedure, § 312.3.1.



WECC developed these standards following the WECC Standards Development Process as part of its delegation agreement with NERC; therefore, NERC rebuttably presumes they are just, reasonable, and not unduly discriminatory or preferential, and in the public interest. NERC commenced an evaluation of the regional reliability standards as prescribed by Section 312 of NERC's Rules of Procedures, informed in part by the comments during NERC's 45-day posting of the regional standards and WECC's response to those comments.<sup>5</sup> During the evaluation, NERC identified minor shortcomings in the standards that WECC agreed to address in future revisions to the regional standards. NERC's evaluation of the proposed regional reliability standards is available in **Exhibit C**. The proposed WECC regional reliability standards were approved by the NERC Board of Trustees on October 29, 2008, conditioned on WECC's addressing the identified shortcomings in future revisions to the standards.

#### **b. Progress in Improving Proposed Reliability Standards**

These four regional standards address directives from FERC in its June 8, 2007 Order. In the Order, FERC approved the currently effective version of these standards, among others, and directed WECC to develop several specific modifications to the regional reliability standard when WECC develops, through its reliability standard development process, permanent, replacement reliability standard.

On June 10, 2008 WECC submitted to NERC seven replacement standards for the eight FERC approved regional standards approved in the June 8, 2007 Order, four of

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<sup>5</sup> In accordance with the NERC Rules of Procedure, NERC initiated its required 45-day public comment period concurrent with the WECC Board consideration of the proposed regional standards. This comment period began on April 4, 2008.

which are subject of this filing.<sup>6</sup> WECC utilized its WECC Standards Development Process to address FERC directives in the Order and no commenter disagreed. NERC confirmed that WECC followed its approved process per its Regional Delegation Agreement with NERC in developing four replacement standards.

Because these four standards address FERC's concerns in the June 8, 2007 Order, and since no substantial additional technical modifications were made to these four regional reliability standards, NERC continues to rebuttably presume these standards are just, reasonable, and not unduly discriminatory or preferential, and in the public interest.

#### **IV. DEVELOPMENT SUMMARY OF FOUR RELIABILITY STANDARDS**

On June 8, 2007, FERC approved, with conditions, eight WECC Tier 1 Reliability Management System ("RMS") Regional Reliability Standards stating that the reliability of the bulk power system of the Western Interconnection is best served by their implementation. These standards are:

- WECC-BAL-STD-002-0 — Operating Reserves
- WECC-IRO-STD-006-0 — Qualified Path Unscheduled Flow Relief
- WECC-PRC-STD-001-1 — Certification of Protective Relay Applications and Settings
- WECC-PRC-STD-003-1 — Protective Relay and Remedial Action Scheme Misoperation
- WECC-PRC-STD-005-1 — Transmission Maintenance
- WECC-TOP-STD-007-0 — Operating Transfer Capability
- WECC-VAR-STD-002a-1 — Automatic Voltage Regulators
- WECC-VAR-STD-002b-1 — Power System Stabilizers

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<sup>6</sup> PRC-004-WECC-1 is proposed to supersede both WECC-PRC-STD-001-1 and WECC-PRC-STD-003-1 that were approved by the Commission. NERC will file the remaining three WECC regional standards in a separate filing. These are BAL-002-WECC-1 (Contingency Reserves) that replaces WECC-BAL-STD-002-0 (Operating Reserves), IRO-006-WECC-1 (Qualified Transfer Path Unscheduled Flow Relief) that replaces WECC-IRO-STD-006-0 (Qualified Path Unscheduled Flow Relief), and TOP-007-WECC-1 (System Operating Limits) that replaces TOP-STD-007-0 (Operating Transfer Capability).

WECC, supported by the Western Interconnection Regional Advisory Body (“WIRAB”), identified these regional standards as essential and necessary for the reliable operation of the Western Interconnection. The majority of these standards were specifically developed to address and mitigate the main causes of two major system outages that occurred in the Western Interconnection in July and August of 1996.

WECC used its WECC Standards Development Process in developing these proposed standards, and, furthermore, satisfied the conditions under which the original Tier 1 standards were approved. NERC’s responsibility in considering proposed regional standards is to ensure the standards meet the statutory criteria to be approved.

WECC is a Regional Entity organized on an Interconnection-wide basis, and the proposed Regional Reliability Standards are to be applicable on an Interconnection-wide basis. As such, NERC rebuttably presumes the proposed standards are just, reasonable, not unduly discriminatory or preferential, and in the public interest. Absent strong technical objection from commenters, NERC will not second-guess the technical merits of the proposed regional reliability standard proposed on an interconnection wide basis. They were developed by those from the Western Interconnection, to apply in the Western Interconnection, in a process that enabled all those with an interest in the standards to be heard. NERC’s public posting of these four proposed regional reliability standard did not elicit any significant technical objection. Further, considering the proposed standards on their merits, NERC concluded that the proposed standards meet the criteria for consideration and approval as a regional reliability standard.

The following summarizes NERC’s evaluation of the four regional reliability standards:

### **FAC-501-WECC-1 — Transmission Maintenance**

- NERC recommends approval of FAC-501-WECC-1 — Transmission Maintenance to replace PRC-STD-005-1.
- The proposed regional reliability standard addresses matters that the continent-wide NERC reliability standard does not, thus satisfying the statutory criteria for a regional reliability standard.
- FAC-501-WECC-1 requires, for specified transmission paths, a highly detailed maintenance and inspection plan for all transmission and substation equipment components, well beyond the relay and communication system maintenance and testing requirements in continent-wide NERC reliability standard.
- No challenges were made by commenters that would serve to rebut WECC’s presumption of validity.
- NERC also found that WECC adequately addressed the FERC and NERC directives.
- NERC recommended that, in a future revision of the standard, WECC address several minor shortcomings in the standard including formatting of the compliance elements.

### **PRC-004-WECC-1 — Protection System and Remedial Action Scheme Misoperation**

- NERC recommends approval of PRC-004-WECC-1 — Protection System and Remedial Action Scheme Misoperation and four associated definitions to replace PRC-STD-001-1 and PRC-STD-003-1.
- The regional reliability standard is more stringent than the corresponding NERC Reliability Standard, PRC-004-1, thus satisfying the statutory criteria for a regional reliability standard.
- PRC-004-WECC-1 requires that all transmission and generation protection system and remedial action scheme misoperations on major WECC Transfer Paths be analyzed and mitigated within a specific timeframe. These major paths and remedial action schemes are significant components for the reliable delivery of power within the Western Interconnection. The NERC standard PRC-003-1 has requirements for Regional Reliability Organizations to establish procedures for review, analysis, reporting, and mitigation of transmission and generation Protection System Misoperations, but it does not specifically address the owners of the transmission and generation facilities. The NERC standard PRC-004-1 has requirements for Protection System Misoperations, but it does not provide for the additional requirements included in PRC-004-WECC-1.
- No challenges were made by commenters that would serve to rebut WECC’s presumption of validity.
- NERC found that WECC adequately addressed the FERC and NERC directives.

- NERC recommends that, in a future revision of the standard, WECC address several minor shortcomings in the standard with the purpose of improving clarity.

#### **VAR-002-WECC-1 — Automatic Voltage Regulators**

- NERC recommends approval of VAR-002-WECC-1 — Automatic Voltage Regulators (“AVRs”) and associated definition to replace VAR-STD-002a-1.
- The regional reliability standard is more stringent than the continent-wide NERC Reliability Standard VAR-002-1a — Generator Operation for Maintaining Network Voltage Schedules, thus satisfying the statutory criteria for a regional reliability standard.
- The continent-wide NERC Reliability Standard VAR-002-1a — Generator Operation for Maintaining Network Voltage Schedules requires that a generator operator operate each generator connected to the interconnected transmission system in the automatic voltage control mode (automatic voltage regulator in service and controlling voltage) unless the Generator Operator has notified the Transmission Operator. VAR-002-WECC-1, R1 requires all synchronous generators to have their voltage regulators in service at all times with exceptions only for specified circumstances, making it more stringent than NERC’s standard.
- No challenges were made by commenters that would serve to rebut WECC’s presumption of validity.
- NERC also found that WECC adequately addressed the FERC and NERC directives.
- NERC recommended that, in a future revision of the standard, WECC address several minor shortcomings in the standard including formatting of the compliance elements.

#### **VAR-501-WECC-1 — Power System Stabilizer**

- NERC recommends approval of VAR-501-WECC-1 — Power System Stabilizer and associated definition to replace VAR-STD-002b-1.
- The regional reliability standard addresses matters that the continent-wide NERC reliability standard does not, thus satisfying the statutory criteria for a regional reliability standard.
- VAR-501-WECC-1 — Power System Stabilizer ensures Power System Stabilizers (“PSS”) on synchronous generators shall be kept in service, which far exceeds the specificity in the continent-wide NERC Reliability Standard, VAR-002-1a — Generator Operation for Maintaining Network Voltage Schedules.
- No challenges were made by commenters that would serve to rebut WECC’s presumption of validity.
- NERC also found that WECC adequately addressed the FERC and NERC directives.

- NERC recommended that in a future revision of the standard WECC address several minor shortcomings in the standard including formatting of the compliance elements.

**V. DEMONSTRATION THAT THE PROPOSED RELIABILITY STANDARDS ADDRESS THE FERC DIRECTIVES AND DEVELOPMENT HISTORY**

This section summarizes the purpose of proposed regional reliability standards and provides evidence that the proposed reliability standards address the FERC directives in the June 8, 2007 Order. This section includes a description of how the regional reliability standards address the FERC directives, how key issues were considered and addressed by the standard drafting team, and a description of the stakeholder ballot results.

The complete development record for the proposed reliability standards is available in **Exhibit C**. This record includes the WECC approval process prior to submitting the proposed standards to NERC, the comments received during the industry-wide comment period NERC held on the proposed standards, WECC’s responses to those comments, the WECC ballot information, WECC’s submittal request to NERC for evaluation of the proposed standards, and the NERC evaluation of the proposed standards.

**a. Basis and Purpose of FAC-501-WECC-1 — Transmission Maintenance**

The purpose of FAC-501-WECC-1 is to ensure the Transmission Owner of a transmission path identified in the table titled “Major WECC Transfer Paths in the Bulk Electric System” including associated facilities has a Transmission Maintenance and Inspection Plan (“TMIP”); and performs and documents maintenance and inspection activities in accordance with the TMIP. The requirements proposed in FAC-501-WECC-1 are beyond the relay and communication system maintenance and testing requirements

in the continent-wide NERC reliability standards. The NERC standard PRC-005-1 has requirements for equipment maintenance and inspection of relay and backup power systems. FAC-003-1 has requirements for vegetation management. The NERC standards do not have any maintenance and test requirements for the additional components such as breakers, reactive devices, transformers and the associated transmission line. FAC-501-WECC-1 Transmission Maintenance is intended to replace PRC-STD-005-1 approved in the June 8, 2007 Order.

**Demonstration that the proposed reliability standard addresses the FERC directives**

In the Order that approved PRC-STD-005-1, FERC found the regional reliability standard satisfied the statutory standard for approval, because it is more stringent than the corresponding NERC reliability standard by requiring for specified transmission paths a highly detailed maintenance and inspection plan for all transmission and substation equipment components.<sup>7</sup> FERC also agreed with NERC's concerns regarding the format and content of PRC-STD-005-1 and instructed WECC in developing a permanent replacement standard to address these concerns.

Specifically, NERC had identified the following shortcomings with PRC-STD-005-1:

- The WECC Sanctions Table and missing Violation Risk Factors, Violation Severity Levels and Time Horizons were not consistent with the NERC format.
- The applicability section should contain two subsections (4.1 and 4.2): one for Transmission Operator and one for Transmission Owner.
- The standard contains one formal requirement WR1 with multiple sub-requirements, and additional language embedded for which compliance is not mandatory. This section of the standard should be rewritten in its entirety.

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<sup>7</sup> June 8, 2007 Order at P 95.

- The measures as written are not acceptable and will need to be rewritten in conjunction with the requirements.
- Several paragraphs under Compliance Monitor Period should be moved under Additional Compliance Information.
- A better reference should be provided for Form A.12. A search of the WECC website did not produce a copy of the referenced Form A.12.
- The definition for “Disturbance” provided by WECC is not identical to the NERC definition.

In the proposed FAC-501-WECC-1 regional reliability standard to be responsive to

FERC’s directive regarding NERC’s concerns, WECC:

- Removed the Sanctions Table and added Violation Risk Factors, Violation Severity Levels, and Time Horizons.
- Removed Transmission Operators from the applicability section of the standard to add clarity and to conform to NERC’s Functional Model.
- Modified the purpose statement from:

“Regional Reliability Standard to ensure the Transmission Operator or Owner of a transmission path identified in Attachment A perform maintenance and inspection on identified paths as described by its transmission maintenance plan”

to the following:

“To ensure the Transmission Owner of a transmission path identified in the table titled “Major WECC Transfer Paths in the Bulk Electric System” including associated facilities has a Transmission Maintenance and Inspection Plan (TMIP); and performs and documents maintenance and inspection activities in accordance with the TMIP.”

- Removed compliance-related information and elements that were embedded within the requirements.
- Clarified the measures and removed extraneous information from the requirements.
- Eliminated references to Form A.12.
- Eliminated the definition of Disturbance that conflicts with the NERC definition.

In addition to the directed changes, WECC made other modifications to the standard not directed by FERC or NERC:

- WECC modified the applicability of the standard to apply to Transmission Owners that maintain the transmission paths in the most current table: “Major WECC Transfer Paths in the Bulk Electric System.” This modification was



made to add clarity and to conform to NERC's Functional Model. NERC's Functional Model gives the responsibility for maintenance to Transmission Owners not Transmission Operators. PRC-STD-005-1 applied to Transmission Operators in addition to Transmission Owners.

- WECC removed the Transmission Line and Station Maintenance Details, contained in the TMIP contents, from the former Requirement WR1.b of PRC-STD-005-1 to an Attachment 1 of standard FAC-501-WECC-1.
- The wording of the data retention requirement was modified in FAC-501-WECC-1 to specify that Transmission Owners shall keep evidence for the Measures M1 through M3 for three years plus the current year, or since the last audit, whichever is longer. PRC-STD-005-1, Measure M1 required that the Responsible Entity maintain records of all maintenance and inspection activities for at least five years. WECC explains that this modification was made to ensure data are kept in a contiguous manner between audit periods.

### **Development History and Key Issues**

In September 2007, WECC posted for initial industry comment the initial draft of the proposed standard. The drafting team reviewed and responded to initial comments in November 2007. During the first comment period, WECC received minor comments from seven entities. WECC implemented the comment that recommended a name change to FAC-501-WECC-1 (Facilities Design, Connections and Maintenance) from PRC-005-WECC-1 to better align with the NERC numbering system for reliability standards and to recognize that the scope of the standard was beyond protection and control systems. WECC did not make other significant conforming changes to the standards as a result of the comments.

In November 2007, the drafting team posted a second draft of the proposed standard for comment. During the second comment period, WECC received minor comments from four entities. WECC did not make any substantial conforming changes to the standards as a result of the comments.

In January 2008, the drafting team posted the third draft for approval by WECC's Operating Committee. The WECC Operating Committee balloted the proposed standard

in March 2008 with the 59 votes in favor of the proposed standard, five negative votes, and 16 abstentions. The WECC Board of Directors balloted the proposed standard in April 2008, voting unanimously in favor of the standard.

Concurrent with WECC Board of Directors consideration of the proposed regional standard in April, 2008 and as permitted by NERC's Rules of Procedure, WECC submitted and NERC posted FAC-501-WECC-1 for the required 45-day public posting that took place from April 4 - May 20, 2008. The proposed regional standard received two minor comments during the NERC posting. WECC supplied NERC with its response to comments on June 10, 2008. WECC did not make conforming changes to the standards as a result of the comments received.

In accordance with NERC's Rules of Procedure and the Regional Reliability Standards Evaluation Procedure approved by the Regional Reliability Standards Working Group, NERC provided its evaluation of the WECC proposed standard FAC-501-WECC-1 to WECC on July 30, 2008. NERC made several recommendations to the proposed standard FAC-501-WECC-1 to which WECC responded in an August 18, 2008 letter as follows:

- NERC suggested that WECC add a table containing the Violation Severity Levels to conform to the NERC standards. WECC agreed that the proposed Violation Severity Levels in FAC-501-WECC-1 are inconsistent in format with that of the NERC reliability standards. WECC noted that at the time of development and WECC Operating Committee and Board of Directors' approval, the final format for Violation Severity Levels had not been established. WECC indicated that the essential information for developing Violation Severity Levels consistent with the current format is included in the existing Violations Severity Levels.
- NERC also suggested capitalizing references to defined terms throughout the standard. WECC clarified that the terms used in the standard do not have corresponding entries in the NERC Glossary of Terms and did not intend on proposing a new defined term for "transmission facilities," for example.

Exhibit C of this filing contains the record of development of the proposed regional reliability standards that includes the procedural documents noted in this description. NERC believes WECC responded adequately to NERC's suggestions by agreeing to conform the Violation Severity Levels format to that of the NERC reliability standards in a revision to the standard.

FAC-501-WECC-1 was approved by the NERC Board of Trustees on October 29, 2008, conditioned on WECC's addressing the identified shortcomings in future revisions to the standard. Exhibit B of this filing contains the NERC Board of Trustees' resolution on the WECC regional reliability standard.

**b. Basis and Purpose of PRC-004-WECC-1 — Protection System and Remedial Action Scheme Misoperation**

The purpose of PRC-004-WECC-1 is to ensure all transmission and generation Protection System and Remedial Action Scheme ("RAS") Misoperations on Transmission Paths and RAS defined in the "Major WECC Transfer Paths in the Bulk Electric System," and the "Major WECC Remedial Action Schemes (RAS)," tables referenced in the standard<sup>8</sup> are analyzed and/or mitigated.

The PRC-004-WECC-1 standard permanently replaces WECC regional standards PRC-STD-001-1 and PRC-STD-003-1 previously approved by FERC. PRC-004-WECC-1 addresses the FERC directives and recommendations of NERC when PRC-STD-001-1 and PRC-STD-003-1 were originally approved as NERC reliability standards.

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<sup>8</sup> The Applicability section (section 4) of the standard references the tables and includes links to the location of the information on the WECC website. "Major WECC Transfer Paths in the Bulk Electric System," provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc> and "Major WECC Remedial Action Schemes (RAS)" provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc>.

The NERC standard PRC-003-1 – Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems has requirements for Regional Reliability Organizations to establish procedures for review, analysis, reporting, and mitigation of transmission and generation Protection System Misoperations but does not address the owners of the transmission and generation facilities. Further, NERC standard PRC-004-1 – Analysis and Mitigation of Transmission and Generation Protection System Misoperations has requirements for Protection System Misoperations, but it does not provide for the additional requirements as listed in PRC-004-WECC-1.

Specifically NERC PRC-004-1, Requirement R1 requires that the Transmission Owner and any Distribution Provider that own a transmission Protection System shall each analyze its transmission Protection System Misoperations and shall develop and implement a Corrective Action Plan to avoid future Misoperations of a similar nature. Requirement R2 requires that the Generator Owner analyze its generator Protection System Misoperations, and develop and implement a Corrective Action Plan to avoid future Misoperations of a similar nature; and, Requirement R3 requires that the Transmission Owner, and any Distribution Provider that own a transmission Protection System, and the Generator Owner provide to its Regional Reliability Organization (Regional Entity), documentation of its Misoperations analyses and Corrective Action Plans according to the Regional Reliability Organization's (Regional Entity) procedures developed according to PRC-003-1 – Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems, Requirement R1.

Proposed regional standard, PRC-004-WECC-1, exceeds the NERC continent-wide standard by requiring that Transmission Owners and Generator Owners review all

Protection System and remedial action scheme operations, including all trips, within 24 hours, and analyze all operations within 20 business days to determine whether a Misoperation has occurred per Requirements R1.1 and R1.2. Requirement R2 of the proposed standard requires that Transmission Owners and Generator Owners perform specific actions for each Misoperation of the Protection System or remedial action scheme. Further, Requirement R3 requires that Transmission Owners and Generation Owners submit Misoperation incident reports to WECC within 10 business days for identification of Misoperations and/or the subsequent replacement or repairs of a protection system and/or remedial action scheme. On this basis, the proposed regional reliability standard is more stringent than existing NERC reliability standards.

Note that PRC-STD-003 was renumbered to PRC-004-WECC-1 to make both the NERC's PRC-004-1 and the WECC's PRC-004-WECC-1 standards applicable to similar entities. PRC-003-1– Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems is currently applicable to the Regional Reliability Organizations.

**Demonstration that the proposed reliability standard addresses the FERC directives**

**PRC-STD-001-1**

FERC approved WECC-PRC-STD-001-1 as mandatory and enforceable in the Western Interconnection and directed WECC in developing replacement standards, to address the shortcomings identified by NERC as follows:

- The WECC Sanctions Table and missing Violation Risk Factors, Violation Severity Levels and Time Horizons were not consistent with the NERC format.
- The Applicability section should contain two subsections (4.1 and 4.2): one for Transmission Operator and one for Transmission Owner.

- The measure WM1 as written states:

“A Transmission Operator or Transmission Owner identified in Section A.4.1 must accurately complete the Protective Relay Application and Settings Certification form. (Source: Compliance Standard).”

However, a requirement does not exist that requires any functional entity to complete the Protective Relay Application and Settings Certification form.

- The following paragraph under Compliance Monitor Period should be moved under Additional Compliance Information:

“Yearly

On or before September 15 of each year (or such other date as specified in Form A.7), a Transmission Operator or Transmission Owner identified in Section A.4.1 shall submit to the WECC office the completed Protective Relay Application and Settings Certification form as specified in Form A.7 (available on the WECC web site). (Source: Data Reporting Requirement).”

- In the paragraph copied above, a better reference should be provided for Form A.7. A search of the WECC Web site did not produce a copy of the referenced Form A.7.
- The definition for “Disturbance” provided by WECC is not identical to the NERC definition.

### **PRC-STD-003-1**

In the June 8, 2007 Order,<sup>9</sup> FERC stated that regional reliability standard WECC-PRC-STD-003-1 has the purpose of ensuring that protection system misoperations are analyzed and mitigated. This regional reliability standard applies to the owners and operators of 40 specific transmission paths that are identified in Attachment A of the standard. The regional reliability standard requires the removal and repair of protection systems after a misoperation within specified time frames. FERC agreed with WECC that the proposed regional reliability standard goes beyond the corresponding NERC standards because no current NERC reliability standard includes the equipment removal and repair requirements set forth in this regional reliability standard. In addition, FERC

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<sup>9</sup> June 8, 2007 Order at P 81.

noted that, upon failure of protective relays, NERC reliability standard PRC-001-1 requires transmission operators and generator operators to take corrective actions as soon as possible while the WECC regional standard provides more stringency by defining a maximum timeframe for removal and repair of protective equipment. Additionally, FERC agreed with the shortcomings identified by NERC that are listed below:

- The WECC Sanctions Table and missing Violation Risk Factors, Violation Severity Levels and Time Horizons were not consistent with the NERC format.
- The applicability section should contain two subsections (4.1 and 4.2): one for Transmission Operator and one for Transmission Owner.
- The measure WM1 as written states:

“A Transmission Operator and/or owners of Remedial Action Schemes identified in Section A.4.1 shall submit to the WECC office the completed Protective Relay and Remedial Action Scheme Misoperation Reporting Form. (Source: Data Reporting Requirement)”

However, a requirement does not exist that requires any functional entity to complete a Protective Relay and Remedial Action Scheme Misoperation Reporting Form.

- The following paragraphs under Compliance Monitor Period should be moved under Additional Compliance Information:

“At Occurrence

With respect to requirements (a) through (c) of Section B, by no later than 5 Business Days following the occurrence of a known or probable relay misoperation and/or a known or probable RAS misoperation, a Responsible Entity identified in Section A.4.1 shall submit to the WECC office the completed Protective Relay and Remedial Action Scheme Misoperation Reporting Form(s) as specified in Form A.9 (available on the WECC Web site).

With respect to requirement (d) of Section B, by no later than 30 Business Days following the occurrence of a known or probable relay misoperation and/or a known or probable RAS misoperation, a Responsible Entity identified in Section A.4.1 shall submit to the WECC office the completed Protective Relay and Remedial Action Scheme Misoperation Reporting Form(s) as specified in Form A.9 (available on the WECC website). (Source: Data Reporting Requirement).”

- In the paragraphs copied above, a better reference should be provided for Form A.9. A search of the WECC website did not produce a copy of the referenced Form A.9.
- It is not clear what the reference “6103 of title 5, U.S. Code” refers to in the definition for “Business Day.”
- The definition for “Disturbance” provided by WECC is not identical to the NERC definition.

WECC made several significant changes to PRC-STD-001 and PRC-STD-003 above and beyond the directives:

- PRC-STD-003-1 was renumbered to PRC-004-WECC-1. This makes both the NERC PRC-004-1 Analysis and Mitigation of Transmission and Generation Protection System Misoperations and the regional PRC-004-WECC-1 standards applicable to similar entities. NERC PRC-003-1 Regional Procedure for Analysis of Misoperations of Transmission and Generation Protection Systems is applicable only to the Regional Reliability Organization.
- Standard PRC-STD-001 is retired once PRC-004-WECC-1 is approved by the Commission because the requirements are covered by other NERC reliability standard:
  - PRC-STD-001 Requirements WR1-a, b, c, and e are covered under existing NERC reliability standard as follows:
    - “WR1. Each Transmission Operator or Transmission Owner identified in Section 4.1 must submit documentation that an officer of the organization certifies...” is covered by NERC reliability standard PRC-001-1 System Protection Coordination Measurement M1
 

“M1. Each Generator Operator and Transmission Operator shall have and provide upon request evidence that could include but is not limited to, revised fault analysis study, letters of agreement on settings, notification of changes, or other equivalent evidence that will be used to confirm that there was coordination of new protective systems or changes as noted in Requirements 3, 3.1, and 3.2.”
    - “WR1.a. All protective relay applications are appropriate for the Bulk Power Transmission Paths (“BPTP”) identified in Attachment A – Table 2 of this Standard pursuant to applicable WECC Standards and NERC Standards” is covered by NERC Reliability Standard PRC-001-1 – System Protection Coordination Requirement R1



“R1. Each Transmission Operator, Balancing Authority, and Generator Operator shall be familiar with the purpose and limitations of protection system schemes applied in its area.” And, Measurement M1: “M1. Each Generator Operator and Transmission Operator shall have and provide upon request evidence that could include but is not limited to, revised fault analysis study, letters of agreement on settings, notifications of changes, or other equivalent evidence that will be used to confirm that there was coordination of new protective systems or changes as noted in Requirements 3, 3.1, and 3.2.”

- “WR1.b. The BPTP protective relay settings and logic are appropriate pursuant to applicable WECC Standards and NERC Standards” is covered by NERC Reliability Standard PRC-001-1 – System Protection Coordination Requirement R1.

“R1. Each Transmission Operator, Balancing Authority, and Generator Operator shall be familiar with the purpose and limitations of protection system schemes applied in its area.”

And Measurement M1:

“M1. Each Generator Operator and Transmission Operator shall have and provide upon request evidence that could include but is not limited to, revised fault analysis study, letters of agreement on settings, notification of changes, or other equivalent evidence that will be used to confirm that there was coordination of new protective systems or changes as noted in Requirements 3, 3.1, and 3.2.

- “WR1.c. Since the last certification or for the last three years all network changes in the path, at the terminals of the path, or in nearby facilities that affect operation of the path have been considered in the protective relay application and settings” is covered by NERC Reliability Standard PRC-001-1 – System Protection Coordination Requirement R5:

“R5. A Generator Operator or Transmission Operator shall coordinate changes in generation, transmission, load or operating conditions that could require changes in the protection systems of others.”

“R5.1. Each Generator Operator shall notify its Transmission Operator in advance of changes in generation or operating conditions that could

require changes in the Transmission Operator’s protection systems.”

“R5.2. Each Transmission Operator shall notify neighboring Transmission Operators in advance of changes in generation, transmission, load or operating conditions that could require changes in the other Transmission Operator’s protection systems.”

- “WR1.e. Up-to-date relay information has been provided to the on-shift operating personnel and the appropriate Reliability Coordinator” is covered by NERC Reliability Standard TOP-005-1 – Operational Reliability Information Requirement R1.

“R1. Each Transmission Operator and Balancing Authority shall provide its Reliability Coordinator with the operating data that the Reliability Coordinator requires to perform operational reliability assessments and to coordinate reliable operations within the Reliability Coordinator Area.”

“R1.1 Each Reliability Coordinator shall identify the data requirements from the list in Attachment 1- TOP-005-0 “Electric System Reliability Data” and any additional operating information requirements relating to operating of the bulk power system within the Reliability Coordinator Area.”

- WECC is proposing four defined terms for approval:

*Functionally Equivalent Protection System (FEPS) – A Protection System that provides performance as follows: Each Protection System can detect the same faults within the zone of protection and provide the clearing times and coordination needed to comply with all Reliability Standards. Each Protection System may have different components and operating characteristics.*

*Functionally Equivalent RAS (FERAS) – A Remedial Action Scheme (RAS) that provides the same performance as follows: Each RAS can detect the same conditions and provide mitigation to comply with all Reliability Standards. Each RAS may have different components and operating characteristics.*

*Security-Based Misoperation – A Misoperation caused by the incorrect operation of a Protection System or RAS. Security is a component of reliability and is the measure of a device’s certainty not to operate falsely.*

*Dependability-Based Misoperation – Is the absence of a Protection System or RAS operation when intended. Dependability is a component of reliability and is the measure of a device’s certainty to operate when required.*

These terms have not been previously approved by FERC and are not in the NERC Glossary of Terms. These terms will be added to the glossary upon approval of PRC-004-WECC-01.

In response to the FERC directive to address NERC’s concerns, WECC removed the RMS Sanctions Table and included Violation Risk Factors, Violation Severity Levels, Measures and Time Horizons in PRC-004-WECC-1. In addition, WECC:

- Made the standard applicable to Transmission Owners, Generator Owners and Transmission Operators that own facilities, operate facilities, or own remedial action schemes found in the Table of Major WECC Transfer Paths and Table of Major WECC Remedial Action Schemes (RAS).
- Removed all requirements embedded in the Measures.
- Removed the suggested language from the Compliance Monitor Period.
- Removed references to “Form A.7” and “Form A.9” in the Compliance Monitor Period by deleting the paragraph in its entirety.
- Removed definition of Business Day and associated reference to “6103 of Title 5, U.S. Code.”
- Removed the proposed definition for “Disturbance” that conflicts with the NERC defined term.

### **Development History and Key Issues**

In September 2007, WECC posted for initial industry comment the initial draft of the proposed standard. The drafting team reviewed and responded to initial comments in November 2007. During the first comment period WECC received comments from seven entities. WECC implemented the comments to make the Transmission Operator responsible for de-rating transmission facilities rather than the Reliability Coordinators. WECC did not make other significant conforming changes to the standards as a result of the comments.

In November 2007, the drafting team posted a second draft of the proposed standard for comment. During the second comment period WECC received comments from nine entities. The most significant comment pertained to updating and making refinements to the list of transmission paths and remedial action schemes identified in the tables without having to go through the complete NERC and FERC approval processes. In response, the tables were included as references in the applicability section, so the tables could be updated as necessary without formal processing for approval. WECC did not make other significant conforming changes to the standards as a result of the comments.

In January 2008, the drafting team posted the third draft for approval by WECC's Operating Committee. The WECC Operating Committee balloted the proposed standard in March 2008 with 63 voting in favor, six voting negatively and 12 abstentions. The WECC Board of Directors balloted the proposed standard in April 2008, voting unanimously in favor of the standard.

Concurrent with WECC Board of Directors consideration of the proposed regional standard in April, 2008 and as permitted by NERC's Rules of Procedure, WECC submitted and NERC posted PRC-004-WECC-1 for the required 45-day public posting that took place from April 4 - May 20, 2008. The standard did not receive any substantial comments during the NERC posting and WECC did not make conforming changes to the standard as a result of the comments received.

In accordance with NERC's Rules of Procedure and the Regional Reliability Standards Evaluation Procedure approved by the Regional Reliability Standards Working Group, NERC provided its evaluation of the WECC proposed standard PRC-004-WECC-

1 to WECC on July 30, 2008. In this report NERC made several recommendations to the proposed standard PRC-004-WECC-1 to which WECC responded in an August 18, 2008 letter as follows:

- NERC suggested adding clarity to the Requirements and the Applicability sections of the proposed standard by removing explanatory text from the requirements and ensuring that requirements apply to only those identified in the applicability section. In its response, WECC acknowledged that the standard drafting team included explanatory text in the requirement section in an attempt to clarify the requirements; however, WECC feels that the duplication does not adversely impact the applicability, or clarity of the requirements. WECC will address this recommendation during the next revision of this standard or the next FERC compliance filing.
- NERC suggests that technical clarity is needed in Requirements R2, R2.1, R2.2.1 and R2.2.2. NERC believes there is sufficient ambiguity in the interplay between the main and sub-requirements that could be remedied by streamlining the requirement language. WECC replied that the requirements in the PRC-004-WECC-1 Standard are clearly written and that industry stakeholders did not submit any comments questioning the clarity of the standard.

Exhibit C of this filing contains the record of development of the proposed reliability standard that includes the procedural documents noted in this description.

NERC believes WECC responded adequately to NERC's suggestions by agreeing to consider these changes at the next revision opportunity.

The WECC Protection System Maintenance Standard was approved by the NERC Board of Trustees on October 29, 2008, conditioned on WECC's addressing the identified shortcomings in future revisions to the standards. Exhibit B of this filing contains the NERC Board of Trustees' resolution on the WECC regional reliability standard.

**c. Basis and Purpose of VAR-002-WECC-1 — Automatic Voltage Regulators**

The purpose of VAR-002-WECC-1 is to ensure that Automatic Voltage Regulators on synchronous generators and condensers are kept in service and controlling voltage. In the Western Interconnection, System Operating Limits for transmission paths in the Bulk Electric System assume that Automatic Voltage Regulators are in service to control voltage to support the transfer capability. WECC's predecessor organization instituted a requirement for generator operators to keep Automatic Voltage Regulators in service controlling voltage 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. As a result of this experience, WECC determined that there should be only very limited circumstances when a generator's Automatic Voltage Regulator should be operated in a mode other than the voltage control mode. Whereas the NERC VAR-002-1a reliability standard only requires that a generator operator notify its transmission operator when it either removes or operates the automatic voltage regulator in a condition other than voltage control mode and does not limit the amount of time for such operations, the proposed WECC regional standard sets only very limited circumstances for when a generator's AVR should be operated in a mode other than the voltage control mode and further limits the cumulative timeframe for doing so. Thus, the VAR-002-WECC-1 regional reliability standard is more stringent than the continent-wide reliability standard VAR-002-1a — Generator Operation for Maintaining Network Voltage Schedules.

In the Order approving WECC-VAR-STD-002a-1 Automatic Voltage Regulators as mandatory and enforceable in the Western Interconnection, FERC agreed that the

regional reliability standard is more stringent than the NERC reliability standard, because it requires all synchronous generators to have their voltage regulator in service at all times with only exceptions for specified circumstances. FERC also directed WECC to address the shortcomings identified by NERC regarding WECC-VAR-002a-1 in developing a permanent replacement standard.

**Demonstration that the proposed reliability standard addresses the FERC directives**

In its approval Order, FERC agreed with NERC that WECC needs to remedy the following shortcomings with WECC-VAR-002a-1:<sup>10</sup>

- The WECC Sanctions Table and missing Violation Risk Factors, Violation Severity Levels and Time Horizons were not consistent with the NERC format.
- Requirement WR1 should be broken into at least two separate requirements and Measurements should be revised accordingly:
  - Automatic voltage control equipment on synchronous generators shall be kept in service at all times, unless one of the exemptions listed in Section C (Measures) applies, with outages coordinated to minimize the number out of service at any one time.
  - All synchronous generators with automatic voltage control equipment shall normally be operated in voltage control mode and set to respond effectively to voltage deviations.
- The following paragraph under Compliance Monitor Period should be moved under Additional Compliance Information:
  - “On or before the twentieth day of the month following the end of a quarter (or such other date specified in Form A.5), a Responsible Entity shall submit to the WECC Staff Automatic Voltage Regulator data in Form A.5 (available on the WECC web site) for the immediately preceding quarter. (Source: Data Reporting Requirement).”
- In the paragraph copied above, a better reference should be provided for Form A.5. A search of the WECC Web Site did not produce a copy of the referenced Form A.5.

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<sup>10</sup> NERC Letter to WECC “WECC Regional Reliability Standards” dated January 9, 2007 at p. 11.

In response to the FERC directive to address NERC's concerns, WECC removed the Sanctions Table and included Violation Risk Factors, Violation Severity Levels, Measures and Time Horizons in VAR-002-WECC-1. In addition, WECC:

- Ensured that each requirement conveyed only one main topic by re-writing requirement WR1.
- Revised the Compliance Monitoring Period section such that the language suggested by NERC to be moved under Additional Compliance Information is no longer in the standard.
- Removed references to Form A.5.

In addition to the directed changes, WECC made other modifications to the standard not included in the FERC directives but ones that were not found to technically deviate from the existing approach in WECC standard WECC-VAR-002a-1:

- WECC proposes a definition for the term “Commercial Operation” as follows:

*Commercial Operation – Achievement of this designation indicates that the Generator Operator or Transmission Operator of the synchronous generator or synchronous condenser has received all approvals necessary for operation after completion of initial start-up testing.*

This term has not been approved by the Commission previously and is not currently in the NERC Glossary of Terms. Upon approval, the term will be added to the glossary as a WECC-specific definition.

- WECC modified the standard to include requirements that were previously located in the Measures. Specifically, Measure WM1 of VAR-STD-002a-1 listed the exceptions to operating with automatic voltage regulators in service. These exceptions were added to Requirement R1 of proposed VAR-002-WECC-1 as sub-requirements.
- WECC added Requirement R2 to require that Generator Operators and Transmission Operators have documentation identifying the number of hours excluded for each of the allowed exemptions.
- Lastly, WECC modified the applicability of the standard to include Transmission Operators that operate synchronous condensers. The NERC standard VAR-002-1 – Generator Operation for Maintaining Network Voltage Schedules standard applies only to Generator Owners and Generator Operators.



## **Development History and Key Issues**

In September 2007, WECC posted for initial industry comment the initial draft of the proposed standard. The drafting team reviewed and responded to initial comments in November 2007. During the first comment period WECC received comments from seven entities. Commenters requested a requirement to necessitate that Transmission Operators provide voltage schedules to the Generator Operators. The drafting team felt this was a replication of VAR-001-1 Requirement R4 and outside the scope of the standard request. The recommendation was not incorporated in the standard. Another commenter recommended keeping the narrower compliance range of the existing standard VAR-STD-002-1a. The drafting team responded that the wider range is consistent with the NERC sanction table. WECC did not make significant conforming changes to the standards as a result of the comments.

In November 2007, the drafting team posted a second draft of the proposed standard for comment. During the second comment period WECC received comments from six entities, some reiterating the comments offered in the first posting that were again rejected. One entity requested that Transmission Operators be given the authority to exclude generators from complying with the standard. The drafting team concluded that implementing this recommendation would circumvent the reliability need for additional voltage support and thus did not act on the recommendation. WECC did not make significant conforming changes to the standards as a result of the comments.

One key issue raised by commenters during the development of VAR-002-WECC-1 was that the Transmission Operator should be required to provide only a voltage schedule, and not a reactive schedule. This was suggested on the basis that the

more restrictive WECC requirement that the automatic voltage regulator must, except for the listed exceptions, always be operated in the voltage control mode. The drafting team responded that a reactive schedule can also be maintained with the automatic voltage regulator in service and controlling voltage and no changes were made to the standard.<sup>11</sup>

In January 2008, the drafting team posted the third draft for approval by WECC's Operating Committee. The WECC Operating Committee balloted the proposed standard in March 2008 with 54 votes in favor, 15 negative votes and 13 abstentions. The WECC Board of Directors balloted the proposed standard in April 2008, voting 24 favor of the standard with four no votes and two abstentions.

Concurrent with WECC Board consideration of the proposed regional standard in April, 2008 and as permitted by NERC's Rules of Procedure, WECC submitted and NERC posted VAR-002-WECC-1 for the required 45-day public posting that took place from April 4 - May 20, 2008. The proposed regional standard received two series of comments during the NERC posting, one challenging the ability of qualifying facilities to remain on-line if operating in the desired voltage control mode during periods of voltage decline. WECC supplied NERC with its response to this comment on June 10, 2008, stating that studies of the 1996 WECC blackouts directly support the control mode contemplated in the proposed regional standard. As a result, WECC did not make conforming changes to the standards as a result of the comments received to NERC's posting.

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<sup>11</sup> Subsequent to the submittal of VAR-002-WECC-1 to NERC for approval, a standards authorization request was submitted to WECC for development of an associated regional reliability standard that would require the TOP to provide only a voltage schedule. WECC has been working with the submitter to clarify the request.

In accordance with NERC's Rules of Procedure and the Regional Reliability Standards Evaluation Procedure approved by the Regional Reliability Standards Working Group, NERC provided its evaluation of the WECC proposed standard VAR-002-WECC-1 to WECC on July 30, 2008. In this report NERC made several recommendations to the proposed standard VAR-002-WECC-1 to which WECC responded in an August 18, 2008 letter as follows:

- NERC suggested that WECC add a table containing the violation severity levels to conform to the NERC standards. WECC agreed that the proposed violation severity levels in VAR-002-WECC-1 are inconsistent in format with that of the NERC reliability standards. WECC noted that at the time of development and WECC Operating Committee and Board of Director's approval, the final format had not been established. WECC indicated that the essential information for developing violation severity levels consistent with the current format is included in the existing violations severity levels.
- NERC noted that the proposed standard, VAR-002-WECC-1 specified in Requirement R1 that AVRs are to be operated in service and controlling voltage 98 percent of all operating hours with the listed exceptions. This initially appeared to be different than the current requirement in WECC-VAR-STD-002a-1 which specifies that they are to be in service at all times. WECC clarified in its response to NERC's evaluation that the requirement had not been modified but rather was a translation of the existing WECC-VAR-STD-002a-1 Levels of Non-compliance into the requirements of VAR-002-WECC-1. The two percent allowance provides for time to start up generating facilities when the AVRs are not yet in voltage control mode. It also allows for evaluation when the Generator Operators respond to unforeseen events.
- NERC also expressed concern that given this 98 percent limitation, the proposed regional standard is no longer more stringent than the NERC continent-wide standard VAR-002-1a. WECC explained that the NERC VAR-002-1a, Requirement R1 permits the Generator Operator to operate in different modes by simply notifying the Transmission Operator. There are no restrictions on the length of time or reasons for operating in other modes. The WECC 1996 outage reports identified the lack of reactive support from generators with AVRs operating in modes other than voltage control as one of the causes of the widespread outages. The VAR-002-WECC-1 regional standard limits the reasons and time for operating a generator without the AVR in service and controlling voltage; therefore it is more stringent than the NERC VAR-002-1a Standard.
- In addition, NERC expressed concern with VAR-002-WECC-1 R1.1 that the standard excludes the hours attributed to the synchronous generator or condenser that operates for less than five percent of all hours during any

calendar quarter. WECC explained that there is no change in the basic five percent threshold between the existing standard and the proposed standard. Peaking units often operate, for short periods, at low megawatt levels (below where manufacturers recommend placing the AVRs in-service). The exclusion below the five percent threshold during a calendar quarter permits the continued practice of allowing the operation of peaking units without penalty for having an out-of-service AVR per the manufacturer recommendations.

Exhibit C of this filing contains the record of development of the proposed reliability standard that includes the procedural documents noted in this description.

NERC believes WECC responded adequately to NERC's suggestions by agreeing to conform the violation severity levels format to that of the NERC reliability standards in a revision to the standard.

The WECC Automatic Voltage Regulators Standard was approved by the NERC Board of Trustees on October 29, 2008, conditioned on WECC's addressing the identified shortcomings in future revisions to the standards. Exhibit B of this filing contains the NERC Board of Trustees' resolution on the WECC regional reliability standard.

**d. Basis and Purpose of VAR-501-WECC-1 — Power System Stabilizer**

The purpose of VAR-501-WECC-1 – Power System Stabilizer is to ensure that Power System Stabilizers (“PSS”) on synchronous generators are kept in service. A power system stabilizer is part of the excitation control system of a generator used to increase power transfer levels by improving power system dynamic performance. In the Western Interconnection, System Operating Limits for transmission paths in the Bulk Electric System assume that PSSs are in service to enhance system damping. The requirements in VAR-501-WECC-1 ensure that the generator provides the proper damping to maintain system stability when generation and transmission outages occur.

Whereas the NERC VAR-002-1a reliability standard only requires that a generator operator notify its transmission operator when it removes the PSS from service and does not limit the amount of time for operating generators without PSS in service, the proposed WECC regional standard requires power system stabilizers to be in service except for very specific conditions and for a cumulative time limit per quarter.

Therefore, the VAR-501-WECC-1 regional reliability standard is more stringent than the continent-wide reliability standard VAR-002-1a — Generator Operation for Maintaining Network Voltage Schedules.

In the FERC Order that approved WECC-VAR-STD-002b-1 Power System Stabilizers as mandatory and enforceable in the Western Interconnection, FERC found that regional reliability standard is justified as it addresses matters that are not addressed by a NERC Reliability Standard. FERC also stated that WECC justified the regional reliability standard as a means to avoid oscillations that contributed to previous disturbances in the Western Interconnection. FERC also directed WECC to address the shortcomings identified by NERC in developing a permanent replacement standard.

NERC identified the following shortcomings with WECC-VAR-002b-1:<sup>12</sup>

- The WECC Sanctions Table and missing Violation Risk Factors, Violation Severity Levels and Time Horizons were not consistent with the NERC format.
- Requirement WR1 should be broken into at least two separate requirements and Measurements should be revised accordingly:
  - Power System Stabilizers on generators shall be kept in service at all times, unless one of the exemptions listed in Section C (Measures) applies.
  - Power System Stabilizers on generators shall be properly tuned in accordance with WECC requirements.
- The following paragraph under Compliance Monitor Period should be moved under Additional Compliance Information:

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<sup>12</sup> NERC Letter to WECC “WECC Regional Reliability Standards” dated January 9, 2007 at p. 11.

- “On or before the twentieth day of the month following the end of a quarter (or such other date specified in Form A.5), a Responsible Entity shall submit to the WECC Staff Power System Stabilizer data in Form A.5 (available on the WECC web site) for the immediately preceding quarter. (Source: Data Reporting Requirement).”
- In the paragraph copied above, a better reference should be provided for Form A.5. A search of the WECC Web site did not produce a copy of the referenced Form A.5.
- The definition for “Disturbance” provided by WECC is not identical to the NERC definition.

In response to the FERC directive to address NERC’s concerns, WECC removed the RMS Sanctions Table and included Violation Risk Factors, Violation Severity Levels, Measures and Time Horizons in VAR-501-WECC-1. In addition, WECC:

- Ensured that each requirement conveyed only one main topic by re-writing requirement WR1.
- Revised the Compliance Monitoring Period section such that the language suggested by NERC to be moved under Additional Compliance Information is no longer in the standard.
- Removed references to Form A.5.
- Removed the definition for “Disturbance”

In addition to the directed changes, WECC made other modifications to the standard not included in the FERC and NERC directives but were not found to technically deviate from the existing approach in WECC standard WECC-VAR-002b-1:

- WECC proposes a defined term for “Commercial Operation” as follows:

*Commercial Operation – Achievement of this designation indicates that the Generator Operator or Transmission Operator of the synchronous generator or synchronous condenser has received all approvals necessary for operation after completion of initial start-up testing.*

- This term is not in the NERC Glossary of Terms and will be added to the glossary as a WECC-specific definition upon approval of VAR-501-WECC-1.
- WECC modified Requirement R1 to state that “Generator Operators shall have PSS [Power System Stabilizers] in service 98% of all operating hours for synchronous generators equipped with PSS...” The 98% in-service requirement is not a modification from the VAR-STD-002b-1. The 98% in-service requirement was reflected in the Compliance section, under Levels of

Non-Compliance. The two percent allowed before requiring PSS to be in service provides time for evaluation and to start up generating facilities when Generator Operators respond to unforeseen events.

- WECC modified the power system stabilizer replacement period to 24 months from 15 months to facilitate procurement requirements for nuclear power plants.

### **Development History and Key Issues**

In September 2007, WECC posted for initial industry comment the initial draft of the proposed standard. The drafting team reviewed and responded to initial comments in November 2007. During the first comment period WECC received comments from three entities. One commenter recommended keeping the [narrower] compliance range of the existing standard VAR-STD-002-1b. The drafting team responded that the wider range is consistent with the NERC sanction table. WECC did not make significant conforming changes to the standards as a result of the comments.

In November 2007, the drafting team posted a second draft of the proposed standard for comment. During the second comment period WECC received comments from four entities but did not make any significant conforming changes to the standards as a result of the comments.

In January 2008, the drafting team posted the third draft for approval by WECC's Operating Committee. The WECC Operating Committee balloted the proposed standard in March 2008 with 66 voting in favor of the proposed standard, three voting negative, with 11 abstentions. The WECC Board of Directors balloted the proposed standard in April 2008, voting unanimously in favor of the standard.

Concurrent with WECC Board consideration of the proposed regional standard in April, 2008 and as permitted by NERC's Rules of Procedure, WECC submitted and NERC posted VAR-501-WECC-1 for the required 45-day public posting that took place

from April 4 - May 20, 2008. During the NERC 45 day posting of the WECC Power System Stabilizer Standard, the standard received very few comments. One commenter; however, did indicate that the standard posed a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability. The commenter suggested that the reliability standard and not WECC policies should include an explicit description of which units must have PSSs (including which units are grandfathered). In addition, the commenter suggested that the criteria in the standard be subject to change in accordance with the standard development process. In response, WECC confirmed that the standard, VAR-501-WECC-1 does not include a description of which units are required to have power system stabilizers nor includes a grandfather provision since the standard applies only to those generators equipped with power system stabilizers. However, WECC committed to further investigating this comment during a future revision of the VAR-501-WECC-1 standard. Therefore, WECC did not make conforming changes to the standards as a result of the comments received to NERC's posting.

In accordance with NERC's Rules of Procedure and the Regional Reliability Standards Evaluation Procedure approved by the Regional Reliability Standards Working Group, NERC provided its evaluation of the WECC proposed standard VAR-501-WECC-1 to WECC on July 30, 2008. In this report NERC made several recommendations to the proposed standard VAR-501-WECC-1 to which WECC responded in an August 18, 2008 letter as follows:

- NERC suggested that WECC add a table containing the violation severity levels to conform to the NERC standards. WECC agreed that the proposed Violation Severity Levels in VAR-501-WECC-1 are inconsistent in format with that of the NERC reliability standards. WECC noted that at the time of



development and WECC Operating Committee and Board of Director's approval, the final format had not been established. WECC indicated that the essential information for developing Violation Severity Levels consistent with the current format is included in the existing Violations Severity Levels.

- NERC noted that the proposed standard, VAR-501-WECC-1 specified in Requirement R1 that Generator Operators shall have power system stabilizers in service 98% of all operating hours. This appears initially to be different than the current requirement WR1 in WECC-VAR-STD-002b-1 which specifies that they are to be in service at all times. WECC clarified in its response to NERC's evaluation Exhibit C to this filing that the requirement had not been modified but rather was a translation of the existing WECC-VAR-STD-002b-1 Levels of Non-compliance into the requirements of VAR-501-WECC-1.
- In addition, NERC expressed concern with VAR-501-WECC-01 R1.1 that the standards excludes the hours for power system stabilizer operation attributed to the synchronous generator that operates for less than five percent of all hours during any calendar quarter. WECC explained that there is no change in the basic five percent threshold between the existing standard and the proposed standard. Peaking units often operate, for short periods, at low megawatt levels (below where manufactures recommend placing the power system stabilizer in-service). Operating at low megawatt levels makes the power system stabilizer ineffective. The exclusion below the five percent threshold during a calendar quarter permits the continued practice of allowing the operation of peaking units without penalty for having an out-of-service power system stabilizer per the manufacturer recommendations.

Exhibit C of this filing contains the record of development of the proposed reliability standard that includes the procedural documents noted in this description.

NERC believes WECC responded adequately to NERC's suggestions by agreeing to conform the violation severity levels format to that of the NERC reliability standards in a revision to the standard.

VAR-501-WECC-1 standard was approved by the NERC Board of Trustees on October 29, 2008, conditioned on WECC's addressing the identified shortcomings in future revisions to the standards. Exhibit B of this filing contains the NERC Board of Trustees' resolution on the WECC regional reliability standard.

Respectfully submitted,

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**Exhibit A**

**Reliability Standards Proposed for Approval**

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **Standard Development Roadmap**

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

#### **Development Steps Completed:**

<b>Completed Actions</b>	<b>Completion Date</b>
1. Post Draft Standard for initial industry comments	September 4, 2007
2. Drafting Team to review and respond to initial industry comments	November 1, 2007
3. Post second Draft Standard for industry comments	November 9, 2007
4. Drafting Team to review and respond to industry comments	January 7, 2008
5. Post Draft Standard for Operating Committee approval	January 17, 2008
6. Operating Committee approved proposed standard	March 6, 2008
7. Post Draft Standard for WECC Board approval	March 12, 2008
8. Post Draft Standard for NERC comment period	April 14, 2008
9. WECC Board approved proposed standard	April 16, 2008
10. NERC comment period ended	May 20, 2008
11. Drafting Team completes review and consideration of NERC industry comments	May 30, 2008

#### **Description of Current Draft:**

The purpose of this standard is to create a permanent replacement standard for PRC-STD-005-1. In response to comments, the drafting team changed the name of the standard from PRC-005-WECC-1 to FAC-501-WECC-1 to better align with the NERC numbering system. FAC-501-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when PRC-STD-005-1 was approved as a NERC reliability standard. This version of the FAC-501-WECC-1 standard is for NERC Board of Trustee ballot. The WECC Board of Directors approved the standard April 16, 2008. WECC Operating Committee approved the standard March 6, 2008. The WECC Board of Directors and Operating Committee request that the NERC Board of Trustees approve the FAC-501-WECC-1 Standard as a permanent replacement standard for PRC-STD-005-1 and that the NERC Board of Trustees submits the standard to FERC for approval and replacement of PRC-STD-005-1.

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **Justification for a Regional Standard**

The NERC standard PRC-005-1 has requirements for equipment maintenance and inspection of relay and backup power systems. FAC-003-1 has requirements for vegetation management. The NERC standards do not have any maintenance and test requirements for the additional components such as breakers, reactive devices, transformers and the associated transmission line. The 40 major paths listed in the Attachment 1-FAC-501-WECC-1 are significant components for reliable delivery of power in the Western Interconnection. Breaker, transformer, and insulator failures cause reductions to the System Operating Limits (SOL) for those paths, and thus limit transfers between remotely located generation in the Western Interconnection and population/load centers. The entities of the Western Interconnection through study and operation see optimizing the capacity for these paths as critical to the reliability of the Western Interconnection. The lack of redundant transmission in these corridors raises the level of scrutiny for the components and facilities associated with these paths; therefore, this standard is designed to minimize the SOL reductions required to maintain reliable Western Interconnection operation.

### **Future Development Plan:**

<b>Anticipated Actions</b>	<b>Anticipated Date</b>
1. NERC Board approval request	June 2008
2. Request FERC approval	June 2008

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **Definitions of Terms Used in Standard**

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **A. Introduction**

- 1. Title:** Transmission Maintenance
- 2. Number:** FAC-501-WECC-1
- 3. Purpose:** To ensure the Transmission Owner of a transmission path identified in the table titled “Major WECC Transfer Paths in the Bulk Electric System” including associated facilities has a Transmission Maintenance and Inspection Plan (TMIP); and performs and documents maintenance and inspection activities in accordance with the TMIP.
- 4. Applicability**
  - 4.1. Transmission Owners that maintain the transmission paths in the most current table titled “Major WECC Transfer Paths in the Bulk Electric System” provided at:  
<http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc>.
- 5. Effective Date:** On the first day of the first quarter, after applicable regulatory approval.

### **B. Requirements**

- R.1.** Transmission Owners shall have a TMIP detailing their inspection and maintenance requirements that apply to all transmission facilities necessary for System Operating Limits associated with each of the transmission paths identified in table titled “Major WECC Transfer Paths in the Bulk Electric System.” *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*
  - R1.1.** Transmission Owners shall annually review their TMIP and update as required. *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*
- R.2.** Transmission Owners shall include the maintenance categories in Attachment 1-FAC-501-WECC-1 when developing their TMIP. *[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]*
- R.3.** Transmission Owners shall implement and follow their TMIP. *[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]*

### **C. Measures**

- M1.** Transmission Owners shall have a documented TMIP per R.1.
  - M1.1** Transmission Owners shall have evidence they have annually reviewed their TMIP and updated as needed.
- M2.** Transmission Owners shall have evidence that their TMIP addresses the required maintenance details of R.2.
- M3.** Transmission Owners shall have records that they implemented and followed their TMIP as required in R.3. The records shall include:

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

1. The person or crew responsible for performing the work or inspection,
2. The date(s) the work or inspection was performed,
3. The transmission facility on which the work was performed, and
4. A description of the inspection or maintenance performed.

### **D. Compliance**

#### **1. Compliance Monitoring Process**

##### **1.1 Compliance Monitoring Responsibility**

Compliance Enforcement Authority

##### **1.2 Compliance Monitoring Period**

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

- Self-certification conducted annually
- Spot check audits conducted anytime with 30 days notice given to prepare
- 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 one year.

##### **1.3 Data Retention**

The Transmission Owners shall keep evidence for Measure M1 through M3 for three years plus the current year, or since the last audit, whichever is longer.

##### **1.4 Additional Compliance Information**

No additional compliance information.

### **2. Violation Severity Levels**

**2.1. Lower:** There shall be a Lower Level of non-compliance if any of the following conditions exist:

- 2.1.1** The TMIP does not include associated Facilities for one of the Paths identified in Attachment 1 FAC-501-WECC-1 as required by R.1 but Transmission Owners are performing maintenance and inspection for the missing Facilities.



## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

- 2.1.2 Transmission Owners did not review their TMIP annually as required by R.1.1.
- 2.1.3 The TMIP does not include one maintenance category identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.
- 2.1.4 Transmission Owners do not have maintenance and inspection records as required by R.3 but have evidence that they are implementing and following their TMIP.

**2.2. Moderate:** There shall be a Moderate Level of non-compliance if any of the following conditions exist:

- 2.2.1 The TMIP does not include associated Facilities for two of the Paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” as required by R.1 and Transmission Owners are not performing maintenance and inspection for the missing Facilities.
- 2.2.2 The TMIP does not include two maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.
- 2.2.3 Transmission Owners are not performing maintenance and inspection for one maintenance category identified in Attachment 1 FAC-501-WECC-1 as required in R3.

**2.3. High:** There shall be a High Level of non-compliance if any of the following condition exists:

- 2.3.1 The TMIP does not include associated Facilities for three of the Paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” as required by R.1 and Transmission Owners are not performing maintenance and inspection for the missing Facilities.
- 2.3.2 The TMIP does not include three maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.
- 2.3.3 Transmission Owners are not performing maintenance and inspection for two maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required in R3.

**2.4. Severe:** There shall be a Severe Level of non-compliance if any of the following condition exists:

- 2.4.1 The TMIP does not include associated Facilities for more than three of the

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

Paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” as required by R.1 and Transmission Owners are not performing maintenance and inspection for the missing Facilities.

**2.4.2** The TMIP does not exist or does not include more than three maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.

**2.4.3** Transmission Owners are not performing maintenance and inspection for more than two maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required in R3.

**Version History** – Shows Approval History and Summary of Changes in the Action Field

<b>Version</b>	<b>Date</b>	<b>Action</b>	<b>Change Tracking</b>
1	April 16, 2008	Permanent Replacement Standard for PRC-STD-005-1	

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **Attachment 1-FAC-501-WECC-1 Transmission Line and Station Maintenance Details**

The maintenance practices in the TMIP may be performance-based, time-based, conditional based, or a combination of all three. The TMIP shall include:

1. A list of Facilities and associated Elements necessary to maintain the SOL for the transfer paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System;”
2. The scheduled interval for any time-based maintenance activities and/or a description supporting condition or performance-based maintenance activities including a description of the condition based trigger;
3. Transmission Line Maintenance Details:
  - a. Patrol/Inspection
  - b. Contamination Control
  - c. Tower and wood pole structure management
4. Station Maintenance Details:
  - a. Inspections
  - b. Contamination Control
  - c. Equipment Maintenance for the following:
    - Circuit Breakers
    - Power Transformers (including phase-shifting transformers)
    - Regulators
    - Reactive Devices (including, but not limited to, Shunt Capacitors, Series Capacitors, Synchronous Condensers, Shunt Reactors, and Tertiary Reactors)

# **WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

## **Standard Development Roadmap**

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

### **Development Steps Completed:**

<b>Completed Actions</b>	<b>Completion Date</b>
1. Post Draft Standard for initial industry comments	September 21, 2007
2. Drafting Team to review and respond to initial industry comments	November 29, 2007
3. Post second Draft Standard for industry comments	November 29, 2007
4. Drafting Team to review and respond to industry comments	January 23, 2008
5. Post Draft Standard for Operating Committee approval	January 23, 2008
6. Operating Committee ballots proposed standard	March 6, 2008
7. Post Draft Standard for WECC Board approval	March 12, 2008
8. Post Draft Standard for NERC comment period	April 14, 2008
9. WECC Board approved proposed standard	April 16, 2008
10. NERC comment period ended	May 20, 2008
11. Drafting Team completes review and consideration of the NERC industry comments	May 30, 2008

### **Description of Current Draft:**

The purpose of this standard is to create a permanent replacement standard for PRC-STD-001-1 and PRC-STD-003-1. PRC-004-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when PRC-STD-001-1 and PRC-STD-003-1 were approved as NERC reliability standards. The new standard addresses the following areas:

1. Requirements for investigating operations to check for Misoperations.
2. Mitigation requirements after security-based Misoperations for redundant or non-redundant Protection Systems or Remedial Action Schemes.
3. Mitigation requirements after dependability-based Misoperations that do not adversely affect the reliability of the Bulk Electric System.

Several significant changes were made to PRC-STD-001 and PRC-STD-003 and they are itemized here:

1. PRC-STD-003 was renumbered to PRC-004-WECC-1. This makes both the PRC-004 and the Regional PRC-004-WECC-1 standards applicable to similar entities. PRC-003 is applicable to the RRO.

## **WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

2. Standard PRC-STD-001 will be retracted because the requirements are covered by other standards per description below:
  - a. PRC-STD-001 requirements B-WR1-a,b,c are covered under PRC-001
  - b. PRC-STD-001 requirement B-WR1-d is covered in this standard PRC-004-WECC-1
  - c. PRC-STD-001 requirement B-WR1-e is covered under TOP-005-1

The WECC Operating Committee approved the PRC-004-WECC-1 standard as a permanent replacement standard for PRC-STD-001-1 and PRC-STD-003-1 on March 6, 2008. The WECC Board of Directors approved this standard April 16, 2008. The WECC Board of Directors recommends that the NERC Board of Trustees approve the PRC-004-WECC-1 as a permanent replacement standard for PRC-STD-001-1 and PRC-STD-003-1. In addition, the WECC Board of Directors recommends that the NERC Board of Trustees submits the standard to FERC for approval.

### **Justification for a Regional Standard**

The NERC standard PRC-003-1 has requirements for Regional Reliability Organizations to establish procedures for review, analysis, reporting, and mitigation of transmission and generation Protection System Misoperations but does not address the owners of the transmission and generation facilities. The NERC standard PRC-004-1 has requirements for Protection System Misoperations but does not provide for the additional requirements as listed in PRC-004-WECC-1. The WECC Transmission Paths listed in the table titled “Major WECC Transfer Paths in the Bulk Electric System” and WECC RAS listed in table titled “Major WECC Remedial Action Schemes (RAS)” of PRC-004-WECC-1 are significant components for reliable delivery of power in the Western Interconnection. Protection System Misoperations and failures can cause reductions to the System Operating Limits (SOL) for those paths, and thus limit transfers between remotely located generation in the Western Interconnection and population/load centers. WECC identified the need for the timely mitigation of relaying problems and implemented such actions under the Reliability Management System (RMS). PRC-004-WECC-1 incorporates the RMS criteria and provides:

1. More robust requirements for review and analysis of all operations of those elements by operating and system protection personnel, and
2. Timely actions that must be taken to ensure that Misoperations of those elements are not repeated.

This standard is designed to minimize the SOL reductions required to maintain reliable Western Interconnection operation.

### **Future Development Plan:**

<b>Anticipated Actions</b>	<b>Anticipated Date</b>
1. NERC Board approval request	June 2008
2. Request FERC approval	June 2008

# **WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

## **Definitions of Terms Used in Standard**

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*

**Functionally Equivalent Protection System (FEPS):** A Protection System that provides performance as follows:

- Each Protection System can detect the same faults within the zone of protection and provide the clearing times and coordination needed to comply with all Reliability Standards.
- Each Protection System may have different components and operating characteristics.

**Functionally Equivalent RAS (FERAS):** A Remedial Action Scheme (RAS) that provides the same performance as follows:

- Each RAS can detect the same conditions and provide mitigation to comply with all Reliability Standards.
- Each RAS may have different components and operating characteristics.

**Security-Based Misoperation:** A Misoperation caused by the incorrect operation of a Protection System or RAS. Security is a component of reliability and is the measure of a device's certainty not to operate falsely.

**Dependability-Based Misoperation:** Is the absence of a Protection System or RAS operation when intended. Dependability is a component of reliability and is the measure of a device's certainty to operate when required.

# WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation

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## A. Introduction

- 1. Title:** Protection System and Remedial Action Scheme Misoperation
- 2. Number:** PRC-004-WECC-1
- 3. Purpose:** Regional Reliability Standard to ensure all transmission and generation Protection System and Remedial Action Scheme (RAS) Misoperations on Transmission Paths and RAS defined in section 4 are analyzed and/or mitigated.

### 4. Applicability

- 4.1.** Transmission Owners of selected WECC major transmission path facilities and RAS listed in tables titled “Major WECC Transfer Paths in the Bulk Electric System” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc> and “Major WECC Remedial Action Schemes (RAS)” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc>.
  - 4.2.** Generator Owners that own RAS listed in the Table titled “Major WECC Remedial Action Schemes (RAS)” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc>.
  - 4.3.** Transmission Operators that operate major transmission path facilities and RAS listed in Tables titled “Major WECC Transfer Paths in the Bulk Electric System” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc> and “Major WECC Remedial Action Schemes (RAS)” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc>.
- 5. Effective Date:** On the first day of the second quarter following applicable regulatory approval.

## B. Requirements

The requirements below only apply to the major transmission paths facilities and RAS listed in the tables titled “Major WECC Transfer Paths in the Bulk Electric System” and “Major WECC Remedial Action Schemes (RAS).”

- R.1.** System Operators and System Protection personnel of the Transmission Owners and Generator Owners shall analyze all Protection System and RAS operations. [*Violation Risk Factor: Lower*] [*Time Horizon: Operations Assessment*]
  - R1.1.** System Operators shall review all tripping of transmission elements and RAS operations to identify apparent Misoperations within 24 hours.
  - R1.2.** System Protection personnel shall analyze all operations of Protection Systems and RAS within 20 business days for correctness to characterize whether a Misoperation has occurred that may not have been identified by System Operators.
- R.2.** Transmission Owners and Generator Owners shall perform the following actions for each Misoperation of the Protection System or RAS. It is not intended that Requirements R2.1 through R2.4 apply to Protection System and/or RAS actions that appear to be entirely reasonable and correct at the time of occurrence and associated system performance is fully compliant with NERC Reliability Standards. If the Transmission Owner or Generator Owner later finds the Protection System or RAS operation to be incorrect through System

## **WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

Protection personnel analysis, the requirements of R2.1 through R2.4 become applicable at the time the Transmission Owner or Generator Owner identifies the Misoperation:

- R2.1.** If the Protection System or RAS has a Security-Based Misoperation and two or more Functionally Equivalent Protection Systems (FEPS) or Functionally Equivalent RAS (FERAS) remain in service to ensure Bulk Electric System (BES) reliability, the Transmission Owners or Generator Owners shall remove from service the Protection System or RAS that misoperated within 22 hours following identification of the Misoperation. Repair or replacement of the failed Protection System or RAS is at the Transmission Owners' and Generator Owners' discretion. *[Violation Risk Factor: High] [Time Horizon: Same-day Operations]*
  
- R2.2.** If the Protection System or RAS has a Security-Based Misoperation and only one FEPS or FERAS remains in service to ensure BES reliability, the Transmission Owner or Generator Owner shall perform the following. *[Violation Risk Factor: High] [Time Horizon: Same-day Operations]*
  - R2.2.1.** Following identification of the Protection System or RAS Misoperation, Transmission Owners and Generator Owners shall remove from service within 22 hours for repair or modification the Protection System or RAS that misoperated.
  
  - R2.2.2.** The Transmission Owner or Generator Owner shall repair or replace any Protection System or RAS that misoperated with a FEPS or FERAS within 20 business days of the date of removal. The Transmission Owner or Generator Owner shall remove the Element from service or disable the RAS if repair or replacement is not completed within 20 business days.
  
- R2.3.** If the Protection System or RAS has a Security-Based or Dependability-Based Misoperation and a FEPS and FERAS is not in service to ensure BES reliability, Transmission Owners or Generator Owners shall repair and place back in service within 22 hours the Protection System or RAS that misoperated. If this cannot be done, then Transmission Owners and Generator Owners shall perform the following. *[Violation Risk Factor: High] [Time Horizon: Same-day Operations]*
  - R2.3.1.** When a FEPS is not available, the Transmission Owners shall remove the associated Element from service.
  
  - R2.3.2.** When FERAS is not available, then
    - 2.3.2.1.** The Generator Owners shall adjust generation to a reliable operating level, or
  
    - 2.3.2.2.** Transmission Operators shall adjust the SOL and operate the facilities within established limits.
  
- R2.4.** If the Protection System or RAS has a Dependability-Based Misoperation but has one or more FEPS or FERAS that operated correctly, the associated Element or



## **WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

transmission path may remain in service without removing from service the Protection System or RAS that failed, provided one of the following is performed.

**R2.4.1.** Transmission Owners or Generator Owners shall repair or replace any Protection System or RAS that misoperated with FEPS and FERAS within 20 business days of the date of the Misoperation identification, or

**R2.4.2.** Transmission Owners or Generator Owners shall remove from service the associated Element or RAS. *[Violation Risk Factor: Lower] [Time Horizon: Operations Assessment]*

**R.3.** Transmission Owners and Generation Owners shall submit Misoperation incident reports to WECC within 10 business days for the following. *[Violation Risk Factor: Lower] [Time Horizon: Operations Assessment]*

**R3.1.** Identification of a Misoperation of a Protection System and/or RAS,

**R3.2.** Completion of repairs or the replacement of Protection System and/or RAS that misoperated.

### **C. Measures**

Each measure below applies directly to the requirement by number.

**M1.** Transmission Owners and Generation Owners shall have evidence that they reported and analyzed all Protection System and RAS operations.

**M1.1** Transmission Owners and Generation Owners shall have evidence that System Operating personnel reviewed all operations of Protection System and RAS within 24 hours.

**M1.2** Transmission Owners and Generation Owners shall have evidence that System Protection personnel analyzed all operations of Protection System and RAS for correctness within 20 business days.

**M2.** Transmission Owners and Generation Owners shall have evidence for the following.

**M2.1** Transmission Owners and Generation Owners shall have evidence that they removed the Protection System or RAS that misoperated from service within 22 hours following identification of the Protection System or RAS Misoperation.

**M2.2** Transmission Owners and Generation Owners shall have evidence that they removed from service and repaired the Protection System or RAS that misoperated per measurements M2.2.1 through M2.2.2.

**M2.2.1** Transmission Owners and Generation Owners shall have evidence that they removed the Protection System or RAS that misoperated from service within 22 hours following identification of the Protection System or RAS Misoperation.

## **WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

**M2.2.2** Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated within 20 business days or either removed the Element from service or disabled the RAS.

**M2.3** The Transmission Owners and Generation Owners shall have evidence that they repaired the Protection System or RAS that misoperated within 22 hours following identification of the Protection System or RAS Misoperation.

**M2.3.1** The Transmission Owner shall have evidence that it removed the associated Element from service.

**M2.3.2** The Generator Owners and Transmission Operators shall have documentation describing all actions taken that adjusted generation or SOLs and operated facilities within established limits.

**M2.4** Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated including documentation that describes the actions taken.

**M2.4.1** Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated within 20 business days of the misoperation identification.

**M2.4.2** Transmission Owners and Generation Owners shall have evidence that they removed the associated Element or RAS from service.

**M3.** Transmission Owners and Generation Owners shall have evidence that they reported the following within 10 business days.

**M3.1** Identification of all Protection System and RAS Misoperations and corrective actions taken or planned.

**M3.2** Completion of repair or replacement of Protection System and/or RAS that misoperated.

### **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:

- Misoperation Reports

**WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

- Reports submitted quarterly
- Spot check audits conducted anytime with 30 days notice given to prepare
- Periodic audit as scheduled by the Compliance Enforcement Authority
- Investigations
- Other methods as provided for in the Compliance Monitoring Enforcement Program

**1.2.1** The Performance-reset Period is one calendar month.

**1.3 Data Retention**

Reliability Coordinators, Transmission Owners, and Generation Owners shall keep evidence for Measures M1 and M2 for five calendar years plus year to date.

**1.4. Additional Compliance Information**

None.

**2. Violation Severity Levels**

**R1**

<b>Lower</b>	<b>Moderate</b>	<b>High</b>	<b>Severe</b>
System Operating personnel of the Transmission Owner or Generator Owner did not review the Protection System Operation or RAS operation within 24 hours but did review the Protection System Operation or RAS operation within six business days.	System Operating personnel of the Transmission Owner or Generator Owner did not review the Protection System operation or RAS operation within six business days.	System Protection personnel of the Transmission Owner and Generator Owner did not analyze the Protection System operation or RAS operation within 20 business days but did analyze the Protection System operation or RAS operation within 25 business days.	System Protection personnel of the Transmission Owner or Generator Owner did not analyze the Protection System operation or RAS operation within 25 business days.

**R2.1 and R2.2.1**

<b>Lower</b>	<b>Moderate</b>	<b>High</b>	<b>Severe</b>
The Transmission Owner and Generator Owner did not remove from service, repair, or implement other compliance measures for the Protection System or RAS that	The Transmission Owner and Generator Owner did not remove from service, repair, or implement other compliance measures for the Protection System or RAS that misoperated as	The Transmission Owner and Generator Owner did not perform the removal from service, repair, or implement other compliance measures for the Protection	The Transmission Owner and Generator Owner did not perform the removal from service, repair, or implement other compliance measures for the Protection

**WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

misoperated as required within 22 hours but did perform the requirements within 24 hours.	required in less than 24 hours but did perform the requirements within 28 hours.	System or RAS that misoperated as required in less than 28 hours but did perform the requirements within 32 hours.	System or RAS that misoperated as required within 32 hours.
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**R2.3**

<b>Lower</b>	<b>Moderate</b>	<b>High</b>	<b>Severe</b>
The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required within 22 hours but did perform the requirements within 24 hours.	The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required in less than 24 hours but did perform the requirements within 28 hours.	The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required in less than 28 hours but did perform the requirements within 32 hours.	The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required within 32 hours.

**R2.2.2 and R2.4**

<b>Lower</b>	<b>Moderate</b>	<b>High</b>	<b>Severe</b>
The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustments to comply with the requirements within 20 business days but did perform the required activities within 25 business days.	The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustment to comply with the requirements within 25 business days but did perform the required activities within 28 business days.	The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustment to comply with the requirements within 28 business days but did perform the required activities within 30 business days.	The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustments to comply with the requirements within 30 business days.

**WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

**R3.1**

<b>Lower</b>	<b>Moderate</b>	<b>High</b>	<b>Severe</b>
The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 10 business days but did perform the required activities within 15 business days.	The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 15 business days but did perform the required activities within 20 business days.	The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 20 business days but did perform the required activities within 25 business days.	The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 25 business days.

**R3.2**

<b>Lower</b>	<b>Moderate</b>	<b>High</b>	<b>Severe</b>
The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 10 business days of the completion but did perform the required activities within 15 business days.	The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 15 business days of the completion but did perform the required activities within 20 business days.	The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 20 business days of the completion but did perform the required activities within 25 business days.	The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 25 business days of the completion.

**Version History – Shows Approval History and Summary of Changes in the Action Field**

<b>Version</b>	<b>Date</b>	<b>Action</b>	<b>Change Tracking</b>
1	April 16, 2008	Permanent Replacement Standard for PRC-STD-001-1 and PRC-STD-003-1	

## **WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

### **Standard Development Roadmap**

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

#### **Development Steps Completed:**

<b>Completed Actions</b>	<b>Completion Date</b>
1. Post Draft Standard for initial industry comments	September 26, 2007
2. Drafting Team to review and respond to initial industry comments	November 30, 2007
3. Post second Draft Standard for industry comments	November 30, 2007
4. Drafting Team to review and respond to industry comments	January 25, 2008
5. Post Draft Standard for Operating Committee approval	January 25, 2008
6. Operating Committee approved proposed standard	March 6, 2008
7. Post Draft Standard for WECC Board approval	March 12, 2008
8. Post Draft Standard for NERC comment period	April 14, 2008
9. WECC Board approved proposed standard	April 16, 2008
10. NERC comment period ended	May 20, 2008
11. Drafting Team completes review and consideration of industry comments to NERC posting	May 30, 2008

#### **Description of Current Draft:**

The purpose of this standard is to create a permanent replacement standard for VAR-STD-002a-1. VAR-002-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when VAR-STD-002a-1 was approved as a NERC reliability standard.

In the Western Interconnection, System Operating Limits for transmission paths in the Bulk Electric System assume that Automatic Voltage Regulators are in service to control voltage to support the transfer capability. The requirements in VAR-002-WECC-1 are to ensure that the generator provides the proper voltage support when generation and transmission outages occur.

This version of the VAR-002-WECC-1 standard is for NERC Board of Trustee ballot. The WECC Board of Directors approved the standard April 16, 2008. WECC Operating Committee approved the standard March 6, 2008. The WECC Board of Directors and Operating Committee request that the NERC Board of Trustees approve the VAR-002-WECC-1 Standard as a permanent replacement standard for VAR-STD-002a-1 and that the

## **WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

NERC Board of Trustees submits the standard to FERC for approval and replacement of VAR-STD-002a-1.

### **Future Development Plan:**

<b>Anticipated Actions</b>	<b>Anticipated Date</b>
1. Submit NERC Board approval request	June 2008
2. Request FERC approval	June 2008

## **WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

### **Definitions of Terms Used in Standard**

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*

**Commercial Operation** - Achievement of this designation indicates that the Generator Operator or Transmission Operator of the synchronous generator or synchronous condenser has received all approvals necessary for operation after completion of initial start-up testing.



## **WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

### **A. Introduction**

- 1. Title:** Automatic Voltage Regulators (AVR)
- 2. Number:** VAR-002-WECC-1
- 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-1 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.

## **WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

- 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]*

### **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, and

**M1.4.2** The adjusted AVR in-service percentage.

- M2.** If excluding hours for R1.1 through R1.10, provide the date of the outage, the number of hours out of service, and supporting documentation for each requirement that applies.

### **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 and M2 for three years plus current year, or since the last audit, whichever is longer.

##### **1.4 Additional Compliance Information**

## **WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

- 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).

### **2. Violation Severity Levels for R1**

**2.1. Lower:** There shall be a Lower Level of non-compliance if the following condition exists:

- 2.1.1.** 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.

**2.2. Moderate:** There shall be a Moderate Level of non-compliance if the following condition exists:

- 2.2.1.** 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.

**2.3. High:** There shall be a High Level of non-compliance if the following condition exists:

- 2.3.1.** 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.

**2.4. Severe:** There shall be a Severe Level of non-compliance if the following condition exists:

- 2.4.1.** 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.

### **3. Violation Severity Levels for R2**

**3.1. Lower:** There shall be a Lower Level of non-compliance if documentation is incomplete with any requirement R1.1 through R1.10.

**3.2. Moderate:** There shall be a Moderate Level of non-compliance if the Generator Operator does not have documentation to demonstrate compliance with any requirement R1.1 through R1.10.

**3.3. High:** Not Applicable

**3.4. Severe:** Not Applicable

### **E. Regional Differences**

**Version History** – Shows Approval History and Summary of Changes in the Action Field

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

**WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

## **WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

### **Standard Development Roadmap**

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

#### **Development Steps Completed:**

<b>Completed Actions</b>	<b>Completion Date</b>
1. Post Draft Standard for initial industry comments	September 26, 2007
2. Drafting Team to review and respond to initial industry comments	November 30, 2007
3. Post second Draft Standard for industry comments	November 30, 2007
4. Drafting Team to review and respond to industry comments	January 25, 2008
5. Post Draft Standard for Operating Committee approval	January 25, 2008
6. Operating Committee ballots proposed standard	March 6, 2008
7. Post Draft Standard for WECC Board approval	March 12, 2008
8. Post Draft Standard for NERC comment period	April 14, 2008
9. WECC Board approved proposed standard	April 16, 2008
10. NERC comment period ended	May 20, 2008
11. Drafting Team to review and respond to industry comments	May 30, 2008

#### **Description of Current Draft:**

The purpose of this standard is to create a permanent replacement standard for VAR-STD-002b-1. VAR-501-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when VAR-STD-002b-1 was approved as a NERC reliability standard.

In the Western Interconnection, System Operating Limits for transmission paths in the Bulk Electric System assume that Power System Stabilizers are in service to enhance system damping. The requirements in VAR-501-WECC-1 are to ensure that the generator provides the proper damping to maintain system stability when generation and transmission outages occur.

This version of the VAR-501-WECC-1 standard is for NERC Board of Trustee ballot. The WECC Board of Directors approved the standard April 16, 2008. WECC Operating Committee approved the standard March 6, 2008. The WECC Board of Directors and Operating Committee request that the NERC Board of Trustees approve the VAR-501-WECC-1 Standard as a permanent replacement standard for VAR-STD-002b-1 and that the NERC Board of Trustees submits the standard to FERC for approval and replacement of VAR-STD-002b-1.

**WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

**Future Development Plan:**

<b>Anticipated Actions</b>	<b>Anticipated Date</b>
1. Submit NERC Board approval request	June 2008
2. Request FERC approval	June 2008

## **WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

### **Definitions of Terms Used in Standard**

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*

**Commercial Operation** - Achievement of this designation indicates that the Generator Operator or Transmission Operator of the synchronous generator or synchronous condenser has received all approvals necessary for operation after completion of initial start-up testing.

## **WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

### **A. Introduction**

- 1. Title:** Power System Stabilizer (PSS)
- 2. Number:** VAR-501-WECC-1
- 3. Purpose:** To ensure that Power System Stabilizers (PSS) on synchronous generators shall be kept in service.
- 4. Applicability**
  - 4.1. Generator Operators
- 5. Effective Date:** On the first day of the first quarter, after applicable regulatory approval.

### **B. Requirements**

- R1.** Generator Operators shall have PSS in service 98% of all operating hours for synchronous generators equipped with PSS. Generator Operators may exclude hours for R1.1 through R1.12 to achieve the 98% requirement. *[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]*
- R1.1.** The synchronous generator 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.** PSS exhibits instability due to abnormal system configuration.
  - R1.4.** Unit is operating in the synchronous condenser mode (very near zero real power level).
  - R1.5.** Unit is generating less power than its design limit for effective PSS operation.
  - R1.6.** Unit is passing through a range of output that is a known “rough zone” (range in which a hydro unit is experiencing excessive vibration).
  - R1.7.** The generator AVR is not in service.
  - R1.8.** Due to component failure, the PSS may be out of service up to 60 consecutive days for repair per incident.
  - R1.9.** Due to a component failure, the PSS may be out of service up to one year provided the Generator Operator submits documentation identifying the need for time to obtain replacement parts and if required to schedule an outage.
  - R1.10.** Due to a component failure, the PSS may be out of service up to 24 months provided the Generator Operator submits documentation identifying the need for time for PSS replacement and to schedule an outage.
  - R1.11.** The synchronous generator has not achieved Commercial Operation.
  - R1.12.** The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the PSS is unavailable for service.
- R2.** Generator Operators shall have documentation identifying the number of hours excluded for each requirement in R1.1 through R1.12. *[Violation Risk Factor: Low] [Time Horizon: Operations Assessment]*

### **C. Measures**

- M1.** Generators Operators shall provide quarterly reports to the compliance monitor and have evidence for each synchronous generator of the following:



## **WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

- M1.1** The number of hours the synchronous generator was on line.
- M1.2** The number of hours the PSS was out of service with generator on line.
- M1.3** The PSS in service percentage
- M1.4** If excluding PSS out of service hours as allowed in R1.1 through R1.12, provide:
  - M1.4.1** The number of hours excluded, and
  - M1.4.2** The adjusted PSS in-service percentage.

**M2.** If excluding hours for R1.1 through R1.12, provide:

- M2.1** The date of the outage
- M2.2** Supporting documentation for each requirement that applies

### **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 shall keep evidence for Measures M1 and M2 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 R1.12 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 R1.8 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.

## **WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

- 1.4.3** When calculating the adjusted in-service percentage, the PSS out of service hours do not include the time associated with R1.1 through R1.12.
- 1.4.4** The standard shall be applied on a generating unit by generating unit basis (a Generator Operator can be subject to a separate sanction for each non-compliant synchronous generating unit or to a single sanction for multiple machines that operate as one unit).

### **2. Violation Severity Levels**

**2.1. Lower:** There shall be a Lower Level of non-compliance if the following condition exists:

**2.1.1.** PSS is in service less than 98% but at least 90% or more of all hours during which the synchronous generating unit is on line for each calendar quarter.

**2.2. Moderate:** There shall be a Moderate Level of non-compliance if the following condition exists:

**2.2.1.** PSS is in service less than 90% but at least 80% or more of all hours during which the synchronous generating unit is on line for each calendar quarter.

**2.3. High:** There shall be a High Level of non-compliance if the following condition exists:

**2.3.1.** PSS is in service less than 80% but at least 70% or more of all hours during which the synchronous generating unit is on line for each calendar quarter.

**2.4. Severe:** There shall be a Severe Level of non-compliance if the following condition exists:

**2.4.1.** PSS is in service less than 70% of all hours during which the synchronous generating unit is on line for each calendar quarter.

### **3. Violation Severity Levels for R2**

**3.1. Lower:** There shall be a Lower Level of non-compliance if documentation is incomplete with any requirement R1.1 through R1.12.

**3.2. Moderate:** There shall be a Moderate Level of non-compliance if the Generator Operator does not have documentation to demonstrate compliance with any requirement R1.1 through R1.12.

**3.3. High:** Not Applicable

**3.4. Severe:** Not Applicable

### **E. Regional Differences**

**Version History** – Shows Approval History and Summary of Changes in the Action Field

<b>Version</b>	<b>Date</b>	<b>Action</b>	<b>Change Tracking</b>
1	April 16, 2008	Permanent Replacement Standard for VAR-STD-002b-1	

**Exhibit B**

**The NERC Board of Trustees' Resolution on the  
WECC Regional Reliability Standards**



NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

## Resolution of the NERC Board of Trustees

October 29, 2008  
The Westin Arlington Gateway  
801 North Glebe Road  
Arlington, Virginia

### **WECC Tier 1 Reliability Standards**

RESOLVED, that the North American Electric Reliability Corporation Board of Trustees approves the following proposed Regional Reliability Standards developed by the Western Electricity Coordinating Council (WECC), on condition that WECC address the shortcomings raised during the comment periods in the next revision of the standards:

- FAC-501-WECC-1 — Transmission Maintenance
- PRC-004-WECC-1 — Protection System and Remedial Action Scheme  
Misoperation
- TOP-007-WECC-1 — System Operating Limits
- VAR-002-WECC-1 — Automatic Voltage Regulators
- VAR-501-WECC-1 — Power System Stabilizer

In addition, the Board approves proposed standard BAL-002-WECC-1 — Contingency Reserves.

The Board also defers action on proposed standard IRO-006-WECC-1 — Qualified Transfer Path Unscheduled Flow (USF) Relief, pending receipt of additional information.

## **Exhibit C**

### **Record of Development of Proposed Reliability Standards**

PRC-005-WECC-1 Transmission Maintenance – Response to Comments  
October 23, 2007

Thank you for the opportunity to review the proposed regional standard. I have just a couple of comments.

I think the standard ought to be an FAC (Facilities Design, Connections and Maintenance) standard rather than PRC (Protection and Control) since it deals exclusively with facilities and not with protection and control.

*Reply: The drafting team changed the name of the standard from PRC-005-WECC-1 to FAC-501-WECC-1 to better align with the NERC numbering system.*

I think the phrase "although they are not as prevalent as protective relay failures and vegetation related problems" is unnecessary and ought to be eliminated from the "Justification for a Regional Standard."

*Reply: The drafting team removed the phrase "although they are not as prevalent as protective relay failures and vegetation related problems."*

R1.1 - Annual review of the TMIP seems excessive but I would leave that contention to the people that will be developing and maintaining the TMIP. (The Time Horizon is indicated as Long-term Planning, however).

*Reply: The drafting team believes the process for "Annual Review" should continue. The requirement does not require that an entity to change its TMIP each year. It requires that entities verify annually that they are following the plan.*

Thank you for the opportunity to comment.

Bill Middaugh  
TriState Generation and Transmission Association, Inc.

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Justification for a Regional Standard: (PER-005-1) should be (PRC-005-1)

*Reply: This was a typo and was corrected.*

R1.1, M1.1 and 2.1.1: TMIP should be reviewed every five years, rather than annually.

*Reply: The drafting team believes the process for "Annual Review" should continue. The requirement does not require that an entity to change its TMIP each year. It requires that entities verify annually that they are following the plan.*

Roberto Rojas  
Tri-State G&T  
Transmission Maint. Mgr.-East

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The standard does not allow for any deviation from the annual plan if certain pieces of TMIP equipment could not be taken out of service for unforeseen circumstances.

*Reply: Entities need to address maintenance for each of the items required. Entities may include in the TMIP the flexibility for unforeseen circumstances.*

From a station maintenance point of view, what is meant by "Contamination Control" on Page 9, 4b?

*Reply: Contamination Control would be any effort to monitor and control contaminants that degrade insulation on substation equipment.*

On Page 9-4c, there is no reference to relaying or communications equipment which we currently include in the TMIP plans. Would the communications equipment be removed from future TMIP plans if this standard is approved (as worded)?

*Reply: NERC has standards covering maintenance for relay and communication equipment. This standard does not require relay and communication equipment to be included in the TMIP.*

Minor detail, but page numbering goes from "Page 7 of 12" to "Page 8 of 9".

*Reply: This was corrected.*

Gary Snyder  
PNM

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A broad definition of the "associated facilities" addressed by a TMIP might include end to end hardware, software, and vegetation related to the specific transmission line. Since protective relays are the focus of PRC-005-1, the associated facilities should be defined using specific categories such as those used in PRC-017-0 Requirement 1.1. This type of definition would delineate PRC-005-1 from the FAC group of standards. Transmission line maintenance may be better served in FAC-003-1.

Nick Lewis

*Reply: The Transmission Operators define the "associated facilities" necessary to maintain SOLs for the paths. The drafting team changed the name of the standard from PRC-005-WECC-1 to FAC-501-WECC-1 to better align with the NERC numbering system and to differentiate from the relay maintenance standards.*

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The applicability of this standard resides on the Transmission Owners and should not be the responsibility of the Transmission Operators. The Functional Model descriptions of the each of these entities provide that the owner is responsible for equipment and transfers the responsibility to the Operator through agreements. Functional Model Reference: Transmission Owner #9 and Transmission Operator #2 and #15 (See Below).

From Functional Model:

Responsible Entity – Transmission Operator

Relationships with Other Responsible Entities

2. Receives maintenance requirements and construction plans and schedules from the Transmission Owner and Generation Owner

15. Develops operating agreements or procedures with Transmission Owners.

Responsible Entity – Transmission Owner

Relationships with Other Responsible Entities

9. Provides maintenance plans and schedules to the transmission Operator and Transmission Planner.

*Reply: References to Transmission operator were removed to align with the functional model and NERC.*

Also, this standard should be renumbered as it no long has any connection with Protection or Control equipment and only provides for the maintenance of major equipment. I would suggest maybe a FAC (Facilities Design, Connections, and Maintenance) or TOP (Transmission Operations). The current PRC-005 and others PRC standards cover relay maintenance.

*Reply: The drafting team changed the name of the standard from PRC-005-WECC-1 to FAC-501-WECC-1 to better align with the NERC numbering system.*

Jonathan Sykes  
Salt River Project

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Applicability

A review of the NERC Reliability Functional Model, Version 3 shows that responsibility for transmission maintenance rests with the Transmission Owner (TO).

“The Transmission Owner owns and maintains its transmission facilities.”

“The Transmission Operator operates or directs the operation of transmission facilities, and is responsible for maintaining local-area reliability, that is, the reliability of the system and area for



which the Transmission Operator has responsibility.”

The Functional Model expands on the topic in this standard further:

“The Transmission Operator may also physically provide or arrange for transmission maintenance, but it does this under the direction of the Transmission Owner, who is ultimately responsible for maintaining its transmission facilities.”

The Functional model is clear on this. The Transmission Owner is the responsible entity for maintenance. If a TOP provides for this service, it is through agreements/delegation from the TO.

We recommend removing Transmission Operator from the Applicability, Requirements, Measures, and Compliance sections to ensure compatibility with the commonly understood NERC responsible entity.

*Reply: References to Transmission Operator were removed to align with the functional model and NERC.*

The terms “transmission facilities” and “associated facilities” are not clear and should be better defined. For example, are “associated facilities” that equipment that may not be part the path, but located at a substation adjacent to the path, where a relay failure would open the path via backup relaying?

*Reply: The Transmission Operators define the “associated facilities” necessary to maintain SOLs for the paths. NERC defines facilities.*

We think that R.4. is actually a measure of R.3. We recommend that R.4. be deleted and that M.4. be combined with M.3. to read as follows:

M3. Transmission Owners shall have evidence that they implemented and followed their TMIP. Transmission Owners shall have maintenance and inspection records that support the TMIP in accordance with R.3. The records could include, but is not limited to:

1. The crew responsible for performing the work or inspection,
2. The date(s) the work or inspection was performed,
3. The transmission facility on which the work was performed, and
4. A description of the inspection or maintenance performed.

This change would also require changes to the following :

Section 1.3 Data Retention

Section 2.1.4 Violation Security Levels

Attachment 2

*Reply: The drafting team removed R4 and made necessary refinements.*

• In Attachment 2, need to add the spirit of bullets 3, 4, 5, and 6 for the existing standard section B.b.i. (a). (see below). This should include describing the maintenance method for each activity along with the basis for using the maintenance triggers. Specify the condition assessment.

Without this detail, the TMIP is just a list of activities with no basis.

- Describe the maintenance, testing and inspection methods for each activity or component listed under Transmission line Maintenance and Station Maintenance;

*Reply: Maintenance and testing activities are covered with Attachment 2-FAC-501-WECC-1 item 2. Additional details explaining how to comply with standard should not be part of a standard.*

- Provide any checklists or forms, or reports used for maintenance activities;

*Reply: The measurement section covers the items to be provided for an audit. All other reporting requirements will be handled by the compliance monitor.*

- Provide criteria to be used to assess the condition of a transmission facility; Specify condition assessment criteria and the requisite response to each condition as may be appropriate for each specific type of component or feature of the transmission facilities.

*Reply: This issue is covered in the measurement section. Additional details explaining how to comply with standard should not be part of a standard.*

Charles Cumpton  
CAISO

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Thanks for the opportunity to comment on behalf of Nevada Power Company and Sierra Pacific Power Company.

I agree with previous comments that this revised Regional Standard no longer has pertinence in the NERC “PRC” category, and rather should be numbered in the “FAC” area of the Standards to avoid confusion.

*Reply: The drafting team changed the name of the standard from PRC-005-WECC-1 to FAC-501-WECC-1 to better align with the NERC numbering system.*

I suggest an increase in the review period for an entity’s TMIP from the proposed 1-year to a minimum of 3 years, perhaps with a provision that it must be updated as additional facilities become applicable to an entity; ie, a new line being placed in service and added to the table of WECC Paths in this Standard. I believe that one year is far too frequent for such a review and will yield little, if any value.

*Reply: The drafting team believes the process for “Annual Review” should continue. The requirement does not require that an entity to change its TMIP each year. It requires that entities verify annually that they are following the plan.*

Similar to the remarks of a previous commenter, I believe that R3 and R4 are really getting at the same thing: The entity must implement and follow its TMIP. The “proof” should be in the measure of R3, not as a separate requirement R4. I recommend elimination of R4, and merging of M3/M4.

*Reply: The drafting team removed R4 and made necessary refinements.*

#### Att 2 Maintenance Details

I would suggest elimination of “Contamination Control” as a specific point in the Station Maintenance Details and in Transmission Line Maintenance Details. The general condition of station equipment insulation and line insulation is a component of any prudent inspection activity for these facilities, and we see no reason to single out this one particular area of inspection without specifying all of the other things that should receive similar attention.

*Reply: Contamination Control efforts may be more critical in some locations within the region. Contamination Control would be any effort to monitor and control contaminants that degrade insulation on substation equipment.*

#### Violation Severity Levels

My general sense of these VSL’s is that there is much subjectivity as to the degree of violation. For example, if I’ve got 1,000 structures to inspect on a given transmission line, and I only get to 999 of them, have I “implemented and followed” my TMIP? Also, there may be valid reasons for not being able to complete the activities specified in the TMIP, such as inability due to system loading/configuration to take equipment out of service. It may be less risky to forego a maintenance item specified in the TMIP than to subject the grid to the risk of removing the equipment from service. We are faced with these sorts of decisions all the time.

*Reply: Entities need to address maintenance for each of the items required. Entities may include in the TMIP the flexibility for unforeseen circumstances.*

For VSL 2.1.4, how would one have evidence of implementation and following the TMIP if he didn’t have the maintenance and inspection records? I don't understand how this would be applied

*Reply: Refinements were made to the violation severity levels.*

It appears that VSL 2.1.2 should refer to R1, not R2, and VSL 2.1.3 should refer to R2, not R3.

*Reply: The drafting team corrected this issue.*

Thanks for the opportunity to comment. I appreciate the work of the Drafting Team.

Rich Salgo  
Sierra Pacific Resources Transmission

One other comment regarding applicability of this Standard: With regard to the Attachment 1, Existing WECC Transfer Paths of Bulk Electric System, I question how it is determined that a particular Path gets placed on this list, and how a Path might be removed if it is known to be relatively insignificant. What process exists or will exist to review and assess which lines should and should not be on the list, and what criteria apply? Of particular concern to me is the continued inclusion of the SPPC-PG&E Path #24, consisting of a pair of 115kV lines and one

60kV line with a rating of barely 100MW in one direction and as little as 10MW in the other. The prominence of this Path and its importance to the Interconnection doesn't even compare to the other facilities that grace this list, such as EOR and COI. In fact, as a testimonial to this Path's insignificance, the phase shifter that fully controls Path 24 was recently disqualified by UFAS as a Qualified Device for unscheduled flow mitigation because of the negligible effect the Cal Sub PST's have today on the WECC Qualified Transfer Paths. While this may not be within the expected scope of the Drafting Team, it does go to the applicability of this Standard and therefore is important to resolve.

*Reply: The inclusion of the path is outside of the scope of this drafting team.*

Rich Salgo  
Sierra Pacific Resources Transmission

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In general, standard PRC-005-WECC-1 deals with maintenance of transmission lines and substation facilities including relaying for specific paths identified in Attachment 1, whereas NERC standard PRC-005-1 deals only with relaying and associated relaying equipment for all transmission facilities 100kV and above. This is somewhat confusing as PRC standards deal with various aspects of relaying systems. Others have commented on this issue and recommend that this standard be reclassified as a facility standard FAC. I think I would agree.

PRC-005-WECC-1 implies that the transmission owner shall have, maintain and document a transmission maintenance and inspection program for all facilities in Attachment 1. This should only apply to the lines and termination equipment owned and maintained by the transmission owner. In the case where two transmission owners own and maintain a common transmission facility or path. Each transmission owner should develop, maintain and document a TMIP for that portion of the path of which they own.

*Reply: The Transmission Operators define the "associated facilities" necessary to maintain SOLs for the paths. The drafting team changed the name of the standard from PRC-005-WECC-1 to FAC-501-WECC-1 to better align with the NERC numbering system and to differentiate from the relay maintenance standards. Yes, each transmission owner should develop, maintain, and document a TMIP for that portion of the path of which they own.*

Requirement R.1 states that Transmission Owners and Transmission Operators shall have a TMIP detailing their inspection and maintenance requirements that apply to all transmission facilities necessary for System Operations Limits associated with each of the transmission paths identified in Attachment 1. Our interpretation of this requirement is that it applies to the path identified in Attachment 1 and associated termination equipment alone. If other transmission facilities not listed in Attachment 1 have potential impacts on the SOL of the path listed in Attachment 1 these facilities are not covered by the standard.

*Reply: The Transmission Operators define the "associated facilities" necessary to maintain SOLs for the paths. These transmission facilities are covered by the standard.*

Requirement R1.1 and Measurement M1.1 require annual review and documentation of the

TMIP and updating as needed. This I believe is excessive and would have little value. Many maintenance activities can be longer than a year and some extensive maintenance activities may be many years between maintenance intervals. This evaluation and documentation should be extended to say a 5 year interval.

*Reply: The drafting team believes the process for “Annual Review” should continue. The requirement does not require that an entity change its TMIP each year and perform annually all maintenance. It requires that entities verify annually that they are following the plan.*

Frank Johnson  
Substation Construction & Maintenance Manager  
SDG&E

Consideration of Comments for FAC-501-WECC-1 – Transmission Maintenance  
Comments were due December 10, 2007  
January 4, 2008

The FAC-501-WECC-1 Standard Drafting Team thanks all commenters who submitted comments on the WECC FAC-501-WECC-1 Standard. This Standard was posted for a 30-day public comment period from November 9, 2007 through December 10, 2007. The Standard Drafting Team asked stakeholders to provide feedback on the standard through posting it comment on the WECC website. There were four sets of comments from four companies.

In this ‘Consideration of Comments’ document, stakeholder comments have been organized so that it is easier to see the responses associated with each comment.

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you may contact the Director of Standards, Steve Rueckert at 801-582-0353 or at [steve@wecc.biz](mailto:steve@wecc.biz). In addition, there is a WECC Appeals Process.

### **Comments and Responses**

There should be a requirement to provide the evidence upon request by WECC or NERC. This will be further incentive for each owner to keep up-to-date records and give WECC and NERC the ability to request this data. Maybe:

R.4. The Transmission Owner shall provide to WECC and NERC within 30 days of the request documentation of its TMIP and provide evidence that they are meeting the TMIP.

The Violation Se[verity] Levels should contain penalties for the following violations:

Lower: Incomplete o[r] lack of evidence provided to WECC or NERC.

Moderate: Owners are one month late in performing their TMIP.

High: Owners are two months late in performing their TMIP.

Severe: Owners are 4 months late in performing their TMIP.

In some instances, the owner may be making ever[y] effort to meet the standard, but may be late in performing the maintenance or inspections. The violation factors based on how much the owner is late in performing their TMIP will provide incentive to stay on track with the TMIP cycles and make the Western Interconnection more reliable.

Thanks

Jonathan Sykes  
Salt River Project

Reply: This recommendation is a measurement for a time based maintenance practice and does not work well with performance-based maintenance activities. The drafting team believes the 30-day requirement to provide information is already built into the compliance submission requirements and is not needed in the standard.

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California ISO

The CAISO appreciates the drafting team being receptive to our comments on the original posting. We would suggest the following to further enhance this standard: For attachment 1, Section 2, we suggest that this section is rewritten to state, "Describe each TMIP activity along with its basis and the analysis of what triggers each activity."

Thank you for your effort on the revisions of this standard.

Brent Kingsford  
California ISO

Reply: Thank you for your comment. Adding the basis and analysis for a maintenance standard is ideal but is beyond the scope of this standard and would be difficult to measure. The intent of this standard is to verify that maintenance is planned and performed in accordance with a TMIP.

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The Alberta Electric System Operator appreciates the opportunity to comment on the standard under development.

We would like to see the term "Compliance Enforcement Authority," in section D 1.1, defined within the standard. The acronym used in D 1.1 (CEA) is defined on the WECC website in the Glossary/Acronyms link as the Canadian Electricity Association.

Pending clarification of the term noted above the AESO has no concerns on the requirements but would like to emphasize that although Path 1 is included in the list, the standard is not enforceable in Alberta until it has received Regulatory Approval here.

Mark Thompson  
AESO

Reply: Thank you for your comment. This standard is not enforceable in Canada until provincial Canadian regulatory authorities have approved the standard. NERC recommended use of the term Compliance Enforcement Authority (CEA) in continent

wide and regional standards. Resolving the conflict between acronyms is beyond the authority of this drafting team.

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This version has many improvements, so thank you to the team for their efforts.

One additional item that we would like to see either in the Purpose or in Attachment 1, under 4. Station Maintenance Details, please add a comment that notes a specific exclusion for protective relays, controls and associated communication system. These devices are covered under NERC PRC-005.

Reply: The drafting team modified the standard number from PRC-005-WECC-1 to FAC-501-WECC-1 to eliminate the correlation with protective relaying, controls, and associated communication systems. Therefore, the drafting team believes this recommendation has been accommodated.

In addition, there is an editorial for M3.1., please add "The person or crew..."

Reply: The drafting team implemented this recommendation.

Thank you  
Kris Buchholz  
PG&E



# *Western Electricity Coordination Council*

**Operating Committee Meeting  
March 6-7, 2008  
Albuquerque, NM  
Voting Results**

1. **Motion:**

*The VAR-002-WECC-1 Standard Drafting Team recommends that the OC approve VAR-002-WECC-1 and that after regulatory approval, it shall supersede VAR-STD-002a-1.*

**Explanation:** To ensure that Automatic Voltage Regulators on synchronous generators and condensers shall be kept in service and controlling voltage to help maintain Bulk Electric System reliability.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	28	4	2
TRANSMISSION CUSTOMERS	25	11	11
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>54</b>	<b>15</b>	<b>13</b>

Result: **PASSED**

Minority Opinion:

- Please see Appendix A for comments received via email– Comments from AVA, BPEC, EPLUW, Mariner Consulting Services, SMUD and TANC

2. **Motion:**

*The VAR-501-WECC-1 Standard Drafting Team recommends that the OC approve VAR-501-WECC-1 and that after regulatory approval, it shall supersede VAR-STD-002b-1.*

**Explanation:** To ensure that Power System Stabilizers (PSS) on synchronous generators shall be kept in service.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	32	1	1
TRANSMISSION CUSTOMERS	33	2	10
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>66</b>	<b>3</b>	<b>11</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from AVA and EPLUW

3. **Motion:**

*The BAL-002-WECC-1 Standard Drafting Team recommends that the OC approve BAL-002-WECC-1 and that after regulatory approval, it shall supersede BAL-STD-002-0.*

**Explanation:** Contingency Reserve is required for the reliable operation of the interconnected power system. Adequate generating capacity must be available at all times to maintain scheduled frequency, and avoid loss of firm load following transmission or generation contingencies. This generating capacity is necessary to replace generating capacity and energy lost due to forced outages of generation or transmission equipment.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	22	6	6
TRANSMISSION CUSTOMERS	36	10	5
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>59</b>	<b>16</b>	<b>11</b>

Result: PASSED

Minority Opinion:

- Talking about a reliability standard, the existing standard with a proven track record of over a few decades is being replaced with one that is based entirely on compromise. The result will be a massive shift in cost without any technical studies to justify the shift to 3% generation and 3% load. The suspicion is an overall reduction of reserves carried in WECC without any technical justification. It is better to spend time on a technical based standard like FRR than putting in place a compromise solution in the interim.
- The standard is based on compromise and reducing reliability
- There are a number of market issues with this standard to the point where the entity is not comfortable supporting the standard even though they think it is the right direction
- Please see Appendix A for comments received via email – Comments submitted by BC Hydro, EPLUW, NCPA, NWMT, Powerex, PGE (TP), PGE (TC), PSEI, SCL, SMUD and TANC

4. **Motion:**

*The PRC-004-WECC-1 Standard Drafting Team recommends that the OC approve PRC-004-WECC-1 and that after regulatory approval, it shall supersede PRC-STD-001-1 and PRC-STD-003-1.*

- **Explanation:** Regional Reliability Standard to ensure all transmission and generation Protection System and Remedial Action Scheme (RAS) Misoperations on Transmission Paths and RAS defined in section 4 are analyzed and/or mitigated.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	30	4	0
TRANSMISSION CUSTOMERS	32	2	12
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>63</b>	<b>6</b>	<b>12</b>

Result: **PASSED**

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from AVA, SMUD and TANC

5. **Motion:**

*The IRO-006-WECC-1 Standard Drafting Team recommends that the OC approve IRO-006-WECC-1 and that after regulatory approval, it shall supersede IRO-STD-006-0.*

**Explanation:** Mitigation of transmission overloads due to unscheduled flow on Qualified Transfer Paths.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	33	0	1
TRANSMISSION CUSTOMERS	39	2	7
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>73</b>	<b>2</b>	<b>8</b>

Result: PASSED

Minority Opinion:

No minority opinions were offered at the meeting and none were received via email.

6. **Motion:**

*The FAC-501-WECC-1 Standard Drafting Team recommends that the OC approve FAC-501-WECC-1 and that after regulatory approval, it shall supersede PRC-STD-005-1.*

**Explanation:** To ensure the Transmission Owner of a transmission path identified in the table titled “Major WECC Transfer Paths in the Bulk Electric System” including associated facilities has a Transmission Maintenance and Inspection Plan (TMIP); and performs and documents maintenance and inspection activities in accordance with the TMIP.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	28	4	2
TRANSMISSION CUSTOMERS	30	1	14

STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>59</b>	<b>5</b>	<b>16</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from SMUD and TANC

7. **Motion:**

*The TOP-007-WECC-1 Standard Drafting Team recommends that the OC approve TOP-007-WECC-1 and that after regulatory approval, it shall supersede TOP-STD-007-0.*

**Explanation:** When actual flows on Major WECC Transfer Paths exceed System Operating Limits (SOL), their associated schedules and actual flows are not exceeded for longer than a specified time.

VOTING CLASS	YES	NO	ABSTAIN
TRANSMISSION PROVIDERS	30	3	1
TRANSMISSION CUSTOMERS	29	4	13
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>60</b>	<b>7</b>	<b>14</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from SMUD and TANC

**APPENDIX A**

**REASONS FOR NO VOTES <sup>1</sup>**

**Scott Kinney, Avista Corp. (AVA)**

Here are my reasons for voting no on the following standards:

VAR-002-WECC-1 and VAR-501-WECC-1 - Neither of these standards give the Transmission Operator any discretion to exempt a generator from requiring operation in AVR mode or having PSS in service regardless of the size of the generator or its impact on the BES. The VAR-002-WECC-1 standard applies to any generator connected to the BES. Avista commented during the standard development that the TO should have some discretion (NERC gives the TO some discretion in VAR-002-1) to exempt generators that have no impact on the BES with or without AVR and PSS in service based on their location and/or size. During the standard drafting Avista suggested the standards should require a TO to provide study results to verify there is no impact to the BES and that there should be a MVA size limit on generators that can be exempt from the standards.

PRC-004-WECC-1 - The WECC standard goes way above and beyond the requirements of NERC standard PRC-004-1. Avista does not believe the additional requirements are necessary to ensure that relay and RAS/SPS failures are adequately reviewed. The standard adds additional burden without and inherent benefits.

Thank you for the opportunity to comment.

\*\*\*\*\*

**Clement Ma, BC Hydro**

BC Hydro has serious concerns regarding the proposed standard BAL-WECC-002. The team that developed the standard has indicated that the 3% load, 3% generation numbers were proposed as a compromise as opposed to being based on a technical evaluation of reserves from a reliability standpoint. In analyzing the costs of the proposal, the team only looked at aggregate impacts for the WECC and the sub regions. However, this analysis misses the significant cost impact that arises for predominantly hydro based Balancing Authorities. BC has operated reliably using the 5% hydro standard for many years. The proposed standard will result in an increase in BC Hydro's operating reserve requirements by almost 1% (close to 100 MW on winter peak) without any technical justification (nor practical justification in light of our reliable operating history) to justify to its ratepayers the increase in cost of holding this additional operating reserve.

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<sup>1</sup> The reasons for no votes in the appendix were submitted by the individual entities via email after the Operating Committee meeting. The reasons for no votes in the main document were stated at the Operating Committee Meeting in Albuquerque, NM

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**Julie Martin, BP Energy Company (BPEC)**

Of the 7 Standards that were balloted, BP Energy Company (BPEC) voted "No" on 1 Standard. This one Standard was VAR-002-WECC-1 (Automatic Voltage Regulators). BPEC voted "No" on this Standard because we felt the following problems exist in the Standard as proposed:

VAR-002-WECC-1 requires generators to operate in a constant voltage mode at all times, but it does not require the transmission operator ("TOP") to provide the generator with a voltage setting to program into the AVR. To the extent that a TOP provides a reactive power schedule (instead of a voltage setting), it forces the generator operator to manually adjust the voltage settings on the AVR throughout the day in an attempt to maintain the amount of reactive power specified by the TOP.

This places a significant burden on the plant operators since they must manually adjust voltage settings every time the system voltage shifts up or down.

It also poses a significant risk of voltage collapse if plant operators see an increase in reactive output caused by a drop in system voltage caused by a transmission contingency and they manually respond by reducing reactive output to the pre-contingency level. This is exactly the opposite of what is needed when system voltage begins to collapse, even though the generation operators were simply following the reactive power schedule provided by the TOP.

This exposes all parties to a large share of responsibility if a voltage collapse does occur. TOPs will be blamed for failing to provide voltage schedules that would have prevented the manual intervention by generators. Generators will be blamed for doing the wrong thing at the wrong time when they reduced reactive output while the system was collapsing. WECC will be blamed for adopting a flawed standard which authorized TOPs to use this mode of voltage control.

A better alternative to the proposed standard is to include in a WECC standard a requirement that TOPs issue voltage schedules to generators.

\*\*\*\*\*

**John Cummings, PPL Energy Plus (EPLUW)**

BAL-002-WECC-1 Contingency Reserves

While EPLUW believes that the redrafted BAL-002 is an improvement, EPLUW voted no because there is an inconsistency between the proposed reliability requirement and the method in which reserves are procured and provided under the existing Open Access Transmission Tariffs (OATT). Transmission Providers (TP) must generally offer operating reserves under their OATTs to Transmission Customers serving load in the TP's Control Area. Otherwise, there is no default supplier of reserves. Further, the implementation of the proposed standard has not been fully explained, and it is unclear if

reserves will be available to all market participants that may be required to procure or provide them in the future. EPLUW would like to see these issues addressed before the standard becomes effective.

VAR-002-WECC-1 Automatic Voltage Regulators

EPLUW voted no because the proposed standard does not have a grandfathering provision to address existing, older generating units that may not meet the proposed requirement.

VAR-501-WECC-1 Power System Stabilizer

EPLUW voted no because the actual reliability standard (not WECC policies) should include an explicit description of which units must have PSS's (including which units are grandfathered), and this criteria should be subject to change in accordance with the standard development process.

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**John Stout, Mariner Consulting Services**

**Why the WECC Automatic Voltage Regulator Standard (VAR-002-WECC-1) Should Not be Approved as Currently Proposed**

At the March OC meeting, a significant number of WECC Generation Operators voted against acceptance of the proposed WECC AVR standard. Most did so because this standard allows Transmission Operators to direct generators to operate in a manner which exposes WECC to a significant and unnecessary risk of voltage collapse, and exposes those generators to increased and unreasonable risk of incurring non-compliance penalties.

One of the important lessons learned in the July/August 1996 WECC blackouts was that operation of generation in a constant reactive power mode increased the risk of voltage collapse and, therefore, should be limited in WECC. The technical reason for this conclusion is the fact that when voltage begins to collapse, increased reactive power output is required in order to raise the voltage and prevent it from collapsing to the point of causing a blackout. Therefore, WECC established a requirement that, with ten exceptions, generation controls had to be operated in the constant voltage mode of operation. In this mode of operation, if voltage declines, the generator automatically increases and maintains its reactive power output until the voltage returns to normal. That requirement is the genesis of the proposed WECC AVR standard.

WECC Generation Operators support the requirement that their AVR's be operated to maintain voltage and automatically respond with increased reactive output to prevent voltage collapse.

However, not all WECC Transmission Operators allow interconnected Generation Operators to provide voltage responsive reactive support. Certain Transmission Operators have refused to provide voltage schedules to their Generation Operators.



They are allowed to do this because the proposed WECC AVR standard does not include a requirement that Transmission Operators provide voltage schedules. Instead, the WECC AVR standard is silent on this issue, allowing Transmission Operators to follow less restrictive NERC standards which afford them the option of providing reactive power schedules rather than voltage schedules. This practice forces Generation Operators to manually adjust their AVR voltage setting by trial and error to find a voltage setting that will provide the exact amount of reactive power directed by the Transmission Operator. Since the voltage on the transmission grid varies throughout the day, the Generation Operator is forced to continuously reset the voltage on the AVR. This is an unnecessary and distracting manual control burden on the Generation Operator. It effectively eliminates the “Automatic” in “Automatic Voltage Regulator.”

NERC VAR-002 requires the Generation Operator to comply exactly with the voltage schedule or reactive power schedule directed by the Transmission Operator. If the Transmission Operator provides a voltage schedule, the AVR can automatically maintain compliance with the NERC standard. If the Transmission Operator refuses to provide a voltage schedule, and instead insists on providing a reactive power schedule, compliance can no longer depend on the automatic operation of the AVR. The proposed WECC AVR standard prohibits the AVR from being switched to a constant reactive power mode of operation. Instead compliance becomes totally dependent on constant attention and readjustment by the Generation Operator. This significantly increases the risk of reliability standard non-compliance for the generator.

Even more disturbing is the fact that this situation (the Transmission Operator specifying a constant reactive power output rather than a constant voltage level) defeats the intended purpose of the WECC AVR standard, to prevent a voltage collapse. If voltage does begin to collapse, the generator AVR, operating in constant voltage mode, will increase the reactive power output from the unit. That increase in reactive output means that the generator will no longer be producing the amount of reactive power specified by the Transmission Operator’s reactive power schedule. Once this occurs, the Generation Operator must immediately reduce the reactive power provided by the generator or risk fines for noncompliance with NERC standard VAR-002, R2. That will result in the generator doing the exact opposite of what is needed to prevent a voltage collapse and exposes WECC to a risk of blackout.

This issue was repeatedly raised during the standards development process, but the drafting team took the position that it was not a problem that needed to be addressed by the WECC AVR standard. During the March vote at the OC, an amendment was proposed to resolve this issue by adding a requirement to the WECC AVR standard that Transmission Operators provide voltage schedules instead of reactive power schedules. No one expressed an opinion that the concerns raised by generators regarding the reliability risk to WECC were invalid, yet the proposed solution was overwhelmingly rejected by the OC. Unfortunately, due to the voting structure of the OC, the concerned Generation Operators are in a minority and could do nothing more to resolve this issue.

The WECC Board should not take the same path as did the drafting team and the Operating Committee. We believe the Board should do at least three things before approving this standard.

First, the WECC Board should ask the OC to report on the validity of the reliability risk and the compliance risk described above. If their response results in a Board conclusion that either risk is valid, the following additional questions should be raised by the Board.

The WECC Board should ask the OC to provide specific information on which Transmission Operator's provide reactive power schedules rather than voltage schedules to their interconnected generators. This information should include the specific reasons why such Transmission Operator's have chosen to provide reactive power schedules and explain why those reasons outweigh the reliability and compliance risk created by reactive power schedules. If the Board concludes those reasons are not sufficiently justified, the Board should remand this AVR standard for inclusion of a voltage schedule requirement.

If valid reasons are provided to the preceding question, the WECC Board should ask the OC to explain why each of those reasons were not included with the ten exceptions already listed under R1 of the WECC AVR standard. If the OC cannot justify why those reasons should not be included in the ten exceptions, the Board should remand the standard until those reasons are included. By adding such reasons to the list of exceptions, Generation Operators should be allowed to place their AVR in the automatic control mode that matches the reactive power schedule provided by the Transmission Operator (i.e. Constant MVAR mode for VAR Schedules or constant Power Factor mode for Power Factor Schedules.)

While Board members may feel a reluctance to not support the OC recommendation to approve the currently proposed AVR standard, each Board member should recognize an important distinction between votes at the OC and votes by the Board. Standing Committee members are entitled to vote in accordance with their self interests. Board members have a different standard. Board Members are obligated to vote what is best for WECC. That difference can cause Board votes to sometimes result in different outcomes than Standing Committee votes. While our position was the minority opinion within the OC, we firmly believe it to be the best path for maintaining the reliability and credibility of WECC.

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**Fred Young, Northern California Power Agency (NCPA)**

NCPA reviewed this standard prior to the OC meeting and from an operating/reliability perspective has no objection to the proposed changes to BAL-STD-002-0. However, based on discussions with our trading personnel and counter-parties, there is significant confusion as to the impacts of the change from 5%hydro/7%thermal to

3%generation/3%load in the calculation of a BA’s Contingency Reserve requirement. The market is saying that the 3% of load portion will be passed on to the LSE irrespective of the LSE’s location, i.e. in the Source BA or Sink BA. This confusion was further reinforced by Mr. David Lemmons response to a question from Powerex concerning cost shifts. Mr. Lemmons’ response is that it is time for the load to carry their share.

This standard, BAL-002-WECC-1 does not contain language that moves any contingency reserve responsibility to the load. It only changes how the Contingency Reserve requirement for a BA or Reserve Sharing Group is calculated. It is evident by one of the author’s comments, Mr. Lemmons, that there are some significant market changes that will result from implementation. Without clarification of these market impacts, NCPA could not support BAL-002-WECC-1.

NCPA fully supports standards that enhance reliability. But reliability at any cost or unknown cost is unacceptable.

The foregoing is why NCPA did not support BAL-002-WECC-1.

Thank you for your consideration.

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**Marc Donaldson, North Western Energy (NWMT)**

Reasons for NorthWestern Energy (NWMT) No Vote on WECC Standard  
BAL-002-WECC-1 – Contingency Reserves

On March 6, 2008, NorthWestern Energy (NWMT) voted No on WECC Standard BAL-002-WECC-1 – Contingency Reserves for the following reasons:

1. Although the amount of required reserves stated in R1.1.2. (sum of three percent of the load and three percent of net generation) may make the determination of required reserves easier than the prior five percent of hydro and seven percent of thermal and, although the previous five and seven percent was determined arbitrarily, the “three plus three” approach is still arbitrary and may negatively impact reliability of the Western Interconnection.
2. The standard may result in an unfair shift of reserve obligation, which may also result in a shift of costs.

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**Mike Ryan, Portland General Electric (PGE), Transmission Provider**

This is in response to your request for the reasons behind NO votes on BAL-002-WECC-1.

As you well know, I have been voicing my concerns over the direction that this drafting team has taken at every opportunity to change the WECC's contingency reserve requirements. I have regularly offered comments on the posted drafts, but have seen little change in the contents.

My comments about the reliability consequences of BAL-002-WECC-1 are these:

- The "Tier One" BAL-STD-002-0 reflects the current WECC MORC by breaking down required operating reserve into four components: regulating reserve, contingency reserve, reserve for on-demand obligations, and reserves for interruptible imports. The proposed BAL-002-WECC-1 narrows the scope to only contingency reserve, which raises the question of what happens to the other components. NERC BAL-002 adequately covers regulating reserve, but includes no provisions for on-demand obligations or interruptible imports. BAL-002-WECC-1 does include some language for on-demand obligations, but only as contingency reserve; no other types of on-demand rights are addressed.

It's not clear to me how the decision to narrow the scope of the WECC BAL-002 standard will affect the current requirements in the WECC MORC. This should have been made clear in the proposal. I hope the Board will make it clear that BA's must still carry additional operating reserves to account for on-demand obligations and interruptible imports.

- The "load responsibility" concept helped characterize the nature of the transactions. For the "sink" BA, it identified those imports that were "firm for the hour". Simplifying the calculation of contingency reserve does NOT relieve the BA from anticipating which imports might be interrupted in-hour, and therefore what additional reserves need to be available. The recently adopted clarification of "load responsibility" and e-tag 1.8 made it easier. Now it seems everyone will be forced to parse the energy codes to infer what's "firm for the hour".

It would be helpful if the Board directed members to continue to use the "load responsibility" feature in e-tag 1.8 to clearly identify those transactions that are not "firm for the hour".

- Despite voiced concern over the difficulty of interpreting "load responsibility", the drafting team saddled WECC BAL-002 with "interruptible load". As a BA, I do not want to be put in a position to judge whether or not loads offered up by an LSE meet the contract requirements of being "interruptible".

I also have a comment not related to reliability. Or rather, a comment that the changes made through BAL-002-WECC-1 don't seem to be prompted by genuine reliability concerns (only thinly disguised in them). At their heart the changes seem to be driven more by the economic interests of some to shift contingency reserve responsibility (i.e. costs) from the generators to the loads (and perhaps the new MIC mantra that transactions

can't have reliability implications). I'd like to think that reliability changes should be driven by technical merit weighed against overall costs, and that the Board will not allow the WECC's standards process to be used as a lever to shift costs among members.

You'll also remember that I've frequently found myself defending the drafting team's right under WECC "due process" to produce their draft as they see fit, however to my eyes the results are far from pretty. This standard, combined with the NERC/FERC ability to trump WECC "due process" (e.g. sanction tables), raises serious doubts in my mind to about the workability of WECC standards process.

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### **JJ Jamieson, Portland General Electric (PGE), Transmission Customer**

Portland General Electric voted against BAL-002-WECC-1 at the 3/6/08 meeting in Albuquerque, New Mexico.

Portland General Electric Merchant posted the following comments 02/21/08 in response to the posting of BAL-002-WECC-1 for review before voting at the upcoming Operating Committee meeting in Albuquerque, New Mexico. Our comments have not been responded to in any forum since posting.

“Portland General Electric Merchant is concerned with the movement toward unnecessary changes to the approved standard proposed in BAL-002-WECC-1 particularly due to the motivation being cited. At no time should the basis of a reliability standard be centered on “a compromise” rather than the requirements of operational reliability.

In public meetings held with / by the BAL-002-WECC-1- drafting team there was no evidence presented that illustrated increased reliability under BAL-002-WECC-1. The meetings showed that in fact BAL-002-WECC-1 could result in a reduced level of reliability in the WECC region.

Why is a reliability entity allowing a compromise on standards that impact reliability?

We are all being held to these standards and they should be defined by what is necessary for reliability, otherwise it isn't a reliability issue and the market will define the products.

The biggest deficiency of this “compromise” is that it assumes that we have a robust and fully functioning market for reserves. To our knowledge most merchants do not have the right to sell reserves, let alone have extra to sell, and there has not been any formal discussion of how cost based entities can function in a WECC region reserves market. We need to agree that reserves are a reliability issue in determining use and level but a market issue when determining responsibility.

The public meetings showed the proposed BAL-002-WECC-1 move towards the creation of a market product rather than a reliability standard.

WECC has been very clear that the definition of market products is not within their mandate “WECC should focus on the interpretation of reliability criteria. It should not define energy market products.” (Load Responsibility July 26, 2007) and it is equally as clear that the proposed BAL-002-WECC-1, while perhaps not intentionally, will result in the definition of a new energy product albeit not named by the standard itself.

Is it WECC’s intention, with BAL-002-WECC-1, to create an energy product leaving only the naming of said product to the WSPP and other like entities?

Portland General Electric Merchant encourages the BAL-002-WECC-1 drafting team to work towards the establishment of a standard that is focused on the reliability of the system rather than a compromise that defines a market product.

Portland General Electric Merchant”

It was communicated at the Operating Committee meeting that we should pass BAL-002-WECC- 1 because ‘WECC doesn’t want to go to FERC and request an extension.’ Is this appropriate reasoning when dealing with issues affecting reliability?

We are concerned that BAL-002-WECC-1 is assuming a robust reserves market in the West. The West doesn’t have a mature reserves market and this will put additional burden on the load serving merchants by forcing them to procure reserves from the generators in order to meet the new standard. How does WECC propose BAL-002-WECC- 1 will be able to sustain a reliable system absent a robust reserves market?

We echo Puget Sound Energy’s concerned that BAL-002-WECC- 1 will result in a cost shift between Market participants without any additional reliability being realized.

Portland General Electric also agrees with Powerex in that there simply was not an appropriate level of analysis down to support a wholesale change in how reserves are handled in the WECC.

Finally, Portland General Electric states again that reliability standards should not be based on compromise but rather careful consideration of what will provide the most reliable and effective system.

Thank you for the opportunity to comment

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**Mike Goodenough, Powerex (PWX)**

Powerex agrees with the explanation for voting "No" to BAL-002 offered by BC Hydro.

In addition, Powerex would add that the proposed standard will require changes in markets that have not yet been considered. While we are supportive of the objectives to bring clarity to how reserve obligations are determined and commend the team for making progress in obtaining that clarity, no consideration was provided for how implementation of the new standard might impact the existing market and transmission tariff structures and what new uncertainties might be created. This should be considered so that we do not incur unnecessary adaption costs, which would then be followed by additional costs to implement the Frequency Response Reserves standard, which is a far more technically sound approach to re-examining the way reserve requirements should be calculated. BC Hydro and Powerex believe that this consideration should occur before the standard is adopted.

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**Gary Nolan, Puget Sound Energy (PSEI)**

PSEI, as a TP, only voted "No" on BAL-002. Our explanation is summed up by the comments Joe Hoerner from PSEM posted on the WECC website with our agreement.

Puget Sound Energy (PSE) appreciates the opportunity to provide comments on the proposed WECC Standard BAL-002-WECC-1 (Contingency Reserve). These comments are provided on behalf of Puget Sound Energy’s transmission and merchant functions.

Upon review and analysis of the proposed Standard BAL-002-WECC-1, PSE can not determine how this standard provides any additional reliability over today’s standard. The proposal alters the calculation for contingency reserves instead of clearly defining how contingency reserves would be activated to ensure system reliability. Furthermore, PSE’s analysis indicates that adoption of this standard will result in significant cost shifts from generators to load-serving entities. PSE’s ratepayers could expect to pay an additional \$14,000,000 more per year in increased contingency reserve obligations without any added reliability benefit. PSE cannot find any legitimate reason as to why our regulating entities could justify our approval of such a cost increase with no benefit. If, in fact, the primary justification for creating the standard is to firmly establish the obligation of where the reserve obligation lies, then we feel it is more appropriate to address this issue in the commercial forum.

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**Pawel Krupa, Seattle City Light (SCL)**

I have to apologize for being late in responding to your e-mail.

On the behalf of SCL I cast NO vote for the BAL-002-WECC-1 standard. In preparation for the OC meeting I attended the BAL-002-WECC-1 workshop in Portland and we discussed this standard internally within SCL. Based on our internal discussions we believed we could not support this standard at its current version. Below are some of the reasons that we are not supporting this proposed standard as currently written:

1. Requirement R.1. The proposed standard changes the amount of contingency reserves required to carry by the BA's to 3% of the BA's total generation and 3% of the BA's total load. The current WECC standard BAL-STD-002-0 requires to carry 5% reserves for load responsibility served by hydro generation and 7 % served by thermal generation. We believe that there is no technical explanation for the new allocation of 3% generation and 3% of load. The 5% and 7% allocation was based on system data collected during the previous system disturbances and it provided safe contingency reserve margin during many severe disturbances in WECC interconnection. During the workshop in Portland drafting team stated that the 3% and 3% allocation was the best compromise the members of the drafting team were able to agreed to. The data presented by the drafting team during the workshop did not support the statement that the amount of contingency reserves available in the WECC Interconnection will not decrease as a result of this new standard. We believe that the reserve allocations should be based on the system studies rather than the ability of the drafting team to reach a compromise.

2. Requirement R.2. This requirement changes the definition of spinning reserve. Under this requirement the spinning reserve doesn't have to be carried by the synchronized generating units. The requirement states that spinning reserve needs to meet two requirements

R.2.1 Initially automatically respond to frequency deviations.

R.2.2. Capable of fully responding within ten minutes.

Based on this definition it is possible to use devices other generators to provide spinning reserves that could meet these requirements. The underfrequency relays for example could meet these new requirements, they will automatically respond to frequency deviation and will definitely respond within 10 minutes. We believe that this is a significant change in the definition of spinning reserves that again could have a detrimental effect on the stability of the WECC Interconnection.

3. R.3.6. This requirement identifies firm load as an acceptable type of reserves during energy emergency. This requirement does not specify if the load could only be used as a reserves by the BA declaring energy emergency. Based on the interpretation it is possible that every BA in the WECC or every BA in the Reserve Sharing Group could use firm load as a source of reserves once the energy emergency is declared by one single BA. This is also significant change from the previous standard and WECC MORC. The firm load was never before consider a source of reserves. I asked this question during the workshop and the drafting team did not provide an explanation why this was included as a acceptable source of contingency reserves.



We understand that there were many comments submitted to the drafting team during development process and we don't believe that all of these comments were addressed by the drafting team. We understand that there were some time limitations to develop and approve this standard, but we don't agree that this standard as currently written addresses all issues related to the contingency reserves in WECC Interconnection.

We believe that the above reasons were sufficient to justify our NO vote for this standard.

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**Vicken Kasarjian, Sacramento Municipal Utility District (SMUD)**

The following are the reasoning behind my “no” vote on VAR-002-WECC-1, BAL-002-WECC-1, FAC-501-WECC-1, TOP-007-WECC-1, and PRC-004-WECC-1.

General comments:

1. Unnecessary additional requirements for WECC Members with higher exposure to violations/sanctions. Without justification, WECC is trying to hold itself to higher standards than the rest of the nation under NERC.
2. The drafting teams did not actually test the proposed standards prior to bringing it to a vote. A 6 month test with some applicable entities would have been quite helpful.
3. No guidance on how to actually be compliant with these standards.

Additional specific comments:

1. BAL-002-WECC-1: 3% has no technical basis – should go with MSSC to retain or enhance reliability
2. FAC-501-WECC-1: Replaces WECC PRC-STD-005-1: Addresses maintenance and test requirements for additional components (CBs, reactive devices, transformers, etc) not addressed in PRC-005; this impacts Transmission Maintenance Inspection Program for the Major WECC Transfer Paths. Also, it uses a justification that states “minimize SOL reductions to maintain reliable Western Interconnection operation” – if this reasoning is true, then it should also be used by NERC.

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**John S. Forman, Transmission Agency of Northern California (TANC)**

In response to the question of why a no vote was made on the standards at the OC meeting, TANC's OC representative voted no on five of the seven proposed standards for one basic reason: The standards require that the WECC be more stringent than the NERC standards. Those entities that have gone through an audit of the standards that are in

effect are finding that they will be sited for something that is not in compliance. In other words, the auditors will keep looking until something is found to be wrong. With the WECC standards higher than NERC, even more compliance problems are anticipated.

We believe that one basic instruction to the drafting teams should be that they need to justify a standard being more stringent than NERC, and that the basic draft should be no more than equal to NERC, unless it's clearly in the interest of the WECC. Our two positive votes on VAR-501 and IRO-006 are in that "best interest of WECC" category. The other standards were not. Basically, we are not sure that always being better than NERC is the right philosophy.

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**Board of Directors  
April 16-18, 2008  
Coronado, CA**

**Voting Summary  
FAC-501-WECC-1**

<b>Last Name</b>	<b>First Name</b>	<b>Organization</b>	<b>Class</b>
Anderson	Bob	Non-affiliated Director	Non-Affiliated
Areghini	David	Salt River Project	Class 1
Barbash	Carolyn	Sierra Pacific Power Company	Class 1
Beyer	Lee	California Public Utilities Commission	Class 5
Brown	Duncan	Calpine Corporation	Class 3
Campbell	Ric	Utah Public Service Commission	Class 5
Cauchois	Scott	CADRA	Class 4
Chamberlain	Bill	California Energy Commission	Class 5
Cleary	Anne	Mirant Americas, Inc.	Class 3
Conway	Teresa	Powerex Corp.	Class 6
Coughlin	John	Non-affiliated Board Member	Non-Affiliated
Dearing	Bill	Grant County PUD	Class 2
Ferreira	Richard	TANC Executive Advisor	Class 2
Grantham-Richards	Maude	Farmington Electric Utility System	Class 2
Gutting	Scott	Energy Strategies, LLC	Class 4
Kelly	Nancy	Utah Committee of Consumer Services	Class 4
King	Jack	Non-affiliated Board Member	Non-Affiliated
LaFond	Steve	The Boeing Company	Class 4
Little	Doug	British Columbia Transmission Corporation	Class 6
McMaster	Dale	Alberta Electrical System Operator	Class 6
Moya	Jesus	Comision Federal de Electricidad	Mexico
Newton	Tim	Non-affiliated Director	Non-Affiliated
Sharpless	Jananne	Non Affiliated Board Member	Non-Affiliated
Smith	Marsha	Idaho Public Utilities Commission	Class 5
Stout	John	Mariner Consulting	Class 3
Tarplee	Gary	Southern California Edison	Class 1
Thuston	Tim	Williams Power	Class 3
Weis	Larry	Turlock Irrigation District	Class 2
VanZandt	Vicki	Bonneville Power Administration	Class 1
Zaozirny	Lori Ann	British Columbia Utilities Commission	Class 6

The Board Members listed above voted whether to approve FAC-501-WECC-1.  
The Regional Reliability Standard was approved unanimously.

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **Standard Development Roadmap**

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

#### **Development Steps Completed:**

<b>Completed Actions</b>	<b>Completion Date</b>
1. Post Draft Standard for initial industry comments	September 4, 2007
2. Drafting Team to review and respond to initial industry comments	November 1, 2007
3. Post second Draft Standard for industry comments	November 9, 2007
4. Drafting Team to review and respond to industry comments	January 7, 2008
5. Post Draft Standard for Operating Committee approval	January 17, 2008
6. Operating Committee approved proposed standard	March 6, 2008
7. Post Draft Standard for WECC Board approval	March 12, 2008
8. Post Draft Standard for NERC comment period	April 14, 2008
9. WECC Board approved proposed standard	April 16, 2008
10. NERC comment period ended	May 20, 2008
11. Drafting Team completes review and consideration of NERC industry comments	May 30, 2008

#### **Description of Current Draft:**

The purpose of this standard is to create a permanent replacement standard for PRC-STD-005-1. In response to comments, the drafting team changed the name of the standard from PRC-005-WECC-1 to FAC-501-WECC-1 to better align with the NERC numbering system. FAC-501-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when PRC-STD-005-1 was approved as a NERC reliability standard. This version of the FAC-501-WECC-1 standard is for NERC Board of Trustee ballot. The WECC Board of Directors approved the standard April 16, 2008. WECC Operating Committee approved the standard March 6, 2008. The WECC Board of Directors and Operating Committee request that the NERC Board of Trustees approve the FAC-501-WECC-1 Standard as a permanent replacement standard for PRC-STD-005-1 and that the NERC Board of Trustees submits the standard to FERC for approval and replacement of PRC-STD-005-1.

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **Justification for a Regional Standard**

The NERC standard PRC-005-1 has requirements for equipment maintenance and inspection of relay and backup power systems. FAC-003-1 has requirements for vegetation management. The NERC standards do not have any maintenance and test requirements for the additional components such as breakers, reactive devices, transformers and the associated transmission line. The 40 major paths listed in the Attachment 1-FAC-501-WECC-1 are significant components for reliable delivery of power in the Western Interconnection. Breaker, transformer, and insulator failures cause reductions to the System Operating Limits (SOL) for those paths, and thus limit transfers between remotely located generation in the Western Interconnection and population/load centers. The entities of the Western Interconnection through study and operation see optimizing the capacity for these paths as critical to the reliability of the Western Interconnection. The lack of redundant transmission in these corridors raises the level of scrutiny for the components and facilities associated with these paths; therefore, this standard is designed to minimize the SOL reductions required to maintain reliable Western Interconnection operation.

### **Future Development Plan:**

<b>Anticipated Actions</b>	<b>Anticipated Date</b>
1. NERC Board approval request	June 2008
2. Request FERC approval	June 2008

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **Definitions of Terms Used in Standard**

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **A. Introduction**

- 1. Title:** Transmission Maintenance
- 2. Number:** FAC-501-WECC-1
- 3. Purpose:** To ensure the Transmission Owner of a transmission path identified in the table titled “Major WECC Transfer Paths in the Bulk Electric System” including associated facilities has a Transmission Maintenance and Inspection Plan (TMIP); and performs and documents maintenance and inspection activities in accordance with the TMIP.
- 4. Applicability**
  - 4.1. Transmission Owners that maintain the transmission paths in the most current table titled “Major WECC Transfer Paths in the Bulk Electric System” provided at:  
<http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc>.
- 5. Effective Date:** On the first day of the first quarter, after applicable regulatory approval.

### **B. Requirements**

- R.1.** Transmission Owners shall have a TMIP detailing their inspection and maintenance requirements that apply to all transmission facilities necessary for System Operating Limits associated with each of the transmission paths identified in table titled “Major WECC Transfer Paths in the Bulk Electric System.” *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*
  - R1.1.** Transmission Owners shall annually review their TMIP and update as required. *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*
- R.2.** Transmission Owners shall include the maintenance categories in Attachment 1-FAC-501-WECC-1 when developing their TMIP. *[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]*
- R.3.** Transmission Owners shall implement and follow their TMIP. *[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]*

### **C. Measures**

- M1.** Transmission Owners shall have a documented TMIP per R.1.
  - M1.1** Transmission Owners shall have evidence they have annually reviewed their TMIP and updated as needed.
- M2.** Transmission Owners shall have evidence that their TMIP addresses the required maintenance details of R.2.
- M3.** Transmission Owners shall have records that they implemented and followed their TMIP as required in R.3. The records shall include:

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

1. The person or crew responsible for performing the work or inspection,
2. The date(s) the work or inspection was performed,
3. The transmission facility on which the work was performed, and
4. A description of the inspection or maintenance performed.

### **D. Compliance**

#### **1. Compliance Monitoring Process**

##### **1.1 Compliance Monitoring Responsibility**

Compliance Enforcement Authority

##### **1.2 Compliance Monitoring Period**

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

- Self-certification conducted annually
- Spot check audits conducted anytime with 30 days notice given to prepare
- 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 one year.

##### **1.3 Data Retention**

The Transmission Owners shall keep evidence for Measure M1 through M3 for three years plus the current year, or since the last audit, whichever is longer.

##### **1.4 Additional Compliance Information**

No additional compliance information.

### **2. Violation Severity Levels**

**2.1. Lower:** There shall be a Lower Level of non-compliance if any of the following conditions exist:

- 2.1.1** The TMIP does not include associated Facilities for one of the Paths identified in Attachment 1 FAC-501-WECC-1 as required by R.1 but Transmission Owners are performing maintenance and inspection for the missing Facilities.



## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

- 2.1.2 Transmission Owners did not review their TMIP annually as required by R.1.1.
  - 2.1.3 The TMIP does not include one maintenance category identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.
  - 2.1.4 Transmission Owners do not have maintenance and inspection records as required by R.3 but have evidence that they are implementing and following their TMIP.
- 2.2. Moderate:** There shall be a Moderate Level of non-compliance if any of the following conditions exist:
- 2.2.1 The TMIP does not include associated Facilities for two of the Paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” as required by R.1 and Transmission Owners are not performing maintenance and inspection for the missing Facilities.
  - 2.2.2 The TMIP does not include two maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.
  - 2.2.3 Transmission Owners are not performing maintenance and inspection for one maintenance category identified in Attachment 1 FAC-501-WECC-1 as required in R3.
- 2.3. High:** There shall be a High Level of non-compliance if any of the following condition exists:
- 2.3.1 The TMIP does not include associated Facilities for three of the Paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” as required by R.1 and Transmission Owners are not performing maintenance and inspection for the missing Facilities.
  - 2.3.2 The TMIP does not include three maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.
  - 2.3.3 Transmission Owners are not performing maintenance and inspection for two maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required in R3.
- 2.4. Severe:** There shall be a Severe Level of non-compliance if any of the following condition exists:
- 2.4.1 The TMIP does not include associated Facilities for more than three of the

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

Paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” as required by R.1 and Transmission Owners are not performing maintenance and inspection for the missing Facilities.

**2.4.2** The TMIP does not exist or does not include more than three maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.

**2.4.3** Transmission Owners are not performing maintenance and inspection for more than two maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required in R3.

**Version History** – Shows Approval History and Summary of Changes in the Action Field

<b>Version</b>	<b>Date</b>	<b>Action</b>	<b>Change Tracking</b>
1	April 16, 2008	Permanent Replacement Standard for PRC-STD-005-1	

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **Attachment 1-FAC-501-WECC-1 Transmission Line and Station Maintenance Details**

The maintenance practices in the TMIP may be performance-based, time-based, conditional based, or a combination of all three. The TMIP shall include:

1. A list of Facilities and associated Elements necessary to maintain the SOL for the transfer paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System;”
2. The scheduled interval for any time-based maintenance activities and/or a description supporting condition or performance-based maintenance activities including a description of the condition based trigger;
3. Transmission Line Maintenance Details:
  - a. Patrol/Inspection
  - b. Contamination Control
  - c. Tower and wood pole structure management
4. Station Maintenance Details:
  - a. Inspections
  - b. Contamination Control
  - c. Equipment Maintenance for the following:
    - Circuit Breakers
    - Power Transformers (including phase-shifting transformers)
    - Regulators
    - Reactive Devices (including, but not limited to, Shunt Capacitors, Series Capacitors, Synchronous Condensers, Shunt Reactors, and Tertiary Reactors)

**Table**  
**Major WECC Transfer Paths in the Bulk Electric System**  
**Used in Standards FAC-501-WECC-1, PRC-004-WECC-1, and TOP-007-WECC-1**  
**(Revised September 19, 2007)**

	<b>PATH NAME*</b>	<b>Path Number</b>
1.	Alberta – British Columbia	1
2.	Northwest – British Columbia	3
3.	West of Cascades – North	4
4.	West of Cascades – South	5
5.	West of Hatwai	6
6.	Montana to Northwest	8
7.	Idaho to Northwest	14
8.	South of Los Banos or Midway- Los Banos	15
9.	Idaho – Sierra	16
10.	Borah West	17
11.	Idaho – Montana	18
12.	Bridger West	19
13.	Path C	20
14.	Southwest of Four Corners	22
15.	PG&E – SPP	24
16.	Northern – Southern California	26
17.	Intmntn. Power Project DC Line	27
18.	TOT 1A	30
19.	TOT 2A	31
20.	Pavant – Gonder 230 kV Intermountain – Gonder 230 kV	32
21.	TOT 2B	34
22.	TOT 2C	35
23.	TOT 3	36
24.	TOT 5	39
25.	SDGE – CFE	45
26.	West of Colorado River (WOR)	46
27.	Southern New Mexico (NM1)	47
28.	Northern New Mexico (NM2)	48
29.	East of the Colorado River (EOR)	49
30.	Cholla – Pinnacle Peak	50
31.	Southern Navajo	51
32.	Brownlee East	55
33.	Lugo – Victorville 500 kV	61
34.	Pacific DC Intertie	65
35.	COI	66
36.	North of John Day cutplane	73
37.	Alturas	76
38.	Montana Southeast	80
39.	SCIT**	
40.	COI/PDCI – North of John Day cutplane**	

\* For an explanation of terms, path numbers, and definition for the paths refer to WECC's Path Rating Catalog.

\*\* The SCIT and COI/PDCI-North of John Day Cutplane are paths that are operated in accordance with nomograms identified in WECC's Path Rating Catalog.

**FERC and NERC Directives for a Permanent Replacement Standard  
for PRC-STD-005-1 Operating Reserves  
May 1, 2008**

<b>Received From</b>	<b>FERC and NERC Directives for a Permanent Replacement Standard for PRC-STD-005-1 June 8, 2007</b>	<b>Completed Actions</b>
<b>NERC Staff Common Revisions to WECC “Tier 1” Standards</b>	Remove RMS Sanction Table	The Reliability Management System (RMS) Sanction Table is removed from the standard.
NERC	Include Violation Risk Factors	The drafting team added Violation Risk Factors.
NERC	Include Violation Severity Levels	The drafting team added Violation Severity Levels for each main requirement.
NERC	Include Mitigation Time Horizon	The drafting team added Time Horizon.
NERC	Start date first day of quarter	<b>Effective Date:</b> On the first day of the next quarter, after receipt of applicable regulatory approval.
NERC	Include Applicable functional entity in Requirements and Measures	The drafting team included the applicable functional model entity in requirements and measures.
NERC	Written in Active Voice	The standard is written in an active voice.
NERC	Exclude comments, statements, background and references	The drafting team removed comments, statements, background, and references.
NERC	Individual requirements and measures convey only one main issue	Each requirement and measure conveys only one main issue.
NERC	Each measure refers to clearly to requirement(s) applicable to	There is a measure for each main requirement.
NERC	Include Reset Time Frame	The drafting team included a

Received From	FERC and NERC Directives for a Permanent Replacement Standard for PRC-STD-005-1 June 8, 2007	Completed Actions
		reset time frame.
NERC	Remove second sentence of data retention	The drafting team removed reference to data retention.
NERC	Exclude Excuse for Performance	The drafting team removed the Excuse for Performance provision.
NERC	Align definitions with NERC definitions	The standard uses the NERC definitions.
NERC	Include functional entity in Additional Compliance Information	Functional model entity information is in the compliance section.
NERC	Clarify reference used for Business Day	The definition for Business Day is removed.
<b>FERC Revisions to PRC-STD-005-1</b>	Consider adding the specificity included in PRC-017, i.e. batteries and instrument Transformers.	The drafting team did not include the requested specificity for batteries and instrument transformer because it would repeat requirements contained in a NERC reliability standard. The drafting team considered that these items were addressed in PRC-005-1. In addition, the NERC definition for protection system is: Protective relays, associated communication systems, voltage and current sensing devices, station batteries and DC control circuitry.
<b>NERC Revisions to PRC-STD-005-1</b>	<p>Applicability should have two subsections.</p> <p>Rewrite WR1</p> <p>Rewrite M1</p> <p>Move paragraph two, three and four under Compliance Monitoring Period to Additional Compliance</p>	The drafting team rewrote these subsections to conform to NERC requirements.

<b>Received From</b>	<b>FERC and NERC Directives for a Permanent Replacement Standard for PRC-STD-005-1 June 8, 2007</b>	<b>Completed Actions</b>
	Information	

**The FAC-501-WECC-1 Drafting Team Completed Actions for a Permanent Replacement Standard  
for PRC-STD-005-1 Operating Reserves  
May 1, 2008**

<b>Received From</b>	<b>Pervious Comments to Consider for PRC-STD-005-1 June 8, 2007</b>	<b>The PRC-STD-005-1 Drafting Team Consideration of Comments</b>	<b>The FAC-501-WECC-1 Drafting Team Completed Actions</b>
<b>NERC Question #1</b>	<b>Was the proposed standard developed in a fair and open process, using the associated Regional Reliability Standards Development Procedure? If not, please explain in the comment area.</b>		
No Comments			
<b>Question #2</b>	<b>Does the proposed standard pose an adverse impact to reliability or commerce in a neighboring region or interconnection?</b>		
No Comments			
<b>Question #3</b>	<b>Does the proposed standard pose a serious and substantial threat to public health, safety, welfare, or national security?</b>		
No Comments			



Received From	Pervious Comments to Consider for PRC-STD-005-1 June 8, 2007	The PRC-STD-005-1 Drafting Team Consideration of Comments	The FAC-501-WECC-1 Drafting Team Completed Actions
Question #4	<p><b>Does the proposed standard pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?</b></p>		
No Comments			
Question #5	<p><b>Does the proposed regional reliability standard meet at least one of the following criteria?</b></p> <p>The proposed standard has more specific criteria for the same requirements covered in a continent-wide standard. The proposed standard has requirements that are not included in the corresponding continent-wide reliability standard. The proposed regional difference is necessitated by a physical difference in the bulk power system.</p>		
No Comments			

Received From	Pervious Comments to Consider for PRC-STD-005-1 June 8, 2007	The PRC-STD-005-1 Drafting Team Consideration of Comments	The FAC-501-WECC-1 Drafting Team Completed Actions
<b>WECC Proposed Tier 1 Standards – Response to Comments</b>	November 7, 2006 – 3-4:30 PM PST <b>Conference call participants:</b> Don Watkins, David Lemons, Ed Hulls, Paul Humberson, Sarah Majok, Brent Kingsford, Steve Cobb		
No Comments			

## **FAC-501-WECC-1 Comparison**

This following document prepared by the drafting team during the development of the WECC Standard FAC-501-WECC-1 – Contingency Reserve compares this proposed regional standard to the existing WECC PRC-STD-005-1.

The purpose of this document to provide documentation of each proposed change.

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<b>A. Introduction</b>		
<b>1. Title:</b> Transmission Maintenance	<b>1. Title:</b> Transmission Maintenance	
<b>2. Number:</b> FAC-501-WECC-1	<b>2. Number:</b> PRC-STD-005-1	Title updated to reflect revised titling criteria
<b>3. Purpose:</b> To ensure the Transmission Owner of a transmission path identified in the table titled “Major WECC Transfer Paths in the Bulk Electric System” including associated facilities has a Transmission Maintenance and Inspection Plan (TMIP); and performs and documents maintenance and inspection activities in accordance with the TMIP.	<b>3. Purpose:</b> Regional Reliability Standard to ensure the Transmission Operator or Owner of a transmission path identified in Attachment A perform maintenance and inspection on identified paths as described by its transmission maintenance plan.	Updated to reflect the overall purpose of the proposed revised standard.
<b>4. Applicability</b>	<b>4) Applicability</b>	
4.1 Transmission Owners that maintain the transmission paths in the most current table titled “Major WECC Transfer Paths in the Bulk Electric System” provided at:	4.1. This Standard is applicable to Transmission Owners or Operators that maintain the transmission paths in Attachment A – WECC Table 2 and is applicable only to those facilities associated with each of the paths identified.	Transmission Owners is a defined term in NERC’s Functional Model, so it is used in this standard without being redefined.
<b>5. Effective Date:</b> On the first day of the next quarter, after receipt of applicable regulatory approval.	<b>5. Effective Date:</b> This Western Electricity Coordinating Council Regional Reliability Standard will be effective when approved by the Federal Energy Regulatory Commission under Section 215 of the Federal Power Act. This Regional Reliability Standard shall be in effect for one year from the date of Commission approval or until a North American Standard or a revised Western Electricity Coordinating Council Regional Reliability Standard goes into place, whichever occurs first. At no time shall this regional	

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
	Standard be enforced in addition to a similar North American Standard.	
<b>B. Requirements</b>	<b>B. Requirements</b>	
<p><b>R.1.</b> Transmission Owners shall have a TMIP detailing their inspection and maintenance requirements that apply to all transmission facilities necessary for System Operating Limits associated with each of the transmission paths identified in table titled “Major WECC Transfer Paths in the Bulk Electric System.” <i>[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]</i></p> <p><b>R1.1.</b> Transmission Owners shall annually review their TMIP and update as required. <i>[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]</i></p> <p><b>R.2.</b> Transmission Owners shall include the maintenance categories in Attachment 1-FAC-501-WECC-1 when developing their TMIP. <i>[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]</i></p> <p><b>R.3.</b> Transmission Owners shall implement and follow their TMIP. <i>[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]</i></p> <p><b>Attachment 1-FAC-501-WECC-1</b></p>	<p><b>WR1</b></p> <p>All bulk power transmission elements (i.e. lines, stations and rights of way) included as part of the transmission facilities (or required to maintain transfer capability) impacting each of the transmission paths listed in Attachment A – WECC Table 2 shall be inspected and maintained in accordance with this criterion, taking into consideration diverse environmental and climatic conditions, terrain, equipment, maintenance philosophies, and design practices.</p> <p><b>a. General</b></p> <p>This Transmission Maintenance Standard requires each Responsible Entity identified in Section A.4.1 to develop and implement a Transmission Maintenance and Inspection Plan (TMIP) detailing the Responsible Entity’s inspection and maintenance activities applicable to the transmission facilities comprising each of the transmission paths identified in Attachment A – Table 2.</p> <p><b>b. Standard Requirements (i) TMIP</b></p> <p>To comply with this Standard, each Responsible Entity identified in Section A4.1 must develop and implement a TMIP.</p> <ul style="list-style-type: none"> <li>• Because maintenance and inspection practices vary, it is the intent of this Transmission Maintenance Standard to allow flexibility in inspection and</li> </ul>	<p>R.1 and WR1 are intended to perform the same function.</p> <p>The drafting team removed relay maintenance from Attachment 1 because NERC protection system reliability standards exist.</p>

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<p><b>Transmission Line and Station Maintenance Details</b></p> <p>The maintenance practices in the TMIP may be performance-based, time-based, conditional based, or a combination of all three. The TMIP shall include:</p> <ol style="list-style-type: none"> <li>1. A list of Facilities and associated Elements necessary to maintain the SOL for the transfer paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System;”</li> <li>2. The scheduled interval for any time-based maintenance activities and/or a description supporting condition or performance-based maintenance activities including a description of the condition based trigger;</li> <li>3. Transmission Line Maintenance Details: <ol style="list-style-type: none"> <li>a. Patrol/Inspection</li> <li>b. Contamination Control</li> <li>c. Tower and wood pole structure management</li> </ol> </li> <li>4. Station Maintenance Details: <ol style="list-style-type: none"> <li>a. Inspections</li> <li>b. Contamination Control</li> <li>c. Equipment Maintenance for the following: <ul style="list-style-type: none"> <li>• Circuit Breakers</li> </ul> </li> </ol> </li> </ol>	<p>maintenance practices while still requiring a description of certain specific inspection and maintenance practices.</p> <p><b>(a) TMIP Contents</b></p> <p>The TMIP may be performance-based, time-based, conditional based, or a combination of all three as may be appropriate. The TMIP shall:</p> <ul style="list-style-type: none"> <li>• Identify the facilities for which it is covering by listing the names of each transmission path and the quantities of each equipment component, such as; circuit breaker, relay scheme, transmission line;</li> <li>• Include the scheduled interval (e.g., every two years) for any time-based maintenance activities and a description of conditions that will initiate any condition or performance-based activities;</li> <li>• Describe the maintenance, testing and inspection methods for each activity or component listed under Transmission Line Maintenance and Station Maintenance;</li> <li>• Provide any checklists or forms, or reports used for maintenance activities;</li> <li>• Provide criteria to be used to assess the condition of a transmission facility or component;</li> <li>• Specify condition assessment criteria and the requisite response to each condition as may be</li> </ul>	

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<ul style="list-style-type: none"> <li>• Power Transformers (including phase-shifting transformers)</li> <li>• Regulators</li> <li>• Reactive Devices (including, but not limited to, Shunt Capacitors, Series Capacitors, Synchronous Condensers, Shunt Reactors, and Tertiary Reactors)</li> </ul>	<p>appropriate for each specific type of component or feature of the transmission facilities;</p> <ul style="list-style-type: none"> <li>• Include specific details regarding Transmission Line and Station Maintenance practices as per subsections (1) and (2) below.               <ul style="list-style-type: none"> <li>(1) Transmission Line Maintenance Details                   <p>The TMIP shall, at a minimum, describe the Responsible Entity’s practices for the following transmission line maintenance activities:</p> <ul style="list-style-type: none"> <li>• Patrol/Inspection;</li> <li>• Contamination Control (Insulator Washing)</li> </ul> </li> <li>(2) Station Maintenance Details                   <p>The TMIP shall describe the Responsible Entity’s maintenance practices for the following station equipment:</p> <ul style="list-style-type: none"> <li>• Circuit Breakers</li> <li>• Power Transformers (including phase-shifting transformers)</li> <li>• Regulators</li> <li>• Protective Relay Systems and associated Communication RAS Systems and associated</li> </ul> </li> </ul> </li> </ul>	

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
	<p style="text-align: center;">Communication Equipment</p> <ul style="list-style-type: none"> <li>• Reactive Devices (including, but not limited to, Shunt Capacitors, Series Capacitors, Synchronous Condensers, Shunt Reactors, and Tertiary Reactors)</li> </ul>	
<b>C. Measures</b>	<b>C. Compliance Measures</b>	
<p><b>M1.</b> Transmission Owners shall have a documented TMIP per R.1.</p> <p><b>M1.1.</b> Transmission Owners shall have evidence they have annually reviewed their TMIP and updated as needed.</p> <p><b>M2.</b> Transmission Owners shall have evidence that their TMIP addresses the required maintenance details of R.2.</p> <p><b>M3.</b> Transmission Owners shall have records that they implemented and followed their TMIP as required in R.3. The records shall include:</p> <ol style="list-style-type: none"> <li>1. The person or crew responsible for performing the work or inspection,</li> <li>2. The date(s) the work or inspection was performed,</li> <li>3. The transmission facility on which the work was performed, and</li> <li>4. A description of the inspection or maintenance performed.</li> </ol>	<p>This section defines the items that will be reviewed by WECC Staff to monitor and measure each Responsible Entity’s compliance with this Standard, and the compliance levels that will be assessed in the review process.</p> <p><b>(i) TMIP Certification</b></p> <p>Each Responsible Entity identified in Section A.4.1 shall annually certify to WECC Staff that it has developed, documented, and implemented a TMIP.</p> <p><b>(ii) WECC Staff Review</b></p> <p>WECC Staff will assess performance in the three broad areas described in Paragraph 8 of the Certification Form. These areas are:</p> <ol style="list-style-type: none"> <li>(1) Development and documentation of the TMIP;</li> <li>(2) Performing maintenance in accordance with the TMIP;</li> <li>(3) Maintaining maintenance records as required by</li> </ol>	<p>Measures were simplified to correspond with each main requirement.</p>



FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
	<p style="text-align: center;">this Standard.</p> <p><b>(iii) Review Triggers</b></p> <p>The WECC Staff will conduct a review of the Responsible Entity’s TMIP, maintenance and inspection practices and maintenance records when triggered as described below.</p> <ul style="list-style-type: none"> <li>(a) Disturbance Report. If a WECC Disturbance Report identifies that transmission maintenance and inspection activities were a substantial contributing factor in the disturbance, WECC Staff may request a review of the Responsible Entity.</li> <li>(b) Recommendation by CMWG team. If in its tri-annual review, the CMWG review team notes areas in transmission availability or maintenance that warrant further review, they may recommend a review by the WECC Staff.</li> <li>(c) Incomplete Annual Certification. If the Responsible Entity identified in Section A.4.1 fails to certify one or more categories of paragraph 8 of the Certification Plan, WECC Staff may request a review of the Responsible Entity.</li> <li>(d) Random Audit. The WECC Staff shall randomly select two or three Responsible Entities each year for review. When a review is requested, the Responsible Entity shall make its TMIP and all</li> </ul>	

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
	<p style="text-align: right;">maintenance records for the facilities that are part of RMS available to the WECC Staff for review within 30 calendar days from the request date.</p> <p>C. Measures WM1</p> <p>Each Responsible Entity identified in Section A.4.1 shall develop, document and implement a TMIP, perform maintenance in accordance with that TMIP, and maintain maintenance records as required by this Transmission Maintenance Standard. (Source: Compliance Standard)</p> <p>Full compliance:</p> <ol style="list-style-type: none"> <li>1. The Responsible Entity identified in Section A.4.1 has developed and documented a transmission maintenance, testing and inspection plan that meets the requirements of the Transmission Maintenance Standard.</li> <li>2. The Responsible Entity identified in Section A.4.1 is performing maintenance, testing and inspections in accordance with its TMIP.</li> <li>3. The Responsible Entity identified in Section A.4.1 is maintaining maintenance and inspection records as required by the Transmission Maintenance Standard.</li> </ol>	
<b>D. Compliance</b>	<b>D Compliance</b>	
<b>1 Compliance Monitoring Process</b>	<b>1. Compliance Monitoring Process</b>	
<b>1.1 Compliance Monitoring Responsibility</b> Compliance Enforcement Authority	<b>1.1 Compliance Monitoring Responsibility</b> Western Electricity Coordinating Council (WECC)	
<b>1.2 Compliance Monitoring Period</b> The Compliance Enforcement Authority may use one	<b>1.2 Compliance Monitoring Period</b> At Occurrence and Yearly  Each Responsible Entity identified in Section A.4.1 shall	Remove specificity for reporting. The Compliance

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<p>or more of the following methods to assess compliance:</p> <ul style="list-style-type: none"> <li>- Self-certification conducted annually</li> <li>- Spot check audits conducted anytime with 30 days notice given to prepare</li> <li>- Periodic audit as scheduled by the Compliance Enforcement Authority</li> <li>- Investigations</li> <li>- Other methods as provided for in the Compliance Monitoring Enforcement Program</li> </ul> <p>The Reset Time Frame shall be one year.</p>	<p>certify to the WECC Staff on or before January 15 of each year, that it has implemented a TMIP in compliance with this Transmission Maintenance Standard by submitting a completed Transmission Maintenance Certification Form (Form A.12).</p> <p>If a review is triggered according to Section B.c (iii), a Responsible Entity identified in Section A.4.1 shall make its TMIP and maintenance records for those facilities available to the WECC Staff within 30 calendar days from the date requested. The WECC Staff may have to visit several maintenance headquarters or offices to review the maintenance records.</p> <p>Each Responsible Entity identified in Section A.4.1 shall submit the completed form(s) by e-mail to the WECC Staff at the address specified in the form. Electronic data submittal forms for use in preparing a customized form specifically for your organization are available from the WECC web site or by email from WECC Staff at the e-mail address specified on the WECC web site.</p>	<p>Enforcement Authority will include this detail in its reporting instructions.</p>
<p><b>1.3 Data Retention Data Retention</b></p> <p>The Transmission Owners shall keep evidence for Measure M1 through M3 for three years plus the current year, or since the last audit, whichever is longer.</p>	<p><b>Maintenance Record Keeping</b></p> <p>M1. Each Responsible Entity identified in Section A.4.1 must retain all pertinent maintenance and inspection records that support the TMIP according to the following guidelines:</p> <ul style="list-style-type: none"> <li>• The Responsible Entity shall maintain records of all maintenance and inspection activities for at least five years.</li> </ul>	<p>Data retention period lengthened to 3 years plus the current year to ensure data are kept in a contiguous manner between audit periods.</p>

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
	<ul style="list-style-type: none"> <li>• Each Responsible Entity’s maintenance and inspection records shall identify, at a minimum: <ul style="list-style-type: none"> <li>o The person(s) responsible for performing the work or inspection;</li> <li>o The date(s) the work or inspection was performed;</li> <li>o The transmission facility on which the work was performed, and</li> <li>o A description of the inspection or maintenance performed.</li> </ul> </li> </ul> <p>The Transmission Owner or Operator shall maintain (and make available on request) records for maintenance or inspection pertaining to the items listed in subsections (a) and (b) below.</p> <p>(a) Transmission Line Maintenance Records</p> <ul style="list-style-type: none"> <li>• Patrol/Inspection</li> <li>• Contamination Control (Insulator Washing)</li> </ul> <p>(b) Station Maintenance Records</p> <ul style="list-style-type: none"> <li>• Circuit Breakers</li> <li>• Power Transformers</li> <li>• Regulators</li> </ul>	

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
	<ul style="list-style-type: none"> <li>• Protective Relay Systems and associated Communication Equipment</li> <li>• RAS Systems and associated Communication Equipment</li> <li>• Reactive Devices</li> </ul> <p><b>1.3 Data Retention</b> Data will be retained in electronic form for at least four years. The retention period will be evaluated before expiration of four years to determine if a longer retention period is necessary. If the data are being reviewed to address a question of compliance, the data will be saved beyond the normal retention period until the question is formally resolved.</p>	
<p><b>1.4 Additional Compliance Information</b></p> <p>No additional compliance information.</p>	<p><b>1.4. Additional Compliance Information</b>  For purposes of applying the sanctions specified in the WECC Reliability Standard for violations of this criterion, the “Sanction Measure” is Normal Path Rating and the “Specified Period” is the four most recent calendar years. The sanctions shall be assessed on an annual basis, but for purposes of determining the applicable column in the Sanctions Table, all occurrences within the specified period of the most recent calendar year and all immediately preceding consecutive calendar years in which at least one instance of non-compliance occurred shall be considered.</p>	<p>No longer needed because the NERC sanction table is used.</p>
<p><b>2. Violation Severity Levels for Requirements</b></p>	<p><b>Levels of Non-Compliance Sanction</b></p>	
	<p><b>Sanction Measure:</b> Normal Path Rating</p>	
<p><b>2.1. Lower:</b> There shall be a Lower Level of non-compliance if any of the following conditions exist:</p> <p><b>2.1.1</b> The TMIP does not include associated Facilities for one of the Paths</p>	<p><b>2.1. Level 1:</b> There shall be a Level 1 non-compliance if any of the following conditions exist:</p> <p>2.1.1 The Responsible Entity certifies that it has developed and documented a TMIP (8a from Certification Form) and certifies that it is fulfilling only one of the following two</p>	<p>Lower Severity Levels defined for each requirement.</p>

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<p>identified in Attachment 1 FAC-501-WECC-1 as required by R.1 but Transmission Owners are performing maintenance and inspection for the missing Facilities.</p> <p><b>2.1.2</b> Transmission Owners did not review their TMIP annually as required by R.1.1.</p> <p><b>2.1.3</b> The TMIP does not include one maintenance category identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.</p> <p><b>2.1.4</b> Transmission Owners do not have maintenance and inspection records as required by R.3 but have evidence that they are implementing and following their TMIP.</p>	<p>requirements:</p> <ul style="list-style-type: none"> <li>• Performing maintenance, testing and inspections in accordance with its TMIP (8b from Certification Form), or</li> <li>• Maintaining maintenance and inspection records as required by the Transmission Maintenance Standard (8c from Certification Form).</li> </ul>	
<p><b>2.2. Moderate:</b> There shall be a Moderate Level of non-compliance if any of the following conditions exist:</p> <p><b>2.2.1</b> The TMIP does not include associated Facilities for two of the Paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” as required by R.1 and Transmission Owners are</p>	<p><b>2.2. Level 2:</b> There shall be a Level 2 non-compliance if any of the following conditions exist:</p> <p>2.2.1 The Responsible Entity certifies that it has developed and documented a TMIP (8a from Certification Form) and has not certified that it is fulfilling the following two requirements:</p> <ul style="list-style-type: none"> <li>• Performing maintenance, testing and inspections in accordance with its TMIP (8b</li> </ul>	<p>Moderate Severity Levels defined for each requirement.</p>

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<p>not performing maintenance and inspection for the missing Facilities.</p> <p><b>2.2.2</b> The TMIP does not include two maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.</p> <p><b>2.2.3</b> Transmission Owners are not performing maintenance and inspection for one maintenance category identified in Attachment 1 FAC-501-WECC-1 as required in R3.</p>	<p>from Certification Form), and</p> <ul style="list-style-type: none"> <li>Maintaining maintenance and inspection records as required by the Transmission Maintenance Standard (8c from Certification Form).</li> </ul>	
<p><b>2.3. High:</b> There shall be a High Level of non-compliance if any of the following condition exists:</p> <p><b>2.3.1</b> The TMIP does not include associated Facilities for three of the Paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” as required by R.1 and Transmission Owners are not performing maintenance and inspection for the missing Facilities.</p> <p><b>2.3.2</b> The TMIP does not include three maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission</p>	<p><b>2.3. Level 3:</b> There shall be a Level 3 non-compliance if any of the following conditions exist:</p> <p>2.3.1 The Responsible Entity does not have a TMIP but has submitted a mitigation plan to achieve full compliance.</p>	<p>High Severity Levels defined for each requirement.</p>

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<p>Owners are performing maintenance and inspection for the missing maintenance categories.</p> <p><b>2.3.3</b> Transmission Owners are not performing maintenance and inspection for two maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required in R3.</p>		
<p><b>2.4. Severe:</b> There shall be a Severe Level of non-compliance if any of the following condition exists:</p> <p><b>2.4.1</b> The TMIP does not include associated Facilities for more than three of the Paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” as required by R.1 and Transmission Owners are not performing maintenance and inspection for the missing Facilities.</p> <p><b>2.4.2</b> The TMIP does not exist or does not include more than three maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.</p> <p><b>2.4.3</b> Transmission Owners are not performing maintenance and inspection for more than two</p>	<p><b>2.4. Level 4:</b> There shall be a Level 4 non-compliance if any of the following conditions exist:</p> <p>2.4.1 The Responsible Entity does not have a TMIP and has not submitted a mitigation plan to achieve full compliance.</p>	<p>Severe Severity Levels defined for each requirement.</p>



<b>FAC-501-WECC-1 - Transmission Maintenance</b>	<b>WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings</b>	<b>Comment</b>
maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required in R3.		



## Comment Report Form for WECC Standard FAC-501-WECC-1 – Transmission Maintenance

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The FAC-501-WECC-1 Standard Drafting Team thanks all commenters who submitted comments on the FAC-501-WECC-1 Standard. This Standard was posted for a 45-day public comment period from April 4, 2008 through May 20, 2008. NERC distributed the notice for this posting on April 7, 2008. The Standard Drafting Team asked stakeholders to provide feedback on the standard through a special Standard Comment Form. There were three sets of comments from five companies representing four of the ten Industry Segments as shown in the table on the following pages.

In this 'Consideration of Comments' document stakeholder comments have been organized so that it is easier to see the responses associated with each question. All comments received on the Standard can be viewed in their original format at:

[http://www.nerc.com/~filez/regional\\_standards/regional\\_reliability\\_standards\\_under\\_development.html](http://www.nerc.com/~filez/regional_standards/regional_reliability_standards_under_development.html)

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you can contact the Manager of Regional Standards, Stephanie Monzon at [Stephanie.monzon@nerc.net](mailto:Stephanie.monzon@nerc.net). In addition, there is a NERC Reliability Standards Appeals Process.<sup>1</sup>

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<sup>1</sup> The appeals process is described in the NERC Regional Reliability Standards Development Procedure: [ftp://www.nerc.com/pub/sys/all\\_updl/sac/rrswg/NERC\\_Regional\\_Reliability\\_Standards\\_Development\\_Procedure\\_Version%200-0%202007-06-15\\_dwt.pdf](ftp://www.nerc.com/pub/sys/all_updl/sac/rrswg/NERC_Regional_Reliability_Standards_Development_Procedure_Version%200-0%202007-06-15_dwt.pdf)

**Comment Report Form for WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

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The Industry Segments are:

- 1 – Transmission Owners
- 2 – RTOs, ISOs
- 3 – Load-serving Entities
- 4 – Transmission-dependent Utilities
- 5 – Electric Generators
- 6 – Electricity Brokers, Aggregators, and Marketers
- 7 – Large Electricity End Users
- 8 – Small Electricity End Users
- 9 – Federal, State, Provincial Regulatory or other Government Entities
- 10 – Regional Reliability Organizations, Regional Entities

Commenter		Organization	Industry Segment											
			1	2	3	4	5	6	7	8	9	10		
1.	Denise Koehn	Bonneville Power Administration	✓		✓		✓	✓						
2.	Annette Bannon	PPL Generation, LLC					✓	✓						
3.	Jon Williamson	PPL EnergyPlus						✓						
4.	John Cummings	PPL EnergyPlus						✓						
5.	Tom Olson	PPL Montana, LLC					✓							
6.	Paul Mueller	Arizona Public Service, T&D Reliability Analysis and Management	✓											

## Index to Questions, Comments, and Responses

1. Was the WECC Standard IRO-006-WECC-1 – Qualified Transfer Path Unscheduled Flow Relief developed in a fair and open process, using the Process for Developing and Approving WECC Standards? page 4
2. Does the WECC Standard IRO-006-WECC-1 – Qualified Transfer Path Unscheduled Flow Relief pose an adverse impact to reliability or commerce in a neighboring region or interconnection? page 4
3. Does the WECC Standard IRO-006-WECC-1 – Qualified Transfer Path Unscheduled Flow Relief pose a serious and substantial threat to public health, safety, welfare, or national security? page 5
4. Does the WECC Standard IRO-006-WECC-1 – Qualified Transfer Path Unscheduled Flow Relief pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability? page 5
5. Does the WECC Standard IRO-006-WECC-1 – Qualified Transfer Path Unscheduled Flow Relief meet at least one of the following criteria? page 6
  - The proposed standard has more specific criteria for the same requirements covered in a continent-wide standard
  - The proposed standard has requirements that are not included in the corresponding continent-wide reliability standard
  - The proposed regional difference is necessitated by a physical difference in the bulk power system.

**Comment Report Form for WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

**1. Was the WECC Standard FAC-501-WECC-1 – Transmission Maintenance developed in a fair and open process, using the Process for Developing and Approving WECC Standards?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Denise Koehn	X		
Response: Thank you.			
Annette Bannon, Jon Williamson, John Cummings, and Tom Olson	X		PPL believes that this revision of the standard adds valuable language to help make the grid more reliable.
Response: Thank you.			
Paul Mueller	X		General review comments: Now that the procedure references the WECC Web page for the transmission paths, it is more dynamic and will necessitate more periodic reviews. Whenever the Web page is revised beyond simple editorial changes we would expect notification. What is the intent of changing D.1.1 from "WECC" to "Compliance Enforcement Agency"? Does this defer to NERC?
Response: Modifications to the table titled "Major WECC Transfer Paths in the Bulk Electric System" are to be developed using the "Process for Developing and Approving WECC Standards." The refinements would require posting for comment, OC approval, and WECC Board approval. However, NERC and FERC approval is not required.			
In the U.S. the "Compliance Enforcement Authority" is the Electric Reliability Organization (ERO). The "Compliance Enforcement Authority" outside of the U.S. has not been defined. In Canada, this may be the Provincial Regulators. The ERO in the U.S. is NERC. However, the Delegation Agreement transfers compliance enforcement to the regions. Therefore, in the U.S. the "Compliance Enforcement Authority" is a combination of WECC and NERC.			
Response:			

**2. Does the WECC Standard FAC-501-WECC-1 – Transmission Maintenance pose an adverse impact to reliability or commerce in a neighboring region or interconnection?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Denise Koehn		X	
Response: Thank you.			

**Comment Report Form for WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

Commenter	Yes	No	Comment
Annette Bannon, Jon Williamson, John Cummings, and Tom Olson			
Response:			
Paul Mueller		X	
Response: Thank you.			

**3. Does the WECC Standard FAC-501-WECC-1 – Transmission Maintenance pose a serious and substantial threat to public health, safety, welfare, or national security?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Denise Koehn		X	
Response: Thank you.			
Annette Bannon, Jon Williamson, John Cummings, and Tom Olson			
Response:			
Paul Mueller		X	
Response: Thank you.			

**4. Does the WECC Standard FAC-501-WECC-1 – Transmission Maintenance pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Denise Koehn		X	
Response: Thank you.			
Annette Bannon, Jon Williamson, John Cummings, and Tom Olson			
Response:			
Paul Mueller		X	

**Comment Report Form for WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

Commenter	Yes	No	Comment
Response: Thank you.			

**5. Does the WECC Standard FAC-501-WECC-1 – Transmission Maintenance meet at least one of the following criteria?**

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

**Summary Consideration:**

Commenter	Yes	No	Comment
Denise Koehn	X		
Response: Thank you.			
Annette Bannon, Jon Williamson, John Cummings, and Tom Olson			
Response:			
Paul Mueller			
Response:			



**Regional Reliability Standard Submittal Request**

**Region: Western Electricity Coordinating Council**

**Regional Standard Number: FAC-501-WECC-1**

**Regional Standard Title: Transmission Maintenance**

**Date Submitted: June 10, 2008**

**Regional Contact Name: Steven L. Rueckert**

**Regional Contact Title: Director of Standards**

**Regional Contact Telephone Number: (801) 582-0353**

**Request (check all that apply):**

- 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 (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)):**

- Yes April 16, 2008
- No

**[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:**

The purpose of this standard is to create a permanent replacement standard for PRC-STD-005-1. In response to comments, the drafting team changed the name of the standard from PRC-005-WECC-1 to FAC-501-WECC-1 to better align with the NERC numbering system. FAC-501-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when PRC-STD-005-1 was approved as a NERC reliability standard.



**Concise statement of the justification of the request:**

The FAC-501-WECC-1 regional reliability standard contains maintenance requirements not covered in the continent-wide reliability standards. The NERC standard PRC-005-1 has requirements for equipment maintenance and inspection of relay and backup power systems. FAC-003-1 has requirements for vegetation management. The NERC standards do not have any maintenance and test requirements for the additional components such as breakers, reactive devices, transformers and the associated transmission line. The 40 major paths listed in the Attachment 1-FAC-501-WECC-1 are significant components for reliable delivery of power in the Western Interconnection. Breaker, transformer, and insulator failures cause reductions to the System Operating Limits (SOL) for those paths, and thus limit transfers between remotely located generation in the Western Interconnection and population/load centers. The entities of the Western Interconnection through study and operation see optimizing the capacity for these paths as critical to the reliability of the Western Interconnection. The lack of redundant transmission in these corridors raises the level of scrutiny for the components and facilities associated with these paths; therefore, this standard is designed to minimize the SOL reductions required to maintain reliable Western Interconnection operation.

**Other – please attach or include as separate files:**

- **The text of the regional reliability standard in MS Word format that:**
  - **has either been, or is anticipated to be, approved by the regional entity's board, and**
  - **is in a format consistent with the NERC template for reliability standards.**
- **An implementation plan.**
- **The regional entity standard drafting team roster.**
- **The names and affiliations of the ballot pool members or names and affiliations of the committee and committee members that approved the submittal of the standard.**
- **The final ballot results, including a list of significant minority issues that were not resolved, and**
- **For each public comment period, a copy of each comment submitted and its associated response along with the associated changes made to the standard.**

Comment Received During the First Posting of PRC-004-WECC-1  
November 29, 2007

- I agree with that the owner(s) should report misoperations instead of the operating agent(s) of the paths

*Reply: No Reply necessary.*

- Please clarify which elements need to be considered for misoperation reporting, just those which comprise the paths or any elements which can affect the SOL of a path

*Reply: Similar to the previous RMS standards, only the elements listed in the tables "Major WECC Transfer Paths in the Bulk Electric System" and "Major WECC Remedial Action Schemes (RAS)" need be reported. Other elements that may affect path SOLs are covered under other standards. We do not propose any modification.*

- The Measures contained in Section M2 appear to be repetitive

*Reply: The drafting team agrees that it may appear repetitive. The intent is to maintain a one-to-one relationship between the Requirements and the Measures for clarity of reporting. We do not propose any modification.*

- The standard refers to "Misoperation Reports". Will WECC provide a standard reporting form?

*Reply: Yes, the WECC Compliance Monitor will provide a standard reporting form. The existing RMS forms will be used until they are superseded.*

- Section D. 1.4 refers to the submittal of misoperation and followup reports. Are the 10 day filing requirements in consecutive days or business days?

*Reply: We will change the standard to indicate business days.*

Nicholas Klemm - Western Area Power Administration

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1) The title and purpose of this standard is defined as reviewing misoperation but the requirement R1 says review all operations. We think it is unnecessarily burdensome to have to review all operations since the vast majority of operations are correct operations. We would recommend that there be no requirement for reviewing the correct operations.

*Reply: Incorrect or questionable operations are generally easily detected, but unless each operation is evaluated, there is no assurance that incorrect operations are identified. We do not propose any modification.*

- 2) R1.1 requires that all operations be reviewed within one day. This is unnecessary and burdensome. Our suggestion would be allow one week to review. Daily review requirement mean having one expert on hand every day, 365 days a year, can not fall sick and can not miss the work without being non-compliant.

*Reply: This requirement does not require detailed analysis. Trained System Operating personnel can classify most operations as correct or incorrect almost immediately. The draft standard was revised to clarify purpose, responsibility, and timing.*

- 3) R2.2.1 provides a 22 hours window for action. I am not sure what is the rational for 22 hours. We would suggest one day as the more appropriate so as to allow the work to be completed by end of the next day.

*Reply: The 22 hour window is the same criterion that is currently used in the RMS. This is to try to ensure that a misoperation that is a result of any daily loading cycle is mitigated before the opportunity for a similar misoperation. We do not propose any modification.*

- 4) M1.1 requires evidence of having reviewed. What will constitute an acceptable evidence?

*Reply: The owner's evidence to comply with PRC-004 M1 and M2 is acceptable for this standard as well.*

- 5) We also feel some of the 22 to 32 hours windows are unnecessarily tight going from low violation risk factor to sever. If one has a problem removing the protection system or RAS from service in 22 hours, there must be some very unusual circumstance. Our suggestion would be to extend it to at least 48 hours.

*Reply: These time periods are duplicated from the RMS program. We do not propose any modification.*

Tom Glock, Baj Agrawal  
Arizona Public Service Co

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The purpose of PRC-STD-003-1 has been lost in the replacement. Without the description in this draft, it is no longer clear that the standard is to meet PRC-003-1 R1.

Steve Alexanderson PE  
Central Lincoln PUD

*Reply: This standard is not intended to meet PRC-003-1. This standard is intended to replace the conditionally approved PRC-STD-003-1.*

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## WECC Reliability Coordination Comments Work Group (RCCWG) Comments

### WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation

The Reliability Coordinators are referred to in the WECC Standard PRC-004-WECC-1 in Requirement 2.3.2.2, with a requirement that “the WECC Reliability Coordinators shall derate the facilities to a reliable operating level” if a protection scheme cannot be repaired and placed back into service. In WECC, the path operator, not the WECC Reliability Coordinator determines and manages path limits. Removal of remedial action schemes and the resultant impact on paths and elements should be studied and known prior to real-time need as part of path management. As this requirement is WECC-specific, the assignment of this responsibility should remain with the path or element operator. The WECC Reliability Coordinators will receive a revised operating limit from the path operator, and will operate using that revised operating limit. Should the path or element operator not take action to reduce loading below the revised rating, the WECC Reliability Coordinator will monitor and, if needed, issue a directive that the path or element operator reduce loading using whatever method is necessary, including load shedding. The WECC RCCWG believes that this WECC standard should not be applicable to the WECC Reliability Coordinators.

*Reply: The applicability to reliability coordinators has been removed from this standard and the responsibility for meeting 2.3.2.2 has been transferred to the Transmission Owner.*

Measure M2.3.2 states that

“The Reliability Coordinator and GO shall have documentation describing all actions taken that adjusted generation or derated associated transmission facilities to a reliable operating level.” The Path Operator (TOP) and Generator owner should retain documentation describing all actions taken to derate facilities and reduce generation. The WECC RCCWG notes that this measure assigns responsibility to the Reliability Coordinator. There is no requirement that the Reliability Coordinator monitor and record all generation redispatch. As previously noted, the WECC RCCWG believes that the Path Operator (TOP) and the Generator Owner should retain responsibility to meet the requirements of this standard. The Reliability Coordinator will become involved only if those requirements are not met.

*Reply: The applicability to reliability coordinators has been removed from this standard and the responsibility for meeting 2.3.2.2 has been transferred to the Transmission Operator. (The functional model and TOP-002-2 R11 assign this responsibility to the Transmission Operator. I recommend 2.3.2 be Transmission Operator.)*

WECC RCCWG

RCCWG Members Commenting on this draft standard:

Nancy Bellows, WACM

Terry Baker, PRPA  
Paul Bleuss, CMRC  
Jeremy Brownrigg, RDRC  
Mike Gentry, SRP  
Robert Johnson, PSC  
Greg Tillitson

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I commend the standard drafting team for a well written, easily understood draft standard. The original requirements of the predecessor standards all seem to be present along with the definitions and more specific Requirements make for an improved standard.

My comments are:

1. R.2.3 should say: "If the Protection system has a *Security-Based Misoperation...*"

*Reply: The drafting team believes that either a Security- or Dependability-Based misoperation can apply to R2.3. If a Dependability-Based misoperation cannot be mitigated within 22 hours after discovery and the reliability of the BES is at risk because another functionally equivalent system is unavailable, the mitigation of R2.3.1 and R2.3.2 must be implemented. The clarification was added to R2.3.*

2. R2.4 talked about actions to take when a Dependability-Based Misoperation occurs with one or more FEPS/FERAS. What about if *no* FEPS/FERAS exists?

*Reply: Then R2.3 would apply.*

3. The various Measures state that relay/RAS owners shall have "evidence" that various actions were taken (e.g., take a relay out-of-service). The word "evidence" can have a wide degree of interpretation for an auditor. For example, does evidence include producing the offending relay for an auditor/photographs/fingerprints? This opens the door to inconsistent auditing practices. I suggest that all instances of "evidence" should be replaced with "documentation."

*Reply: This standard uses terminology consistent with the NERC standards. The owner's evidence to comply with PRC-004 Measures is acceptable for this standard as well. We do not propose any modifications.*

4. Lastly, all of the Measures in PRC-004 are a dramatic increase in the documentation required, not present in the predecessor standards. So dramatic, that the standard really isn't about relay/RAS performance; it's about the paperwork. The standard is about the process, not the end result--greater reliability. Even my earlier comment about "documentation" rather than "evidence" does not focus on the important aspect of this exercise: higher reliability. It's a full-employment act for document management staff and lawyers. These new effective requirements for "evidence" are too burdensome.

*Reply: This standard is an implementation of the already existing RMS program under the NERC Standard functional model. All such standards must have measurable requirements and violation severity levels. We do not propose modification.*

## **Anonymous**

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4.1 and 4.2 Clarify which document contains the Tables, not just a link to WECC.

*Reply: The appropriate link will be included in the final draft. The current draft has the tables included at the end of the body of the standard.*

5.0 Make the effective date 90 days after approval (they could approve on the last day of a quarter, then it would be mandatory the next day).

*Reply: We will make the standard effective the first day of the second quarter following the regulatory approval.*

Requirements: Clarify that these requirements only apply to protection and RAS to those paths or schemes contained in the Tables. As written, it says it applies to the Owners, but doesn't say it applies only to the paths or schemes.

*Reply: The Applicability section clearly identifies the impacted owners. We do not propose modification.*

R.2.2.2 and R2.4.2 should still allow for operation of the elements at levels that meet NERC and WECC standards beyond the 20 day period. Or at least the RC should be able to allow.

*Reply: This is an implementation of the existing RMS program and uses the same allowable time periods. We do not propose modification.*

Adjust measures accordingly. Measures are about paperwork, not greater reliability. At some time, they system will collapse due to the paperwork, not instability.

*Reply: The requirements are only slightly different than exist under the current RMS program. We do not propose modification.*

Scott Peterson, SDG&E

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The measurements are littered with references to reporting. Reporting is not mentioned in any of the Requirements. If the measurements are going to refer to reporting, the

Requirements need to be specific in what the reporting requirements are.

Mike Gentry  
Salt River Project

*Reply: The standard was modified to have separate requirements (R3) and measures (M3) for reporting.*

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Comments from Bonneville Power Administration

WECC Standard PRC-004-WECC-1 Protection System and Remedial Action Scheme Misoperation

#### DEFINITIONS OF TERMS USED IN STANDARD

Dependability-Based Misoperation: Any of the following:

The absence of a Protection System or RAS operation when intended

A Protection System or RAS equipment failure is alarmed or indicated to operating personnel.

A Protection System or RAS equipment failure is discovered.

A Protection System or RAS equipment failure is alarmed or indicated to operating personnel should not be considered a Misoperation. It is an alarm that indicates that the equipment is compromised. The operating staff will take action to get the equipment repaired. If the operating staff determines that there isn't adequate RAS or protective system coverage, they will take the correct action to mitigate the situation. An alarm is not a misoperation.

A Protection System or RAS equipment failure is discovered is not a Misoperation - it is only a misoperation when it does not operate when required. If an equipment failure is discovered, it is repaired or replaced or mitigated by the operating staff. The failure of equipment should not be identified as a misoperation.

The definition of a 'Dependability-Based Misoperation' should simply read, "A Dependability-Based Misoperation is the failure of a Protection System or RAS to operate when intended."

*Reply: The standard was modified to eliminate alarming.*

#### B. Requirements

R.1. System Operating and System Protection personnel of the Transmission Owners and

Generator Owners shall analyze all Protection System and RAS operations. [Violation Risk Factor: Lower] [Time Horizon: Operations Assessment]

R1.1. System Operating personnel shall review all operations or alarms of Protection Systems and RAS within one business day.

R1.2. System Protection personnel shall analyze all operations or alarms of Protection Systems and RAS for correctness within 20 business days.

R1.2 should read, "System Protection personnel shall analyze all operations of Protection Systems and RAS for correctness within 20 business days." Most alarms for RAS are caused by communication fades on analog microwave systems. If you have a microwave communications system, you expect to see this type of alarm. Other types of common alarms are to notify the dispatcher when they should alter the arming status of the RAS. The System Operating Staff make an assessment of the alarm and will pull in the System Protection staff if further action is required.

*Reply: The standard was modified to eliminate alarming.*

R2.3.2.2 The Reliability Coordinators shall derate the facilities to a reliable operating level.

This sentence should read, R2.3.2.2. The Path Operator shall set the operating transfer capability (OTC) of the impacted path to a reliable operating level.

*Reply: The applicability to reliability coordinators has been removed from this standard and the responsibility for meeting 2.3.2.2 has been transferred to the Transmission Operator. (The functional model and TOP-002-2 R11 assign this responsibility to the Transmission Operator. I recommend 2.3.2 be Transmission Operator.)*

### C. Measures

M1. Transmission Owners and Generation Owners shall have evidence that they reported and analyzed all Protection System and RAS operations or alarms.

M1.1 Transmission Owners and Generation Owners shall have evidence that System Operating personnel reviewed all operations and alarms of Protection System and RAS within one business day.

M1.2 Transmission Owners and Generation Owners shall have evidence that System Protection personnel analyzed all operations and alarms of Protection System and RAS for correctness within 20 business days.

C.M1. should read, M1. Transmission Owners and Generation Owners shall have evidence that they reported and analyzed all Protection System and RAS operations.

*Reply: The standard was modified to eliminate alarming.*

Remove the word "alarms" from this measure.

C.M1.1 remove the words, "and alarms".



C.M1.2 remove the words, “and alarms”.

*Reply: The standard was modified to eliminate alarming.*

M2. Transmission Owner and Generation Owner shall have evidence for the following.  
M2.1 Transmission Owners and Generation Owners shall have evidence that they reported and removed the Protection System or RAS that misoperated from service within 22 hours following identification of the Protection System or RAS Misoperation.

*Reply: No reply necessary.*

The definition of Dependability-Based Misoperation must be changed, otherwise every time there is a momentary communications alarm, or some other minor alarm, we'd have to remove equipment from service.

*Reply: The standard was modified to eliminate alarming.*

M2.3.2 The Reliability Coordinator and Generator Owner shall have documentation describing all actions taken that adjusted generation or derated associated transmission facilities to a reliable operating level.

"Derated" is not the correct term to use. Use Operating Transfer Capability (OTC) instead. Rating a transmission path is a complex process involving system studies and going through various WECC study groups. Setting a new OTC based upon current conditions, for example a complete RAS outage, does not change the official rating of the path. Also, "Reliability Coordinator" should be changed to "path operator."

*Reply: The applicability to reliability coordinators has been removed from this standard and the responsibility for meeting 2.3.2.2 has been transferred to the Transmission Operator. The term SOL is used in place of “derated.” (The functional model and TOP-002-2 R11 assign this responsibility to the Transmission Operator. I recommend 2.3.2 be Transmission Operator.)*

Comments from Bonneville Power Administration  
Commenter: John Kerr, Electrical Engineer, Technical Operations

Consideration of Comments for PRC-004-WECC-1 – Relay and RAS Misoperations  
Comments were due January 2, 2008  
January 18, 2008

The PRC-004-WECC-1 Standard Drafting Team thanks all commenters who submitted comments on the WECC PRC-004-WECC-1 Standard. This Standard was posted for a 30-day public comment period from November 29, 2007 through January 2, 2008. The Standard Drafting Team asked stakeholders to provide feedback on the standard by posting comments on the WECC website. There were seven sets of comments from seven companies.

In this ‘Consideration of Comments’ document, stakeholder comments have been organized so that it is easier to see the responses associated with each comment.

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you may contact the Director of Standards, Steve Rueckert at 801-582-0353 or at [steve@wecc.biz](mailto:steve@wecc.biz). In addition, there is a WECC Appeals Process.

### **Comments and Responses**

#### PRC-004-WECC-1

How can the repair or replacement at owners discretion in R2.1 occur when the repair or replacement measures in M2.2.2, M2.3, and M2.4 require 22 hours to 20 days for action?

[richard.dernbach@ladwp.com](mailto:richard.dernbach@ladwp.com)

Reply: M2.1 is in response to R2.1, which requires that two or more functionally equivalent relay systems remain in service after the relay that misoperated is removed. With three or more equivalent relays in service prior to the misoperation of one of them, removing one from service leaves at least two relays in service which meets minimum redundancy requirements.

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Comments on draft standard PRC-004-WECC-1 by Ron Forster and Jeanne Harshbarger, Substation Engineering, Puget Sound Energy

Extra word, p.1., Several Significant Changes.... Part 2.b. “is covered in the this standard”

Reply: The drafting team made the correction.

There is an inconsistency regarding the response time for System Operators, which shows up on:

p.5., B. Requirements, R1.1 “shall review all operations of Protection Systems and RAS

to identify apparent Misoperations within 24 hours”

p.7., C. Measures, M1.1 “Shall have evidence that System Operations personnel reviewed all operations of Protection System and RAS within one business day”

Reply: The drafting team changed M1.1 to 24 hours to be consistent with R1.1.

p.10. R1, Lower, “did not review the Protection System Operation or RAS operation within one business day”

Reply: The drafting team changed VSL of R1 to 24 hours to be consistent with M1.1.

A confusing point on p.6., R2.2.2., “of the date of removal, or either remove the Element from service or disable the RAS.”

Reply: The drafting team modified R2.2.2 to clarify the requirement.

Concerning all of M2., since there are different requirements depending on whether the misoperation is security-based or dependability-based, should the measures reflect this?

Anonymous

Reply: The drafting team added a statement that each measure applies directly to the requirement by number.

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We were hopeful that after reviewing the submitted comments from the first posting, the drafting team would remove or reduce the requirement for a 24-hour review of operations and the associated documentation evidence burden that results from this requirement. The latest draft does clarify that Operating personnel (we assume real-time) can sufficiently conduct this review. We believe that this activity does occur in all practicality absent having a specific requirement, but that having this requirement in the Standard is onerous from an evidence standpoint and goes beyond anything in the NERC Standards, which appear to be silent on this matter.

Rich Salgo - Sierra Pacific Resources Transmission

Reply: Documentation appears to be the primary concern. The drafting team believes that documentation is necessary. For example, the operator’s log that identifies the relay operation as suspicious would be sufficient documentation.

The drafting team realizes that regional standards have to be more restrictive than NERC reliability standards. The drafting team believes it important to remedy apparent relay or

RAS misoperations before they can recur and in order to do that all operations have to be evaluated.

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The listing of Major WECC Remedial Action Schemes needs to be updated. Items 14 and 15 involving SDGE are not applicable-

Bill Cook- San Diego Gas & Electric

Reply: Updating the RAS list is not intended to be part of the PRC-004-WECC-1 Standard development. The drafting team recommends that SDG&E submit a request using the WECC standards process to update the RAS list.

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The Alberta Electric System Operator appreciates the opportunity to comment on this proposed standard and would like to offer the following comments:

The reporting schemes for Alberta Transmission Owners and Generation Owners to the WECC is under review in Alberta and future changes may be necessary.

The RAS scheme for Path 1 pertaining to curtailment of generation north of SOK should be reviewed for accuracy.

There seems to be a discrepancy between the wording in R1.1 and M1.1 where one refers to "within 24 hours" and the other "within one business day."

Thank you.

Anita Lee, P. Eng.

Manager, Operating Policies and Procedures  
Alberta Electric System Operator (AESO)

Reply: Updating the RAS list is not intended to be part of the PRC-004-WECC-1 Standard development. The drafting team recommends that AESO submit a request using the WECC standards process to update the RAS list. The drafting team changed M1.1 to 24 hours to be consistent with R1.1.

R1.1.

"System Operators or System Protection personnel" should replace "System Operators"

Reply: The drafting team believes System Operator is correct. The operator's log that identifies the relay operation as suspicious would be sufficient documentation.

"24 hours" should be changed to one business day to match the measures of M1.1 and the Violation Severity Levels of Table R1.

Reply: The drafting team changed M1.1 to 24 hours to be consistent with R1.1.

M1.1

"System Operating personnel or System Protection personnel" should replace "System Operating personnel "

Reply: In reference to the "System Operators or System Protection personnel" question, it is the operator's responsibility for the initial review. The operator performs the initial review with whatever resources are needed, including protection personnel. However, the operator documents the operation, and protection personnel provide a more detailed analysis as needed.

2. Violation Severity Levels.

Table R1 uses a response time of one business day, which is not consistent with R1.1 (which says 24 hours)

Reply: Table R1 was changed to 24 hours to be consistent with R1.1.

Also, "System Operating personnel or System Protection personnel" should replace "System Operating personnel " on each category (Lower, Moderate, High, Severe) on table R1

Reply: In reference to the "System Operators or System Protection personnel" question, it is the operator's responsibility for the initial review. The operator performs the initial review with whatever resources are needed, including protection personnel. However, the operator documents the operation, and protection personnel provide a more detailed analysis as needed.

D1.3 Data Retention

Should have the phrase, "or since the last audit, whichever is longer" stricken or a finite limitation to data retention expressed. The way this is phrased now, if no audit occurs, data retention is unlimited.

Reply: The drafting team has changed the standard to implement the comment.

The proposed standard PRC-004 fails by only defining two extreme ways in which a RAS can fail, Security Misoperations and Dependability Misoperation. This proposed standard does not acknowledge that responses by a RAS can exist between those two extremes. For a RAS that adjusts its response to try and match the magnitude of system events it is very nearly impossible to perfectly match the response to the inputs as quickly as system events require correction. As a result, such systems are usually programmed to trip more aggressively than necessary, preferring the added stability that such conservatism represents. That should not be considered misoperation, even if a thorough

post-event analysis reveals that less generation could be dropped. This proposed standard makes no accommodation for that.

Reply: The commenter is correct that RAS are often designed to accommodate the worst credible contingencies. This standard is intended to apply when the RAS did not function as designed.

Leland McMillan

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- Regarding the Table "Major WECC Remedial Action Schemes (RAS) (Revised September 19, 2007)", Page 15 of 17, please check and clarify whether presently generation tripping is still required north of the SOK cutplane in Alberta, for high East to West transfers on the Alberta – British Columbia Path 1. Please remove this sentence if no generation tripping is presently required north of the SOK cutplane in Alberta.

Reply: Updating the RAS list is not intended to be part of the PRC-004-WECC-1 Standard development. The drafting team recommends that TransAlta submit a request using the WECC standards process to update the RAS list.

- Also, for each RAS it will be useful to identify the applicable TO and/or GO in the RAS Table.

Reply: To implement the NERC functional model the applicability section was change from transmission and generation operators to the owners. The drafting team does not have the information to implement this recommendation. The applicability section 4 and the NERC functional registration identifies the entities that are required to comply with the standard. The drafting team recommends that TransAlta submit a request using the WECC standards process to modify the RAS list.

Comment posted by WECC Staff on behalf of Sudershan Srinivasan, TransAlta

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I am not certain about when the 22 hour clock starts. It starts when the system operator identifies a misoperations or when system protection analyze and identify the misoperations, which can be after 20 business day.

Reply: The 22 hour time limit begins when either the System Operating personnel or the System Protection personnel suspect or identify a Misoperation.

If system operator identifies a misoperation, then system protection still has 20 business days to analyze it.

Reply: The 20 business days analysis limit applies to the System Protection personnel if the System Operating personnel did not recognize a Misoperation. If the System Operating personnel indicate an apparent Misoperation but the System Protection personnel determine, within the allowed 22 hours, that a Misoperation did not occur no additional mitigation is required.

Malkiat Dhillon

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From: Williams, Benjamin E (ET)  
Sent: Monday, December 17, 2007 11:06 AM  
To: Buchholz, Kristine (ET)  
Subject: RE: Time Sensitive Action Required - WECC Standard PRC-004-WECC-1 - Comments Due January 2, 2008

One could choose to read the applicability as applying to the entire system of a Transmission Owner, as long as that TO owns just one of the listed WECC Paths or Major RAS systems. That "loophole" needs to be closed in the language of this standard to make sure that this is no longer open for interpretation and is strictly limited to only those facilities that are actually listed.

Reply: The drafting team changed the Requirements to clarify that they apply only to major transmission path facilities and RAS listed in Tables titled "Major WECC Transfer Paths in the Bulk Electric System" and the Major WECC Remedial Action Schemes (RAS)" listed on the web site.

-Ben Williams

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Sandra, Tanyl has been on the committee that worked on the draft of this standard so she can correct me if my comments are off base. In any case, my comments are as follows:

**1. page 5 R1.1 refers to "all operations"**

I believe "all" needs to be clarified. I doubt that it is really intended to mean all in the sense that for every legitimate relay fault operation there are possibly hundreds of overreaching relay elements the operate or restrain at remote locations.

Reply: The drafting team changed the Requirements to clarify that System Operating personnel must review tripping of transmission elements and RAS operations. The analysis of operations of Protection Systems and RAS is left to Protection System personnel.

**2. page 6 R2.1 (and R2.2)**

I believe clarification is needed regarding "remaining in service" and "removing." Something like "if two or more FERAS remain in service AFTER the one that experienced the security-based misoperation has been removed from service, then ..."

What this really implies is that there must have been three FERAS to begin with.

Reply: R2.1 does apply only if three or more FERAS are normally in service.

**3. page 7 R.3 (and perhaps other places)**

PacifiCorp has had a case in which we neither repaired or replaced the system that misoperated. However, we returned to normal operation based on a procedural change. The change we made would prevent the same event from being able to happen in the future by requiring manual intervention by a relay tech before restoring the system to normal. The language as written makes no allowance for that type of fix. I recommend that language be incorporated that allows for other types of corrective actions. In our case, the procedure is not a particularly desirable long term solution because it requires manual intervention. However, it was a reasonable temporary fix because the whole scheme is being changed out in 2008.

Reply: The drafting team believes that changing operating procedures is essentially a design change and no change is required in the Standard.



## PRC-004-WECC-1 Standard Drafting Team proposed response to PacifiCorp comments

Steve Leistner  
PacifiCorp

1. What is the definition of "element"? It is used in R2.4. with "or transmission path" so I take it that element is something other than a transmission path.

Element is defined in the NERC Glossary of Terms. The drafting team recommends leaving the wording of "transmission path" because it is a term used in WECC but not necessarily in other regions and is not in the definition of Element.

2. FEPS definition: suggest "within its zone of protection" or "within the intended zone of protection"

The drafting team believes the original language is better.

3. The misoperation definitions appear to be limited to equipment failures. Is it the intention to rule out "workman errors" as part of the reporting requirements.

The NERC Glossary of Terms definition of "Misoperation" does exclude "onsite maintenance and testing activity."

4. Suggest re-ordering of R2.2.1. "...TO and GO shall remove the Protection System or RAS that misoperated from service within 22 hours for repair or modification."

The drafting team is not certain this is a better wording and did not implement the wording.

5. Regarding R2.2.2. Is the RAS to be "disabled" the same RAS that has already been removed from service in R2.2.1.?

This is referring to an additional RAS being disabled.

6. R2.4.1. should misoperate be past tense?

R2.4.1 will be changed to "misoperated."

7. The standard only allows for repair, replacement, removing elements from service or altering operating levels as corrective actions. Other actions could be used to prevent future misoperations such as procedural changes. As written, other actions do not appear to be permitted.

The drafting team believes that changing operating procedures is essentially a design change and no change is required in the Standard.

[steve.leistner@pacifiCorp.com](mailto:steve.leistner@pacifiCorp.com)

# *Western Electricity Coordination Council*

**Operating Committee Meeting  
March 6-7, 2008  
Albuquerque, NM  
Voting Results**

1. **Motion:**

*The VAR-002-WECC-1 Standard Drafting Team recommends that the OC approve VAR-002-WECC-1 and that after regulatory approval, it shall supersede VAR-STD-002a-1.*

**Explanation:** To ensure that Automatic Voltage Regulators on synchronous generators and condensers shall be kept in service and controlling voltage to help maintain Bulk Electric System reliability.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	28	4	2
TRANSMISSION CUSTOMERS	25	11	11
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>54</b>	<b>15</b>	<b>13</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email– Comments from AVA, BPEC, EPLUW, Mariner Consulting Services, SMUD and TANC

2. **Motion:**

*The VAR-501-WECC-1 Standard Drafting Team recommends that the OC approve VAR-501-WECC-1 and that after regulatory approval, it shall supersede VAR-STD-002b-1.*

**Explanation:** To ensure that Power System Stabilizers (PSS) on synchronous generators shall be kept in service.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	32	1	1
TRANSMISSION CUSTOMERS	33	2	10
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>66</b>	<b>3</b>	<b>11</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from AVA and EPLUW

3. **Motion:**

*The BAL-002-WECC-1 Standard Drafting Team recommends that the OC approve BAL-002-WECC-1 and that after regulatory approval, it shall supersede BAL-STD-002-0.*

**Explanation:** Contingency Reserve is required for the reliable operation of the interconnected power system. Adequate generating capacity must be available at all times to maintain scheduled frequency, and avoid loss of firm load following transmission or generation contingencies. This generating capacity is necessary to replace generating capacity and energy lost due to forced outages of generation or transmission equipment.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	22	6	6
TRANSMISSION CUSTOMERS	36	10	5
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>59</b>	<b>16</b>	<b>11</b>

Result: PASSED

Minority Opinion:

- Talking about a reliability standard, the existing standard with a proven track record of over a few decades is being replaced with one that is based entirely on compromise. The result will be a massive shift in cost without any technical studies to justify the shift to 3% generation and 3% load. The suspicion is an overall reduction of reserves carried in WECC without any technical justification. It is better to spend time on a technical based standard like FRR than putting in place a compromise solution in the interim.
- The standard is based on compromise and reducing reliability
- There are a number of market issues with this standard to the point where the entity is not comfortable supporting the standard even though they think it is the right direction
- Please see Appendix A for comments received via email – Comments submitted by BC Hydro, EPLUW, NCPA, NWMT, Powerex, PGE (TP), PGE (TC), PSEI, SCL, SMUD and TANC

4. **Motion:**

*The PRC-004-WECC-1 Standard Drafting Team recommends that the OC approve PRC-004-WECC-1 and that after regulatory approval, it shall supersede PRC-STD-001-1 and PRC-STD-003-1.*

- **Explanation:** Regional Reliability Standard to ensure all transmission and generation Protection System and Remedial Action Scheme (RAS) Misoperations on Transmission Paths and RAS defined in section 4 are analyzed and/or mitigated.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	30	4	0
TRANSMISSION CUSTOMERS	32	2	12
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>63</b>	<b>6</b>	<b>12</b>

Result: **PASSED**

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from AVA, SMUD and TANC

5. **Motion:**

*The IRO-006-WECC-1 Standard Drafting Team recommends that the OC approve IRO-006-WECC-1 and that after regulatory approval, it shall supersede IRO-STD-006-0.*

**Explanation:** Mitigation of transmission overloads due to unscheduled flow on Qualified Transfer Paths.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	33	0	1
TRANSMISSION CUSTOMERS	39	2	7
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>73</b>	<b>2</b>	<b>8</b>

Result: PASSED

Minority Opinion:

No minority opinions were offered at the meeting and none were received via email.

6. **Motion:**

*The FAC-501-WECC-1 Standard Drafting Team recommends that the OC approve FAC-501-WECC-1 and that after regulatory approval, it shall supersede PRC-STD-005-1.*

**Explanation:** To ensure the Transmission Owner of a transmission path identified in the table titled “Major WECC Transfer Paths in the Bulk Electric System” including associated facilities has a Transmission Maintenance and Inspection Plan (TMIP); and performs and documents maintenance and inspection activities in accordance with the TMIP.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	28	4	2
TRANSMISSION CUSTOMERS	30	1	14

STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>59</b>	<b>5</b>	<b>16</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from SMUD and TANC

7. **Motion:**

*The TOP-007-WECC-1 Standard Drafting Team recommends that the OC approve TOP-007-WECC-1 and that after regulatory approval, it shall supersede TOP-STD-007-0.*

**Explanation:** When actual flows on Major WECC Transfer Paths exceed System Operating Limits (SOL), their associated schedules and actual flows are not exceeded for longer than a specified time.

VOTING CLASS	YES	NO	ABSTAIN
TRANSMISSION PROVIDERS	30	3	1
TRANSMISSION CUSTOMERS	29	4	13
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>60</b>	<b>7</b>	<b>14</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from SMUD and TANC

**APPENDIX A**

**REASONS FOR NO VOTES <sup>1</sup>**

**Scott Kinney, Avista Corp. (AVA)**

Here are my reasons for voting no on the following standards:

VAR-002-WECC-1 and VAR-501-WECC-1 - Neither of these standards give the Transmission Operator any discretion to exempt a generator from requiring operation in AVR mode or having PSS in service regardless of the size of the generator or its impact on the BES. The VAR-002-WECC-1 standard applies to any generator connected to the BES. Avista commented during the standard development that the TO should have some discretion (NERC gives the TO some discretion in VAR-002-1) to exempt generators that have no impact on the BES with or without AVR and PSS in service based on their location and/or size. During the standard drafting Avista suggested the standards should require a TO to provide study results to verify there is no impact to the BES and that there should be a MVA size limit on generators that can be exempt from the standards.

PRC-004-WECC-1 - The WECC standard goes way above and beyond the requirements of NERC standard PRC-004-1. Avista does not believe the additional requirements are necessary to ensure that relay and RAS/SPS failures are adequately reviewed. The standard adds additional burden without and inherent benefits.

Thank you for the opportunity to comment.

\*\*\*\*\*

**Clement Ma, BC Hydro**

BC Hydro has serious concerns regarding the proposed standard BAL-WECC-002. The team that developed the standard has indicated that the 3% load, 3% generation numbers were proposed as a compromise as opposed to being based on a technical evaluation of reserves from a reliability standpoint. In analyzing the costs of the proposal, the team only looked at aggregate impacts for the WECC and the sub regions. However, this analysis misses the significant cost impact that arises for predominantly hydro based Balancing Authorities. BC has operated reliably using the 5% hydro standard for many years. The proposed standard will result in an increase in BC Hydro's operating reserve requirements by almost 1% (close to 100 MW on winter peak) without any technical justification (nor practical justification in light of our reliable operating history) to justify to its ratepayers the increase in cost of holding this additional operating reserve.

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<sup>1</sup> The reasons for no votes in the appendix were submitted by the individual entities via email after the Operating Committee meeting. The reasons for no votes in the main document were stated at the Operating Committee Meeting in Albuquerque, NM

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**Julie Martin, BP Energy Company (BPEC)**

Of the 7 Standards that were balloted, BP Energy Company (BPEC) voted "No" on 1 Standard. This one Standard was VAR-002-WECC-1 (Automatic Voltage Regulators). BPEC voted "No" on this Standard because we felt the following problems exist in the Standard as proposed:

VAR-002-WECC-1 requires generators to operate in a constant voltage mode at all times, but it does not require the transmission operator ("TOP") to provide the generator with a voltage setting to program into the AVR. To the extent that a TOP provides a reactive power schedule (instead of a voltage setting), it forces the generator operator to manually adjust the voltage settings on the AVR throughout the day in an attempt to maintain the amount of reactive power specified by the TOP.

This places a significant burden on the plant operators since they must manually adjust voltage settings every time the system voltage shifts up or down.

It also poses a significant risk of voltage collapse if plant operators see an increase in reactive output caused by a drop in system voltage caused by a transmission contingency and they manually respond by reducing reactive output to the pre-contingency level. This is exactly the opposite of what is needed when system voltage begins to collapse, even though the generation operators were simply following the reactive power schedule provided by the TOP.

This exposes all parties to a large share of responsibility if a voltage collapse does occur. TOPs will be blamed for failing to provide voltage schedules that would have prevented the manual intervention by generators. Generators will be blamed for doing the wrong thing at the wrong time when they reduced reactive output while the system was collapsing. WECC will be blamed for adopting a flawed standard which authorized TOPs to use this mode of voltage control.

A better alternative to the proposed standard is to include in a WECC standard a requirement that TOPs issue voltage schedules to generators.

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**John Cummings, PPL Energy Plus (EPLUW)**

BAL-002-WECC-1 Contingency Reserves

While EPLUW believes that the redrafted BAL-002 is an improvement, EPLUW voted no because there is an inconsistency between the proposed reliability requirement and the method in which reserves are procured and provided under the existing Open Access Transmission Tariffs (OATT). Transmission Providers (TP) must generally offer operating reserves under their OATTs to Transmission Customers serving load in the TP's Control Area. Otherwise, there is no default supplier of reserves. Further, the implementation of the proposed standard has not been fully explained, and it is unclear if



reserves will be available to all market participants that may be required to procure or provide them in the future. EPLUW would like to see these issues addressed before the standard becomes effective.

VAR-002-WECC-1 Automatic Voltage Regulators

EPLUW voted no because the proposed standard does not have a grandfathering provision to address existing, older generating units that may not meet the proposed requirement.

VAR-501-WECC-1 Power System Stabilizer

EPLUW voted no because the actual reliability standard (not WECC policies) should include an explicit description of which units must have PSS's (including which units are grandfathered), and this criteria should be subject to change in accordance with the standard development process.

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**John Stout, Mariner Consulting Services**

**Why the WECC Automatic Voltage Regulator Standard (VAR-002-WECC-1) Should Not be Approved as Currently Proposed**

At the March OC meeting, a significant number of WECC Generation Operators voted against acceptance of the proposed WECC AVR standard. Most did so because this standard allows Transmission Operators to direct generators to operate in a manner which exposes WECC to a significant and unnecessary risk of voltage collapse, and exposes those generators to increased and unreasonable risk of incurring non-compliance penalties.

One of the important lessons learned in the July/August 1996 WECC blackouts was that operation of generation in a constant reactive power mode increased the risk of voltage collapse and, therefore, should be limited in WECC. The technical reason for this conclusion is the fact that when voltage begins to collapse, increased reactive power output is required in order to raise the voltage and prevent it from collapsing to the point of causing a blackout. Therefore, WECC established a requirement that, with ten exceptions, generation controls had to be operated in the constant voltage mode of operation. In this mode of operation, if voltage declines, the generator automatically increases and maintains its reactive power output until the voltage returns to normal. That requirement is the genesis of the proposed WECC AVR standard.

WECC Generation Operators support the requirement that their AVR's be operated to maintain voltage and automatically respond with increased reactive output to prevent voltage collapse.

However, not all WECC Transmission Operators allow interconnected Generation Operators to provide voltage responsive reactive support. Certain Transmission Operators have refused to provide voltage schedules to their Generation Operators.

They are allowed to do this because the proposed WECC AVR standard does not include a requirement that Transmission Operators provide voltage schedules. Instead, the WECC AVR standard is silent on this issue, allowing Transmission Operators to follow less restrictive NERC standards which afford them the option of providing reactive power schedules rather than voltage schedules. This practice forces Generation Operators to manually adjust their AVR voltage setting by trial and error to find a voltage setting that will provide the exact amount of reactive power directed by the Transmission Operator. Since the voltage on the transmission grid varies throughout the day, the Generation Operator is forced to continuously reset the voltage on the AVR. This is an unnecessary and distracting manual control burden on the Generation Operator. It effectively eliminates the “Automatic” in “Automatic Voltage Regulator.”

NERC VAR-002 requires the Generation Operator to comply exactly with the voltage schedule or reactive power schedule directed by the Transmission Operator. If the Transmission Operator provides a voltage schedule, the AVR can automatically maintain compliance with the NERC standard. If the Transmission Operator refuses to provide a voltage schedule, and instead insists on providing a reactive power schedule, compliance can no longer depend on the automatic operation of the AVR. The proposed WECC AVR standard prohibits the AVR from being switched to a constant reactive power mode of operation. Instead compliance becomes totally dependent on constant attention and readjustment by the Generation Operator. This significantly increases the risk of reliability standard non-compliance for the generator.

Even more disturbing is the fact that this situation (the Transmission Operator specifying a constant reactive power output rather than a constant voltage level) defeats the intended purpose of the WECC AVR standard, to prevent a voltage collapse. If voltage does begin to collapse, the generator AVR, operating in constant voltage mode, will increase the reactive power output from the unit. That increase in reactive output means that the generator will no longer be producing the amount of reactive power specified by the Transmission Operator’s reactive power schedule. Once this occurs, the Generation Operator must immediately reduce the reactive power provided by the generator or risk fines for noncompliance with NERC standard VAR-002, R2. That will result in the generator doing the exact opposite of what is needed to prevent a voltage collapse and exposes WECC to a risk of blackout.

This issue was repeatedly raised during the standards development process, but the drafting team took the position that it was not a problem that needed to be addressed by the WECC AVR standard. During the March vote at the OC, an amendment was proposed to resolve this issue by adding a requirement to the WECC AVR standard that Transmission Operators provide voltage schedules instead of reactive power schedules. No one expressed an opinion that the concerns raised by generators regarding the reliability risk to WECC were invalid, yet the proposed solution was overwhelmingly rejected by the OC. Unfortunately, due to the voting structure of the OC, the concerned Generation Operators are in a minority and could do nothing more to resolve this issue.

The WECC Board should not take the same path as did the drafting team and the Operating Committee. We believe the Board should do at least three things before approving this standard.

First, the WECC Board should ask the OC to report on the validity of the reliability risk and the compliance risk described above. If their response results in a Board conclusion that either risk is valid, the following additional questions should be raised by the Board.

The WECC Board should ask the OC to provide specific information on which Transmission Operator's provide reactive power schedules rather than voltage schedules to their interconnected generators. This information should include the specific reasons why such Transmission Operator's have chosen to provide reactive power schedules and explain why those reasons outweigh the reliability and compliance risk created by reactive power schedules. If the Board concludes those reasons are not sufficiently justified, the Board should remand this AVR standard for inclusion of a voltage schedule requirement.

If valid reasons are provided to the preceding question, the WECC Board should ask the OC to explain why each of those reasons were not included with the ten exceptions already listed under R1 of the WECC AVR standard. If the OC cannot justify why those reasons should not be included in the ten exceptions, the Board should remand the standard until those reasons are included. By adding such reasons to the list of exceptions, Generation Operators should be allowed to place their AVR in the automatic control mode that matches the reactive power schedule provided by the Transmission Operator (i.e. Constant MVAR mode for VAR Schedules or constant Power Factor mode for Power Factor Schedules.)

While Board members may feel a reluctance to not support the OC recommendation to approve the currently proposed AVR standard, each Board member should recognize an important distinction between votes at the OC and votes by the Board. Standing Committee members are entitled to vote in accordance with their self interests. Board members have a different standard. Board Members are obligated to vote what is best for WECC. That difference can cause Board votes to sometimes result in different outcomes than Standing Committee votes. While our position was the minority opinion within the OC, we firmly believe it to be the best path for maintaining the reliability and credibility of WECC.

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**Fred Young, Northern California Power Agency (NCPA)**

NCPA reviewed this standard prior to the OC meeting and from an operating/reliability perspective has no objection to the proposed changes to BAL-STD-002-0. However, based on discussions with our trading personnel and counter-parties, there is significant confusion as to the impacts of the change from 5%hydro/7%thermal to

3%generation/3%load in the calculation of a BA’s Contingency Reserve requirement. The market is saying that the 3% of load portion will be passed on to the LSE irrespective of the LSE’s location, i.e. in the Source BA or Sink BA. This confusion was further reinforced by Mr. David Lemmons response to a question from Powerex concerning cost shifts. Mr. Lemmons’ response is that it is time for the load to carry their share.

This standard, BAL-002-WECC-1 does not contain language that moves any contingency reserve responsibility to the load. It only changes how the Contingency Reserve requirement for a BA or Reserve Sharing Group is calculated. It is evident by one of the author’s comments, Mr. Lemmons, that there are some significant market changes that will result from implementation. Without clarification of these market impacts, NCPA could not support BAL-002-WECC-1.

NCPA fully supports standards that enhance reliability. But reliability at any cost or unknown cost is unacceptable.

The foregoing is why NCPA did not support BAL-002-WECC-1.

Thank you for your consideration.

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**Marc Donaldson, North Western Energy (NWMT)**

Reasons for NorthWestern Energy (NWMT) No Vote on WECC Standard  
BAL-002-WECC-1 – Contingency Reserves

On March 6, 2008, NorthWestern Energy (NWMT) voted No on WECC Standard BAL-002-WECC-1 – Contingency Reserves for the following reasons:

1. Although the amount of required reserves stated in R1.1.2. (sum of three percent of the load and three percent of net generation) may make the determination of required reserves easier than the prior five percent of hydro and seven percent of thermal and, although the previous five and seven percent was determined arbitrarily, the “three plus three” approach is still arbitrary and may negatively impact reliability of the Western Interconnection.
2. The standard may result in an unfair shift of reserve obligation, which may also result in a shift of costs.

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**Mike Ryan, Portland General Electric (PGE), Transmission Provider**

This is in response to your request for the reasons behind NO votes on BAL-002-WECC-1.

As you well know, I have been voicing my concerns over the direction that this drafting team has taken at every opportunity to change the WECC's contingency reserve requirements. I have regularly offered comments on the posted drafts, but have seen little change in the contents.

My comments about the reliability consequences of BAL-002-WECC-1 are these:

- The "Tier One" BAL-STD-002-0 reflects the current WECC MORC by breaking down required operating reserve into four components: regulating reserve, contingency reserve, reserve for on-demand obligations, and reserves for interruptible imports. The proposed BAL-002-WECC-1 narrows the scope to only contingency reserve, which raises the question of what happens to the other components. NERC BAL-002 adequately covers regulating reserve, but includes no provisions for on-demand obligations or interruptible imports. BAL-002-WECC-1 does include some language for on-demand obligations, but only as contingency reserve; no other types of on-demand rights are addressed.

It's not clear to me how the decision to narrow the scope of the WECC BAL-002 standard will affect the current requirements in the WECC MORC. This should have been made clear in the proposal. I hope the Board will make it clear that BA's must still carry additional operating reserves to account for on-demand obligations and interruptible imports.

- The "load responsibility" concept helped characterize the nature of the transactions. For the "sink" BA, it identified those imports that were "firm for the hour". Simplifying the calculation of contingency reserve does NOT relieve the BA from anticipating which imports might be interrupted in-hour, and therefore what additional reserves need to be available. The recently adopted clarification of "load responsibility" and e-tag 1.8 made it easier. Now it seems everyone will be forced to parse the energy codes to infer what's "firm for the hour".

It would be helpful if the Board directed members to continue to use the "load responsibility" feature in e-tag 1.8 to clearly identify those transactions that are not "firm for the hour".

- Despite voiced concern over the difficulty of interpreting "load responsibility", the drafting team saddled WECC BAL-002 with "interruptible load". As a BA, I do not want to be put in a position to judge whether or not loads offered up by an LSE meet the contract requirements of being "interruptible".

I also have a comment not related to reliability. Or rather, a comment that the changes made through BAL-002-WECC-1 don't seem to be prompted by genuine reliability concerns (only thinly disguised in them). At their heart the changes seem to be driven more by the economic interests of some to shift contingency reserve responsibility (i.e. costs) from the generators to the loads (and perhaps the new MIC mantra that transactions

can't have reliability implications). I'd like to think that reliability changes should be driven by technical merit weighed against overall costs, and that the Board will not allow the WECC's standards process to be used as a lever to shift costs among members.

You'll also remember that I've frequently found myself defending the drafting team's right under WECC "due process" to produce their draft as they see fit, however to my eyes the results are far from pretty. This standard, combined with the NERC/FERC ability to trump WECC "due process" (e.g. sanction tables), raises serious doubts in my mind to about the workability of WECC standards process.

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### **JJ Jamieson, Portland General Electric (PGE), Transmission Customer**

Portland General Electric voted against BAL-002-WECC-1 at the 3/6/08 meeting in Albuquerque, New Mexico.

Portland General Electric Merchant posted the following comments 02/21/08 in response to the posting of BAL-002-WECC-1 for review before voting at the upcoming Operating Committee meeting in Albuquerque, New Mexico. Our comments have not been responded to in any forum since posting.

“Portland General Electric Merchant is concerned with the movement toward unnecessary changes to the approved standard proposed in BAL-002-WECC-1 particularly due to the motivation being cited. At no time should the basis of a reliability standard be centered on “a compromise” rather than the requirements of operational reliability.

In public meetings held with / by the BAL-002-WECC-1- drafting team there was no evidence presented that illustrated increased reliability under BAL-002-WECC-1. The meetings showed that in fact BAL-002-WECC-1 could result in a reduced level of reliability in the WECC region.

Why is a reliability entity allowing a compromise on standards that impact reliability?

We are all being held to these standards and they should be defined by what is necessary for reliability, otherwise it isn't a reliability issue and the market will define the products.

The biggest deficiency of this “compromise” is that it assumes that we have a robust and fully functioning market for reserves. To our knowledge most merchants do not have the right to sell reserves, let alone have extra to sell, and there has not been any formal discussion of how cost based entities can function in a WECC region reserves market. We need to agree that reserves are a reliability issue in determining use and level but a market issue when determining responsibility.

The public meetings showed the proposed BAL-002-WECC-1 move towards the creation of a market product rather than a reliability standard.

WECC has been very clear that the definition of market products is not within their mandate “WECC should focus on the interpretation of reliability criteria. It should not define energy market products.” (Load Responsibility July 26, 2007) and it is equally as clear that the proposed BAL-002-WECC-1, while perhaps not intentionally, will result in the definition of a new energy product albeit not named by the standard itself.

Is it WECC’s intention, with BAL-002-WECC-1, to create an energy product leaving only the naming of said product to the WSPP and other like entities?

Portland General Electric Merchant encourages the BAL-002-WECC-1 drafting team to work towards the establishment of a standard that is focused on the reliability of the system rather than a compromise that defines a market product.

Portland General Electric Merchant”

It was communicated at the Operating Committee meeting that we should pass BAL-002-WECC- 1 because ‘WECC doesn’t want to go to FERC and request an extension.’ Is this appropriate reasoning when dealing with issues affecting reliability?

We are concerned that BAL-002-WECC-1 is assuming a robust reserves market in the West. The West doesn’t have a mature reserves market and this will put additional burden on the load serving merchants by forcing them to procure reserves from the generators in order to meet the new standard. How does WECC propose BAL-002-WECC- 1 will be able to sustain a reliable system absent a robust reserves market?

We echo Puget Sound Energy’s concerned that BAL-002-WECC- 1 will result in a cost shift between Market participants without any additional reliability being realized.

Portland General Electric also agrees with Powerex in that there simply was not an appropriate level of analysis down to support a wholesale change in how reserves are handled in the WECC.

Finally, Portland General Electric states again that reliability standards should not be based on compromise but rather careful consideration of what will provide the most reliable and effective system.

Thank you for the opportunity to comment

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**Mike Goodenough, Powerex (PWX)**

Powerex agrees with the explanation for voting "No" to BAL-002 offered by BC Hydro.

In addition, Powerex would add that the proposed standard will require changes in markets that have not yet been considered. While we are supportive of the objectives to bring clarity to how reserve obligations are determined and commend the team for making progress in obtaining that clarity, no consideration was provided for how implementation of the new standard might impact the existing market and transmission tariff structures and what new uncertainties might be created. This should be considered so that we do not incur unnecessary adaption costs, which would then be followed by additional costs to implement the Frequency Response Reserves standard, which is a far more technically sound approach to re-examining the way reserve requirements should be calculated. BC Hydro and Powerex believe that this consideration should occur before the standard is adopted.

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**Gary Nolan, Puget Sound Energy (PSEI)**

PSEI, as a TP, only voted "No" on BAL-002. Our explanation is summed up by the comments Joe Hoerner from PSEM posted on the WECC website with our agreement.

Puget Sound Energy (PSE) appreciates the opportunity to provide comments on the proposed WECC Standard BAL-002-WECC-1 (Contingency Reserve). These comments are provided on behalf of Puget Sound Energy’s transmission and merchant functions.

Upon review and analysis of the proposed Standard BAL-002-WECC-1, PSE can not determine how this standard provides any additional reliability over today’s standard. The proposal alters the calculation for contingency reserves instead of clearly defining how contingency reserves would be activated to ensure system reliability. Furthermore, PSE’s analysis indicates that adoption of this standard will result in significant cost shifts from generators to load-serving entities. PSE’s ratepayers could expect to pay an additional \$14,000,000 more per year in increased contingency reserve obligations without any added reliability benefit. PSE cannot find any legitimate reason as to why our regulating entities could justify our approval of such a cost increase with no benefit. If, in fact, the primary justification for creating the standard is to firmly establish the obligation of where the reserve obligation lies, then we feel it is more appropriate to address this issue in the commercial forum.

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**Pawel Krupa, Seattle City Light (SCL)**



I have to apologize for being late in responding to your e-mail.

On the behalf of SCL I cast NO vote for the BAL-002-WECC-1 standard. In preparation for the OC meeting I attended the BAL-002-WECC-1 workshop in Portland and we discussed this standard internally within SCL. Based on our internal discussions we believed we could not support this standard at its current version. Below are some of the reasons that we are not supporting this proposed standard as currently written:

1. Requirement R.1. The proposed standard changes the amount of contingency reserves required to carry by the BA's to 3% of the BA's total generation and 3% of the BA's total load. The current WECC standard BAL-STD-002-0 requires to carry 5% reserves for load responsibility served by hydro generation and 7 % served by thermal generation. We believe that there is no technical explanation for the new allocation of 3% generation and 3% of load. The 5% and 7% allocation was based on system data collected during the previous system disturbances and it provided safe contingency reserve margin during many severe disturbances in WECC interconnection. During the workshop in Portland drafting team stated that the 3% and 3% allocation was the best compromise the members of the drafting team were able to agreed to. The data presented by the drafting team during the workshop did not support the statement that the amount of contingency reserves available in the WECC Interconnection will not decrease as a result of this new standard. We believe that the reserve allocations should be based on the system studies rather than the ability of the drafting team to reach a compromise.

2. Requirement R.2. This requirement changes the definition of spinning reserve. Under this requirement the spinning reserve doesn't have to be carried by the synchronized generating units. The requirement states that spinning reserve needs to meet two requirements

R.2.1 Initially automatically respond to frequency deviations.

R.2.2. Capable of fully responding within ten minutes.

Based on this definition it is possible to use devices other generators to provide spinning reserves that could meet these requirements. The underfrequency relays for example could meet these new requirements, they will automatically respond to frequency deviation and will definitely respond within 10 minutes. We believe that this is a significant change in the definition of spinning reserves that again could have a detrimental effect on the stability of the WECC Interconnection.

3. R.3.6. This requirement identifies firm load as an acceptable type of reserves during energy emergency. This requirement does not specify if the load could only be used as a reserves by the BA declaring energy emergency. Based on the interpretation it is possible that every BA in the WECC or every BA in the Reserve Sharing Group could use firm load as a source of reserves once the energy emergency is declared by one single BA. This is also significant change from the previous standard and WECC MORC. The firm load was never before consider a source of reserves. I asked this question during the workshop and the drafting team did not provide an explanation why this was included as a acceptable source of contingency reserves.

We understand that there were many comments submitted to the drafting team during development process and we don't believe that all of these comments were addressed by the drafting team. We understand that there were some time limitations to develop and approve this standard, but we don't agree that this standard as currently written addresses all issues related to the contingency reserves in WECC Interconnection.

We believe that the above reasons were sufficient to justify our NO vote for this standard.

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**Vicken Kasarjian, Sacramento Municipal Utility District (SMUD)**

The following are the reasoning behind my “no” vote on VAR-002-WECC-1, BAL-002-WECC-1, FAC-501-WECC-1, TOP-007-WECC-1, and PRC-004-WECC-1.

General comments:

1. Unnecessary additional requirements for WECC Members with higher exposure to violations/sanctions. Without justification, WECC is trying to hold itself to higher standards than the rest of the nation under NERC.
2. The drafting teams did not actually test the proposed standards prior to bringing it to a vote. A 6 month test with some applicable entities would have been quite helpful.
3. No guidance on how to actually be compliant with these standards.

Additional specific comments:

1. BAL-002-WECC-1: 3% has no technical basis – should go with MSSC to retain or enhance reliability
2. FAC-501-WECC-1: Replaces WECC PRC-STD-005-1: Addresses maintenance and test requirements for additional components (CBs, reactive devices, transformers, etc) not addressed in PRC-005; this impacts Transmission Maintenance Inspection Program for the Major WECC Transfer Paths. Also, it uses a justification that states “minimize SOL reductions to maintain reliable Western Interconnection operation” – if this reasoning is true, then it should also be used by NERC.

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**John S. Forman, Transmission Agency of Northern California (TANC)**

In response to the question of why a no vote was made on the standards at the OC meeting, TANC's OC representative voted no on five of the seven proposed standards for one basic reason: The standards require that the WECC be more stringent than the NERC standards. Those entities that have gone through an audit of the standards that are in

effect are finding that they will be sited for something that is not in compliance. In other words, the auditors will keep looking until something is found to be wrong. With the WECC standards higher than NERC, even more compliance problems are anticipated.

We believe that one basic instruction to the drafting teams should be that they need to justify a standard being more stringent than NERC, and that the basic draft should be no more than equal to NERC, unless it's clearly in the interest of the WECC. Our two positive votes on VAR-501 and IRO-006 are in that "best interest of WECC" category. The other standards were not. Basically, we are not sure that always being better than NERC is the right philosophy.

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**Board of Directors  
April 16-18, 2008  
Coronado, CA**

**Voting Summary  
PRC-004-WECC-1**

<b>Last Name</b>	<b>First Name</b>	<b>Organization</b>	<b>Class</b>
Anderson	Bob	Non-affiliated Director	Non-Affiliated
Areghini	David	Salt River Project	Class 1
Barbash	Carolyn	Sierra Pacific Power Company	Class 1
Beyer	Lee	California Public Utilities Commission	Class 5
Brown	Duncan	Calpine Corporation	Class 3
Campbell	Ric	Utah Public Service Commission	Class 5
Cauchois	Scott	CADRA	Class 4
Chamberlain	Bill	California Energy Commission	Class 5
Cleary	Anne	Mirant Americas, Inc.	Class 3
Conway	Teresa	Powerex Corp.	Class 6
Coughlin	John	Non-affiliated Board Member	Non-Affiliated
Dearing	Bill	Grant County PUD	Class 2
Ferreira	Richard	TANC Executive Advisor	Class 2
Grantham-Richards	Maude	Farmington Electric Utility System	Class 2
Gutting	Scott	Energy Strategies, LLC	Class 4
Kelly	Nancy	Utah Committee of Consumer Services	Class 4
King	Jack	Non-affiliated Board Member	Non-Affiliated
LaFond	Steve	The Boeing Company	Class 4
Little	Doug	British Columbia Transmission Corporation	Class 6
McMaster	Dale	Alberta Electrical System Operator	Class 6
Moya	Jesus	Comision Federal de Electricidad	Mexico
Newton	Tim	Non-affiliated Director	Non-Affiliated
Sharpless	Jananne	Non Affiliated Board Member	Non-Affiliated
Smith	Marsha	Idaho Public Utilities Commission	Class 5
Stout	John	Mariner Consulting	Class 3
Tarplee	Gary	Southern California Edison	Class 1
Thuston	Tim	Williams Power	Class 3
Weis	Larry	Turlock Irrigation District	Class 2
VanZandt	Vicki	Bonneville Power Administration	Class 1
Zaozirny	Lori Ann	British Columbia Utilities Commission	Class 6

The Board Members listed above voted whether to approve PRC-004-WECC-1.  
The Regional Reliability Standard was approved unanimously.

**Table**  
**Major WECC Transfer Paths in the Bulk Electric System**  
**Used in Standards FAC-501-WECC-1, PRC-004-WECC-1, and TOP-007-WECC-1**  
**(Revised September 19, 2007)**

	<b>PATH NAME*</b>	<b>Path Number</b>
1.	Alberta – British Columbia	1
2.	Northwest – British Columbia	3
3.	West of Cascades – North	4
4.	West of Cascades – South	5
5.	West of Hatwai	6
6.	Montana to Northwest	8
7.	Idaho to Northwest	14
8.	South of Los Banos or Midway- Los Banos	15
9.	Idaho – Sierra	16
10.	Borah West	17
11.	Idaho – Montana	18
12.	Bridger West	19
13.	Path C	20
14.	Southwest of Four Corners	22
15.	PG&E – SPP	24
16.	Northern – Southern California	26
17.	Intmntn. Power Project DC Line	27
18.	TOT 1A	30
19.	TOT 2A	31
20.	Pavant – Gonder 230 kV Intermountain – Gonder 230 kV	32
21.	TOT 2B	34
22.	TOT 2C	35
23.	TOT 3	36
24.	TOT 5	39
25.	SDGE – CFE	45
26.	West of Colorado River (WOR)	46
27.	Southern New Mexico (NM1)	47
28.	Northern New Mexico (NM2)	48
29.	East of the Colorado River (EOR)	49
30.	Cholla – Pinnacle Peak	50
31.	Southern Navajo	51
32.	Brownlee East	55
33.	Lugo – Victorville 500 kV	61
34.	Pacific DC Intertie	65
35.	COI	66
36.	North of John Day cutplane	73
37.	Alturas	76
38.	Montana Southeast	80
39.	SCIT**	
40.	COI/PDCI – North of John Day cutplane**	

\* For an explanation of terms, path numbers, and definition for the paths refer to WECC's Path Rating Catalog.

\*\* The SCIT and COI/PDCI-North of John Day Cutplane are paths that are operated in accordance with nomograms identified in WECC's Path Rating Catalog.

**Table**  
**Major WECC Remedial Action Schemes (RAS)**  
**Used in Standard PRC-004-WECC-1**  
**(Revised September 19, 2007)**

	<b>Path Name*</b>	<b>Path</b>	<b>RAS</b>
1.	Alberta – British Columbia	Path 1	Remedial actions are required to achieve the rated transfer capability. Most involve tripping tie lines for outages in the BCTC system. East to West: For high transfers, generation tripping is required north of the SOK cutplane in Alberta.
2.	Northwest – British Columbia	Path 3	Generator and reactive tripping in the BCTC system to protect against the impact caused by various contingencies during transfers between British Columbia and the Northwest.
3.	West of Hatwai	Path 6	Generator dropping (Libby, Noxon, Lancaster, Dworshak); Reactor tripping (Garrison); Tripping of Miles City DC link.
4.	Montana to Northwest	Path 8	Tripping Colstrip by ATR (NWMT); Switching shunt reactors at Garrison 500 kV; Tripping the back-to-back DC tie at Miles City; Tripping Libby, and Noxon generation by WM-RAS (BPA).
5.	Idaho to Northwest	Path 14	Generator Runback at Hells Canyon; Jim Bridger tripping for loss of Midpoint – Summer Lake 500 kV line.
6.	Midway-Los Banos	Path 15	CDWR and PG&E pump load dropping north of Path 15. PG&E service area load dropping north of Path 15. PG&E service area generation dropping south of Path 15.
7.	Idaho Sierra	Path 16	Automatic load shedding is required when the Alturas line is open for loss of the Midpoint-Humbolt 345 kV line during high Sierra system imports.
8.	Bridger West	Path 19	Jim Bridger tripping for delayed clearing and multi-line faults; Addition of shunt capacitors at Jim Bridger, Kinport and Goshen and series capacitor bypassing at Burns.
9.	IPP DC Line	Path 27	IPP Contingency Arming System trips one or two IPP generating units.
10.	TOT1A	Path 30	Bonanza and Flaming Gorge generation is tripped for loss of the Bonanza-Mona 345 kV line to achieve rating on TOT1A.

11.	TOT2A	Path 31	For the Montrose-Hesperus 345 kV line outage with Nucla generation above 60 MW, the parallel Montrose-Nucla 115 kV line is automatically transfer tripped.
12.	TOT2B	Path 34	Trip Huntington generation for loss of the Huntington-Pinto + Four Corners lines when parallel lines are heavily loaded.
13.	TOT5	Path 39	For an outage of the Hayden-Gore Pass 230 kV line, the lower voltage parallel path is tripped.
14.	SDGE RAS	Path 44	RAS used to meet reactive margin criteria for loss of both San Onofre units.
15.	SDGE – CFE	Path 45	The purpose of the RAS is to automatically cross-trip (transfer trip) the Miguel – Tijuana 230kV following the outage of Imperial Valley – Miguel 500kV line.
16.	Southern New Mexico	Path 47	For double contingencies on the 345 kV lines defined in the path, WECC Operating Procedure EPE-1 is implemented.
17.	Pacific DC Intertie	Path 65	Northwest generator tripping; Series capacitor fast insertion; mechanically switched shunt capacitors
18.	California – Oregon Intertie	Path 66	Northwest generator tripping; Chief Jo Brake insertion; Fort Rock Series Capacitor insertion; Northern California generator and pump load tripping; N. California series capacitor bypassing, shunt reactor or capacitor insertion; Initiation of NE\SE Separation Scheme at Four Corners.
19.	Meridian 500/230 kV Transformers**		Following the loss of the Meridian 500/230kV transformers, RAS is used to comply with WECC Standards under high load conditions.
20.	Northern-Southern California	Path 26	Remedial action required to achieve the rated transfer capability. Midway area generation tripped for loss of any two of three Midway-Vincent 500 kV lines.
21.	PNM Import Contingency Load Shedding Scheme (ICLSS)	Path 48	ICLSS is a centralized load shedding scheme for low probability events such as simultaneous outage of the Four Corners-West Mesa (FW) 345 kV and San Juan-B-A (WW) 345 kV lines, as well as any unplanned disturbance affecting voltage in the Northern New Mexico transmission system.

22.	Valley Direct Load Trip (DLT)		RAS is required for the loss of the Serrano-Valley 500 kV line. About 200 MW of Valley load is tripped.
23.	South of Lugo N-2 RAS		RAS is required for the simultaneous double line outage of any combination of the Lugo-Mira Loma 1 (when looped), 2, and 3 500 kV lines and the Lugo-Serrano (when de-looped) 500 kV line.
24.	Lower Snake RAS		The RAS is required to protect for the double line outage of the Lower Monumental-Little Goose 500-kV lines. Generation is dropped at Little Goose and Lower Granite Powerhouses as well as key the WM RAS. An outage of the Little Goose – Lower Granite 500 kV lines will drop generation at Lower Granite Powerhouse and key the Western Montana RAS.
25.	Palo Verde – COI Mitigation Scheme	Path 66	Required to provide for safe operation of the COI for the loss of two units at Palo Verde Nuclear Generating Station (PVNGS). The RAS protects the PVNGS and Palo Verde Transmission System (PVTs) for faults at Palo Verde and subsequent outage of the Palo Verde – Westwing 500 kV lines.
26.	Palo Verde/Hassayampa RAS		Provides protection to the PVNGS and the PVTs for faults at Palo Verde and subsequent double line outage of the Palo Verde to Westwing 500 kV lines.***
27.	Sierra Pacific – PacifiCorp RAS	Path 76	Needed for loss of the 230 kV Malin-Hilltop line when heavily loaded unless automatic reclose is successful. The scheme closes the Hilltop 345 kV line reactor if pre-outage northbound flow is greater than 150 MW. For pre-outage southbound flow greater than 235 MW the Hilltop 345 kV line trips and the Hilltop 345 kV line reactors closes.

\* For an explanation of terms, path numbers, and definition for the paths refer to WECC’s Path Rating Catalog.

\*\* The Meridian 500/230 kV transformers are not included in the Path Rating Catalog. The RAS associated with the Meridian transformers is included in Table 3 because the failure of the RAS may result in cascading.

\*\*\* The Palo Verde/Hassayampa RAS is designed to prevent cascading problems throughout the WECC region. This scheme is not Path related and is not used to protect any specific WECC Path.



**FERC and NERC Directives for a Permanent Replacement Standard  
for PRC-STD-001-1 Certification of Protective Relay Applications and Settings  
and PRC-STD-003-1 Protective Relay and Special Protection Systems (Remedial  
Action Scheme) Misoperation  
May 1, 2008**

<b>Received From</b>	<b>FERC and NERC Directives for a Permanent Replacement Standard for PRC-STD-001-1 June 8, 2007</b>	<b>PRC-004-WECC-1 Completed Actions</b>
<b>NERC Staff Common Revisions to WECC “Tier 1” Standards</b>	Remove RMS Sanction Table	The PRC-004-WECC-1 standard drafting team identified that all the requirements in PRC-STD-001-1 except WR1.c duplicated existing NERC reliability standards. The drafting team recommended that WR1.c be moved to PRC-STD-003-1 and that PRC-STD-001-1 be retired and. Subsequently the drafting team renamed PRC-STD-003-1 PRC-004-WECC-1.
<b>FERC Revisions to PRC-004-WECC-1</b>	No comments	
<b>NERC Revisions to PRC-004-WECC-1</b>	Applicability should have two subsections.	The PRC-004-WECC-1 standard drafting team retired PRC-STD-001-1.
<b>NERC Revisions to PRC-004-WECC-1</b>	Add a Requirement associated with WM1	The PRC-004-WECC-1 standard drafting team retired PRC-STD-001-1.
<b>NERC Revisions to PRC-004-WECC-1</b>	Move paragraph two under Compliance Monitoring Period to Additional Compliance Information	The PRC-004-WECC-1 standard drafting team retired PRC-STD-001-1.

Received From	FERC and NERC Directives for a Permanent Replacement Standard for PRC-STD-003-1 June 8, 2007	PRC-004-WECC-1 Completed Actions
<b>NERC Staff Common Revisions to WECC “Tier 1” Standards</b>	Remove RMS Sanction Table	The Reliability Management System (RMS) Sanction Table is removed from the standard.
NERC	Include Violation Risk Factors	The drafting team added Violation Risk Factors.
NERC	Include Violation Severity Levels	The drafting team added Violation Severity Levels for each main requirement.
NERC	Include Mitigation Time Horizon	The drafting team added Time Horizon.
NERC	Start date first day of quarter	<b>Effective Date:</b> On the first day of the next quarter, after receipt of applicable regulatory approval.
NERC	Include Applicable functional entity in Requirements and Measures	The drafting team included the applicable functional model entity in requirements and measures.
NERC	Written in Active Voice	The standard is written in an active voice.
NERC	Exclude comments, statements, background and references	The drafting team removed comments, statements, background, and references.
NERC	Individual requirements and measures convey only one main issue	Each requirement and measure conveys only one main issue.
NERC	Each measure refers clearly to requirement(s)	There is a measure for each main requirement.
NERC	Include Reset Time Frame	The drafting team included a reset time frame.
NERC	Remove second sentence of data retention	The drafting team removed reference to data retention.

<b>Received From</b>	<b>FERC and NERC Directives for a Permanent Replacement Standard for PRC-STD-003-1 June 8, 2007</b>	<b>PRC-004-WECC-1 Completed Actions</b>
NERC	Exclude Excuse for Performance	The drafting team removed the Excuse for Performance provision.
NERC	Align definitions with NERC definitions	The standard uses the NERC definitions.
NERC	Include functional entity in Additional Compliance Information	Functional model entity information is in the compliance section.
NERC	Clarify reference used for Business Day	The definition for Business Day is removed.
<b>FERC Revisions to PRC-004-WECC-1</b>	No comments.	
<b>NERC Revisions to PRC-004-WECC-1</b>	Applicability should have two subsections.	The drafting team rewrote these subsections to conform to NERC requirements.
<b>NERC Revisions to PRC-004-WECC-1</b>	Add a Requirement associated with WM1	The drafting team moved the data submission information to the compliance section.
<b>NERC Revisions to PRC-004-WECC-1</b>	Move paragraph two and three under Compliance Monitoring Period to Additional Compliance Information	The drafting team removed these paragraphs from the standard.

**The PRC-004-WECC-1 Drafting Team Completed Actions for a Permanent Replacement Standard  
for PRC-STD-001-1 Certification of Protective Relay Applications and Settings  
and PRC-STD-003-1 Protective Relay and Special Protection Systems (Remedial Action Scheme) Misoperation  
May 1, 2008**

Received From	Previous Comments to Consider for PRC-STD-003-1 June 8, 2007	The PRC-STD-003-1 Drafting Team Consideration of Comments	The PRC-004-WECC-1 Drafting Team Completed Actions
NERC Question #1	<b>Was the proposed standard developed in a fair and open process, using the associated Regional Reliability Standards Development Procedure? If not, please explain in the comment area.</b>		
Sierra Pacific Power Company	No comment.		
<b>Question #2</b>	<b>Does the proposed standard pose an adverse impact to reliability or commerce in a neighboring region or interconnection?</b>		
Sierra Pacific Power Company	No comment.		
<b>Question #3</b>	<b>Does the proposed standard pose a serious and substantial threat to public health, safety, welfare, or national security?</b>		
Sierra Pacific Power Company	No comment.		

Received From	Previous Comments to Consider for PRC-STD-003-1 June 8, 2007	The PRC-STD-003-1 Drafting Team Consideration of Comments	The PRC-004-WECC-1 Drafting Team Completed Actions
<b>Question #4</b>	<b>Does the proposed standard pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?</b>		
Sierra Pacific Power Company	No comment.		
<b>Question #5</b>	<p><b>Does the proposed regional reliability standard meet at least one of the following criteria?</b></p> <p>The proposed standard has more specific criteria for the same requirements covered in a continent-wide standard. The proposed standard has requirements that are not included in the corresponding continent-wide reliability standard. The proposed regional difference is necessitated by a physical difference in the bulk power system.</p>		
Constellation Energy Control and Dispatch	Yes, I believe there is a discrepancy in the description of Level 4 non-compliance, in section 2.4. Level 3, section 2.3, specifies removing misoperating equipment from service in more than 28 hours but $\leq 32$	<b>Response:</b> <a href="#">The wording in the compliance measures identified in section 2.4 of WECC PRC-STD-003-1 is taken directly from the existing Reliability</a>	The PRC-004-WECC-1 standard drafting team clarified the language in the violation severity levels.

Received From	Previous Comments to Consider for PRC-STD-003-1 June 8, 2007	The PRC-STD-003-1 Drafting Team Consideration of Comments	The PRC-004-WECC-1 Drafting Team Completed Actions
	<p>hours to meet requirements (a) - (c) , or for requirement (d) &gt; 28 business days but &lt;= 30 business days. Level 4 non-compliance continues with &lt;= 32 hours for requirements (a)-(c) or &lt;=30 business days for requirement (d). In effect there is no functional difference between Level 3 and Level 4 non-compliance.</p> <p>It appears that Level 4 should be applied when requirements (a) - (c) are met in &gt; (more than) 32 hours or requirement (d) is met in &gt; (more than) 30 business days.</p>	<p>Management System (RMS) Reliability Criteria Agreement. The standard request was to convert the existing RMS Protective Relay and Remedial Action Scheme Misoperation Criterion into the NERC standards format using as much of the original language as possible and the Expedited Process for Urgent Action Interim Standards. We recognize that the existing wording may cause confusion. WECC is required to develop a successor permanent standard or the interim standard expires one year after FERC approval. Your wording clarification will be forwarded to the applicable standards drafting team for consideration as part of the successor permanent standard.</p>	<p>The comment that was made is correct and the response from WECC was incorrect. However, the new standard corrected the issue</p>
<p><b>WECC Proposed Tier 1 Standards – Response to</b></p>	<p>November 7, 2006 – 3-4:30 PM PST  <b>Conference call participants:</b> Don Watkins, David Lemons, Ed Hulls, Paul</p>		

<b>Received From</b>	<b>Previous Comments to Consider for PRC-STD-003-1 June 8, 2007</b>	<b>The PRC-STD-003-1 Drafting Team Consideration of Comments</b>	<b>The PRC-004-WECC-1 Drafting Team Completed Actions</b>
<b>Comments</b>	Humberson, Sarah Majok, Brent Kingsford, Steve Cobb		
Richard Padilla	3) The NERC PRC standards for protective relays address both Transmission Relays as well as Generator Protective relays. However, the posted standard only addresses the Transmission side.	Response: The current RMS standard only addresses transmission relays. Changing the RMS standard is outside of the scope of this “Tier 1” standard. It was focused on this due to the substantial participation of relays in the 1996 disturbances. Generation relaying standards in excess to the NERC requirements could be proposed as a future standard if a need was identified.	The PRC-004-WECC-1 standard applies to Transmission Owners and Generator Owners.

**Comment Report Form for WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

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The PRC-004-WECC-1 Standard Drafting Team thanks all commenters who submitted comments on the PRC-004-WECC-1 Standard. This Standard was posted for a 45-day public comment period from April 4, 2008 through May 20, 2008. NERC distributed the notice for this posting on April 7, 2008. The Standard Drafting Team asked stakeholders to provide feedback on the standard through a special Standard Comment Form. There were two sets of comments from four companies representing three of the ten Industry Segments as shown in the table on the following pages.

In this 'Consideration of Comments' document stakeholder comments have been organized so that it is easier to see the responses associated with each question. All comments received on the Standard can be viewed in their original format at:

[http://www.nerc.com/~filez/regional\\_standards/regional\\_reliability\\_standards\\_under\\_development.html](http://www.nerc.com/~filez/regional_standards/regional_reliability_standards_under_development.html)

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you can contact the Manager of Regional Standards, Stephanie Monzon at [Stephanie.monzon@nerc.net](mailto:Stephanie.monzon@nerc.net). In addition, there is a NERC Reliability Standards Appeals Process.<sup>1</sup>

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<sup>1</sup> The appeals process is described in the NERC Regional Reliability Standards Development Procedure: [ftp://www.nerc.com/pub/sys/all\\_updl/sac/rrswg/NERC\\_Regional\\_Reliability\\_Standards\\_Development\\_Procedure\\_Version%200-0%202007-06-15\\_dwt.pdf](ftp://www.nerc.com/pub/sys/all_updl/sac/rrswg/NERC_Regional_Reliability_Standards_Development_Procedure_Version%200-0%202007-06-15_dwt.pdf)



**Comment Report Form for WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

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The Industry Segments are:

- 1 – Transmission Owners
- 2 – RTOs, ISOs
- 3 – Load-serving Entities
- 4 – Transmission-dependent Utilities
- 5 – Electric Generators
- 6 – Electricity Brokers, Aggregators, and Marketers
- 7 – Large Electricity End Users
- 8 – Small Electricity End Users
- 9 – Federal, State, Provincial Regulatory or other Government Entities
- 10 – Regional Reliability Organizations, Regional Entities

Commenter		Organization	Industry Segment											
			1	2	3	4	5	6	7	8	9	10		
1.	Dean Bender	Bonneville Power	✓											
2.	Annette Bannon	PPL Generation, LLC					✓	✓						
3.	Jon Williamson	PPL EnergyPlus						✓						
4.	John Cummings	PPL EnergyPlus						✓						
5.	Tom Olson	PPL Montana, LLC					✓							

## **Index to Questions, Comments, and Responses**

- 1. Was the WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation developed in a fair and open process, using the Process for Developing and Approving WECC Standards? page 4**
- 2. Does the WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation pose an adverse impact to reliability or commerce in a neighboring region or interconnection? page 4**
- 3. Does the WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation pose a serious and substantial threat to public health, safety, welfare, or national security? page 4**
- 4. Does the WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability? page 5**
- 5. Does the WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation meet at least one of the following criteria? page 5**
  - The proposed standard has more specific criteria for the same requirements covered in a continent-wide standard**
  - The proposed standard has requirements that are not included in the corresponding continent-wide reliability standard**
  - The proposed regional difference is necessitated by a physical difference in the bulk power system.**

**Comment Report Form for WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

**1. Was the WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation developed in a fair and open process, using the Process for Developing and Approving WECC Standards?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Dean Bender	X		
Response: Thank you.			
Annette Bannon, Jon Williamson, John Cummings, and Tom Olson	X		PPL believes that this standard provides good rules on equipment misoperations.
Response: Thank you for your support.			
Response:			

**2. Does the WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation pose an adverse impact to reliability or commerce in a neighboring region or interconnection?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Dean Bender		X	
Response: Thank you.			
Annette Bannon, Jon Williamson, John Cummings, and Tom Olson			
Response:			
Response:			

**3. Does the WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation pose a serious and substantial threat to public health, safety, welfare, or national security?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Dean Bender		X	

**Comment Report Form for WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

Commenter	Yes	No	Comment
Response: Thank you.			
Annette Bannon, Jon Williamson, John Cummings, and Tom Olson			
Response:			
Response:			

**4. Does the WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Dean Bender		X	
Response: Thank you.			
Annette Bannon, Jon Williamson, John Cummings, and Tom Olson			
Response:			
Response:			

**5. Does the WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation meet at least one of the following criteria?**

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

**Summary Consideration:**

**Comment Report Form for WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

Commenter	Yes	No	Comment
Dean Bender	X		
<a href="#">Response: Thank you.</a>			
Annette Bannon, Jon Williamson, John Cummings, and Tom Olson			
<a href="#">Response:</a>			
<a href="#">Response:</a>			

# WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation

## Standard Development Roadmap

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

### Development Steps Completed:

Completed Actions	Completion Date
1. Post Draft Standard for initial industry comments	September 21, 2007
2. Drafting Team to review and respond to initial industry comments	November 29, 2007
3. Post second Draft Standard for industry comments	November 29, 2007
4. Drafting Team to review and respond to industry comments	January 23, 2008
5. Post Draft Standard for Operating Committee approval	January 23, 2008
6. Operating Committee ballots proposed standard	March 6, 2008
7. Post Draft Standard for WECC Board approval	March 12, 2008
8. Post Draft Standard for NERC comment period	April 14, 2008
9. WECC Board approved proposed standard	April 16, 2008
10. NERC comment period ended	May 20, 2008
11. Drafting Team completes review and consideration of the NERC industry comments	May 30, 2008

### Description of Current Draft:

The purpose of this standard is to create a permanent replacement standard for PRC-STD-001-1 and PRC-STD-003-1. PRC-004-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when PRC-STD-001-1 and PRC-STD-003-1 were approved as NERC reliability standards. The new standard addresses the following areas:

1. Requirements for investigating operations to check for Misoperations.
2. Mitigation requirements after security-based Misoperations for redundant or non-redundant Protection Systems or Remedial Action Schemes.
3. Mitigation requirements after dependability-based Misoperations that do not adversely affect the reliability of the Bulk Electric System.

Several significant changes were made to PRC-STD-001 and PRC-STD-003 and they are itemized here:

1. PRC-STD-003 was renumbered to PRC-004-WECC-1. This makes both the PRC-004 and the Regional PRC-004-WECC-1 standards applicable to similar entities. PRC-003 is applicable to the RRO.

## **WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

2. Standard PRC-STD-001 will be retracted because the requirements are covered by other standards per description below:
  - a. PRC-STD-001 requirements B-WR1-a,b,c are covered under PRC-001
  - b. PRC-STD-001 requirement B-WR1-d is covered in this standard PRC-004-WECC-1
  - c. PRC-STD-001 requirement B-WR1-e is covered under TOP-005-1

The WECC Operating Committee approved the PRC-004-WECC-1 standard as a permanent replacement standard for PRC-STD-001-1 and PRC-STD-003-1 on March 6, 2008. The WECC Board of Directors approved this standard April 16, 2008. The WECC Board of Directors recommends that the NERC Board of Trustees approve the PRC-004-WECC-1 as a permanent replacement standard for PRC-STD-001-1 and PRC-STD-003-1. In addition, the WECC Board of Directors recommends that the NERC Board of Trustees submits the standard to FERC for approval.

### **Justification for a Regional Standard**

The NERC standard PRC-003-1 has requirements for Regional Reliability Organizations to establish procedures for review, analysis, reporting, and mitigation of transmission and generation Protection System Misoperations but does not address the owners of the transmission and generation facilities. The NERC standard PRC-004-1 has requirements for Protection System Misoperations but does not provide for the additional requirements as listed in PRC-004-WECC-1. The WECC Transmission Paths listed in the table titled “Major WECC Transfer Paths in the Bulk Electric System” and WECC RAS listed in table titled “Major WECC Remedial Action Schemes (RAS)” of PRC-004-WECC-1 are significant components for reliable delivery of power in the Western Interconnection. Protection System Misoperations and failures can cause reductions to the System Operating Limits (SOL) for those paths, and thus limit transfers between remotely located generation in the Western Interconnection and population/load centers. WECC identified the need for the timely mitigation of relaying problems and implemented such actions under the Reliability Management System (RMS). PRC-004-WECC-1 incorporates the RMS criteria and provides:

1. More robust requirements for review and analysis of all operations of those elements by operating and system protection personnel, and
2. Timely actions that must be taken to ensure that Misoperations of those elements are not repeated.

This standard is designed to minimize the SOL reductions required to maintain reliable Western Interconnection operation.

### **Future Development Plan:**

<b>Anticipated Actions</b>	<b>Anticipated Date</b>
1. NERC Board approval request	June 2008
2. Request FERC approval	June 2008

# **WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

## **Definitions of Terms Used in Standard**

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*

**Functionally Equivalent Protection System (FEPS):** A Protection System that provides performance as follows:

- Each Protection System can detect the same faults within the zone of protection and provide the clearing times and coordination needed to comply with all Reliability Standards.
- Each Protection System may have different components and operating characteristics.

**Functionally Equivalent RAS (FERAS):** A Remedial Action Scheme (RAS) that provides the same performance as follows:

- Each RAS can detect the same conditions and provide mitigation to comply with all Reliability Standards.
- Each RAS may have different components and operating characteristics.

**Security-Based Misoperation:** A Misoperation caused by the incorrect operation of a Protection System or RAS. Security is a component of reliability and is the measure of a device's certainty not to operate falsely.

**Dependability-Based Misoperation:** Is the absence of a Protection System or RAS operation when intended. Dependability is a component of reliability and is the measure of a device's certainty to operate when required.



# WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation

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## A. Introduction

- 1. Title:** Protection System and Remedial Action Scheme Misoperation
- 2. Number:** PRC-004-WECC-1
- 3. Purpose:** Regional Reliability Standard to ensure all transmission and generation Protection System and Remedial Action Scheme (RAS) Misoperations on Transmission Paths and RAS defined in section 4 are analyzed and/or mitigated.

### 4. Applicability

- 4.1.** Transmission Owners of selected WECC major transmission path facilities and RAS listed in tables titled “Major WECC Transfer Paths in the Bulk Electric System” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc> and “Major WECC Remedial Action Schemes (RAS)” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc>.
  - 4.2.** Generator Owners that own RAS listed in the Table titled “Major WECC Remedial Action Schemes (RAS)” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc>.
  - 4.3.** Transmission Operators that operate major transmission path facilities and RAS listed in Tables titled “Major WECC Transfer Paths in the Bulk Electric System” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc> and “Major WECC Remedial Action Schemes (RAS)” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc>.
- 5. Effective Date:** On the first day of the second quarter following applicable regulatory approval.

## B. Requirements

The requirements below only apply to the major transmission paths facilities and RAS listed in the tables titled “Major WECC Transfer Paths in the Bulk Electric System” and “Major WECC Remedial Action Schemes (RAS).”

- R.1.** System Operators and System Protection personnel of the Transmission Owners and Generator Owners shall analyze all Protection System and RAS operations. [*Violation Risk Factor: Lower*] [*Time Horizon: Operations Assessment*]
  - R1.1.** System Operators shall review all tripping of transmission elements and RAS operations to identify apparent Misoperations within 24 hours.
  - R1.2.** System Protection personnel shall analyze all operations of Protection Systems and RAS within 20 business days for correctness to characterize whether a Misoperation has occurred that may not have been identified by System Operators.
- R.2.** Transmission Owners and Generator Owners shall perform the following actions for each Misoperation of the Protection System or RAS. It is not intended that Requirements R2.1 through R2.4 apply to Protection System and/or RAS actions that appear to be entirely reasonable and correct at the time of occurrence and associated system performance is fully compliant with NERC Reliability Standards. If the Transmission Owner or Generator Owner later finds the Protection System or RAS operation to be incorrect through System

## **WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

Protection personnel analysis, the requirements of R2.1 through R2.4 become applicable at the time the Transmission Owner or Generator Owner identifies the Misoperation:

- R2.1.** If the Protection System or RAS has a Security-Based Misoperation and two or more Functionally Equivalent Protection Systems (FEPS) or Functionally Equivalent RAS (FERAS) remain in service to ensure Bulk Electric System (BES) reliability, the Transmission Owners or Generator Owners shall remove from service the Protection System or RAS that misoperated within 22 hours following identification of the Misoperation. Repair or replacement of the failed Protection System or RAS is at the Transmission Owners' and Generator Owners' discretion. *[Violation Risk Factor: High] [Time Horizon: Same-day Operations]*
  
- R2.2.** If the Protection System or RAS has a Security-Based Misoperation and only one FEPS or FERAS remains in service to ensure BES reliability, the Transmission Owner or Generator Owner shall perform the following. *[Violation Risk Factor: High] [Time Horizon: Same-day Operations]*
  - R2.2.1.** Following identification of the Protection System or RAS Misoperation, Transmission Owners and Generator Owners shall remove from service within 22 hours for repair or modification the Protection System or RAS that misoperated.
  
  - R2.2.2.** The Transmission Owner or Generator Owner shall repair or replace any Protection System or RAS that misoperated with a FEPS or FERAS within 20 business days of the date of removal. The Transmission Owner or Generator Owner shall remove the Element from service or disable the RAS if repair or replacement is not completed within 20 business days.
  
- R2.3.** If the Protection System or RAS has a Security-Based or Dependability-Based Misoperation and a FEPS and FERAS is not in service to ensure BES reliability, Transmission Owners or Generator Owners shall repair and place back in service within 22 hours the Protection System or RAS that misoperated. If this cannot be done, then Transmission Owners and Generator Owners shall perform the following. *[Violation Risk Factor: High] [Time Horizon: Same-day Operations]*
  - R2.3.1.** When a FEPS is not available, the Transmission Owners shall remove the associated Element from service.
  
  - R2.3.2.** When FERAS is not available, then
    - 2.3.2.1.** The Generator Owners shall adjust generation to a reliable operating level, or
  
    - 2.3.2.2.** Transmission Operators shall adjust the SOL and operate the facilities within established limits.
  
- R2.4.** If the Protection System or RAS has a Dependability-Based Misoperation but has one or more FEPS or FERAS that operated correctly, the associated Element or

## **WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

transmission path may remain in service without removing from service the Protection System or RAS that failed, provided one of the following is performed.

**R2.4.1.** Transmission Owners or Generator Owners shall repair or replace any Protection System or RAS that misoperated with FEPS and FERAS within 20 business days of the date of the Misoperation identification, or

**R2.4.2.** Transmission Owners or Generator Owners shall remove from service the associated Element or RAS. *[Violation Risk Factor: Lower] [Time Horizon: Operations Assessment]*

**R.3.** Transmission Owners and Generation Owners shall submit Misoperation incident reports to WECC within 10 business days for the following. *[Violation Risk Factor: Lower] [Time Horizon: Operations Assessment]*

**R3.1.** Identification of a Misoperation of a Protection System and/or RAS,

**R3.2.** Completion of repairs or the replacement of Protection System and/or RAS that misoperated.

### **C. Measures**

Each measure below applies directly to the requirement by number.

**M1.** Transmission Owners and Generation Owners shall have evidence that they reported and analyzed all Protection System and RAS operations.

**M1.1** Transmission Owners and Generation Owners shall have evidence that System Operating personnel reviewed all operations of Protection System and RAS within 24 hours.

**M1.2** Transmission Owners and Generation Owners shall have evidence that System Protection personnel analyzed all operations of Protection System and RAS for correctness within 20 business days.

**M2.** Transmission Owners and Generation Owners shall have evidence for the following.

**M2.1** Transmission Owners and Generation Owners shall have evidence that they removed the Protection System or RAS that misoperated from service within 22 hours following identification of the Protection System or RAS Misoperation.

**M2.2** Transmission Owners and Generation Owners shall have evidence that they removed from service and repaired the Protection System or RAS that misoperated per measurements M2.2.1 through M2.2.2.

**M2.2.1** Transmission Owners and Generation Owners shall have evidence that they removed the Protection System or RAS that misoperated from service within 22 hours following identification of the Protection System or RAS Misoperation.

## **WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

**M2.2.2** Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated within 20 business days or either removed the Element from service or disabled the RAS.

**M2.3** The Transmission Owners and Generation Owners shall have evidence that they repaired the Protection System or RAS that misoperated within 22 hours following identification of the Protection System or RAS Misoperation.

**M2.3.1** The Transmission Owner shall have evidence that it removed the associated Element from service.

**M2.3.2** The Generator Owners and Transmission Operators shall have documentation describing all actions taken that adjusted generation or SOLs and operated facilities within established limits.

**M2.4** Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated including documentation that describes the actions taken.

**M2.4.1** Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated within 20 business days of the misoperation identification.

**M2.4.2** Transmission Owners and Generation Owners shall have evidence that they removed the associated Element or RAS from service.

**M3.** Transmission Owners and Generation Owners shall have evidence that they reported the following within 10 business days.

**M3.1** Identification of all Protection System and RAS Misoperations and corrective actions taken or planned.

**M3.2** Completion of repair or replacement of Protection System and/or RAS that misoperated.

### **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:

- Misoperation Reports

**WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

- Reports submitted quarterly
- Spot check audits conducted anytime with 30 days notice given to prepare
- Periodic audit as scheduled by the Compliance Enforcement Authority
- Investigations
- Other methods as provided for in the Compliance Monitoring Enforcement Program

**1.2.1** The Performance-reset Period is one calendar month.

**1.3 Data Retention**

Reliability Coordinators, Transmission Owners, and Generation Owners shall keep evidence for Measures M1 and M2 for five calendar years plus year to date.

**1.4. Additional Compliance Information**

None.

**2. Violation Severity Levels**

**R1**

<b>Lower</b>	<b>Moderate</b>	<b>High</b>	<b>Severe</b>
System Operating personnel of the Transmission Owner or Generator Owner did not review the Protection System Operation or RAS operation within 24 hours but did review the Protection System Operation or RAS operation within six business days.	System Operating personnel of the Transmission Owner or Generator Owner did not review the Protection System operation or RAS operation within six business days.	System Protection personnel of the Transmission Owner and Generator Owner did not analyze the Protection System operation or RAS operation within 20 business days but did analyze the Protection System operation or RAS operation within 25 business days.	System Protection personnel of the Transmission Owner or Generator Owner did not analyze the Protection System operation or RAS operation within 25 business days.

**R2.1 and R2.2.1**

<b>Lower</b>	<b>Moderate</b>	<b>High</b>	<b>Severe</b>
The Transmission Owner and Generator Owner did not remove from service, repair, or implement other compliance measures for the Protection System or RAS that	The Transmission Owner and Generator Owner did not remove from service, repair, or implement other compliance measures for the Protection System or RAS that misoperated as	The Transmission Owner and Generator Owner did not perform the removal from service, repair, or implement other compliance measures for the Protection	The Transmission Owner and Generator Owner did not perform the removal from service, repair, or implement other compliance measures for the Protection

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misoperated as required within 22 hours but did perform the requirements within 24 hours.	required in less than 24 hours but did perform the requirements within 28 hours.	System or RAS that misoperated as required in less than 28 hours but did perform the requirements within 32 hours.	System or RAS that misoperated as required within 32 hours.
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**R2.3**

<b>Lower</b>	<b>Moderate</b>	<b>High</b>	<b>Severe</b>
The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required within 22 hours but did perform the requirements within 24 hours.	The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required in less than 24 hours but did perform the requirements within 28 hours.	The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required in less than 28 hours but did perform the requirements within 32 hours.	The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required within 32 hours.

**R2.2.2 and R2.4**

<b>Lower</b>	<b>Moderate</b>	<b>High</b>	<b>Severe</b>
The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustments to comply with the requirements within 20 business days but did perform the required activities within 25 business days.	The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustment to comply with the requirements within 25 business days but did perform the required activities within 28 business days.	The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustment to comply with the requirements within 28 business days but did perform the required activities within 30 business days.	The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustments to comply with the requirements within 30 business days.

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**R3.1**

<b>Lower</b>	<b>Moderate</b>	<b>High</b>	<b>Severe</b>
The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 10 business days but did perform the required activities within 15 business days.	The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 15 business days but did perform the required activities within 20 business days.	The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 20 business days but did perform the required activities within 25 business days.	The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 25 business days.

**R3.2**

<b>Lower</b>	<b>Moderate</b>	<b>High</b>	<b>Severe</b>
The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 10 business days of the completion but did perform the required activities within 15 business days.	The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 15 business days of the completion but did perform the required activities within 20 business days.	The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 20 business days of the completion but did perform the required activities within 25 business days.	The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 25 business days of the completion.

**Version History – Shows Approval History and Summary of Changes in the Action Field**

<b>Version</b>	<b>Date</b>	<b>Action</b>	<b>Change Tracking</b>
1	April 16, 2008	Permanent Replacement Standard for PRC-STD-001-1 and PRC-STD-003-1	

## **PRC-004-WECC-1 Comparison**

This following document prepared by the drafting team during the development of the WECC Standard PRC-004-WECC-1 – Contingency Reserve compares this proposed regional standard to the existing WECC PRC-STD-003-1 and PRC-STD-001-1.

The purpose of this document to provide documentation of each proposed change.



PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<b>A. Introduction</b>		
<b>1. Title:</b> Protection System and Remedial Action Scheme Misoperation	<b>1. Title:</b> Certification of Protective Relay Applications and Settings	
<b>2. Number:</b> PRC-004-WECC-1	<b>2. Number:</b> PRC-STD-001-1	Retired Criteria
<b>3. Purpose:</b> Regional Reliability Standard to ensure all transmission and generation Protection System and Remedial Action Scheme (RAS) Misoperations on Transmission Paths and RAS defined in section 4 are analyzed and/or mitigated.	<b>3. Purpose:</b> Regional Reliability Standard to certify all protective relay applications for the Bulk Power Transmission Paths <sup>1</sup> of the Western Interconnection.	Updated to reflect the overall purpose of the proposed revised standard.
<b>4. Applicability</b>	<b>4) Applicability</b>	
<b>4.1.</b> Transmission Owners of selected WECC major transmission path facilities and RAS listed in tables titled “Major WECC Transfer Paths in the Bulk Electric System” provided at <a href="http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%2004-28-08.doc">http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%2004-28-08.doc</a> and “Major WECC Remedial Action Schemes (RAS)” provided at <a href="http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%2004-28-08.doc">http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%2004-28-08.doc</a> .	4.1. This criterion applies to each Transmission Operator or Transmission Owner (as specified in Section B) of a transmission path in the Attachment A – WECC Table 2 (Source: Participants Subject to Criterion)	
<b>4.2</b> Generator Owners that own RAS listed in the Table titled “Major WECC Remedial Action Schemes (RAS)” provided at <a href="http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%2004-28-08.doc">http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%2004-28-08.doc</a> .		
<b>4.3</b> Transmission Operators that operate major transmission path facilities and RAS listed in Tables titled “Major WECC Transfer Paths in the		

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<p>Bulk Electric System” provided at <a href="http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc">http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc</a> and “Major WECC Remedial Action Schemes (RAS)” provided at <a href="http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc">http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc</a>.</p>		
<p><b>5. Effective Date:</b> On the first day of the next quarter, after receipt of applicable regulatory approval.</p>	<p><b>5. Effective Date:</b> This Western Electricity Coordinating Council Regional Reliability Standard will be effective when approved by the Federal Energy Regulatory Commission under Section 215 of the Federal Power Act. This Regional Reliability Standard shall be in effect for one year from the date of Commission approval or until a North American Standard or a revised Western Electricity Coordinating Council Regional Reliability Standard goes into place, whichever occurs first. At no time shall this regional Standard be enforced in addition to a similar North American Standard.</p>	
<p><b>B. Requirements</b></p>		
<p>The requirements below only apply to the major transmission paths facilities and RAS listed in the tables titled “Major WECC Transfer Paths in the Bulk Electric System” and “Major WECC Remedial Action Schemes (RAS).”</p> <p><b>R.1.</b> System Operators and System Protection personnel of the Transmission Owners and Generator Owners shall analyze all</p>	<p>WR1. Each Transmission Operator or Transmission Owner identified in Section 4.1 must submit documentation that an officer of the organization certifies that:</p> <p>a. All protective relay applications are</p>	<p>1. Standard PRC-STD-001 will be retracted because the requirements are covered by other standards per description</p>

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings</b>	<b>Comment</b>
<p>Protection System and RAS operations. <i>[Violation Risk Factor: Lower] [Time Horizon: Operations Assessment]</i></p> <p><b>R1.1.</b> System Operators shall review all tripping of transmission elements and RAS operations to identify apparent Misoperations within 24 hours.</p> <p><b>R1.2.</b> System Protection personnel shall analyze all operations of Protection Systems and RAS within 20 business days for correctness to characterize whether a Misoperation has occurred that may not have been identified by System Operators.</p> <p><b>R.2.</b> Transmission Owners and Generator Owners shall perform the following actions for each Misoperation of the Protection System or RAS. It is not intended that Requirements R2.1 through R2.4 apply to Protection System and/or RAS actions that appear to be entirely reasonable and correct at the time of occurrence and associated system performance is fully compliant with NERC Reliability Standards. If the Transmission Owner or Generator Owner later finds the Protection System or RAS operation to be incorrect through System Protection personnel analysis, the requirements of R2.1 through R2.4 become applicable at the time the Transmission Owner or Generator Owner identifies the Misoperation:</p> <p><b>R2.1.</b> If the Protection System or RAS has a Security-Based Misoperation and two or more Functionally Equivalent</p>	<p>appropriate for the Bulk Power Transmission Paths (“BPTP”) identified in Attachment A – Table 2 of this Standard pursuant to applicable WECC Standards and NERC Standards;</p> <p>b. The BPTP protective relay settings and logic are appropriate pursuant to applicable WECC Standards and NERC Standards;</p> <p>c. Since the last certification or for the last three years all network changes in the path, at the terminals of the path, or in nearby facilities that affect operation of the path have been considered in the protective relay application and settings;</p> <p>d. All relay operations since the last certification or during the last three-year period have been analyzed for correctness and appropriate corrective action</p>	<p>below:</p> <p>a. PRC-STD-001 requirements B-WR1-a,b,c are covered under PRC-001</p> <p>b. PRC-STD-001 requirement B-WR1-d is covered in this standard PRC-004-WECC-1</p> <p>c. PRC-STD-001 requirement B-WR1-e is covered under TOP-005-1</p>

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings</b>	<b>Comment</b>
<p>Protection Systems (FEPS) or Functionally Equivalent RAS (FERAS) remain in service to ensure Bulk Electric System (BES) reliability, the Transmission Owners or Generator Owners shall remove from service the Protection System or RAS that misoperated within 22 hours following identification of the Misoperation. Repair or replacement of the failed Protection System or RAS is at the Transmission Owners’ and Generator Owners’ discretion. <i>[Violation Risk Factor: High] [Time Horizon: Same-day Operations]</i></p> <p><b>R2.2.</b> If the Protection System or RAS has a Security-Based Misoperation and only one FEPS or FERAS remains in service to ensure BES reliability, the Transmission Owner or Generator Owner shall perform the following. <i>[Violation Risk Factor: High] [Time Horizon: Same-day Operations]</i></p> <p><b>R2.2.1.</b> Following identification of the Protection System or RAS Misoperation, Transmission Owners and Generator Owners shall remove from service within 22 hours for repair or modification the Protection System or RAS that misoperated.</p> <p><b>R2.2.2.</b> The Transmission Owner or Generator Owner shall repair or replace any Protection System or RAS that misoperated with a FEPS or FERAS</p>	<p>taken pursuant to applicable WECC Standards and NERC Standards;</p> <p>e. Up-to-date relay information has been provided to the on-shift operating personnel and the appropriate Reliability Coordinator.</p>	

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings</b>	<b>Comment</b>
<p style="text-align: center;">within 20 business days of the date of removal. The Transmission Owner or Generator Owner shall remove the Element from service or disable the RAS if repair or replacement is not completed within 20 business days.</p> <p><b>R2.3.</b> If the Protection System or RAS has a Security-Based or Dependability-Based Misoperation and a FEPS and FERAS is not in service to ensure BES reliability, Transmission Owners or Generator Owners shall repair and place back in service within 22 hours the Protection System or RAS that misoperated. If this cannot be done, then Transmission Owners and Generator Owners shall perform the following. <i>[Violation Risk Factor: High] [Time Horizon: Same-day Operations]</i></p> <p><b>R2.3.1.</b> When a FEPS is not available, the Transmission Owners shall remove the associated Element from service.</p> <p><b>R2.3.2.</b> When FERAS is not available, then</p> <p style="padding-left: 40px;"><b>2.3.2.1.</b>The Generator Owners shall adjust generation to a reliable operating level, or</p> <p style="padding-left: 40px;"><b>2.3.2.2.</b>Transmission Operators shall adjust the SOL and operate the facilities</p>		

PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<p style="text-align: center;">within established limits.</p> <p><b>R2.4.</b> If the Protection System or RAS has a Dependability-Based Misoperation but has one or more FEPS or FERAS that operated correctly, the associated Element or transmission path may remain in service without removing from service the Protection System or RAS that failed, provided one of the following is performed.</p> <p><b>R2.4.1.</b> Transmission Owners or Generator Owners shall repair or replace any Protection System or RAS that misoperated with FEPS and FERAS within 20 business days of the date of the Misoperation identification, or</p> <p><b>R2.4.2.</b> Transmission Owners or Generator Owners shall remove from service the associated Element or RAS. <i>[Violation Risk Factor: Lower] [Time Horizon: Operations Assessment]</i></p> <p><b>R.3.</b> Transmission Owners and Generation Owners shall submit Misoperation incident reports to WECC within 10 business days for the following. <i>[Violation Risk Factor: Lower] [Time Horizon: Operations Assessment]</i></p> <p><b>R3.1.</b> Identification of a Misoperation of a Protection System and/or RAS,</p> <p><b>R3.2.</b> Completion of repairs or the replacement of Protection</p>		

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System and/or RAS that misoperated.		
<b>C. Measures</b>	<b>C. Measures WM1.</b>	
<p>Each measure below applies directly to the requirement by number.</p> <p><b>M1.</b> Transmission Owners and Generation Owners shall have evidence that they reported and analyzed all Protection System and RAS operations.</p> <p><b>M1.1</b> Transmission Owners and Generation Owners shall have evidence that System Operating personnel reviewed all operations of Protection System and RAS within 24 hours.</p> <p><b>M1.2</b> Transmission Owners and Generation Owners shall have evidence that System Protection personnel analyzed all operations of Protection System and RAS for correctness within 20 business days.</p> <p><b>M2.</b> Transmission Owners and Generation Owners shall have evidence for the following.</p> <p><b>M2.1</b> Transmission Owners and Generation Owners shall have evidence that they removed the Protection System or RAS that misoperated from service within 22 hours following identification of the Protection System or RAS Misoperation.</p>	<p>WM1. A Transmission Operator or Transmission Owner identified in Section A.4.1 must accurately complete the Protective Relay Application and Settings Certification form.</p>	<p>Measures expended and split into a measure for each main requirement.</p>

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<p><b>M2.2</b> Transmission Owners and Generation Owners shall have evidence that they removed from service and repaired the Protection System or RAS that misoperated per measurements M2.2.1 through M2.2.2.</p> <p><b>M2.2.1</b> Transmission Owners and Generation Owners shall have evidence that they removed the Protection System or RAS that misoperated from service within 22 hours following identification of the Protection System or RAS Misoperation.</p> <p><b>M2.2.2</b> Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated within 20 business days or either removed the Element from service or disabled the RAS.</p> <p><b>M2.3</b> The Transmission Owners and Generation Owners shall have evidence that they repaired the Protection System or RAS that misoperated within 22 hours following identification of the Protection System or RAS Misoperation.</p> <p><b>M2.3.1</b> The Transmission Owner shall have evidence that it removed the associated Element from service.</p> <p><b>M2.3.2</b> The Generator Owners and Transmission Operators shall have documentation describing all actions</p>		



<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings</b>	<b>Comment</b>
<p style="text-align: center;">taken that adjusted generation or SOLs and operated facilities within established limits.</p> <p><b>M2.4</b> Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated including documentation that describes the actions taken.</p> <p><b>M2.4.1</b> Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated within 20 business days of the misoperation identification.</p> <p><b>M2.4.2</b> Transmission Owners and Generation Owners shall have evidence that they removed the associated Element or RAS from service.</p> <p><b>M3.</b> Transmission Owners and Generation Owners shall have evidence that they reported the following within 10 business days.</p> <p><b>M3.1</b> Identification of all Protection System and RAS Misoperations and corrective actions taken or planned.</p> <p><b>M3.2</b> Completion of repair or replacement of Protection System and/or RAS that misoperated.</p>		
<b>D. Compliance</b>	<b>D Compliance</b>	

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<b>1 Compliance Monitoring Process</b>	<b>1. Compliance Monitoring Process</b>	
<b>1.1 Compliance Monitoring Responsibility</b> Compliance Enforcement Authority	<b>1.1 Compliance Monitoring Responsibility</b> Western Electricity Coordinating Council (WECC)	
<p><b>1.2 Compliance Monitoring Period</b> Compliance Enforcement Authority may use one or more of the following methods to assess compliance:</p> <ul style="list-style-type: none"> <li>- Misoperation Reports</li> <li>- Reports submitted quarterly</li> <li>- Spot check audits conducted anytime with 30 days notice given to prepare</li> <li>- Periodic audit as scheduled by the Compliance Enforcement Authority</li> <li>- Investigations</li> <li>- Other methods as provided for in the Compliance Monitoring Enforcement Program</li> </ul> <p><b>1.2.1</b> The Performance-reset Period is one calendar month.</p>	<p><b>1.2 Compliance Monitoring Period</b> At Occurrence and Quarterly By no later than 5:00 p.m. Mountain Time on the first Business Day following the day on which an instance of non-compliance occurs (or such other date specified in Form A.1(a)), the Responsible Entities identified in Section A.4 shall submit to the WECC office Operating Reserve data in Form A.1(a) (available on the WECC web site) for each such instance of non-compliance. On or before the tenth day of each calendar quarter (or such other date specified in Form A.1(b)), the Responsible Entities identified in Section A.4 (including Responsible Entities with no reported instances of non-compliance) shall submit to the WECC office a completed Operating Reserve summary compliance Form A.1(b) (available on the WECC web site) for the immediately preceding calendar quarter.</p>	Remove specificity for reporting. The Compliance Enforcement Authority will include this detail in its reporting instructions.
<p><b>1.3 Data Retention</b> The Transmission Owners shall keep evidence for Measure M1 through M3 Reliability Coordinators, Transmission Owners, and Generation Owners shall keep evidence for Measures M1 and M2 for five calendar years plus year to date.</p>	<p><b>1.3 Data Retention</b> Data will be retained in electronic form for at least one year. The retention period will be evaluated before expiration of one year to determine if a longer retention period is necessary. If the data is being reviewed to</p>	Data retention period lengthened to 5 years plus the current year to ensure data are kept in a contiguous manner between audit periods.

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	address a question of compliance, the data will be saved beyond the normal retention period until the question is formally resolved.	
<p><b>1.4 Additional Compliance Information</b></p> <p>No additional compliance information.</p>	<p><b>1.4. Additional Compliance Information</b></p> <p>For purposes of applying the sanctions specified in Section II for violations of this criterion, the “Sanction Measure” is Normal Path Rating and the “Specified Period” is the most recent 12 month period ending August 31.</p>	<p>No longer needed because the NERC sanction table is used.</p>
<p><b>2. Violation Severity Levels</b></p>	<p><b>Levels of Non-Compliance Sanction</b></p>	
<p><b>Violation Severity Levels for Requirement R1</b></p>	<p><b>Measure: Average Generation</b></p>	
<p><b>Lower</b> System Operating personnel of the Transmission Owner or Generator Owner did not review the Protection System Operation or RAS operation within 24 hours but did review the Protection System Operation or RAS operation within six business days.</p> <p><b>Moderate</b> System Operating personnel of the Transmission Owner or Generator Owner did not review the Protection System operation or RAS operation within six business days.</p> <p><b>High</b> System Protection personnel of the Transmission Owner and Generator Owner did not analyze the Protection System operation or RAS operation within 20 business days but did analyze the Protection System operation or RAS operation within 25 business days.</p> <p><b>Severe</b> System Protection personnel of the Transmission Owner or Generator Owner did not analyze the Protection System operation or RAS operation within 25 business days.</p>	<p><b>2.1. Level 1:</b> There shall be a Level 1 non-compliance if any of the following conditions exist:</p> <p>2.1.1 The reporting Transmission Operator or Transmission Owner accurately certified to completing items (a) and (b) and all but one of items (c)-(e) listed above in Section B.</p> <p><b>2.2. Level 2:</b> There shall be a Level 2 non-compliance if any of the following conditions exist:</p> <p>2.2.1 The reporting Transmission Operator or Transmission Owner accurately certified to completing items (a) and (b) and all but two of items (c)-(e) listed above in Section B.</p>	<p>Lower Severity Levels defined for each requirement.</p>

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	<p><b>2.3. Level 3:</b> There shall be a Level 3 non-compliance if any of the following conditions exist:</p> <p>2.3.1 The reporting Transmission Operator or Transmission Owner accurately certified to completing of items (a) and (b) and to all but three of items (c)-(e) listed above in Section B.</p> <p><b>2.4. Level 4:</b> There shall be a Level 4 non-compliance if any of the following conditions exist:</p> <p>2.4.1 The reporting Transmission Operator or Transmission Owner did not certify to completion of either item (a) or (b) or did not certify to the completion of any four of items (c)-(e) listed above in Section B.</p>	
<b>Violation Severity Levels for Requirements R2.1 and R2.2</b>		
<p><b>Lower</b> The Transmission Owner and Generator Owner did not remove from service, repair, or implement other compliance measures for the Protection System or RAS that misoperated as required within 22 hours but did perform the requirements within 24 hours.</p> <p><b>Moderate</b> The Transmission Owner and Generator Owner did not remove from service, repair, or implement other compliance measures for the Protection System or RAS that misoperated as</p>		

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<p>required in less than 24 hours but did perform the requirements within 28 hours.</p> <p><b>High</b> The Transmission Owner and Generator Owner did not perform the removal from service, repair, or implement other compliance measures for the Protection System or RAS that misoperated as required in less than 28 hours but did perform the requirements within 32 hours.</p> <p><b>Severe</b> The Transmission Owner and Generator Owner did not perform the removal from service, repair, or implement other compliance measures for the Protection System or RAS that misoperated as required within 32 hours.</p>		
<b>Violation Severity Levels for Requirement R2.3</b>		
<p><b>Lower</b> The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required within 22 hours but did perform the requirements within 24 hours.</p> <p><b>Moderate</b> The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required in less than 24 hours but did perform the requirements within 28 hours.</p> <p><b>High</b> The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL</p>		

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<p>and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required in less than 28 hours but did perform the requirements within 32 hours.</p> <p><b>Severe</b> The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required within 32 hours.</p>		
<p><b>Violation Severity Levels for Requirements R2.2.2.4 and R2.4</b></p>		
<p><b>Lower</b> The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustments to comply with the requirements within 20 business days but did perform the required activities within 25 business days.</p> <p><b>Moderate</b> The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustment to comply with the requirements within 25 business days but did perform the required activities within 28 business days.</p> <p><b>High</b> The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustment to comply with the requirements within 28 business days but did perform the required activities within 30 business days.</p> <p><b>Severe</b> The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation</p>		

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adjustments to comply with the requirements within 30 business days.		
<b>Violation Severity Levels for Requirement R3.1</b>		
<p><b>Lower</b> The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 10 business days but did perform the required activities within 15 business days.</p> <p><b>Moderate</b> The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 15 business days but did perform the required activities within 20 business days.</p> <p><b>High</b> The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 20 business days but did perform the required activities within 25 business days.</p> <p><b>Severe</b> The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 25 business days.</p>		
<b>Violation Severity Levels for Requirement R3.2</b>		
<p><b>Lower</b> The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 10 business days of the completion but did perform the required activities within 15 business days.</p> <p><b>Moderate</b> The Transmission Owner and Generator Owner did not</p>		

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings</b>	<b>Comment</b>
<p>report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 15 business days of the completion but did perform the required activities within 20 business days.</p> <p><b>High</b> The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 20 business days of the completion but did perform the required activities within 25 business days.</p> <p><b>Severe</b> The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 25 business days of the completion.</p>		



PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation	WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation	Comment
<b>A. Introduction</b>		
<b>1. Title:</b> Protection System and Remedial Action Scheme Misoperation	<b>1. Title:</b> Protective Relay and Remedial Action Scheme Misoperation	
<b>2. Number:</b> PRC-004-WECC-1	<b>2. Number:</b> PRC-STD-003-1	Retired Criteria
<b>3. Purpose:</b> Regional Reliability Standard to ensure all transmission and generation Protection System and Remedial Action Scheme (RAS) Misoperations on Transmission Paths and RAS defined in section 4 are analyzed and/or mitigated.	<b>3. Purpose:</b> Regional Reliability Standard to ensure all transmission and generation Protection System Misoperations affecting the reliability of the Bulk Electric System (BES) are analyzed and mitigated. PRC-STD-003-1 is a Regional Reliability Standard that meets Requirement 1 of the NERC Standard PRC003-1.	Updated to reflect the overall purpose of the proposed revised standard.
<b>4. Applicability</b>	<b>4) Applicability</b>	
<b>4.2.</b> Transmission Owners of selected WECC major transmission path facilities and RAS listed in tables titled “Major WECC Transfer Paths in the Bulk Electric System” provided at <a href="http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%2004-28-08.doc">http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%2004-28-08.doc</a> and “Major WECC Remedial Action Schemes (RAS)” provided at <a href="http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%2004-28-08.doc">http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%2004-28-08.doc</a> .	4.1. This criterion applies to each Transmission Operator or Transmission Owner (as specified in Section B) of a transmission path in the Attachment A – WECC Table 2 and owners of Remedial Action Schemes listed in Table 3, Attachment B, Existing WECC Remedial Action Schemes (Source: Participants Subject to Criterion).	
<b>4.2</b> Generator Owners that own RAS listed in the Table titled “Major WECC Remedial Action Schemes (RAS)” provided at		

PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation	WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation	Comment
<a href="http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc">http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc</a> .		
<p><b>4.3</b> Transmission Operators that operate major transmission path facilities and RAS listed in Tables titled “Major WECC Transfer Paths in the Bulk Electric System” provided at <a href="http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc">http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc</a> and “Major WECC Remedial Action Schemes (RAS)” provided at <a href="http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc">http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc</a>.</p>		
<p><b>5. Effective Date:</b> On the first day of the next quarter, after receipt of applicable regulatory approval.</p>	<p><b>5. Effective Date:</b> This Western Electricity Coordinating Council Regional Reliability Standard will be effective when approved by the Federal Energy Regulatory Commission under Section 215 of the Federal Power Act. This Regional Reliability Standard shall be in effect for one year from the date of Commission approval or until a North American Standard or a revised Western Electricity Coordinating Council Regional Reliability Standard goes into place, whichever occurs first. At no time shall this regional Standard be enforced in addition to a similar North American Standard.</p>	
<p><b>B. Requirements</b></p>		
<p>The requirements below only apply to the major transmission paths facilities and RAS listed in the tables titled “Major WECC Transfer Paths</p>	<p>WR1. Owners of protective relays and Remedial Action Schemes (RAS)</p>	

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b>	<b>Comment</b>
<p>in the Bulk Electric System” and “Major WECC Remedial Action Schemes (RAS).”</p> <p><b>R.1.</b> System Operators and System Protection personnel of the Transmission Owners and Generator Owners shall analyze all Protection System and RAS operations. <i>[Violation Risk Factor: Lower] [Time Horizon: Operations Assessment]</i></p> <p><b>R1.1.</b> System Operators shall review all tripping of transmission elements and RAS operations to identify apparent Misoperations within 24 hours.</p> <p><b>R1.2.</b> System Protection personnel shall analyze all operations of Protection Systems and RAS within 20 business days for correctness to characterize whether a Misoperation has occurred that may not have been identified by System Operators.</p> <p><b>R.2.</b> Transmission Owners and Generator Owners shall perform the following actions for each Misoperation of the Protection System or RAS. It is not intended that Requirements R2.1 through R2.4 apply to Protection System and/or RAS actions that appear to be entirely reasonable and correct at the time of occurrence and associated system performance is fully compliant with NERC Reliability Standards. If the Transmission Owner or Generator Owner later finds the Protection System or RAS operation to be incorrect through System Protection personnel analysis, the requirements of R2.1 through R2.4 become</p>	<p>applied to path elements of selected WECC major transmission path facilities (listed in Attachment A – Table 2) and RAS (listed in Attachment B – Table 3) must take the following action for each known or probable relay misoperation:</p> <p>a. If functionally equivalent protective relaying or RAS remains in service to ensure bulk transmission system reliability; the relay or RAS that misoperated is to be removed from service for repair or modification within 22 hours of the relay or RAS misoperation. The relay or RAS shall be replaced, repaired, or modified such that the incorrect operation will not be repeated.</p> <p>b. If functionally equivalent protective relaying or RAS does not remain in service that will ensure bulk transmission system reliability, and the relay or RAS that misoperated cannot be repaired and placed back in service within 22 hours, the associated transmission path</p>	<p>Requirement R1 was to clarify the review and analysis of relay operations.</p>

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b>	<b>Comment</b>
<p>applicable at the time the Transmission Owner or Generator Owner identifies the Misoperation:</p> <p><b>R2.1.</b> If the Protection System or RAS has a Security-Based Misoperation and two or more Functionally Equivalent Protection Systems (FEPS) or Functionally Equivalent RAS (FERAS) remain in service to ensure Bulk Electric System (BES) reliability, the Transmission Owners or Generator Owners shall remove from service the Protection System or RAS that misoperated within 22 hours following identification of the Misoperation. Repair or replacement of the failed Protection System or RAS is at the Transmission Owners’ and Generator Owners’ discretion. <i>[Violation Risk Factor: High] [Time Horizon: Same-day Operations]</i></p> <p><b>R2.2.</b> If the Protection System or RAS has a Security-Based Misoperation and only one FEPS or FERAS remains in service to ensure BES reliability, the Transmission Owner or Generator Owner shall perform the following. <i>[Violation Risk Factor: High] [Time Horizon: Same-day Operations]</i></p> <p><b>R2.2.1.</b> Following identification of the Protection System or RAS Misoperation, Transmission Owners and Generator Owners shall remove from service within 22 hours for repair or</p>	<p>facility must be removed from service. The remaining path facilities, if any, must be de-rated to a reliable operating level.</p> <p>c. If the relay or RAS misoperates and there is some protection but not entirely functionally equivalent, the relay or RAS must be repaired or removed from service within 22 hours. The associated transmission may remain in service; however, system operation must fully comply with WECC and NERC operating standards. This may require an adjustment of operating levels.</p> <p>d. Protective relays or RAS removed from service must be repaired or replaced with functionally equivalent protective relays or RAS within 20 Business Days of removal, or the system shall be operated at levels that meet WECC Standards and NERC Standards or the associated transmission path elements shall</p>	<p>Requirement R2 is equivalent to the PRC-STD-003-1 standard that provided 22 hour to remove the relay that misoperated and 20 business days to repair the relay. The drafting team, however, differentiated between Security-Based misoperations and Dependability-Based misoperations.</p>

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b>	<b>Comment</b>
<p style="text-align: center;">modification the Protection System or RAS that misoperated.</p> <p><b>R2.2.2.</b> The Transmission Owner or Generator Owner shall repair or replace any Protection System or RAS that misoperated with a FEPS or FERAS within 20 business days of the date of removal. The Transmission Owner or Generator Owner shall remove the Element from service or disable the RAS if repair or replacement is not completed within 20 business days.</p> <p><b>R2.3.</b> If the Protection System or RAS has a Security-Based or Dependability-Based Misoperation and a FEPS and FERAS is not in service to ensure BES reliability, Transmission Owners or Generator Owners shall repair and place back in service within 22 hours the Protection System or RAS that misoperated. If this cannot be done, then Transmission Owners and Generator Owners shall perform the following. <i>[Violation Risk Factor: High] [Time Horizon: Same-day Operations]</i></p> <p><b>R2.3.1.</b> When a FEPS is not available, the Transmission Owners shall remove the associated Element from service.</p> <p><b>R2.3.2.</b> When FERAS is not available, then</p>	<p style="text-align: center;">be removed from service.</p> <p>It is not intended that the above requirements apply to system protection and/or RAS actions that appear to be entirely reasonable and correct at the time of occurrence and associated system performance is fully compliant with WECC and NERC standards, and the protective relaying or RAS operation is later found to be incorrect. In such cases, upon determination of the incorrect operation, the requirements of (a) through (d) above will become applicable at the time the incorrect operation is identified. (Source: WECC Criterion)</p>	

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b>	<b>Comment</b>
<p style="text-align: center;"> <b>2.3.2.1.</b>The Generator Owners shall adjust generation to a reliable operating level, or    <b>2.3.2.2.</b>Transmission Operators shall adjust the SOL and operate the facilities within established limits. </p> <p> <b>R2.4.</b> If the Protection System or RAS has a Dependability-Based Misoperation but has one or more FEPS or FERAS that operated correctly, the associated Element or transmission path may remain in service without removing from service the Protection System or RAS that failed, provided one of the following is performed. </p> <p> <b>R2.4.1.</b> Transmission Owners or Generator Owners shall repair or replace any Protection System or RAS that misoperated with FEPS and FERAS within 20 business days of the date of the Misoperation identification, or </p> <p> <b>R2.4.2.</b> Transmission Owners or Generator Owners shall remove from service the associated Element or RAS. <i>[Violation Risk Factor: Lower] [Time Horizon: Operations Assessment]</i> </p> <p> <b>R.3.</b> Transmission Owners and Generation Owners shall submit Misoperation incident reports to WECC within 10 business days </p>		

PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation	WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation	Comment
<p>for the following. <i>[Violation Risk Factor: Lower] [Time Horizon: Operations Assessment]</i></p> <p><b>R3.1.</b> Identification of a Misoperation of a Protection System and/or RAS,</p> <p><b>R3.2.</b> Completion of repairs or the replacement of Protection System and/or RAS that misoperated.</p>		
<b>C. Measures</b>	<b>C. Measures WM1.</b>	
<p>Each measure below applies directly to the requirement by number.</p> <p><b>M1.</b> Transmission Owners and Generation Owners shall have evidence that they reported and analyzed all Protection System and RAS operations.</p> <p><b>M1.1</b> Transmission Owners and Generation Owners shall have evidence that System Operating personnel reviewed all operations of Protection System and RAS within 24 hours.</p> <p><b>M1.2</b> Transmission Owners and Generation Owners shall have evidence that System Protection personnel analyzed all operations of Protection System and RAS for correctness within 20 business days.</p> <p><b>M2.</b> Transmission Owners and Generation Owners shall have evidence</p>	<p>WM1 A Transmission Operator and/or owners of Remedial Action Schemes identified in Section A.4.1 shall submit to the WECC office the completed Protective Relay and Remedial Action Scheme Misoperation Reporting Form. (Source: Data Reporting Requirement)</p>	<p>Measures expended and split into a measure for each main requirement.</p>

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b>	<b>Comment</b>
<p>for the following.</p> <p><b>M2.1</b> Transmission Owners and Generation Owners shall have evidence that they removed the Protection System or RAS that misoperated from service within 22 hours following identification of the Protection System or RAS Misoperation.</p> <p><b>M2.2</b> Transmission Owners and Generation Owners shall have evidence that they removed from service and repaired the Protection System or RAS that misoperated per measurements M2.2.1 through M2.2.2.</p> <p><b>M2.2.1</b> Transmission Owners and Generation Owners shall have evidence that they removed the Protection System or RAS that misoperated from service within 22 hours following identification of the Protection System or RAS Misoperation.</p> <p><b>M2.2.2</b> Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated within 20 business days or either removed the Element from service or disabled the RAS.</p> <p><b>M2.3</b> The Transmission Owners and Generation Owners shall have evidence that they repaired the Protection System or</p>		



<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b>	<b>Comment</b>
<p>RAS that misoperated within 22 hours following identification of the Protection System or RAS Misoperation.</p> <p><b>M2.3.1</b> The Transmission Owner shall have evidence that it removed the associated Element from service.</p> <p><b>M2.3.2</b> The Generator Owners and Transmission Operators shall have documentation describing all actions taken that adjusted generation or SOLs and operated facilities within established limits.</p> <p><b>M2.4</b> Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated including documentation that describes the actions taken.</p> <p><b>M2.4.1</b> Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated within 20 business days of the misoperation identification.</p> <p><b>M2.4.2</b> Transmission Owners and Generation Owners shall have evidence that they removed the associated Element or RAS from service.</p> <p><b>M3.</b> Transmission Owners and Generation Owners shall have evidence</p>		

<p><b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b></p>	<p><b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b></p>	<p><b>Comment</b></p>
<p>that they reported the following within 10 business days.</p> <p><b>M3.1</b> Identification of all Protection System and RAS Misoperations and corrective actions taken or planned.</p> <p><b>M3.2</b> Completion of repair or replacement of Protection System and/or RAS that misoperated.</p>		
<p><b>E. Compliance</b></p>	<p><b>D Compliance</b></p>	
<p><b>1 Compliance Monitoring Process</b></p>	<p><b>1. Compliance Monitoring Process</b></p>	
<p><b>1.1 Compliance Monitoring Responsibility</b> Compliance Enforcement Authority</p>	<p><b>1.1 Compliance Monitoring Responsibility</b> Western Electricity Coordinating Council (WECC)</p>	
<p><b>1.2 Compliance Monitoring Period</b> Compliance Enforcement Authority may use one or more of the following methods to assess compliance:</p> <ul style="list-style-type: none"> <li>- Misoperation Reports</li> <li>- Reports submitted quarterly</li> <li>- Spot check audits conducted anytime with 30 days notice given to prepare</li> <li>- Periodic audit as scheduled by the Compliance Enforcement Authority</li> <li>- Investigations</li> <li>- Other methods as provided for in the Compliance Monitoring Enforcement Program</li> </ul> <p><b>1.2.1</b> The Performance-reset Period is one calendar month.</p>	<p><b>1.2 Compliance Monitoring Period</b></p> <p>At Occurrence</p> <p>With respect to requirements (a) through (c) of Section B, by no later than 5 Business Days following the occurrence of a known or probable relay misoperation and/or a known or probable RAS misoperation, a Responsible Entity identified in Section A.4.1 shall submit to the WECC office the completed Protective Relay and Remedial Action Scheme Misoperation Reporting Form(s) as specified in Form A.9 (available on the WECC web site).</p>	<p>Remove specificity for reporting. The Compliance Enforcement Authority will include this detail in its reporting instructions.</p>

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b>	<b>Comment</b>
	<p>With respect to requirement (d) of Section B, by no later than 30 Business Days following the occurrence of a known or probable relay misoperation and/or a known or probable RAS misoperation, a Responsible Entity identified in Section A.4.1 shall submit to the WECC office the completed Protective Relay and Remedial Action Scheme Misoperation Reporting Form(s) as specified in Form A.9 (available on the WECC web site).(Source: Data Reporting Requirement)</p>	
<p><b>1.3 Data Retention Data Retention</b> The Transmission Owners shall keep evidence for Measure M1 through M3 Reliability Coordinators, Transmission Owners, and Generation Owners shall keep evidence for Measures M1 and M2 for five calendar years plus year to date.</p>	<p><b>1.3 Data Retention</b> Data will be retained in electronic form for at least one year. The retention period will be evaluated before expiration of one year to determine if a longer retention period is necessary. If the data is being reviewed to address a question of compliance, the data will be saved beyond the normal retention period until the question is formally resolved.</p>	<p>Data retention period lengthened to 5 years plus the current year to ensure data are kept in a contiguous manner between audit periods.</p>
<p><b>1.5 Additional Compliance Information</b></p> <p>No additional compliance information.</p>	<p><b>1.4. Additional Compliance Information</b> For purposes of applying the sanctions specified in <a href="#">Sanction Table</a> for violations of this criterion, the “Sanction Measure” is Normal Path Rating and the “Specified Period” is the Most Recent Calendar</p>	<p>No longer needed because the NERC sanction table is used.</p>

<p><b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b></p>	<p><b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b></p>	<p><b>Comment</b></p>
	<p>Month.” (Source: Sanctions)</p>	
<p><b>2. Violation Severity Levels</b></p>	<p><b>Levels of Non-Compliance Sanction</b></p>	
<p><b>Violation Severity Levels for Requirement R1</b></p>	<p><b>Measure:</b> Normal Path Rating</p>	
<p><b>Lower</b> System Operating personnel of the Transmission Owner or Generator Owner did not review the Protection System Operation or RAS operation within 24 hours but did review the Protection System Operation or RAS operation within six business days.</p> <p><b>Moderate</b> System Operating personnel of the Transmission Owner or Generator Owner did not review the Protection System operation or RAS operation within six business days.</p> <p><b>High</b> System Protection personnel of the Transmission Owner and Generator Owner did not analyze the Protection System operation or RAS operation within 20 business days but did analyze the Protection System operation or RAS operation within 25 business days.</p> <p><b>Severe</b> System Protection personnel of the Transmission Owner or Generator Owner did not analyze the Protection System operation or RAS operation within 25 business days.</p>	<p><b>2.1. Level 1:</b> There shall be a Level 1 non-compliance if any of the following conditions exist:</p> <p>2.1.1 For requirements (a) through (c) of Section B, the relay or RAS that misoperated was removed from service, repaired, or other compliance measures implemented as described in requirements (a) through (c) in &gt; 22 hours but :5 24 hours.</p> <p>2.1.2 For requirement (d) of Section B, repairs or replacement &gt; 20 business days :5 25 business days and system operation not adjusted to comply with applicable WECC Standards and NERC Standards in the case where there is not redundant relay protection or RAS.</p> <p><b>2.2. Level 2:</b> There shall be a Level 2 non-compliance if any of the following conditions exist:</p> <p>2.2.1 For requirements (a) through (c) of Section B, the relay or RAS that misoperated was removed from service, repaired, or other compliance measures implemented as described in</p>	<p>Same non compliance severity violation measure as existing standard except updated to reflect standard current guidelines and to reflect that the revised standard pertain to misoperations.</p>

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b>	<b>Comment</b>
	<p>requirements (a) through (c) in &gt; 24 hours but :5 28 hours.</p> <p>2.2.2 For requirement (d) of Section B, repairs or replacement &gt; 25 business days :5 28 business days and system operation not adjusted to comply with applicable WECC Standards and NERC Standards in the case where there is not redundant relay protection or RAS.</p> <p><b>2.3. Level 3:</b> There shall be a Level 3 non-compliance if any of the following conditions exist:</p> <p>2.3.1 For requirements (a) through (c) of Section B, the relay or RAS that misoperated was removed from service, repaired, or other compliance measures implemented as described in requirements (a) through (c) in &gt; 28 hours but :5 32 hours.</p> <p>2.3.2 For requirement (d) of Section B, repairs or replacement &gt; 28 business days :5 30 business days and system operation not adjusted to comply with applicable WECC Standards and NERC Standards in the case where there is not redundant relay protection or RAS.</p>	

PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation	WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation	Comment
	<p><b>2.4. Level 4:</b> There shall be a Level 4 non-compliance if any of the following conditions exist:</p> <p>2.4.1 For requirements (a) through (c) of Section B, the relay or RAS that misoperated was removed from service, repaired, or other compliance measures implemented as described in requirements (a) through (c) in &lt; 32 hours.</p> <p>2.4.2 For requirement (d) of Section B, repairs or replacement &lt; 30 business days and system operation not adjusted to comply with applicable</p>	
<p><b>Violation Severity Levels for Requirements R2.1 and R2.2</b></p>		
<p><b>Lower</b> The Transmission Owner and Generator Owner did not remove from service, repair, or implement other compliance measures for the Protection System or RAS that misoperated as required within 22 hours but did perform the requirements within 24 hours.</p> <p><b>Moderate</b> The Transmission Owner and Generator Owner did not remove from service, repair, or implement other compliance measures for the Protection System or RAS that misoperated as required in less than 24 hours but did perform the requirements within 28 hours.</p> <p><b>High</b> The Transmission Owner and Generator Owner did not perform the</p>		<p>Same as above</p>

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b>	<b>Comment</b>
<p>removal from service, repair, or implement other compliance measures for the Protection System or RAS that misoperated as required in less than 28 hours but did perform the requirements within 32 hours.</p> <p><b>Severe</b> The Transmission Owner and Generator Owner did not perform the removal from service, repair, or implement other compliance measures for the Protection System or RAS that misoperated as required within 32 hours.</p>		
<b>Violation Severity Levels for Requirement R2.3</b>		
<p><b>Lower</b> The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required within 22 hours but did perform the requirements within 24 hours.</p> <p><b>Moderate</b> The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required in less than 24 hours but did perform the requirements within 28 hours.</p> <p><b>High</b> The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required in less than 28 hours but did</p>		<p>Same as above</p>

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b>	<b>Comment</b>
<p>perform the requirements within 32 hours.</p> <p><b>Severe</b> The Transmission Operator and Generator Owner did not adjust generation to a reliable operating level, adjust the SOL and operate the facilities within established limits or implement other compliance measures for the Protection System or RAS that misoperated as required within 32 hours.</p>		
<p><b>Violation Severity Levels for Requirements R2.2.2.4 and R2.4</b></p>		
<p><b>Lower</b> The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustments to comply with the requirements within 20 business days but did perform the required activities within 25 business days.</p> <p><b>Moderate</b> The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustment to comply with the requirements within 25 business days but did perform the required activities within 28 business days.</p> <p><b>High</b> The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustment to comply with the requirements within 28 business days but did perform the required activities within 30 business days.</p> <p><b>Severe</b> The Transmission Owner and Generator Owner did not perform the required repairs, replacement, or system operation adjustments to comply with the requirements within 30 business days.</p>		<p>Same as above</p>



PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation	WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation	Comment
<b>Violation Severity Levels for Requirement R3.1</b>		
<p><b>Lower</b> The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 10 business days but did perform the required activities within 15 business days.</p> <p><b>Moderate</b> The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 15 business days but did perform the required activities within 20 business days.</p> <p><b>High</b> The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 20 business days but did perform the required activities within 25 business days.</p> <p><b>Severe</b> The Transmission Owner and Generator Owner did not report the Misoperation and corrective actions taken or planned to comply with the requirements within 25 business days.</p>		Same as above
<b>Violation Severity Levels for Requirement R3.2</b>		
<p><b>Lower</b> The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 10 business days of the completion but did perform the required activities within 15 business days.</p> <p><b>Moderate</b> The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection</p>		

<b>PRC-004-WECC-1 - Protection System and Remedial Action Scheme Misoperation</b>	<b>WECC Standard PRC-STD-003-1 – Protective Relay and Remedial Action Scheme Misoperation</b>	<b>Comment</b>
<p>System and/or RAS that misoperated to comply with the requirements within 15 business days of the completion but did perform the required activities within 20 business days.</p> <p><b>High</b> The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 20 business days of the completion but did perform the required activities within 25 business days.</p> <p><b>Severe</b> The Transmission Owner and Generator Owner did not report the completion of repair or replacement of Protection System and/or RAS that misoperated to comply with the requirements within 25 business days of the completion.</p>		

## Appendix A

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### Regional Reliability Standard Submittal Request

**Region: Western Electricity Coordinating Council**

**Regional Standard Number: PRC-004-WECC-1**

**Regional Standard Title: Protection System and Remedial Action Scheme Misoperation**

**Date Submitted: June 10, 2008**

**Regional Contact Name: Steven L. Rueckert**

**Regional Contact Title: Director of Standards**

**Regional Contact Telephone Number: (801) 582-0353**

**Request (check all that apply):**

- 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 (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)):**

- Yes April 16, 2008
- No

**[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:**

The purpose of the PRC-004-WECC-1 standard is to create a permanent replacement standard for PRC-STD-001-1 and PRC-STD-003-1. PRC-004-WECC-1 is designed to implement the

directives of FERC and recommendations of NERC when PRC-STD-001-1 and PRC-STD-003-1 were approved as NERC reliability standards. The new standard addresses the following areas:

1. Requirements for investigating operations to check for Misoperations.
2. Mitigation requirements after security-based Misoperations for redundant or non-redundant Protection Systems or Remedial Action Schemes.
3. Mitigation requirements after dependability-based Misoperations that do not adversely affect the reliability of the Bulk Electric System.

Several significant changes were made to PRC-STD-001 and PRC-STD-003 and they are itemized here:

1. PRC-STD-003 was renumbered to PRC-004-WECC-1. This makes both the PRC-004 and the Regional PRC-004-WECC-1 standards applicable to similar entities. PRC-003 is applicable to the RRO.
2. Standard PRC-STD-001 will be retracted because the requirements are covered by other standards per description below:
  - a. PRC-STD-001 requirements B-WR1-a,b,c are covered under PRC-001
  - b. PRC-STD-001 requirement B-WR1-d is covered in the new standard PRC-004-WECC-1
  - c. PRC-STD-001 requirement B-WR1-e is covered under TOP-005-1

### **Concise statement of the justification of the request:**

The PRC-004-WECC-1 regional reliability standard is more stringent than the continent-wide reliability standard (Standard PRC-004-1 — Analysis and Mitigation of Transmission and Generation Protection System Misoperations). The new standard addresses the following areas:

1. Requirements for investigating operations to check for Misoperations.
2. Mitigation requirements after security-based Misoperations for redundant or non-redundant Protection Systems or Remedial Action Schemes.
3. Mitigation requirements after dependability-based Misoperations that do not adversely affect the reliability of the Bulk Electric System.

The NERC standard PRC-003-1 has requirements for Regional Reliability Organizations to establish procedures for review, analysis, reporting, and mitigation of transmission and generation Protection System Misoperations but does not address the owners of the transmission and generation facilities. The NERC standard PRC-004-1 has requirements for Protection System Misoperations but does not provide for the additional requirements as listed in PRC-004-WECC-1. The WECC Transmission Paths listed in the table titled “Major WECC Transfer Paths in the Bulk Electric System” and WECC RAS listed in table titled “Major WECC Remedial Action Schemes (RAS)” of PRC-004-WECC-1 are significant components for reliable delivery of power in the Western Interconnection. Protection System Misoperations and failures can cause reductions to the System Operating Limits (SOL) for those paths, and thus limit transfers between remotely located generation in the Western Interconnection and population/load centers. WECC identified the need for the timely mitigation of relaying problems and implemented such actions under the Reliability Management System (RMS). PRC-004-WECC-1 incorporates the RMS criteria and provides:

1. More robust requirements for review and analysis of all operations of those elements by operating and system protection personnel, and
2. Timely actions that must be taken to ensure that Misoperations of those elements are not repeated.

This standard is designed to minimize the SOL reductions required to maintain reliable Western Interconnection operation.

**Other – please attach or include as separate files:**

- **The text of the regional reliability standard in MS Word format that:**
  - **has either been, or is anticipated to be, approved by the regional entity's board, and**
  - **is in a format consistent with the NERC template for reliability standards.**
- **An implementation plan.**
- **The regional entity standard drafting team roster.**
- **The names and affiliations of the ballot pool members or names and affiliations of the committee and committee members that approved the submittal of the standard.**
- **The final ballot results, including a list of significant minority issues that were not resolved, and**
- **For each public comment period, a copy of each comment submitted and its associated response along with the associated changes made to the standard.**

VAR-002-WECC-1 - Automatic Voltage Regulators - Comments Due November 12,  
2007

November 26, 2007

This standard needs to include a requirement that the TO provide a voltage setpoint for each AVR to be set at, and a requirement that the generator operate at that setpoint within the ratings of its equipment. There are TO's within WECC that do not provide setpoints and/or require specific MVAR outputs which makes AVR compliance confusing and impractical.

John Stout

*Reply: The NERC standard VAR-001-1 Requirement 4 requires Transmission Operators to provide voltage schedules. Implementing this recommendation would duplicate an existing NERC requirement. Therefore, the drafting team did not implement the recommendation.*

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The Requirement section mentions a documentation requirement for identifying the number of hours excluded for R1.1-R1.9. The Measures section mentions submitting data to the compliance monitor but no frequency of submittals is mentioned. Then under Compliance, para 1.2, there is mention of quarterly reports being used as a measure of compliance. I think you need to add to the Measurements section the quarterly submittal of AVR in service hours. You also should give a better explanation of what type of quarterly reports are needed (it might help if you referenced the RMS form 5a). Otherwise, Generator Operators run the risk of not seeing the need for quarterly reporting and thus violating this standard.

Karl Bryan

*Reply: The standard's compliance section is designed to give the compliance monitor guidance in developing reporting forms. The drafting team added clarification to M1 regarding reporting frequency.*

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Under the Violation Severity Levels section, BPA agrees with the noncompliance starting at 98%, but it seems disproportional to have the Lower Severity Level drop all the way down to 90%, Moderate to 80%, High to 70%, and below 70% for Severe. With all the exemptions allowed outside of the 98% it would seem more appropriate to have level of 96% for Lower Level, 94% for Moderate Level, 92% for High Level, and 90% and below for Severe.

James Murphy, BPA

*Reply: The drafting team believes using a wider range for compliance is more appropriate with the implementation of the NERC sanction table.*

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- Based on the statement of purpose for the Standard, it is believed that WECC's intent with this replacement Standard is to close off the flexibility allowed for the TOP to direct other automatic modes given in the NERC interpretation of NERC-VAR-002 by its omission in the hours removed calculation in VAR-002-WECC-1. If WECC's intent is to continue recognizing the interpretation that "in automatic controlling voltage" is equivalent to "in automatic controlling in a mode as directed by the TOP" then the following comments do not apply. However, that clarification should be specifically included in the Standard.

*Reply: Yes, the drafting team's intent is to be more restrictive than the NERC standard. The purpose of this standard is to allow the operation of the excitation system in modes other than automatic voltage control only under specific conditions.*

- Transmission Operators should be allowed to exempt or direct generators to operate AVRs in different automatic control modes due to local system conditions, physical equipment limitations, or contractual requirements.

*Reply: R1.3 addresses abnormal system configurations. The drafting team added R1.10 to address local system conditions. The drafting team believes new generators should be equipped with AVR and the AVR should be operated to control voltage.*

- An exemption for "controlling voltage mode" should be made for "as available" QFs connected at less than 20 MVA to the bulk electric system.

*Reply: The functional registration process addresses the generator size for compliance. The drafting team added 4.3 applying the standard to synchronous generators and condensers connected to the interconnected transmission system.*

- Western Interconnection SOLs should be recalculated with an allowance margin for some small generators in other than "controlling voltage mode."

*Reply: The determination of System Operating Limits is outside the scope of this standard.*

Edie L. Kinsley  
Constellation Energy Group, Inc.  
750 East Pratt Street  
Baltimore, MD 21202  
410.783.2855 (office)  
edie.l.kinsley@constellation.com

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The WECC intends that VAR-002-WECC-1 will replace VAR-STD-002a-1. However, the language used in this draft of the new standard dramatically increases the scope of applicability. PPLM suggests that the following language from VAR-STD-002a-1 in Section 4, Applicability of VAR-002-WECC-1 be retained in the new standard.

“Generator Operators of synchronous generating units equipped with Automatic Voltage Regulators”

WECC issued a policy in 2004 to address Automatic Voltage Regulators. In that document, the following statement is included:

“This policy statement defines the minimum requirements for excitation systems and automatic voltage regulating equipment applied to new synchronous generators connected directly or by a step-up-transformer to the Western Electricity Coordinating Council (WECC) transmission system (60 kV or higher). This policy also applies to existing synchronous generators if their excitation system or voltage controlling equipment is upgraded, replaced, or significantly modified.”

PPLM suggests that the WECC reference this policy statement in the new standard, or include all applicable language, from the policy statement in the standard.

PPLM appreciates the standard drafting team efforts and the opportunity to comment.

Jon Williamson  
PPL Montana, LLC

*Reply: The WECC Board has not approved the draft AVR policy statement. The drafting team added 4.3 to apply the standard to synchronous generators connected to the interconnected transmission system. In addition, the NERC functional registration process identifies the generator size for determining applicability.*

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Avista believes that the WECC standard should have similar language to the NERC standard that allows a Transmission Operator to grant an exemption to a Generator Operator from the requirement to operate in voltage control mode. This exemption should only be granted after the Transmission Operator has performed a thorough analysis that indicates there is no impact to the interconnection based on this mode of operation. The final decision should be up to the Transmission Operator not the Generator Operator. There are several generators that do not have a direct impact in supporting the grid voltage based on size and location and therefore should be granted an exemption from requirement 1.

Avista



*Reply: The drafting team added 4.3 to apply the standard to synchronous generators connected to the interconnected transmission system. The purpose of this standard is to allow the operation of the excitation system in modes other than automatic voltage control only under specific conditions. In addition, the drafting team added R1.10 to address local system instability.*

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The standard should mention the minimum size of unit where AVR reporting is required. There has been different numbers floating over the years. I recall WECC policy used to have 30 MVA. The last I heard of was 10 MVA. What is it now?

Anonymous

*Reply: The functional registration process addresses the generator size for compliance. The drafting team added 4.3 applying the standard to synchronous generators and condensers connected to the interconnected transmission system.*

Consideration of Comments for VAR-002-WECC-1 – Automatic Voltage Regulator  
Comments were due January 2, 2008  
January 24, 2008

The VAR-002-WECC-1 Standard Drafting Team thanks all commenters who submitted comments on the WECC VAR-002-WECC-1 Standard. This Standard was posted for a 30-day public comment period from November 30, 2007 through January 2, 2008. The Standard Drafting Team asked stakeholders to provide feedback on the standard by posting comments on the WECC website. There were six sets of comments from five companies.

In this 'Consideration of Comments' document, stakeholder comments have been organized so that it is easier to see the responses associated with each comment.

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you may contact the Director of Standards, Steve Rueckert at 801-582-0353 or at [steve@wecc.biz](mailto:steve@wecc.biz). In addition, there is a WECC Appeals Process.

### **Comments and Responses**

Your response to my original comment states the following:

Reply: The NERC standard VAR-001-1 Requirement 4 requires Transmission Operators to provide voltage schedules. Implementing this recommendation would duplicate an existing NERC requirement. Therefore, the drafting team did not implement the recommendation

Your response is factually incorrect...the NERC standard does not require the TO to provide a voltage schedule...it gives the TO the option of providing either a voltage schedule or a reactive power schedule. The exact language from R4 is quoted below:

"Each Transmission Operator shall specify a voltage or Reactive Power schedule at the interconnection between the generator facility and the Transmission Owner's facilities to be maintained by each generator"

The WECC standard is inconsistent with permitting the TO to use a reactive power schedule instead of a voltage schedule. That is why my original comment is still valid and still needs to be addressed in the standard.

John Stout

Reply: The drafting team does not believe there is any inconsistency between VAR-002-WECC-1 and NERC VAR-001-1. The second sentence in NERC VAR-001 Requirement 4 states:

“The Transmission Operator shall provide the voltage or Reactive Power schedule to the associated Generator Operator and direct the Generator Operator to comply with the schedule in automatic voltage control mode (AVR in service and controlling voltage).”

The parenthetical indicates that the AVR is always to be controlling voltage whether the Transmission Operator provides a voltage or VAR schedule.

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Many Qualified Facilities (QF) in California were connected to the BES under the California Public Utility Commission (CPUC) Rule 21. Some Utilities in their interpretation of Rule 21 required the QF to operate the AVR in Power Factor (pf) mode as a condition of the Interconnection Agreement (ICA) and Power Purchase Agreement (PPA). Requiring the QF to now operate in the AVR in automatic, controlling voltage, puts operation of these plants in conflict with the criteria used for the Reliability, Safety, and Stability Studies of the BES that were completed by the Transmission Operator (TOP) at the time of the interconnection. Operating in the voltage control mode also puts the QF in conflict with the contractual conditions with the TOP currently in force.

The above is in conformance with NERC Standard VAR-002 and the current NERC interpretation of that standard as referenced in WECC-VAR-STD-002a. The relief given in the draft VAR-002-WECC-1 R1.10 only temporarily deals with the specific instability due to a LTC in the area and does not address the above issues.

The PPAs for QFs requires them to pay for VARs taken and not be paid for VARs given to the grid. Operating in the voltage control mode with the set point, as directed by the TOP, does not allow the QF any control over the movement of VARs to and from the BES and can be a severe financial hardship.

Roger Robinson  
rmc@att.net

Reply: CPUC Rule 21 only applies to generators on distribution systems. This standard applies to synchronous generators and condensers that are connected to the Bulk Electric System.

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Considerations for VAR-002-WECC-1

Comment on Purpose Statement:

The purpose statement's intent is not as clear as the previous version of the standard. Is the purpose to just have AVR equipment, or is it to have AVR equipment and operate the equipment in a certain manner.

Reply: The drafting team made refinements to the purpose statement to clarify the statement.

Is the purpose to have Automatic Voltage Regulator equipment installed on, fully functional, and in service whenever a qualifying synchronous generator or condenser is connected to the interconnected transmission system?

Reply: The VAR-002-WECC-1 standard applies to the same entities to which the NERC Reliability Standards apply.

Clarification of 4.3.

This paragraph seems to be very inclusive in its scope. There may be circumstances where a synchronous generator is connected to the BES, but it does not qualify under NERC criteria (the unit is smaller than 20 MVA, the aggregate plant is smaller than 75 MVA, etc.).

Reply: The NERC Functional Model registration criterion governs which units are subject to compliance regarding VAR-002-WECC-1. This is true for all NERC Reliability Standards.

Further, there are circumstances where a generating unit or plant may not be a contributing element to system reliability, regardless of its AVR. There should be provisions, similar to provisions in the NERC standard, for a Transmission Operator to exempt some units or plants based on thorough analysis that demonstrates there is no adverse impact. It may be prudent to subject those studies to some type of review and concurrence if the exemption is being provided for plants that are larger in aggregate size.

Reply: These standards are developed under the assumption that all generating units contribute to system reliability. It is not practicable to determine the unit's contribution because its contribution can vary depending upon the continuously changing conditions of the system. The drafting team does not believe that the Transmission Operator's discretion provides a carte blanche exemption to the standard. This standard qualifies what type of operation may be excluded.

General Suggestion to add to section 4:

If this is intended to work in companion with the NERC standard, would it be appropriate to include a reference that this is intended to work in companion with NERC VAR-002. The NERC VAR-002 has a number of reporting requirements regarding this operation, which are not part of this standard, and while entities should be aware of the order of precedent, a statement here would help with overall compliance efforts.

Reply: This standard will become part of the body of the NERC Reliability Standards. References to other NERC standards are not necessary.

Comment on R1.

This appears to be a significant change from previous standards. Previous standards required operation of the AVR in a voltage control mode. This version does not appear to specifically require operation in the voltage control mode. I would interpret this that if I had an AVR operating in power factor mode or VAR control mode, it would be compliant. The previous standard was more specific in identifying the voltage control mode. The intent of what is the intended control mode should be stated.

Reply: The drafting team refined R1 to require operation in automatic voltage control mode.

A similar comment to one already stated above, the Transmission Operator should be given authority to provide exemptions from this operating mode through either analysis or specific operating direction. While the NERC standard provides for this, it is not clear that this standard does. This is an area where the two standards appear to be in conflict. If a generator is directed by the Transmission Operator to operate in a different mode, does this violate this proposed standard?

Reply: There are no normal operating configurations that would require a Transmission Operator to request operation in a mode other than automatic voltage control mode. If the Transmission Operator requires a generator to operate in an operating mode other than voltage control mode, then those hours would be counted as operating without AVR in service. The generator can still meet a VAR schedule request with the AVR in automatic voltage control mode.

Comment on R1.1

The drafting team should consider establishing a specific threshold of hours given that there are small differences in hours between quarters. For example, the equipment operates less than  $(3 \text{ mon/qtr} \times 30 \text{ days/mon} \times 24 \text{ hrs/day} \times 5\% =) 108$  hours per calendar quarter.

It would be desirable to increase the threshold to something more like 200 hours. This number of hours is derived from a reasonable number of hours that a simple cycle emergency peaking CT might run if it was fitted with reasonably available control technology (RACT) for controlling emission levels. This would help Generator Owners with complying with the need of this standard, but not reach into units, which seldom run, and are limited in their run time by emission permit conditions and emergency peaking operations.

Reply: The standard drafting team believes a percentage is more appropriate. The intent of the standard is to keep the AVR in service and not designed to avoid having to purchase an AVR. Lengthening the exemption in R1.1 to 200 hours would amount to doubling the 5% exclusion. The drafting team does not believe this is justifiable.

#### Comment on R1.5 and R1.6

It would seem to simplify the standard if these were combined and the 15 month provision retained. In both exceptions, documentation must be submitted to explain the need to have the AVR out of service. It is not clear why from system reliability and performance standard perspective, there is a need to distinguishing between replacement parts or system replacement.

Reply: The drafting team extended the time for AVR replacement to 24 months to accommodate design and procurement especially for nuclear units. There is a distinction between the time required to repair an AVR versus replacement.

#### Comment on R1.10

This seems unduly restrictive. The ability for the Transmission Operator to direct the Generator Operator to operate the excitation system in other modes should not be restricted by a singular occurrence of a LTC operation. The LTC should be removed. The provisions for the Transmission Operator to direct the Generator Operator to operating in modes other than automatic modes could be incorporated with R1.8.

Reply: In R1 the drafting team has provided exclusions for credible situations for the Transmission Operator to direct operating without the AVR in automatic voltage control. R1.8 permits the Transmission Operator to allow a unit to operate when the AVR is **unavailable for service** without a violation.

#### Comment on R2

Clearly, there is a need for the Generator Operator and Transmission Operator to have timely (i.e. quarterly) documentation of the out of service hours and to document the reason for the out of service hours. Consideration should be given to determine how much detail information needs to be reported. For example, is it critical to report that each exclusion be separately reported? These records are required to be kept by the asset owner to support the reported data and the Compliance Enforcement Authority has abilities to require these records be produced if there are concerns about the quality of the reporting of a particular entity. How would this data be used by the Reliability Coordinator if it was reported? It would seem the most critical element is how many hours the AVR was in service while the generator/condenser is operating. Could the report be simply limited to a hour many hours the unit ran against the hours the AVR is in service?

Reply: The Compliance Enforcement Authority will develop reporting instructions including reporting forms, the date data are due, and other data retention requirements for audits. It is the responsibility of the Transmission Operator to know the status of all reactive resources. Compliance reporting is never submitted to the Reliability Coordinator.

Anonymous

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Comment on Purpose Statement:

The purpose statement's intent is not as clear as the previous version of the standard. Is the purpose to just have AVR equipment, or is it to have AVR equipment and operate the equipment in a certain manner.

[Reply: The drafting team made refinements to the purpose statement to clarify the statement.](#)

Is the purpose to have Automatic Voltage Regulator equipment installed on, fully functional, and in service whenever a qualifying synchronous generator or condenser is connected to the interconnected transmission system?

[Reply: The VAR-002-WECC-1 standard applies to the same entities to which the NERC Reliability Standards apply.](#)

Clarification of 4.3.

This paragraph seems to be very inclusive in its scope. There may be circumstances where a synchronous generator is connected to the BES, but it does not qualify under NERC criteria (the unit is smaller than 20 MVA, the aggregate plant is smaller than 75 MVA, etc. ).

[Reply: The NERC Functional Model registration criterion governs which units are subject to compliance regarding VAR-002-WECC-1. This is true for all NERC Reliability Standards.](#)

Further, there are circumstances where a generating unit or plant may not be a contributing element to system reliability, regardless of its AVR. There should be provisions, similar to provisions in the NERC standard, for a Transmission Operator to exempt some units or plants based on thorough analysis that demonstrates there is no adverse impact. It may be prudent to subject those studies to some type of review and concurrence if the exemption is being provided for plants that are larger in aggregate size.

[Reply: These standards are developed under the assumption that all generating units contribute to system reliability. It is not practicable to determine the unit's contribution because its contribution can vary depending upon the continuously changing conditions of the system. The drafting team does not believe that the Transmission Operator's discretion provides a carte blanche exemption to the standard. This standard qualifies what type of operation may be excluded.](#)

General Suggestion to add to section 4:

If this is intended to work in companion with the NERC standard, would it be appropriate to include a reference that this is intended to work in companion with NERC VAR-002. The NERC VAR-002 has a number of reporting requirements regarding this operation, which are not part of this standard, and while entities should be aware of the order of precedent, a statement here would help with overall compliance efforts.

Reply: This standard will become part of the body of the NERC Reliability Standards. References to other NERC standards are not necessary.

Comment on R1.

This appears to be a significant change from previous standards. Previous standards required operation of the AVR in a voltage control mode. This version does not appear to specifically require operation in the voltage control mode. I would interpret this that if I had an AVR operating in power factor mode or VAR control mode, it would be compliant. The previous standard was more specific in identifying the voltage control mode. The intent of what is the intended control mode should be stated.

Reply: The drafting team refined R1 to require operation in automatic voltage control mode.

A similar comment to one already stated above, the Transmission Operator should be given authority to provide exemptions from this operating mode through either analysis or specific operating direction. While the NERC standard provides for this, it is not clear that this standard does. This is an area where the two standards appear to be in conflict. If a generator is directed by the Transmission Operator to operate in a different mode, does this violate this proposed standard?

Reply: There are no normal operating configurations that would require a Transmission Operator to request operation in a mode other than automatic voltage control mode. If the Transmission Operator requires a generator to operate in an operating mode other than voltage control mode, then those hours would be counted as operating without AVR in service. The generator can still meet a VAR schedule request with the AVR in automatic voltage control mode.

Comment on R1.1

The drafting team should consider establishing a specific threshold of hours given that there are small differences in hours between quarters. For example, the equipment operates less than  $(3 \text{ mon/qtr} \times 30 \text{ days/mon} \times 24 \text{ hrs/day} \times 5\% =) 108$  hours per calendar quarter.

It would be desirable to increase the threshold to something more like 200 hours. This number of hours is derived from a reasonable number of hours that a simple cycle



emergency peaking CT might run if it was fitted with reasonably available control technology (RACT) for controlling emission levels. This would help Generator Owners with complying with the need of this standard, but not reach into units, which seldom run, and are limited in their run time by emission permit conditions and emergency peaking operations.

Reply: The standard drafting team believes a percentage is more appropriate. The intent of the standard is to keep the AVR in service and not designed to avoid having to purchase an AVR. Lengthening the exemption in R1.1 to 200 hours would amount to doubling the 5% exclusion. The drafting team does not believe this is justifiable.

Comment on R1.5 and R1.6

It would seem to simplify the standard if these were combined and the 15 month provision retained. In both exceptions, documentation must be submitted to explain the need to have the AVR out of service. It is not clear why from system reliability and performance standard perspective, there is a need to distinguishing between replacement parts or system replacement.

Reply: The drafting team extended the time for AVR replacement to 24 months to accommodate design and procurement especially for nuclear units. There is a distinction between the time required to repair an AVR versus replacement.

Comment on R1.10

This seems unduly restrictive. The ability for the Transmission Operator to direct the Generator Operator to operate the excitation system in other modes should not be restricted by a singular occurrence of a LTC operation. The LTC should be removed. The provisions for the Transmission Operator to direct the Generator Operator to operating in modes other than automatic modes could be incorporated with R1.8.

Reply: In R1 the drafting team has provided exclusions for credible situations for the Transmission Operator to direct operating without the AVR in automatic voltage control. R1.8 permits the Transmission Operator to allow a unit to operate when the AVR is **unavailable for service** without a violation.

Comment on R2

Clearly, there is a need for the Generator Operator and Transmission Operator to have timely (i.e. quarterly) documentation of the out of service hours and to document the reason for the out of service hours. Consideration should be given to determine how much detail information needs to be reported. For example, is it critical to report that each exclusion be separately reported? These records are required to be kept by the asset owner to support the reported data and the Compliance Enforcement Authority has abilities to require these records be produced if there are concerns about the quality of the reporting of a particular entity. How would this data be used by the Reliability

Coordinator if it was reported? It would seem the most critical element is how many hours the AVR was in service while the generator/condenser is operating. Could the report be simply limited to a hour many hours the unit ran against the hours the AVR is in service?

Reply: The Compliance Enforcement Authority will develop reporting instructions including reporting forms, the date data are due, and other data retention requirements for audits. It is the responsibility of the Transmission Operator to know the status of all reactive resources. Compliance reporting is never submitted to the Reliability Coordinator.

Posted by: Crystal Musselman  
Avista Corp.

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Considerations for VAR-002-WECC-1

Comment on R1.9 and R1.10

It would seem to simplify the standard if these were combined and the 15 month provision retained. In both exceptions, documentation must be submitted to explain the need to have the AVR out of service. It is not clear why from system reliability and performance standard perspective, there is a need to distinguishing between replacement parts or system replacement.

Crystal Musselman

Reply: The drafting team extended the time for AVR replacement to 24 months to accommodate design and procurement especially for nuclear units. There is a distinction between the time required to repair an AVR versus replacement.

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The Alberta Electric System Operator (AESO) appreciates the opportunity to comment and would like to offer the following:

- The AESO currently reports AVR data to the WECC on behalf of all Generator Operators in Alberta, instead of each GOP reporting individually.
- It may be worthwhile to review how and if R1.1 fit in the overall R1 requirement together with the other listed "exceptions." It would seem logical, and R1 does seem to imply that, if a generator was operated for less than 5% of time in a calendar quarter, then the generator (versus the time period when AVR was not in service) is to be excluded from the 98% requirement. However, the wording in R1 doesn't quite say that literally. Please review and revise as required.

Thank you.

Anita Lee, P. Eng.  
Manager, Operating Policies and Procedures  
Alberta Electric System Operator

Reply: The drafting team made refinements to R1 to clarify the requirement. If the unit does not operate five percent or more of all hours during a quarter, the hours the unit operated without AVR may be excluded from the in service percentage calculation.

# *Western Electricity Coordination Council*

**Operating Committee Meeting  
March 6-7, 2008  
Albuquerque, NM  
Voting Results**

1. **Motion:**

*The VAR-002-WECC-1 Standard Drafting Team recommends that the OC approve VAR-002-WECC-1 and that after regulatory approval, it shall supersede VAR-STD-002a-1.*

**Explanation:** To ensure that Automatic Voltage Regulators on synchronous generators and condensers shall be kept in service and controlling voltage to help maintain Bulk Electric System reliability.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	28	4	2
TRANSMISSION CUSTOMERS	25	11	11
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>54</b>	<b>15</b>	<b>13</b>

Result: **PASSED**

Minority Opinion:

- Please see Appendix A for comments received via email– Comments from AVA, BPEC, EPLUW, Mariner Consulting Services, SMUD and TANC

2. **Motion:**

*The VAR-501-WECC-1 Standard Drafting Team recommends that the OC approve VAR-501-WECC-1 and that after regulatory approval, it shall supersede VAR-STD-002b-1.*

**Explanation:** To ensure that Power System Stabilizers (PSS) on synchronous generators shall be kept in service.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	32	1	1
TRANSMISSION CUSTOMERS	33	2	10
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>66</b>	<b>3</b>	<b>11</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from AVA and EPLUW

3. **Motion:**

*The BAL-002-WECC-1 Standard Drafting Team recommends that the OC approve BAL-002-WECC-1 and that after regulatory approval, it shall supersede BAL-STD-002-0.*

**Explanation:** Contingency Reserve is required for the reliable operation of the interconnected power system. Adequate generating capacity must be available at all times to maintain scheduled frequency, and avoid loss of firm load following transmission or generation contingencies. This generating capacity is necessary to replace generating capacity and energy lost due to forced outages of generation or transmission equipment.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	22	6	6
TRANSMISSION CUSTOMERS	36	10	5
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>59</b>	<b>16</b>	<b>11</b>

Result: PASSED

Minority Opinion:

- Talking about a reliability standard, the existing standard with a proven track record of over a few decades is being replaced with one that is based entirely on compromise. The result will be a massive shift in cost without any technical studies to justify the shift to 3% generation and 3% load. The suspicion is an overall reduction of reserves carried in WECC without any technical justification. It is better to spend time on a technical based standard like FRR than putting in place a compromise solution in the interim.
- The standard is based on compromise and reducing reliability
- There are a number of market issues with this standard to the point where the entity is not comfortable supporting the standard even though they think it is the right direction
- Please see Appendix A for comments received via email – Comments submitted by BC Hydro, EPLUW, NCPA, NWMT, Powerex, PGE (TP), PGE (TC), PSEI, SCL, SMUD and TANC

4. **Motion:**

*The PRC-004-WECC-1 Standard Drafting Team recommends that the OC approve PRC-004-WECC-1 and that after regulatory approval, it shall supersede PRC-STD-001-1 and PRC-STD-003-1.*

- **Explanation:** Regional Reliability Standard to ensure all transmission and generation Protection System and Remedial Action Scheme (RAS) Misoperations on Transmission Paths and RAS defined in section 4 are analyzed and/or mitigated.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	30	4	0
TRANSMISSION CUSTOMERS	32	2	12
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>63</b>	<b>6</b>	<b>12</b>

Result: **PASSED**

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from AVA, SMUD and TANC

5. **Motion:**

*The IRO-006-WECC-1 Standard Drafting Team recommends that the OC approve IRO-006-WECC-1 and that after regulatory approval, it shall supersede IRO-STD-006-0.*

**Explanation:** Mitigation of transmission overloads due to unscheduled flow on Qualified Transfer Paths.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	33	0	1
TRANSMISSION CUSTOMERS	39	2	7
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>73</b>	<b>2</b>	<b>8</b>

Result: PASSED

Minority Opinion:

No minority opinions were offered at the meeting and none were received via email.

6. **Motion:**

*The FAC-501-WECC-1 Standard Drafting Team recommends that the OC approve FAC-501-WECC-1 and that after regulatory approval, it shall supersede PRC-STD-005-1.*

**Explanation:** To ensure the Transmission Owner of a transmission path identified in the table titled “Major WECC Transfer Paths in the Bulk Electric System” including associated facilities has a Transmission Maintenance and Inspection Plan (TMIP); and performs and documents maintenance and inspection activities in accordance with the TMIP.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	28	4	2
TRANSMISSION CUSTOMERS	30	1	14

STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>59</b>	<b>5</b>	<b>16</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from SMUD and TANC

7. **Motion:**

*The TOP-007-WECC-1 Standard Drafting Team recommends that the OC approve TOP-007-WECC-1 and that after regulatory approval, it shall supersede TOP-STD-007-0.*

**Explanation:** When actual flows on Major WECC Transfer Paths exceed System Operating Limits (SOL), their associated schedules and actual flows are not exceeded for longer than a specified time.

VOTING CLASS	YES	NO	ABSTAIN
TRANSMISSION PROVIDERS	30	3	1
TRANSMISSION CUSTOMERS	29	4	13
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>60</b>	<b>7</b>	<b>14</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from SMUD and TANC



**APPENDIX A**

**REASONS FOR NO VOTES <sup>1</sup>**

**Scott Kinney, Avista Corp. (AVA)**

Here are my reasons for voting no on the following standards:

VAR-002-WECC-1 and VAR-501-WECC-1 - Neither of these standards give the Transmission Operator any discretion to exempt a generator from requiring operation in AVR mode or having PSS in service regardless of the size of the generator or its impact on the BES. The VAR-002-WECC-1 standard applies to any generator connected to the BES. Avista commented during the standard development that the TO should have some discretion (NERC gives the TO some discretion in VAR-002-1) to exempt generators that have no impact on the BES with or without AVR and PSS in service based on their location and/or size. During the standard drafting Avista suggested the standards should require a TO to provide study results to verify there is no impact to the BES and that there should be a MVA size limit on generators that can be exempt from the standards.

PRC-004-WECC-1 - The WECC standard goes way above and beyond the requirements of NERC standard PRC-004-1. Avista does not believe the additional requirements are necessary to ensure that relay and RAS/SPS failures are adequately reviewed. The standard adds additional burden without and inherent benefits.

Thank you for the opportunity to comment.

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**Clement Ma, BC Hydro**

BC Hydro has serious concerns regarding the proposed standard BAL-WECC-002. The team that developed the standard has indicated that the 3% load, 3% generation numbers were proposed as a compromise as opposed to being based on a technical evaluation of reserves from a reliability standpoint. In analyzing the costs of the proposal, the team only looked at aggregate impacts for the WECC and the sub regions. However, this analysis misses the significant cost impact that arises for predominantly hydro based Balancing Authorities. BC has operated reliably using the 5% hydro standard for many years. The proposed standard will result in an increase in BC Hydro's operating reserve requirements by almost 1% (close to 100 MW on winter peak) without any technical justification (nor practical justification in light of our reliable operating history) to justify to its ratepayers the increase in cost of holding this additional operating reserve.

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<sup>1</sup> The reasons for no votes in the appendix were submitted by the individual entities via email after the Operating Committee meeting. The reasons for no votes in the main document were stated at the Operating Committee Meeting in Albuquerque, NM

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**Julie Martin, BP Energy Company (BPEC)**

Of the 7 Standards that were balloted, BP Energy Company (BPEC) voted "No" on 1 Standard. This one Standard was VAR-002-WECC-1 (Automatic Voltage Regulators). BPEC voted "No" on this Standard because we felt the following problems exist in the Standard as proposed:

VAR-002-WECC-1 requires generators to operate in a constant voltage mode at all times, but it does not require the transmission operator ("TOP") to provide the generator with a voltage setting to program into the AVR. To the extent that a TOP provides a reactive power schedule (instead of a voltage setting), it forces the generator operator to manually adjust the voltage settings on the AVR throughout the day in an attempt to maintain the amount of reactive power specified by the TOP.

This places a significant burden on the plant operators since they must manually adjust voltage settings every time the system voltage shifts up or down.

It also poses a significant risk of voltage collapse if plant operators see an increase in reactive output caused by a drop in system voltage caused by a transmission contingency and they manually respond by reducing reactive output to the pre-contingency level. This is exactly the opposite of what is needed when system voltage begins to collapse, even though the generation operators were simply following the reactive power schedule provided by the TOP.

This exposes all parties to a large share of responsibility if a voltage collapse does occur. TOPs will be blamed for failing to provide voltage schedules that would have prevented the manual intervention by generators. Generators will be blamed for doing the wrong thing at the wrong time when they reduced reactive output while the system was collapsing. WECC will be blamed for adopting a flawed standard which authorized TOPs to use this mode of voltage control.

A better alternative to the proposed standard is to include in a WECC standard a requirement that TOPs issue voltage schedules to generators.

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**John Cummings, PPL Energy Plus (EPLUW)**

BAL-002-WECC-1 Contingency Reserves

While EPLUW believes that the redrafted BAL-002 is an improvement, EPLUW voted no because there is an inconsistency between the proposed reliability requirement and the method in which reserves are procured and provided under the existing Open Access Transmission Tariffs (OATT). Transmission Providers (TP) must generally offer operating reserves under their OATTs to Transmission Customers serving load in the TP's Control Area. Otherwise, there is no default supplier of reserves. Further, the implementation of the proposed standard has not been fully explained, and it is unclear if

reserves will be available to all market participants that may be required to procure or provide them in the future. EPLUW would like to see these issues addressed before the standard becomes effective.

VAR-002-WECC-1 Automatic Voltage Regulators

EPLUW voted no because the proposed standard does not have a grandfathering provision to address existing, older generating units that may not meet the proposed requirement.

VAR-501-WECC-1 Power System Stabilizer

EPLUW voted no because the actual reliability standard (not WECC policies) should include an explicit description of which units must have PSS's (including which units are grandfathered), and this criteria should be subject to change in accordance with the standard development process.

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**John Stout, Mariner Consulting Services**

**Why the WECC Automatic Voltage Regulator Standard (VAR-002-WECC-1) Should Not be Approved as Currently Proposed**

At the March OC meeting, a significant number of WECC Generation Operators voted against acceptance of the proposed WECC AVR standard. Most did so because this standard allows Transmission Operators to direct generators to operate in a manner which exposes WECC to a significant and unnecessary risk of voltage collapse, and exposes those generators to increased and unreasonable risk of incurring non-compliance penalties.

One of the important lessons learned in the July/August 1996 WECC blackouts was that operation of generation in a constant reactive power mode increased the risk of voltage collapse and, therefore, should be limited in WECC. The technical reason for this conclusion is the fact that when voltage begins to collapse, increased reactive power output is required in order to raise the voltage and prevent it from collapsing to the point of causing a blackout. Therefore, WECC established a requirement that, with ten exceptions, generation controls had to be operated in the constant voltage mode of operation. In this mode of operation, if voltage declines, the generator automatically increases and maintains its reactive power output until the voltage returns to normal. That requirement is the genesis of the proposed WECC AVR standard.

WECC Generation Operators support the requirement that their AVR's be operated to maintain voltage and automatically respond with increased reactive output to prevent voltage collapse.

However, not all WECC Transmission Operators allow interconnected Generation Operators to provide voltage responsive reactive support. Certain Transmission Operators have refused to provide voltage schedules to their Generation Operators.

They are allowed to do this because the proposed WECC AVR standard does not include a requirement that Transmission Operators provide voltage schedules. Instead, the WECC AVR standard is silent on this issue, allowing Transmission Operators to follow less restrictive NERC standards which afford them the option of providing reactive power schedules rather than voltage schedules. This practice forces Generation Operators to manually adjust their AVR voltage setting by trial and error to find a voltage setting that will provide the exact amount of reactive power directed by the Transmission Operator. Since the voltage on the transmission grid varies throughout the day, the Generation Operator is forced to continuously reset the voltage on the AVR. This is an unnecessary and distracting manual control burden on the Generation Operator. It effectively eliminates the “Automatic” in “Automatic Voltage Regulator.”

NERC VAR-002 requires the Generation Operator to comply exactly with the voltage schedule or reactive power schedule directed by the Transmission Operator. If the Transmission Operator provides a voltage schedule, the AVR can automatically maintain compliance with the NERC standard. If the Transmission Operator refuses to provide a voltage schedule, and instead insists on providing a reactive power schedule, compliance can no longer depend on the automatic operation of the AVR. The proposed WECC AVR standard prohibits the AVR from being switched to a constant reactive power mode of operation. Instead compliance becomes totally dependent on constant attention and readjustment by the Generation Operator. This significantly increases the risk of reliability standard non-compliance for the generator.

Even more disturbing is the fact that this situation (the Transmission Operator specifying a constant reactive power output rather than a constant voltage level) defeats the intended purpose of the WECC AVR standard, to prevent a voltage collapse. If voltage does begin to collapse, the generator AVR, operating in constant voltage mode, will increase the reactive power output from the unit. That increase in reactive output means that the generator will no longer be producing the amount of reactive power specified by the Transmission Operator’s reactive power schedule. Once this occurs, the Generation Operator must immediately reduce the reactive power provided by the generator or risk fines for noncompliance with NERC standard VAR-002, R2. That will result in the generator doing the exact opposite of what is needed to prevent a voltage collapse and exposes WECC to a risk of blackout.

This issue was repeatedly raised during the standards development process, but the drafting team took the position that it was not a problem that needed to be addressed by the WECC AVR standard. During the March vote at the OC, an amendment was proposed to resolve this issue by adding a requirement to the WECC AVR standard that Transmission Operators provide voltage schedules instead of reactive power schedules. No one expressed an opinion that the concerns raised by generators regarding the reliability risk to WECC were invalid, yet the proposed solution was overwhelmingly rejected by the OC. Unfortunately, due to the voting structure of the OC, the concerned Generation Operators are in a minority and could do nothing more to resolve this issue.

The WECC Board should not take the same path as did the drafting team and the Operating Committee. We believe the Board should do at least three things before approving this standard.

First, the WECC Board should ask the OC to report on the validity of the reliability risk and the compliance risk described above. If their response results in a Board conclusion that either risk is valid, the following additional questions should be raised by the Board.

The WECC Board should ask the OC to provide specific information on which Transmission Operator's provide reactive power schedules rather than voltage schedules to their interconnected generators. This information should include the specific reasons why such Transmission Operator's have chosen to provide reactive power schedules and explain why those reasons outweigh the reliability and compliance risk created by reactive power schedules. If the Board concludes those reasons are not sufficiently justified, the Board should remand this AVR standard for inclusion of a voltage schedule requirement.

If valid reasons are provided to the preceding question, the WECC Board should ask the OC to explain why each of those reasons were not included with the ten exceptions already listed under R1 of the WECC AVR standard. If the OC cannot justify why those reasons should not be included in the ten exceptions, the Board should remand the standard until those reasons are included. By adding such reasons to the list of exceptions, Generation Operators should be allowed to place their AVR in the automatic control mode that matches the reactive power schedule provided by the Transmission Operator (i.e. Constant MVAR mode for VAR Schedules or constant Power Factor mode for Power Factor Schedules.)

While Board members may feel a reluctance to not support the OC recommendation to approve the currently proposed AVR standard, each Board member should recognize an important distinction between votes at the OC and votes by the Board. Standing Committee members are entitled to vote in accordance with their self interests. Board members have a different standard. Board Members are obligated to vote what is best for WECC. That difference can cause Board votes to sometimes result in different outcomes than Standing Committee votes. While our position was the minority opinion within the OC, we firmly believe it to be the best path for maintaining the reliability and credibility of WECC.

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**Fred Young, Northern California Power Agency (NCPA)**

NCPA reviewed this standard prior to the OC meeting and from an operating/reliability perspective has no objection to the proposed changes to BAL-STD-002-0. However, based on discussions with our trading personnel and counter-parties, there is significant confusion as to the impacts of the change from 5%hydro/7%thermal to

3%generation/3%load in the calculation of a BA’s Contingency Reserve requirement. The market is saying that the 3% of load portion will be passed on to the LSE irrespective of the LSE’s location, i.e. in the Source BA or Sink BA. This confusion was further reinforced by Mr. David Lemmons response to a question from Powerex concerning cost shifts. Mr. Lemmons’ response is that it is time for the load to carry their share.

This standard, BAL-002-WECC-1 does not contain language that moves any contingency reserve responsibility to the load. It only changes how the Contingency Reserve requirement for a BA or Reserve Sharing Group is calculated. It is evident by one of the author’s comments, Mr. Lemmons, that there are some significant market changes that will result from implementation. Without clarification of these market impacts, NCPA could not support BAL-002-WECC-1.

NCPA fully supports standards that enhance reliability. But reliability at any cost or unknown cost is unacceptable.

The foregoing is why NCPA did not support BAL-002-WECC-1.

Thank you for your consideration.

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**Marc Donaldson, North Western Energy (NWMT)**

Reasons for NorthWestern Energy (NWMT) No Vote on WECC Standard  
BAL-002-WECC-1 – Contingency Reserves

On March 6, 2008, NorthWestern Energy (NWMT) voted No on WECC Standard BAL-002-WECC-1 – Contingency Reserves for the following reasons:

1. Although the amount of required reserves stated in R1.1.2. (sum of three percent of the load and three percent of net generation) may make the determination of required reserves easier than the prior five percent of hydro and seven percent of thermal and, although the previous five and seven percent was determined arbitrarily, the “three plus three” approach is still arbitrary and may negatively impact reliability of the Western Interconnection.
2. The standard may result in an unfair shift of reserve obligation, which may also result in a shift of costs.

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**Mike Ryan, Portland General Electric (PGE), Transmission Provider**

This is in response to your request for the reasons behind NO votes on BAL-002-WECC-1.

As you well know, I have been voicing my concerns over the direction that this drafting team has taken at every opportunity to change the WECC's contingency reserve requirements. I have regularly offered comments on the posted drafts, but have seen little change in the contents.

My comments about the reliability consequences of BAL-002-WECC-1 are these:

- The "Tier One" BAL-STD-002-0 reflects the current WECC MORC by breaking down required operating reserve into four components: regulating reserve, contingency reserve, reserve for on-demand obligations, and reserves for interruptible imports. The proposed BAL-002-WECC-1 narrows the scope to only contingency reserve, which raises the question of what happens to the other components. NERC BAL-002 adequately covers regulating reserve, but includes no provisions for on-demand obligations or interruptible imports. BAL-002-WECC-1 does include some language for on-demand obligations, but only as contingency reserve; no other types of on-demand rights are addressed.

It's not clear to me how the decision to narrow the scope of the WECC BAL-002 standard will affect the current requirements in the WECC MORC. This should have been made clear in the proposal. I hope the Board will make it clear that BA's must still carry additional operating reserves to account for on-demand obligations and interruptible imports.

- The "load responsibility" concept helped characterize the nature of the transactions. For the "sink" BA, it identified those imports that were "firm for the hour". Simplifying the calculation of contingency reserve does NOT relieve the BA from anticipating which imports might be interrupted in-hour, and therefore what additional reserves need to be available. The recently adopted clarification of "load responsibility" and e-tag 1.8 made it easier. Now it seems everyone will be forced to parse the energy codes to infer what's "firm for the hour".

It would be helpful if the Board directed members to continue to use the "load responsibility" feature in e-tag 1.8 to clearly identify those transactions that are not "firm for the hour".

- Despite voiced concern over the difficulty of interpreting "load responsibility", the drafting team saddled WECC BAL-002 with "interruptible load". As a BA, I do not want to be put in a position to judge whether or not loads offered up by an LSE meet the contract requirements of being "interruptible".

I also have a comment not related to reliability. Or rather, a comment that the changes made through BAL-002-WECC-1 don't seem to be prompted by genuine reliability concerns (only thinly disguised in them). At their heart the changes seem to be driven more by the economic interests of some to shift contingency reserve responsibility (i.e. costs) from the generators to the loads (and perhaps the new MIC mantra that transactions

can't have reliability implications). I'd like to think that reliability changes should be driven by technical merit weighed against overall costs, and that the Board will not allow the WECC's standards process to be used as a lever to shift costs among members.

You'll also remember that I've frequently found myself defending the drafting team's right under WECC "due process" to produce their draft as they see fit, however to my eyes the results are far from pretty. This standard, combined with the NERC/FERC ability to trump WECC "due process" (e.g. sanction tables), raises serious doubts in my mind to about the workability of WECC standards process.

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### **JJ Jamieson, Portland General Electric (PGE), Transmission Customer**

Portland General Electric voted against BAL-002-WECC-1 at the 3/6/08 meeting in Albuquerque, New Mexico.

Portland General Electric Merchant posted the following comments 02/21/08 in response to the posting of BAL-002-WECC-1 for review before voting at the upcoming Operating Committee meeting in Albuquerque, New Mexico. Our comments have not been responded to in any forum since posting.

“Portland General Electric Merchant is concerned with the movement toward unnecessary changes to the approved standard proposed in BAL-002-WECC-1 particularly due to the motivation being cited. At no time should the basis of a reliability standard be centered on “a compromise” rather than the requirements of operational reliability.

In public meetings held with / by the BAL-002-WECC-1- drafting team there was no evidence presented that illustrated increased reliability under BAL-002-WECC-1. The meetings showed that in fact BAL-002-WECC-1 could result in a reduced level of reliability in the WECC region.

Why is a reliability entity allowing a compromise on standards that impact reliability?

We are all being held to these standards and they should be defined by what is necessary for reliability, otherwise it isn't a reliability issue and the market will define the products.

The biggest deficiency of this “compromise” is that it assumes that we have a robust and fully functioning market for reserves. To our knowledge most merchants do not have the right to sell reserves, let alone have extra to sell, and there has not been any formal discussion of how cost based entities can function in a WECC region reserves market. We need to agree that reserves are a reliability issue in determining use and level but a market issue when determining responsibility.



The public meetings showed the proposed BAL-002-WECC-1 move towards the creation of a market product rather than a reliability standard.

WECC has been very clear that the definition of market products is not within their mandate “WECC should focus on the interpretation of reliability criteria. It should not define energy market products.” (Load Responsibility July 26, 2007) and it is equally as clear that the proposed BAL-002-WECC-1, while perhaps not intentionally, will result in the definition of a new energy product albeit not named by the standard itself.

Is it WECC’s intention, with BAL-002-WECC-1, to create an energy product leaving only the naming of said product to the WSPP and other like entities?

Portland General Electric Merchant encourages the BAL-002-WECC-1 drafting team to work towards the establishment of a standard that is focused on the reliability of the system rather than a compromise that defines a market product.

Portland General Electric Merchant”

It was communicated at the Operating Committee meeting that we should pass BAL-002-WECC- 1 because ‘WECC doesn’t want to go to FERC and request an extension.’ Is this appropriate reasoning when dealing with issues affecting reliability?

We are concerned that BAL-002-WECC-1 is assuming a robust reserves market in the West. The West doesn’t have a mature reserves market and this will put additional burden on the load serving merchants by forcing them to procure reserves from the generators in order to meet the new standard. How does WECC propose BAL-002-WECC- 1 will be able to sustain a reliable system absent a robust reserves market?

We echo Puget Sound Energy’s concerned that BAL-002-WECC- 1 will result in a cost shift between Market participants without any additional reliability being realized.

Portland General Electric also agrees with Powerex in that there simply was not an appropriate level of analysis down to support a wholesale change in how reserves are handled in the WECC.

Finally, Portland General Electric states again that reliability standards should not be based on compromise but rather careful consideration of what will provide the most reliable and effective system.

Thank you for the opportunity to comment

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**Mike Goodenough, Powerex (PWX)**

Powerex agrees with the explanation for voting "No" to BAL-002 offered by BC Hydro.

In addition, Powerex would add that the proposed standard will require changes in markets that have not yet been considered. While we are supportive of the objectives to bring clarity to how reserve obligations are determined and commend the team for making progress in obtaining that clarity, no consideration was provided for how implementation of the new standard might impact the existing market and transmission tariff structures and what new uncertainties might be created. This should be considered so that we do not incur unnecessary adaption costs, which would then be followed by additional costs to implement the Frequency Response Reserves standard, which is a far more technically sound approach to re-examining the way reserve requirements should be calculated. BC Hydro and Powerex believe that this consideration should occur before the standard is adopted.

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**Gary Nolan, Puget Sound Energy (PSEI)**

PSEI, as a TP, only voted "No" on BAL-002. Our explanation is summed up by the comments Joe Hoerner from PSEM posted on the WECC website with our agreement.

Puget Sound Energy (PSE) appreciates the opportunity to provide comments on the proposed WECC Standard BAL-002-WECC-1 (Contingency Reserve). These comments are provided on behalf of Puget Sound Energy’s transmission and merchant functions.

Upon review and analysis of the proposed Standard BAL-002-WECC-1, PSE can not determine how this standard provides any additional reliability over today’s standard. The proposal alters the calculation for contingency reserves instead of clearly defining how contingency reserves would be activated to ensure system reliability. Furthermore, PSE’s analysis indicates that adoption of this standard will result in significant cost shifts from generators to load-serving entities. PSE’s ratepayers could expect to pay an additional \$14,000,000 more per year in increased contingency reserve obligations without any added reliability benefit. PSE cannot find any legitimate reason as to why our regulating entities could justify our approval of such a cost increase with no benefit. If, in fact, the primary justification for creating the standard is to firmly establish the obligation of where the reserve obligation lies, then we feel it is more appropriate to address this issue in the commercial forum.

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**Pawel Krupa, Seattle City Light (SCL)**

I have to apologize for being late in responding to your e-mail.

On the behalf of SCL I cast NO vote for the BAL-002-WECC-1 standard. In preparation for the OC meeting I attended the BAL-002-WECC-1 workshop in Portland and we discussed this standard internally within SCL. Based on our internal discussions we believed we could not support this standard at its current version. Below are some of the reasons that we are not supporting this proposed standard as currently written:

1. Requirement R.1. The proposed standard changes the amount of contingency reserves required to carry by the BA's to 3% of the BA's total generation and 3% of the BA's total load. The current WECC standard BAL-STD-002-0 requires to carry 5% reserves for load responsibility served by hydro generation and 7 % served by thermal generation. We believe that there is no technical explanation for the new allocation of 3% generation and 3% of load. The 5% and 7% allocation was based on system data collected during the previous system disturbances and it provided safe contingency reserve margin during many severe disturbances in WECC interconnection. During the workshop in Portland drafting team stated that the 3% and 3% allocation was the best compromise the members of the drafting team were able to agreed to. The data presented by the drafting team during the workshop did not support the statement that the amount of contingency reserves available in the WECC Interconnection will not decrease as a result of this new standard. We believe that the reserve allocations should be based on the system studies rather than the ability of the drafting team to reach a compromise.

2. Requirement R.2. This requirement changes the definition of spinning reserve. Under this requirement the spinning reserve doesn't have to be carried by the synchronized generating units. The requirement states that spinning reserve needs to meet two requirements

R.2.1 Initially automatically respond to frequency deviations.

R.2.2. Capable of fully responding within ten minutes.

Based on this definition it is possible to use devices other generators to provide spinning reserves that could meet these requirements. The underfrequency relays for example could meet these new requirements, they will automatically respond to frequency deviation and will definitely respond within 10 minutes. We believe that this is a significant change in the definition of spinning reserves that again could have a detrimental effect on the stability of the WECC Interconnection.

3. R.3.6. This requirement identifies firm load as an acceptable type of reserves during energy emergency. This requirement does not specify if the load could only be used as a reserves by the BA declaring energy emergency. Based on the interpretation it is possible that every BA in the WECC or every BA in the Reserve Sharing Group could use firm load as a source of reserves once the energy emergency is declared by one single BA. This is also significant change from the previous standard and WECC MORC. The firm load was never before consider a source of reserves. I asked this question during the workshop and the drafting team did not provide an explanation why this was included as a acceptable source of contingency reserves.

We understand that there were many comments submitted to the drafting team during development process and we don't believe that all of these comments were addressed by the drafting team. We understand that there were some time limitations to develop and approve this standard, but we don't agree that this standard as currently written addresses all issues related to the contingency reserves in WECC Interconnection.

We believe that the above reasons were sufficient to justify our NO vote for this standard.

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**Vicken Kasarjian, Sacramento Municipal Utility District (SMUD)**

The following are the reasoning behind my “no” vote on VAR-002-WECC-1, BAL-002-WECC-1, FAC-501-WECC-1, TOP-007-WECC-1, and PRC-004-WECC-1.

General comments:

1. Unnecessary additional requirements for WECC Members with higher exposure to violations/sanctions. Without justification, WECC is trying to hold itself to higher standards than the rest of the nation under NERC.
2. The drafting teams did not actually test the proposed standards prior to bringing it to a vote. A 6 month test with some applicable entities would have been quite helpful.
3. No guidance on how to actually be compliant with these standards.

Additional specific comments:

1. BAL-002-WECC-1: 3% has no technical basis – should go with MSSC to retain or enhance reliability
2. FAC-501-WECC-1: Replaces WECC PRC-STD-005-1: Addresses maintenance and test requirements for additional components (CBs, reactive devices, transformers, etc) not addressed in PRC-005; this impacts Transmission Maintenance Inspection Program for the Major WECC Transfer Paths. Also, it uses a justification that states “minimize SOL reductions to maintain reliable Western Interconnection operation” – if this reasoning is true, then it should also be used by NERC.

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**John S. Forman, Transmission Agency of Northern California (TANC)**

In response to the question of why a no vote was made on the standards at the OC meeting, TANC's OC representative voted no on five of the seven proposed standards for one basic reason: The standards require that the WECC be more stringent than the NERC standards. Those entities that have gone through an audit of the standards that are in

effect are finding that they will be sited for something that is not in compliance. In other words, the auditors will keep looking until something is found to be wrong. With the WECC standards higher than NERC, even more compliance problems are anticipated.

We believe that one basic instruction to the drafting teams should be that they need to justify a standard being more stringent than NERC, and that the basic draft should be no more than equal to NERC, unless it's clearly in the interest of the WECC. Our two positive votes on VAR-501 and IRO-006 are in that "best interest of WECC" category. The other standards were not. Basically, we are not sure that always being better than NERC is the right philosophy.

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**Board of Directors  
April 16-18, 2008  
Coronado, CA**

**Voting Summary  
VAR-002-WECC-1**

<b>Last Name</b>	<b>First Name</b>	<b>Organization</b>	<b>Class</b>
Anderson	Bob	Non-affiliated Director	Non-Affiliated
Areghini	David	Salt River Project	Class 1
Barbash	Carolyn	Sierra Pacific Power Company	Class 1
Beyer	Lee	California Public Utilities Commission	Class 5
*Brown	Duncan	Calpine Corporation	Class 3
Campbell	Ric	Utah Public Service Commission	Class 5
Cauchois	Scott	CADRA	Class 4
Chamberlain	Bill	California Energy Commission	Class 5
*Cleary	Anne	Mirant Americas, Inc.	Class 3
Conway	Teresa	Powerex Corp.	Class 6
Coughlin	John	Non-affiliated Board Member	Non-Affiliated
Dearing	Bill	Grant County PUD	Class 2
Ferreira	Richard	TANC Executive Advisor	Class 2
Grantham-Richards	Maude	Farmington Electric Utility System	Class 2
Gutting	Scott	Energy Strategies, LLC	Class 4
Kelly	Nancy	Utah Committee of Consumer Services	Class 4
King	Jack	Non-affiliated Board Member	Non-Affiliated
LaFond	Steve	The Boeing Company	Class 4
Little	Doug	British Columbia Transmission Corporation	Class 6
McMaster	Dale	Alberta Electrical System Operator	Class 6
Moya	Jesus	Comision Federal de Electricidad	Mexico
Newton	Tim	Non-affiliated Director	Non-Affiliated
Sharpless	Jananne	Non Affiliated Board Member	Non-Affiliated
Smith	Marsha	Idaho Public Utilities Commission	Class 5
*Stout	John	Mariner Consulting	Class 3
Tarplee	Gary	Southern California Edison	Class 1
*Thuston	Tim	Williams Power	Class 3
Weis	Larry	Turlock Irrigation District	Class 2
VanZandt	Vicki	Bonneville Power Administration	Class 1
Zaozirny	Lori Ann	British Columbia Utilities Commission	Class 6

The Board Members listed above voted whether to approve VAR-002-WECC-1.  
 Twenty-four members voted Yes.  
 Four members (identified with asterisks) voted No.  
 Two members (not identified) abstained.

**FERC and NERC Directives for a Permanent Replacement Standard  
for VAR-STD-002A-1 Automatic Voltage Regulators (AVR)  
May 1, 2008**

<b>Received From</b>	<b>FERC and NERC Directives for a Permanent Replacement Standard for VAR-STD-002A-1 June 8, 2007</b>	<b>Completed Actions</b>
<b>NERC Staff Common Revisions to WECC “Tier 1” Standards</b>	Remove RMS Sanction Table	The Reliability Management System (RMS) Sanction Table is removed from the standard.
NERC	Include Violation Risk Factors	The drafting team added Violation Risk Factors.
NERC	Include Violation Severity Levels	The drafting team added Violation Severity Levels for each main requirement.
NERC	Include Mitigation Time Horizon	The drafting team added Time Horizon.
NERC	Start date first day of quarter	<b>Effective Date:</b> On the first day of the next quarter, after receipt of applicable regulatory approval.
NERC	Include Applicable functional entity in Requirements and Measures	The drafting team included the applicable functional model entity in requirements and measures.
NERC	Written in Active Voice	The standard is written in an active voice.
NERC	Exclude comments, statements, background and references	The drafting team removed comments, statements, background, and references.
NERC	Individual requirements and measures convey only one main issue	Each requirement and measure conveys only one main issue.
NERC	Each measure refers to clearly to requirement(s) applicable to	There is a measure for each main requirement.
NERC	Include Reset Time Frame	The drafting team included a

Received From	FERC and NERC Directives for a Permanent Replacement Standard for VAR-STD-002A-1 June 8, 2007	Completed Actions
		reset time frame.
NERC	Remove second sentence of data retention	The drafting team removed reference to data retention.
NERC	Exclude Excuse for Performance	The drafting team removed the Excuse for Performance provision.
NERC	Align definitions with NERC definitions	The standard uses the NERC definitions.
NERC	Include functional entity in Additional Compliance Information	Functional model entity information is in the compliance section.
NERC	Clarify reference used for Business Day	The definition for Business Day is removed.
<b>FERC Revisions to VAR-STD-002A-1</b>	No comments.	.
<b>NERC Revisions to VAR-STD-002A-1</b>	Break WR1 into at least 2 requirements and revise Measures accordingly.	The drafting team completely revised WR1. This comment no longer applies.
<b>NERC Revisions to VAR-STD-002A-1</b>	Move paragraph two under Compliance Monitoring Period to Additional Compliance information	The drafting team completely revised the Compliance Monitoring Period section. This comment no longer applies.



**The VAR-002-WECC-1 Drafting Team Completed Actions for a Permanent Replacement Standard  
for VAR-STD-002A-1 Automatic Voltage Regulators (AVR)  
May 1, 2008**

<b>Received From</b>	<b>Previous Comments to Consider for VAR-STD-002A-1 June 8, 2007</b>	<b>The VAR-STD-002A-1 Drafting Team Consideration of Comments</b>	<b>The VAR-002-WECC-1 Drafting Team Completed Actions</b>
<b>NERC Question #1</b>	<b>Was the proposed standard developed in a fair and open process, using the associated Regional Reliability Standards Development Procedure? If not, please explain in the comment area.</b>		
No comments.			
<b>Question #2</b>	<b>Does the proposed standard pose an adverse impact to reliability or commerce in a neighboring region or interconnection?</b>		
No comments.			
<b>Question #3</b>	<b>Does the proposed standard pose a serious and substantial threat to public health, safety, welfare, or national security?</b>		
No comments.			
<b>Question #4</b>	<b>Does the proposed standard pose a serious and substantial burden on competitive markets within the</b>		

Received From	Previous Comments to Consider for VAR-STD-002A-1 June 8, 2007	The VAR-STD-002A-1 Drafting Team Consideration of Comments	The VAR-002-WECC-1 Drafting Team Completed Actions
	<b>interconnection that is not necessary for reliability?</b>		
No comments.			
<b>Question #5</b>	<p><b>Does the proposed regional reliability standard meet at least one of the following criteria?</b></p> <p>The proposed standard has more specific criteria for the same requirements covered in a continent-wide standard. The proposed standard has requirements that are not included in the corresponding continent-wide reliability standard. The proposed regional difference is necessitated by a physical difference in the bulk power system.</p>		
No comments.			
<b>WECC Proposed Tier 1 Standards – Response to Comments</b>	November 7, 2006 – 3-4:30 PM PST <b>Conference call participants:</b> Don Watkins, David Lemons, Ed Hulls, Paul Humberson, Sarah Majok, Brent Kingsford, Steve Cobb		
Paul Rice	In the RMS Reformatted version of VAR-STD-002-1 for Automatic Voltage	Thank you. This has been corrected in the document.	The VAR-002-WECC-1 standard drafting team was not

Received From	Previous Comments to Consider for VAR-STD-002A-1 June 8, 2007	The VAR-STD-002A-1 Drafting Team Consideration of Comments	The VAR-002-WECC-1 Drafting Team Completed Actions
	Regulators, each "Sanction Measure" contains the same following sentence. "There shall be a Level I non-compliance if any of the following conditions exist:" I believe that the statement should be changed in each of 2.2 Level 2, 2.3 Level 3 and 2.4 Level 4 to coincide with the Level it is referring to. In other words, 2.2. Level 2: (should read) "There shall be a Level 2 non-compliance if any of the following conditions exist:" instead of the way it reads, etc.		required to take any action regarding this comment.
Richard Padilla	I have the following comments: 1) The RMS standards are not fully replicated. You have neglected to include the "Excuse for Performance" sections of the RMS. This cannot be allowed. The development of this as a standard could also allow modifications. I have two items for consideration:		
Richard Padilla	a) The "Excuse for Performance" section should also include an order from the transmission operator. Therefore, if the TO refuses to allow work (i.e. no touch day)	Response: You are correct. This general RMS content will be added to each of the Tier 1 standards it applies to.	FERC directed the removal of the "Excuse of Performance" provisions.

Received From	Previous Comments to Consider for VAR-STD-002A-1 June 8, 2007	The VAR-STD-002A-1 Drafting Team Consideration of Comments	The VAR-002-WECC-1 Drafting Team Completed Actions
	performance should be excused until such time as the required work to restore service for AVR or PSS can be rescheduled.		
Richard Padilla	b) Sub paragraphs c for AVR and g for PSS each include the phrase, "If these changes are outside the control of the owner", this should be stricken since any change that can impact system response will require testing to safely return the equipment to service. The 60 day period to perform testing must be made available.	Response: The standard is intended to exactly preserve the existing RMS meaning. The statement you wish stricken is part of the present RMS requirement and thus included. Changing the RMS standard is outside of the scope of this "Tier 1" standard.	The drafting team removed the requested language when it developed VAR-002-WECC-1.
Richard Padilla	2) The reformatted versions are utilizing the new WECC numbering and naming conventions. These new rules have generated two standards with identical names, namely one addressing Automatic Voltage Regulators and one addressing Power System Stabilizers each titled VAR-STD-002-1. This needs to be resolved. I believe that this problem will get worse since NERC has multiple items in single standards and multiple standards addressing similar issues.	Response: Thank you for identifying this. We will append the standard number with an a, b, c, etc. to account for this.	The drafting team separated the Automatic Voltage Regulator (AVR) requirements from the Power System Stabilizer (PSS) by using the names VAR-002-WECC-1 for AVR and VAR-501-WECC-1 for PSS when it developed permanent replacement standards.

<b>Received From</b>	<b>Previous Comments to Consider for VAR-STD-002A-1 June 8, 2007</b>	<b>The VAR-STD-002A-1 Drafting Team Consideration of Comments</b>	<b>The VAR-002-WECC-1 Drafting Team Completed Actions</b>
Richard Padilla	Given the number of issues, how can due process be followed and still meet the identified timeline. Due process and the consensus process for standard development should not be circumvented.	Response: While this is a new circumstance, we believe that we are operating within the applicable WECC rules and guidelines. The following language from the Process For Developing And Approving WECC Standards - Approved by WSCC Board of Trustees – August 24, 1999, page XI-148-9: “In cases requiring expediency, such as in the development of emergency operating procedures, the Market Interface Committee, Operating Committee, or Planning Coordination Committee may approve a new or modified Standard. Any such Standard must have an associated termination date and, even though already implemented, must undergo the formal technical review and approval process. Should this Standard not be formally approved through	The drafting team followed the Process for Developing and Approving WECC Standards when it developed permanent replacement standards.

Received From	Previous Comments to Consider for VAR-STD-002A-1 June 8, 2007	The VAR-STD-002A-1 Drafting Team Consideration of Comments	The VAR-002-WECC-1 Drafting Team Completed Actions
		<p>WECC's Standards development and approval process it will cease to be in effect upon conclusion of the process." Additionally, the WECC By-laws and the current WECC Process for Developing and Approving WECC Standards specify the WECC Board of Directors must approve of all standards. This effort has been build around posting the proposed standards (containing content of approved and implemented RMS standards), allowing 30 days comment before a vote of the WECC OC. The comments are responded to and commensurate changes to the proposed standards completed and posted by the start of the 10 day OC e-mail ballot period. If approved, the standards will be immediately posted for 30 days after which the Board of Directors will vote on them. Both the OC and the board ballots will need to occur outside</p>	

<b>Received From</b>	<b>Previous Comments to Consider for VAR-STD-002A-1 June 8, 2007</b>	<b>The VAR-STD-002A-1 Drafting Team Consideration of Comments</b>	<b>The VAR-002-WECC-1 Drafting Team Completed Actions</b>
		of scheduled meetings and will be done in accordance with their procedures. If the standard is passed it will be submitted to the NERC Board in time for the required posting and comment period in time for their February meeting.	

## **VAR-002-WECC-1 Comparison**

This following document prepared by the drafting team during the development of the WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulator compares this proposed regional standard to the existing WECC VAR-STD-002a-1.

The purpose of this document to provide documentation of each proposed change.



VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
<b>A. Introduction</b>		
<b>1. Title:</b> Automatic Voltage Regulators (AVR)	<b>1. Title:</b> Automatic Voltage Regulators (AVR)	
<b>2. Number:</b> VAR-002-WECC-1	<b>2. Number:</b> VAR-STD-002a-1	Retired Criteria
<b>3. Purpose:</b> To ensure that Automatic Voltage Regulators on synchronous generators and condensers shall be kept in service and controlling voltage. .	<b>3. Purpose:</b> Regional Reliability Standard to ensure that automatic voltage control equipment on synchronous generators shall be kept in service at all times, unless one of the exemptions listed in Section C (Measures) applies, with outages coordinated to minimize the number out of service at any one time. All synchronous generators with automatic voltage control equipment shall normally be operated in voltage control mode and set to respond effectively to voltage deviations.	Updated to reflect the overall purpose of the proposed revised standard.
<b>4. Applicability</b>	<b>4) Applicability</b>	
<b>4.1.</b> Generator Operators	4.1. The requirements of this criterion apply to all Generator Operators of synchronous generating units equipped with Automatic Voltage Regulators (AVR) within the Western Interconnection. The criterion shall be applied after a synchronous generator has achieved commercial operation. The criterion shall be applied on a generator-by-generator basis (a Responsible Entity can be subject to a separate sanction for each non-compliant synchronous generator). This criterion shall not be applicable to any synchronous generator for any calendar quarter in which	Generator Operators is a defined term in NERC’s Glossary of Terms Used in Reliability Standards so it is used in this standard without being redefined.

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
	such synchronous generator is in service for less than five percent of all hours in such quarter (the owners of the synchronous generator shall still be subject to the data reporting requirements for such quarter).	
4.2 Transmission Operators that operate synchronous condensers.		
4.3 This VAR-002-WECC-1 Standard only applies to synchronous generators and synchronous condensers that are connected to the Bulk Electric System.		
5. <b>Effective Date:</b> On the first day of the next quarter, after receipt of applicable regulatory approval.	5. <b>Effective Date:</b> This Western Electricity Coordinating Council Regional Reliability Standard will be effective when approved by the Federal Energy Regulatory Commission under Section 215 of the Federal Power Act. This Regional Reliability Standard shall be in effect for one year from the date of Commission approval or until a North American Standard or a revised Western Electricity Coordinating Council Regional Reliability Standard goes into place, whichever occurs first. At no time shall this regional Standard be enforced in addition to a similar North American Standard.	
<b>B. Requirements</b>		
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	WR1. Automatic voltage control equipment on synchronous generators shall be kept in service at all times, unless one of the exemptions listed in Section C	AVR replacement period was increased to 24 months from 15 months to facilitate procurement requirements for Nuclear Power Plants.

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
<p>through R1.10 to achieve the 98% requirement. <i>[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]</i></p> <p><b>R1.1.</b> The synchronous generator or synchronous condenser operates for less than five percent of all hours during any calendar quarter.</p> <p><b>R1.2.</b> Performing maintenance and testing up to a maximum of seven calendar days per calendar quarter.</p> <p><b>R1.3.</b> AVR exhibits instability due to abnormal system configuration.</p> <p><b>R1.4.</b> Due to component failure, the AVR may be out of service up to 60 consecutive days for repair per incident.</p> <p><b>R1.5.</b> 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.</p> <p><b>R1.6.</b> 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.</p> <p><b>R1.7.</b> The synchronous generator or synchronous condenser has not achieved Commercial Operation.</p>	<p>(Measures) applies, with outages coordinated to minimize the number out of service at any one time. All synchronous generators with automatic voltage control equipment shall normally be operated in voltage control mode and set to respond effectively to voltage deviations.</p>	<p>The reliability authority directs the operation the generator or synchronous condenser when the AVR is unavailable for service.</p> <p>Permits operation of the generator when the AVR exhibits instability due to operation of a Load Tap Changer (LTC) transformer in the area.</p>

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
<p><b>R1.8.</b> The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the AVR is unavailable for service.</p> <p><b>R1.9.</b> The Reliability Coordinator directs Transmission Operator to operate the synchronous condenser, and the AVR is unavailable for service.</p> <p><b>R1.10.</b> 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.</p> <p><b>R2.</b> Generator Operators and Transmission Operators shall have documentation identifying the number of hours excluded for each requirement in R1.1 through R1.10. <i>[Violation Risk Factor: Low] [Time Horizon: Operations Assessment]</i></p>		
<b>C. Measures</b>	<b>C. Measures WM1.</b>	
<p><b>M1.</b> 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:</p> <p><b>M1.1.</b> The actual number of hours the synchronous generator or synchronous condenser was on line.</p> <p><b>M1.2.</b> The actual number of hours the AVR was out of service.</p>	<p>WM1. Each synchronous generating unit equipped with AVR shall have the AVR in service when the unit is on line with the following exceptions:</p> <p>a) Maintenance and testing, maximum of seven calendar days per quarter.</p> <p>b) AVR exhibits instability due to nonstandard transmission line configuration.</p> <p>c) AVR does not operate properly due</p>	<p>Measures expended and split into a measure for each main requirement.</p>

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
<p><b>M1.3.</b> The AVR in service percentage.</p> <p><b>M1.4.</b> If excluding AVR out of service hours as allowed in R1.1 through R1.10, provide:</p> <p style="padding-left: 40px;">M1.4.1. The number of hours excluded, and</p> <p style="padding-left: 40px;">M1.4.2. The adjusted AVR in-service percentage.</p> <p><b>M2.</b> If excluding hours for R1.1 through R1.10, provide the date of the outage, the number of hours out of service, and supporting documentation for each requirement that applies.</p>	<p>to a failed component in the AVR or resulting from a change in adjacent equipment, whether it is control oriented or physical equipment that defines system response. If these changes are outside the control of the owner and result in an operating condition that is unsuitable for operation of an AVR, an exception shall be granted until the operating condition is once again suitable, but in no event shall the period of operation without AVR exceed 60 days, AVR must be repaired and returned to service within 60 calendar days per incident from time of failure (Source: <a href="#">AVR and PSS 60 Day Exclusion</a>). If, during this 60 day period, the decision is made to replace the excitation system, 1/ the excitation system, including AVR, must be back in service within one year of commitment to replace.</p> <p>If more than 60 days are needed to repair an AVR or more than one year is needed to replace an excitation system due to the length of time needed to obtain parts, an extension will be granted upon receipt of documentation by the WECC. Such documentation shall include notice of the need for replacement or repair, the</p>	

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
	<p>expected time required for the Entity’s procurement process, plus the manufacturer delivery time, plus 30 days for installation or if an outage is required for installation the date of the next scheduled outage, and the expected completion date of the work. The total amount of time shall not exceed one year for repair of the AVR or fifteen months for replacement of the excitation system.</p> <p>Responsible Entities shall provide the WECC such documentation as soon as practicable, but no later than the deadline for responding to the initial non-compliance notification letter issued by the WECC. Once repairs are complete, the WECC shall be notified with the next quarterly report of the time the AVR is back in service.</p>	
<b>D. Compliance</b>	<b>D Compliance</b>	
<b>1 Compliance Monitoring Process</b>	<b>1. Compliance Monitoring Process</b>	
<b>1.1 Compliance Monitoring Responsibility</b> Compliance Enforcement Authority	<b>1.1 Compliance Monitoring Responsibility</b> Western Electricity Coordinating Council (WECC)	
<b>1.2 Compliance Monitoring Period</b> Compliance Enforcement Authority may use one or more of the following methods to assess compliance: <ul style="list-style-type: none"> <li>- Reports submitted quarterly</li> <li>- Spot check audits conducted anytime with 30 days notice</li> </ul>	<b>1.2 Compliance Monitoring Period</b>  Quarterly On or before the twentieth day of the month following the end of a quarter (or such other date specified in Form A.5),	Remove specificity for reporting. The Compliance Enforcement Authority will include this detail in its reporting instructions.

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<ul style="list-style-type: none"> <li>- Periodic audit as scheduled by the Compliance Enforcement Authority</li> <li>- Investigations</li> <li>- Other methods as provided for in the Compliance Monitoring Enforcement Program</li> </ul> <p>The Reset Time Frame shall be a calendar quarter.</p>	<p>a Responsible Entity shall submit to the WECC Staff Automatic Voltage Regulator data in Form A.5 (available on the WECC web site) for the immediately preceding quarter. (Source: Data Reporting Requirement)</p>	
<p><b>1.3 Data Retention</b></p> <p>The Generator Operators and Transmission Operators shall keep evidence for Measures M1 and M2 for three years plus current year, or since the last audit, whichever is longer.</p>	<p><b>1.3 Data Retention</b></p> <p>Data will be retained in electronic form for at least one year. The retention period will be evaluated before expiration of one year to determine if a longer retention period is necessary. If the data is being reviewed to address a question of compliance, the data will be saved beyond the normal retention period until the question is formally resolved.</p>	<p>Data retention period lengthened to 3 years plus the current year to ensure data are kept in a contiguous manner between audit periods.</p>
<p><b>1.4 Additional Compliance Information</b></p> <p><b>1.4.1</b> The sanctions shall be assessed on a calendar quarter basis.</p> <p><b>1.4.2</b> 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.</p> <p><b>1.4.3</b> When calculating the in-service percentages, do not include the time the AVR is out of service due to R1.1 through R1.10.</p>	<p><b>1.4 Additional Compliance Information</b></p> <p>The “Sanction Measure” is Synchronous Generating Unit Capability in MVA - and the Specified Period is the most recent calendar quarter. The sanctions shall be assessed on a quarterly basis, but for purposes of determining the applicable column in the <a href="#">Sanction Table</a>, all occurrences within the specified period of the most recent calendar quarter and all immediately preceding consecutive calendar quarters in which at least one</p>	<p>No longer needed because the NERC sanction table is used.</p> <p>The “additional compliance information” clarifies the calculation of the in service percentage that was previously contained in VAR-STD-002a-1.</p>

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
<p><b>1.4.4</b> 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).</p>	<p>instance of non-compliance occurred shall be considered.</p>	
<p><b>2. Violation Severity Levels for R1</b></p>	<p><b>2. Levels of Non-Compliance</b></p>	
	<p><b>Sanction Measure:</b> Synchronous Generating Unit Capability in MVA For levels of noncompliance with a specific number of days associated, (e.g., 7 days for maintenance and testing, etc.) the level of noncompliance will be calculated by the maximum number of contiguous calendar days of non-compliance reached for that incident during the calendar quarter. If an incident 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. When an incident continues from one quarter to another it will be considered a higher level of non-compliance, not a repeat occurrence.</p>	
<p><b>2.1. Lower:</b> There shall be a Lower Level of non-compliance if the following condition exists:</p> <p><b>2.1.1.</b> AVR is in service less than 98% but at least 90% or more of all hours during which the synchronous</p>	<p>When calculating the in-service percentages in the following levels, do not include the time the AVR is out of service due to the exceptions listed above (Section C Measures).</p>	<p>Same non compliance severity violation measure as existing standard except updated to reflect current standard. The exceptions previously listed are</p>



VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
<p>generating unit or synchronous condenser is on line for each calendar quarter.</p> <p><b>2.2. Moderate:</b> There shall be a Moderate Level of non-compliance if the following condition exists:</p> <p><b>2.2.1.</b> 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.</p> <p><b>2.3. High:</b> There shall be a High Level of non-compliance if the following condition exists:</p> <p><b>2.3.1.</b> 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.</p> <p><b>2.4. Severe:</b> There shall be a Severe Level of non-compliance if the following condition exists:</p> <p><b>2.4.1.</b> 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.</p>	<p><b>2.1. Level 1:</b> There shall be a Level 1 non-compliance if any of the following conditions exist:</p> <p>2.1.1. AVR is in service less than 98% but at least 96% or more of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.1.2. AVR is out of service more than 7 calendar days but not more than 14 calendar days due to maintenance or testing, or</p> <p>2.1.3. AVR is out of service for more than 60 calendar days but not more than 90 calendar days due to failed component, or</p> <p>2.1.4. Following the granting of an extension for repairs, the AVR was returned to service greater than zero days but less than or equal to 30 days beyond the specified extension repair completion date.</p> <p><b>2.2. Level 2:</b> There shall be a Level 2 non-compliance if any of the following conditions exist:</p> <p>2.2.1. AVR is in service less than 96% but at least 94% or more of all hours during which the</p>	<p>excluded in the requirements.</p>

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
	<p>synchronous generating unit is on line for each calendar quarter, or</p> <p>2.2.2. AVR is out of service for more than 90 calendar days but not more than 120 calendar days due to failed component, or</p> <p>2.2.3. Following the granting of an extension for repairs, the AVR was returned to service greater than 30 days but less than or equal to 60 days beyond the specified extension repair completion date.</p> <p><b>2.3. Level 3:</b> There shall be a Level 3 non-compliance if any of the following conditions exist:</p> <p>2.3.1. AVR is in service less than 94% but at least 92% or more of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.3.2. AVR is out of service for more than 120 calendar days but not more than 150 calendar days due to failed component, or</p> <p>2.3.3. Following the granting of an</p>	

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
	<p>extension for repairs, the AVR was returned to service greater than 60 days but less than or equal to 90 days beyond the specified extension repair completion date.</p> <p><b>2.4. Level 4:</b> There shall be a Level 4 non-compliance if any of the following conditions exist:</p> <p>2.4.1. AVR is in service less than 92% of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.4.2. AVR is out of service more than 14 calendar days due to maintenance or testing, or</p> <p>2.4.3. AVR is out of service for more than 150 calendar days due to failed component, or</p> <p>2.4.4. Following the granting of an extension for repairs the AVR was not returned to service or was returned to service greater than 90 days beyond the specified extension repair completion date, or</p> <p>2.4.5. Following the granting of an</p>	

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
	extension for replacement of the excitation system, the AVR is not in service after the specified extension replacement completion date.	
<b>3. Violation Severity Levels for R2</b>		
<p><b>3.1. Lower:</b> There shall be a Lower Level of non-compliance if documentation is incomplete with any requirement R1.1 through R1.10.</p> <p><b>3.2. Moderate:</b> There shall be a Moderate Level of non-compliance if the Generator Operator does not have documentation to demonstrate compliance with any requirement R1.1 through R1.10.</p> <p><b>3.3. High:</b> Not Applicable</p> <p><b>3.4. Severe:</b> Not Applicable</p>		Documentation requirements were added to the standard. Violation severity levels were added for documentation.

## **WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

### **Standard Development Roadmap**

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

#### **Development Steps Completed:**

<b>Completed Actions</b>	<b>Completion Date</b>
1. Post Draft Standard for initial industry comments	September 26, 2007
2. Drafting Team to review and respond to initial industry comments	November 30, 2007
3. Post second Draft Standard for industry comments	November 30, 2007
4. Drafting Team to review and respond to industry comments	January 25, 2008
5. Post Draft Standard for Operating Committee approval	January 25, 2008
6. Operating Committee approved proposed standard	March 6, 2008
7. Post Draft Standard for WECC Board approval	March 12, 2008
8. Post Draft Standard for NERC comment period	April 14, 2008
9. WECC Board approved proposed standard	April 16, 2008
10. NERC comment period ended	May 20, 2008
11. Drafting Team completes review and consideration of industry comments to NERC posting	May 30, 2008

#### **Description of Current Draft:**

The purpose of this standard is to create a permanent replacement standard for VAR-STD-002a-1. VAR-002-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when VAR-STD-002a-1 was approved as a NERC reliability standard.

In the Western Interconnection, System Operating Limits for transmission paths in the Bulk Electric System assume that Automatic Voltage Regulators are in service to control voltage to support the transfer capability. The requirements in VAR-002-WECC-1 are to ensure that the generator provides the proper voltage support when generation and transmission outages occur.

This version of the VAR-002-WECC-1 standard is for NERC Board of Trustee ballot. The WECC Board of Directors approved the standard April 16, 2008. WECC Operating Committee approved the standard March 6, 2008. The WECC Board of Directors and Operating Committee request that the NERC Board of Trustees approve the VAR-002-WECC-1 Standard as a permanent replacement standard for VAR-STD-002a-1 and that the

## **WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

NERC Board of Trustees submits the standard to FERC for approval and replacement of VAR-STD-002a-1.

### **Future Development Plan:**

<b>Anticipated Actions</b>	<b>Anticipated Date</b>
1. Submit NERC Board approval request	June 2008
2. Request FERC approval	June 2008

## **WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

### **Definitions of Terms Used in Standard**

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*

**Commercial Operation** - Achievement of this designation indicates that the Generator Operator or Transmission Operator of the synchronous generator or synchronous condenser has received all approvals necessary for operation after completion of initial start-up testing.

## **WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

### **A. Introduction**

- 1. Title:** Automatic Voltage Regulators (AVR)
- 2. Number:** VAR-002-WECC-1
- 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-1 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.



## **WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

- 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]*

### **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, and

**M1.4.2** The adjusted AVR in-service percentage.

- M2.** If excluding hours for R1.1 through R1.10, provide the date of the outage, the number of hours out of service, and supporting documentation for each requirement that applies.

### **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 and M2 for three years plus current year, or since the last audit, whichever is longer.

##### **1.4 Additional Compliance Information**

## **WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

- 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).

### **2. Violation Severity Levels for R1**

**2.1. Lower:** There shall be a Lower Level of non-compliance if the following condition exists:

- 2.1.1.** 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.

**2.2. Moderate:** There shall be a Moderate Level of non-compliance if the following condition exists:

- 2.2.1.** 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.

**2.3. High:** There shall be a High Level of non-compliance if the following condition exists:

- 2.3.1.** 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.

**2.4. Severe:** There shall be a Severe Level of non-compliance if the following condition exists:

- 2.4.1.** 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.

### **3. Violation Severity Levels for R2**

**3.1. Lower:** There shall be a Lower Level of non-compliance if documentation is incomplete with any requirement R1.1 through R1.10.

**3.2. Moderate:** There shall be a Moderate Level of non-compliance if the Generator Operator does not have documentation to demonstrate compliance with any requirement R1.1 through R1.10.

**3.3. High:** Not Applicable

**3.4. Severe:** Not Applicable

### **E. Regional Differences**

**Version History** – Shows Approval History and Summary of Changes in the Action Field

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

**WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**



**Regional Reliability Standard Submittal Request**

**Region: Western Electricity Coordinating Council**

**Regional Standard Number: VAR-002-WECC-1**

**Regional Standard Title: Automatic Voltage Regulators**

**Date Submitted: June 10, 2008**

**Regional Contact Name: Steven L. Rueckert**

**Regional Contact Title: Director of Standards**

**Regional Contact Telephone Number: (801) 582-0353**

**Request (check all that apply):**

- 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 (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)):**

- Yes April 16, 2008
- No

**[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:**

The purpose of this standard is to create a permanent replacement standard for VAR-STD-002a-1. VAR-002-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when VAR-STD-002a-1 was approved as a NERC reliability standard.

**Concise statement of the justification of the request:**

The VAR-002-WECC-1 regional reliability standard is more stringent than the continent-wide reliability standard (Standard VAR-002-1a — Generator Operation for Maintaining Network Voltage Schedules). In the Western Interconnection, System Operating Limits for transmission paths in the Bulk Electric System assume that Automatic Voltage Regulators are in service to control voltage to support the transfer capability. A requirement for generator operators to keep Automatic Voltage Regulators in service control voltage was instituted 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. As a result of this experience, WECC determined that there should be only very limited circumstances where a generator should remove its unit from AVR operation. The requirements in VAR-002-WECC-1 are to ensure that the generator provides the proper voltage support when generation and transmission outages occur. Therefore in the Western Interconnection, Automatic Voltage Regulators are only permitted to be out of service (not in voltage control mode) under very specific predefined conditions. The NERC VAR-002-1a only requires that a generator operator notify its transmission operator when it either removes or operates the automatic voltage regulator in a condition other than voltage control mode and does not limit the amount of time for such operations.

**Other – please attach or include as separate files:**

- **The text of the regional reliability standard in MS Word format that:**
  - **has either been, or is anticipated to be, approved by the regional entity's board, and**
  - **is in a format consistent with the NERC template for reliability standards.**
- **An implementation plan.**
- **The regional entity standard drafting team roster.**
- **The names and affiliations of the ballot pool members or names and affiliations of the committee and committee members that approved the submittal of the standard.**
- **The final ballot results, including a list of significant minority issues that were not resolved, and**
- **For each public comment period, a copy of each comment submitted and its associated response along with the associated changes made to the standard.**

## **Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

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The VAR-002-WECC-1 Standard Drafting Team thanks all commenters who submitted comments on the VAR-002-WECC-1 Standard. This Standard was posted for a 45-day public comment period from April 4, 2008 through May 20, 2008. NERC distributed the notice for this posting on April 7, 2008. The Standard Drafting Team asked stakeholders to provide feedback on the standard through a special Standard Comment Form. There were three sets of comments from five companies representing four of the ten Industry Segments as shown in the table on the following pages.

In this 'Consideration of Comments' document stakeholder comments have been organized so that it is easier to see the responses associated with each question. All comments received on the Standard can be viewed in their original format at:

[http://www.nerc.com/~filez/regional\\_standards/regional\\_reliability\\_standards\\_under\\_development.html](http://www.nerc.com/~filez/regional_standards/regional_reliability_standards_under_development.html)

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you can contact the Manager of Regional Standards, Stephanie Monzon at [Stephanie.monzon@nerc.net](mailto:Stephanie.monzon@nerc.net). In addition, there is a NERC Reliability Standards Appeals Process.<sup>1</sup>

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<sup>1</sup> The appeals process is described in the NERC Regional Reliability Standards Development Procedure: [ftp://www.nerc.com/pub/sys/all\\_updl/sac/rrswg/NERC\\_Regional\\_Reliability\\_Standards\\_Development\\_Procedure\\_Version%200-0%202007-06-15\\_dwt.pdf](ftp://www.nerc.com/pub/sys/all_updl/sac/rrswg/NERC_Regional_Reliability_Standards_Development_Procedure_Version%200-0%202007-06-15_dwt.pdf)

**Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

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The Industry Segments are:

- 1 – Transmission Owners
- 2 – RTOs, ISOs
- 3 – Load-serving Entities
- 4 – Transmission-dependent Utilities
- 5 – Electric Generators
- 6 – Electricity Brokers, Aggregators, and Marketers
- 7 – Large Electricity End Users
- 8 – Small Electricity End Users
- 9 – Federal, State, Provincial Regulatory or other Government Entities
- 10 – Regional Reliability Organizations, Regional Entities

Commenter		Organization	Industry Segment											
			1	2	3	4	5	6	7	8	9	10		
1.	Scott A. Etnoyer	Constellation Power Generation					✓							
2.	Annette Bannon, Tom Olson, and Gus Wilkins	PPL Generation, LLC, PPL Montana, LLC					✓	✓						
3.	Denise Koehn Jack Allison	Bonneville Power Federal Hydro Projects	✓		✓		✓	✓						
4.														
5.														

## **Index to Questions, Comments, and Responses**

- 1. Was the WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators f developed in a fair and open process, using the Process for Developing and Approving WECC Standards? page 4**
- 2. Does the WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators pose an adverse impact to reliability or commerce in a neighboring region or interconnection? page 15**
- 3. Does the WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators pose a serious and substantial threat to public health, safety, welfare, or national security? page 16**
- 4. Does the WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability? page 16**
- 5. Does the WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators meet at least one of the following criteria? page 17**
  - The proposed standard has more specific criteria for the same requirements covered in a continent-wide standard**
  - The proposed standard has requirements that are not included in the corresponding continent-wide reliability standard**
  - The proposed regional difference is necessitated by a physical difference in the bulk power system.**



Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators

1. Was the WECC Standard VAR-501-WECC-1 – Power System Stabilizer developed in a fair and open process, using the Process for Developing and Approving WECC Standards?

Summary Consideration:

Commenter	Yes	No	Comment
Scott A. Etnoyer		X	<p>Concerns of merchant QF generators provided in written comments to WECC have not been addressed in the drafting of this standard.</p> <p>Constellation Energy (CE) opposes WECC’s request that VAR-002-WECC-1 be approved as a Regional Standard. CE commends WECC for its efforts to improve reliability and is pleased to have actively participated and provided comments to WECC in this regional Standard development process. However, in this case, CE believes that the WECC Standards development process to date has not adequately addressed concerns raised during VAR-002-WECC-1’s review and approval.</p> <p>WECC advanced this standard through its regional commenting process, but the final proposed standard now submitted to NERC does not resolve concerns raised by generation stakeholders, including CE, in this region. Specifically, generation stakeholders believe implementing the standard with respect to small generators would result in loss of generation rather than enhanced reliability at times when the system is in need. As a result, CE believes this proposed standard has serious substantive flaws that, although raised by stakeholders in filed comments, were not addressed during the editing and approval process. <b>CE believes that NERC must reject the proposed standard and remand it to WECC for further discussion.</b></p> <p>As currently written, this Standard does not advance regional reliability (a necessary criterion to create a regional standard), but actually reduces regional reliability. This alone should cause NERC to take a close look at this standard before passing it on to FERC. The Standard would require small merchant QF generation facilities to do something they operationally are unable to do – sustain grid voltage during a degrading condition. The reality is that small generators are far more likely to trip off-line during a negatively trending system voltage if they are forced to operate in Auto Volt Control mode, thus reducing reliability. However, should this standard be approved, it might lead system planners to adopt false assumptions regarding how small generators would perform during voltage</p>

Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators

Commenter	Yes	No	Comment
			<p>declines and thus provide a false margin of modeled security. The standards development process did not address this concern.</p> <p>This fundamental and serious flaw in the proposed standard is a product of defects in the WECC Standards Approval Process. Collectively, members of the merchant generation community have little voting power in the Standards Approval Process of the Operating Committee under the current governance structure. When WECC advances Standards that contain serious flaws, such as this one, this stakeholder segment has too little voting power to influence the voting body to make necessary corrections. Generators are unable to influence outcomes unless they obtain agreement from the more powerful voting block – transmission owners/operators, which at times have competing interests.</p> <p>More specifically to this particular proposed standard, WECC did not adequately address issues raised in a request for interpretation of NERC Standard VAR-002-1 dated January 24, 2007 and the NERC response issued on March 5, 2007 [see attached .pdf document]{the .pdf document is included below as part of this comment}, which makes queries regarding AVR operation and allowances for deviation from that requirement. Nor has WECC adequately addressed the meaning of that interpretation in response to comments made by stakeholders with regard to implementing that interpretation in VAR-002-WECC-1.</p> <p>Also, WECC dismissed issues raised by CE’s consultant (Roger Robinson – see below) regarding Qualified Facilities connected to the Bulk Electric System (BES) under CPUC Rule 21. WECC’s response was factually incorrect in that Rule 21 was indeed the basis for CE’s QF’s connecting to the BES.</p> <p><i>“Many Qualified Facilities (QF) in California were connected to the BES under the California Public Utility Commission (CPUC) Rule 21. Some Utilities in their interpretation of Rule 21 required the QF to operate the AVR in Power Factor (pf) mode as a condition of the Interconnection Agreement (ICA) and Power Purchase Agreement (PPA). Requiring the QF to now operate in the AVR in automatic, controlling voltage, puts operation of these plants in conflict with the criteria used for the Reliability, Safety, and Stability Studies of the BES that were completed by the Transmission Operator (TOP) at the time of the interconnection. Operating in the voltage control mode also puts the QF in conflict with the</i></p>

Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators

Commenter	Yes	No	Comment
			<p><i>contractual conditions with the TOP currently in force.</i></p> <p><i>The above is in conformance with NERC Standard VAR-002 and the current NERC interpretation of that standard as referenced in WECC-VAR-STD-002a. The relief given in the draft VAR-002-WECC-1 R1.10 only temporarily deals with the specific instability due to a LTC in the area and does not address the above issues.</i></p> <p><i>The PPAs for QFs requires them to pay for VARs taken and not be paid for VARs given to the grid. Operating in the voltage control mode with the set point, as directed by the TOP, does not allow the QF any control over the movement of VARs to and from the BES and can be a severe financial hardship.</i></p> <p><i>Roger Robinson rmc@att.net</i></p> <p><i>Reply: CPUC Rule 21 only applies to generators on distribution systems. This standard applies to synchronous generators and condensers that are connected to the Bulk Electric System. “</i></p> <p><i>The operational consequences of WECC’s non-responsiveness to comments and adoption of VAR-002-WECC-1 are effectively summarized in the March 20, 2008 comments posted by John Stout, Mariner Consulting Services, on the WECC website in response to the Operating Committee approval of VAR-002-WECC-1:</i></p> <p><i>“At the March OC meeting, a significant number of WECC Generation Operators voted against acceptance of the proposed WECC AVR standard. Most did so because this standard allows Transmission Operators to direct generators to operate in a manner which exposes WECC to a significant and unnecessary risk of voltage collapse, and exposes those generators to increased and unreasonable risk of incurring non-compliance penalties.</i></p> <p><i>One of the important lessons learned in the July/August 1996 WECC blackouts was that operation of generation in a constant reactive power mode increased the risk of voltage collapse and, therefore, should be limited in WECC. The technical reason for this conclusion</i></p>

Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators

Commenter	Yes	No	Comment
			<p><i>is the fact that when voltage begins to collapse, increased reactive power output is required in order to raise the voltage and prevent it from collapsing to the point of causing a blackout. Therefore, WECC established a requirement that, with ten exceptions, generation controls had to be operated in the constant voltage mode of operation. In this mode of operation, if voltage declines, the generator automatically increases and maintains its reactive power output until the voltage returns to normal. That requirement is the genesis of the proposed WECC AVR standard.</i></p> <p><i>WECC Generation Operators support the requirement that their AVR's be operated to maintain voltage and automatically respond with increased reactive output to prevent voltage collapse.</i></p> <p><i>However, not all WECC Transmission Operators allow interconnected Generation Operators to provide voltage responsive reactive support. Certain Transmission Operators have refused to provide voltage schedules to their Generation Operators. They are allowed to do this because the proposed WECC AVR standard does not include a requirement that Transmission Operators provide voltage schedules. Instead, the WECC AVR standard is silent on this issue, allowing Transmission Operators to follow less restrictive NERC standards which afford them the option of providing reactive power schedules rather than voltage schedules. This practice forces Generation Operators to manually adjust their AVR voltage setting by trial and error to find a voltage setting that will provide the exact amount of reactive power directed by the Transmission Operator. Since the voltage on the transmission grid varies throughout the day, the Generation Operator is forced to continuously reset the voltage on the AVR. This is an unnecessary and distracting manual control burden on the Generation Operator. It effectively eliminates the "Automatic" in "Automatic Voltage Regulator."</i></p> <p><i>NERC VAR-002 requires the Generation Operator to comply exactly with the voltage schedule or reactive power schedule directed by the Transmission Operator. If the Transmission Operator provides a voltage schedule, the AVR can automatically maintain compliance with the NERC standard. If the Transmission Operator refuses to provide a voltage schedule, and instead insists on providing a reactive power schedule, compliance can no longer depend on the automatic operation of the AVR. The proposed WECC AVR</i></p>

**Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

Commenter	Yes	No	Comment
			<p><i>standard prohibits the AVR from being switched to a constant reactive power mode of operation. Instead compliance becomes totally dependent on constant attention and readjustment by the Generation Operator. This significantly increases the risk of reliability standard non-compliance for the generator.</i></p> <p><i>Even more disturbing is the fact that this situation (the Transmission Operator specifying a constant reactive power output rather than a constant voltage level) defeats the intended purpose of the WECC AVR standard, to prevent a voltage collapse. If voltage does begin to collapse, the generator AVR, operating in constant voltage mode, will increase the reactive power output from the unit. That increase in reactive output means that the generator will no longer be producing the amount of reactive power specified by the Transmission Operator’s reactive power schedule. Once this occurs, the Generation Operator must immediately reduce the reactive power provided by the generator or risk fines for noncompliance with NERC standard VAR-002, R2. That will result in the generator doing the exact opposite of what is needed to prevent a voltage collapse and exposes WECC to a risk of blackout.</i></p> <p><i>This issue was repeatedly raised during the standards development process, but the drafting team took the position that it was not a problem that needed to be addressed by the WECC AVR standard. During the March vote at the OC, an amendment was proposed to resolve this issue by adding a requirement to the WECC AVR standard that Transmission Operators provide voltage schedules instead of reactive power schedules. No one expressed an opinion that the concerns raised by generators regarding the reliability risk to WECC were invalid, yet the proposed solution was overwhelmingly rejected by the OC. Unfortunately, due to the voting structure of the OC, the concerned Generation Operators are in a minority and could do nothing more to resolve this issue.</i></p> <p><i>The WECC Board should not take the same path as did the drafting team and the Operating Committee. We believe the Board should do at least three things before approving this standard.</i></p> <p><i>First, the WECC Board should ask the OC to report on the validity of the reliability risk and the compliance risk described above. If their response results in a Board conclusion that either risk is valid, the following additional questions should be raised by the</i></p>

Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators

Commenter	Yes	No	Comment
			<p><i>Board.</i></p> <p><i>The WECC Board should ask the OC to provide specific information on which Transmission Operators provide reactive power schedules rather than voltage schedules to their interconnected generators. This information should include the specific reasons why such Transmission Operator’s have chosen to provide reactive power schedules and explain why those reasons outweigh the reliability and compliance risk created by reactive power schedules. If the Board concludes those reasons are not sufficiently justified, the Board should remand this AVR standard for inclusion of a voltage schedule requirement.</i></p> <p><i>If valid reasons are provided to the preceding question, the WECC Board should ask the OC to explain why each of those reasons were not included with the ten exceptions already listed under R1 of the WECC AVR standard. If the OC cannot justify why those reasons should not be included in the ten exceptions, the Board should remand the standard until those reasons are included. By adding such reasons to the list of exceptions, Generation Operators should be allowed to place their AVR in the automatic control mode that matches the reactive power schedule provided by the Transmission Operator (i.e. Constant MVAR mode for VAR Schedules or constant Power Factor mode for Power Factor Schedules.)</i></p> <p><i>While Board members may feel a reluctance to not support the OC recommendation to approve the currently proposed AVR standard, each Board member should recognize an important distinction between votes at the OC and votes by the Board. Standing Committee members are entitled to vote in accordance with their self interests. Board members have a different standard. Board Members are obligated to vote what is best for WECC. That difference can cause Board votes to sometimes result in different outcomes than Standing Committee votes. While our position was the minority opinion within the OC, we firmly believe it to be the best path for maintaining the reliability and credibility of WECC.”</i></p> <p>For the reasons discussed above, CE requests that NERC reject this proposed standard and remand it to WECC for further discussion and resolution of the issues identified herein amongst the stakeholders.</p> <p>Scott Etnoyer</p>

Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators

Commenter	Yes	No	Comment
			<p>Manager – CPG NERC Compliance (410)470-2661</p> <p><b>Request for Interpretation of NERC Standard VAR-002-1</b></p> <p><b>Dated January 24, 2007</b> <b>John H. Stout</b> <b>Mariner Consulting Services, Inc.</b> <b>1303 Lake Way Drive</b> <b>Taylor Lake Village, Texas 77586</b></p> <p>Requirement R1 of Standard VAR-002-1 states that Generation Operators shall operate each generator connected to the interconnected transmission system in the automatic voltage control mode (<i>automatic voltage regulator in service and controlling voltage</i>) unless the Generator Operator has notified the Transmission Operator.</p> <p>Requirement R2 goes on to state that each Generation Operator shall maintain the generator voltage <i>or Reactive Power output</i> as directed by the Transmission Operator.</p> <p>The two underlined phrases are the reasons for this interpretation request.</p> <p>Most generation excitation controls include a device known as the Automatic Voltage Regulator, or AVR. This is the device which is referred to by the R1 requirement above. Most AVR's have the option of being set in various operating modes, such as constant voltage, constant power factor, and constant Mvar.</p> <p>In the course of helping members of the WECC insure that they are in full compliance with NERC Reliability Standards, I have discovered both Transmission Operators and Generation Operators who have interpreted this standard to mean that AVR operation in the constant power factor or constant Mvar modes complies with the R1 and R2 requirements cited above. Their rational is as follows:</p> <ul style="list-style-type: none"> <li>• The AVR is clearly in service because it is operating in one of its operating</li> </ul>

**Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

Commenter	Yes	No	Comment
			<p>modes</p> <ul style="list-style-type: none"> <li>• The AVR is clearly controlling voltage because to maintain constant PF or constant Mvar, it controls the generator terminal voltage</li> <li>• R2 clearly gives the Transmission Operator the option of directing the Generation Operator to maintain a constant reactive power output rather than a constant voltage.</li> </ul> <p>Other parties have interpreted this standard to require operation in the constant voltage mode only. Their rationale stems from the belief that the purpose of the VAR-002-1 standard is to insure the automatic delivery of additional reactive to the system whenever a voltage decline begins to occur.</p> <p>The material impact of misinterpretation of these standards is twofold.</p> <ul style="list-style-type: none"> <li>• First, misinterpretation may result in reduced reactive response during system disturbances, which in turn may contribute to voltage collapse.</li> <li>• Second, misinterpretation may result in substantial financial penalties imposed on generation operators and transmission operators who believe that they are in full compliance with the standard.</li> </ul> <p>In accordance with the NERC Reliability Standards Development Procedure, I am requesting that a formal interpretation of the VAR-002-1 standard be provided. Two specific questions need to be answered.</p> <ul style="list-style-type: none"> <li>• First, does AVR operation in the constant PF or constant Mvar modes comply with R1?</li> <li>• Second, does R2 give the Transmission Operator the option of directing the Generation Owner to operate the AVR in the constant Pf or constant Mvar modes rather than the constant voltage mode?</li> </ul> <p><b>Interpretation of NERC Standard VAR-002-1 Prepared by Phase 3&amp;4 Standard Drafting Team Members Dated March 5, 2007</b></p> <p><b>In response to February 2007 request from John H. Stout Mariner Consulting Services, Inc.</b></p>



Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators

Commenter	Yes	No	Comment
			<p><b>1303 Lake Way Drive Taylor Lake Village, Texas 77586</b></p> <p><b>Questions and Answers</b></p> <p>The answers to the two questions posed by Mr. John H. Stout are:</p> <p>1. Question: First, does AVR operation in the constant PF or constant Mvar modes comply with R1? Answer: No, only operation in constant voltage mode meets this requirement. This answer is predicated on the assumption that the generator has the physical equipment that will allow such operation and that the Transmission Operator has not directed the generator to run in a mode other than constant voltage.</p> <p>2. Question: Second, does R2 give the Transmission Operator the option of directing the Generation Owner (sic) to operate the AVR in the constant Pf or constant Mvar modes rather than the constant voltage mode? Answer: Yes, if the Transmission Operator specifically directs a Generator Operator to operate the AVR in a mode other than constant voltage mode, then that directed mode of AVR operation is allowed.</p> <p><b>Background and Discussion</b></p> <p>Requirement R1 of Standard VAR-002-1 states that Generation Operators shall operate each generator connected to the interconnected transmission system in the automatic voltage control mode (<i>automatic voltage regulator in service and controlling voltage</i>) unless the Generator Operator has notified the Transmission Operator.</p> <p>Requirement R1 clearly states controlling voltage. This can only be accomplished by using the automatic voltage control mode. Using the Power Factor (PF) or constant MVAR control is not a true method to control voltage even though they may have some effect on voltage. This is the baseline mode of operation that is clearly conditioned by “unless the Generator Operator has notified the Transmission Operator”. The following Requirement R2 introduces the possibility of an exemption to this baseline mode of operation discussed below.</p>

Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators

Commenter	Yes	No	Comment
			<p>The above interpretation is further reinforced by reviewing the origin of the requirement. The current Requirement R1 is an evolution of the words in the associated source document, namely NERC Planning Standards Compliance Template for III.C.M1, “Operation of all synchronous generators in the automatic voltage control mode”.</p> <p>As stated in the original III.C.S1 Standard:  <b>“All synchronous generators connected to the interconnected transmission systems shall be operated with their excitation system in the automatic voltage control mode (automatic voltage regulator in service and controlling voltage) unless approved otherwise by the transmission system operator.”</b></p> <p>Requirement R2 of Standard VAR-002-1 goes on to state that “Unless exempted by the Transmission Operator, each Generator Operator shall maintain the generator voltage or Reactive Power output (within applicable Facility Ratings) as directed by the Transmission Operator.” The purpose of this requirement is to give the Transmission Operator the ability to direct the Generator Operator to use another mode of operation. This ability may be necessary based on the Transmission Operator’s system studies and/or knowledge of system conditions. This ability also gives the Transmission Operator the latitude to work with the Generator Operator who has a generating unit that lacks the physical equipment to be able to run in the automatic voltage control mode or has contractual requirements to operate in a certain manner.</p> <p>Both Requirements R1 and R2 in VAR-002-1 were worded such that they coordinate with Requirement R4 in VAR-001-1:</p> <p>“Each Transmission Operator shall specify a voltage or Reactive Power schedule at the interconnection between the generator facility and the Transmission Owner's facilities to be maintained by each generator. The Transmission Operator shall provide the voltage or Reactive Power schedule to the associated Generator Operator and direct the Generator Operator to comply with the schedule in automatic voltage control mode (AVR in service and controlling voltage). “</p> <p>Again this Requirement R4 reflects that the baseline mode of operation is to use the automatic voltage control mode with the option for the Transmission Operator to specify</p>

**Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

Commenter	Yes	No	Comment
			other modes of operation as dictated by system studies and needs to maintain system reliability.
<p>Response: The drafting team disagrees with the commenter’s fundamental premise that operation of generator automatic voltage regulators (AVR) in any mode other than voltage control is acceptable for synchronous machines connected to the Bulk Electric System (BES). Due to reliability concerns, WECC has a long history recommending and requiring that generation connected to the BES operate the generator automatic voltage regulators in voltage control mode. These recommendations were validated in 1996 when insufficient control of reactive power resulted in a major disturbance in the West. Subsequent identification of numerous synchronous machines operating the generator AVR in constant power factor mode and other deficiencies resulted in the development of the Reliability Management System, which contractually obligated machine owners to only operate the generator AVRs in voltage control mode.</p> <p>The drafting team further disagrees that implementing the standard will result in the loss of generation. When the automatic voltage regulators are operated in voltage control mode (controlling voltage), generators will provide additional reactive power to support the system when actual system voltage declines. The additional reactive power support is necessary to enhance BES reliability during system events. The amount of reactive support provided depends on the generator’s reactive support capabilities and the voltage schedule. When automatic voltage regulators are properly tuned, there is no reduction in power production. However, the amount of reactive power provided is limited by the amount of generation. The need for this reactive power response has been demonstrated through technical studies and many years of experience. The commenter did not present any evidence to demonstrate that smaller generators respond differently than larger generators. Therefore, the drafting team does not believe there are serious flaws with the standard.</p> <p>The development and balloting of the VAR-002-WECC-1 Standard was conducted in accordance with the Bylaws of the Western Electric Coordinating Council revised July 27, 2007 and WECC Regional Delegation Agreement. FERC found that WECC’s standard development process and balloting of reliability standards to be fair and open. All industry stakeholders were permitted to participate in the VAR-002-WECC-1 standard development and in the ballot. All industry segments were permitted to participate when a ballot was conducted at the March 6, 2008 Operating Committee meeting. In addition, all industry stakeholders are fairly represented on the WECC Board of Directors, which ensures that the interests of all industry stakeholders and industry sectors are heard and represented fairly. Transmission owners and operators did not inappropriately influence the development of the standard. The ballot results at the Operating Committee and the WECC Board of Directors indicate that many generator owners and operators supported the VAR-002-WECC-1 standard. At the Operating Committee, the vote was in favor of the standard when transmission providers (the transmission owner and operator voting block) were excluded. The ballot results for transmission customers that include generator owners and operators were 25 yes, 11 no, and 11 abstained. The WECC Board of Directors contains seven classes of membership including class 3 that represents independent power producers. The Board of Director ballot was 24 yes, 4 no, and 2 abstained.</p> <p>The drafting team, in accordance with the standard request and its responsibility to protect the reliability of the BES, designed the VAR-002-WECC-1 Standard to contain specific more restrictive criteria not contained in the NERC VAR-002-1 Reliability Standard. The WECC VAR-002-WECC-1 Reliability Standard is designed to limit the reasons for not operating automatic voltage regulators in voltage control mode and the amount of time generators may be operated in different modes. Therefore, the commenter is correct the WECC VAR-002-WECC-1 Standard restricts the amount of time that generators are permitted to be operated when automatic voltage regulators are not controlling voltage. The reason for these more restrictive requirements is to support transfer capabilities and to address the insufficient supply of reactive power, which was identified as a cause of a 1996 system disturbance.</p> <p>The existence of the claimed conflict is also questionable. Assuming there is a conflict, the VAR-002-WECC-1 standard applies to electric generation</p>			

**Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

Commenter	Yes	No	Comment
			resources connected at voltages of 100 kV or higher, generally, as noted in the NERC definition and applicability Section A.4.3 of the standard. Where as, Rule 21 applies to generators interconnected to the distribution system generally at voltages 60 kV and below. It is, however, possible for generator operators to operate AVRs to comply with both requirements, that is at the same time operate to control voltage and operate within a range of reactive power limits. This may be more difficult, but is still possible and will add to the reliability of the Bulk Electric System. Finally, Rule 21 appears to address commercial interconnection issues unrelated to the reliability of the Bulk Electric System.
			The standard drafting team believes that it adequately considered the commenter’s concerns and the concerns of merchant QF generators provided as written comments to the drafting of this standard. The standard drafting team recognizes that in order to development a standard that enhances the reliability of the BES, the team did not implement the commenter’s recommendations.
Annette Bannon, Tom Olson, and Gus Wilkins			
Response:			
Denise Koehn Jack Allison	X		
Response: Thank you.			
Response:			

**2. Does the WECC Standard VAR-501-WECC-1 – Power System Stabilizer pose an adverse impact to reliability or commerce in a neighboring region or interconnection?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Scott A. Etnoyer	X		Smaller QF generators are being asked to perform during a potential voltage decline in a manner they operationally cannot, hence creating a false set of modeled assumptions on real-time conditions that will take place at a very critical period on the bulk electric system. See also comments on Question 1.
			Response: The drafting team disagrees that implementing the standard will result in the requirement of generators operating in a manner that they operationally cannot. When the automatic voltage regulators are operated in voltage control mode (controlling voltage), generators will provide additional reactive power to support the system when actual system voltage declines. The additional reactive power support is necessary to enhance BES reliability during system events. The amount of reactive support provided depends on the generator’s reactive support capabilities and the voltage schedule. The need for this reactive power response has been demonstrated through technical studies and many years of experience. The commenter did not present any evidence to demonstrate that smaller generators respond differently than larger generators and cannot operate to control voltage.
Annette Bannon, Tom Olson, and			

**Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

Commenter	Yes	No	Comment
Gus Wilkins			
Response:			
Denise Koehn Jack Allison		X	
Response: Thank you.			
Response:			

**3. Does the WECC Standard VAR-501-WECC-1 – Power System Stabilizer pose a serious and substantial threat to public health, safety, welfare, or national security?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Scott A. Etnoyer		X	Smaller QFS are only one contributor to voltage support on the WECC grid. The performance concern identified here has a significant negative impact on the QF generator and could potentially be harmful to grid reliability, it is not predictable whether this standard would pose substantial threat to public health, safety and welfare or national security.
Response: The drafting team recognizes that a single smaller Qualified Facility (QF) only provides a limited amount of voltage support. But many smaller QFs working jointly to provide reactive support have a positive effect on system voltage during system events. Additional reactive power support is necessary to enhance BES reliability during system events. The amount of reactive support provided depends on the generators' reactive support capabilities and the voltage schedule. The need for this reactive power response has been demonstrated through technical studies and many years of experience. Enhanced system reliability will not impose a substantial threat to public health, safety and welfare, or national security.			
Annette Bannon, Tom Olson, and Gus Wilkins			
Response:			
Denise Koehn Jack Allison		X	
Response: Thank you.			
Response:			

**Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

**4. Does the WECC Standard VAR-501-WECC-1 – Power System Stabilizer pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Scott A. Etnoyer		X	
Response: Thank you.			
Annette Bannon, Tom Olson, and Gus Wilkins	X		The proposed standard does not have a grandfathering provision to address existing, older generating units that may not meet the proposed requirement. Also, this standard does not give the generator operator the option to operate in manual voltage setpoint mode.
Response: The drafting team did not identify a need to permit a grandfather provision for the automatic voltage regulator standard. The NERC VAR-002-1 standard does not have a provision that provides an exception due to age. Automatic voltage regulators are not new devices. WECC, through its RMS program, has required the operation of synchronous generators in voltage control mode since 1999.			
Additional reactive power support is necessary to enhance BES reliability during system events. The amount of reactive support provided depends on the generator’s reactive support capabilities and the voltage schedule. The drafting team did not identify a specific need to permit the operation in manual voltage setpoint mode for extended periods of time. The commenter did not demonstrate that operation in manual voltage setpoint is necessary for reliability.			
Denise Koehn Jack Allison		X	
Response: Thank you.			
Response:			

**5. Does the WECC Standard VAR-501-WECC-1 – Power System Stabilizer meet at least one of the following criteria?**

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

**Comment Report Form for WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulators**

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**Summary Consideration:**

Commenter	Yes	No	Comment
Scott A. Etnoyer			
<a href="#">Response:</a>			
Annette Bannon, Tom Olson, and Gus Wilkins			
<a href="#">Response:</a>			
Denise Koehn Jack Allison	X		
<a href="#">Response: Thank you.</a>			
<a href="#">Response:</a>			

VAR-501-WECC-1 - Power System Stabilizer - Comments due November 12, 2007

November 26, 2007

The Requirement section mentions a documentation requirement for identifying the number of hours excluded for R1.1-R1.12. The Measures section mentions submitting data to the compliance monitor but no frequency of submittals is mentioned. Then under Compliance, para 1.2, there is mention of quarterly reports being used as a measure of compliance. I think you need to add to the Measurements section the quarterly submittal of PSS in service hours. It would help if a standardized report form was provided, like what was used for the RMS PSS reporting, form 5a. Otherwise, Generator Operators run the risk of not seeing the need for quarterly reporting and thus violating this standard.

Karl Bryan

*Reply: The standard's compliance section is designed to give the compliance monitor guidance in developing reporting forms. The drafting team added clarification to M1 regarding reporting frequency.*

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Under the Violation Severity Levels section, BPA agrees with the noncompliance starting at 98%, but it seems disproportional to have the Lower Severity Level drop all the way down to 90%, Moderate to 80%, High to 70%, and below 70% for Severe. With all the exemptions allowed outside of the 98% it would seem more appropriate to have level of 96% for Lower Level, 94% for Moderate Level, 92% for High Level, and 90% and below for Severe.

James Murphy, BPA

*Reply: The drafting team believes using a wider range for compliance is more appropriate with the implementation of the NERC sanction table.*

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The WECC intends that VAR-501-WECC-1 will replace VAR-STD-002b-1. However, the language used in this draft of the new standard dramatically increases the scope of applicability. PPLM suggests that the following language from VAR-STD-002b-1 in Section 4 Applicability of VAR-501-WECC-1 be retained in the new standard.

Generator Operators of synchronous generating units equipped with Power System Stabilizers

*Reply: Thank you for your suggestion, R1 was modified.*

The WECC issued a policy in 2002 to address Power System Stabilizers. That document includes criteria to “determine when a PSS shall be installed on a synchronous



generator.” PPLM suggests that the WECC reference this policy statement in the standard or include all applicable language from the policy statement in the standard.

PPLM appreciates the standard drafting team efforts and the opportunity to comment.

Jon Williamson  
PPL Montana, LLC

*Reply: This recommendation is beyond the scope of this standard. The requirements in the standard address PSS operation not applicability.*

Consideration of Comments for VAR-501-WECC-1 – Power System Stabilizer  
Comments were due January 2, 2008  
January 24, 2008

The VAR-501-WECC-1 Standard Drafting Team thanks all commenters who submitted comments on the WECC VAR-501-WECC-1 Standard. This Standard was posted for a 30-day public comment period from November 30, 2007 through January 2, 2008. The Standard Drafting Team asked stakeholders to provide feedback on the standard by posting comments on the WECC website. There were four sets of comments from four companies.

In this ‘Consideration of Comments’ document, stakeholder comments have been organized so that it is easier to see the responses associated with each comment.

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you may contact the Director of Standards, Steve Rueckert at 801-582-0353 or at [steve@wecc.biz](mailto:steve@wecc.biz). In addition, there is a WECC Appeals Process.

The NERC has designed the structure of reliability standards to contain requirements, measures, and compliance. Recommendations such as combining the compliance period into the requirement do not conform to the structure for a standard. The drafting team believes that it should follow the structure for a standard and did not implement these refinements.

### **Comments and Responses**

CEA (used in Section D.1.1) has been well established as the abbreviation for Canadian Electrical Association. This will be quite confusing for those North of the border if adopted as the abbreviation for compliance enforcement authority.

Blaine Beisiegel

Reply: Thank you for your comment. NERC recommended use of the term Compliance Enforcement Authority in continent wide and regional standards. The drafting team removed CEA.

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In R1, I would like the committee to entertain clarification of the 98% statement. I recommend "Generator Operators shall have PSS in service 98% of all operating hours for synchronous generators equipped with PSS, unless one of the following applies." be replaced with "Generator Operators operating synchronous generators with PSS, shall have the PSS in service 98% of all operating hours of the specified quarterly reporting period unless one of the following applies."

Reply: The drafting team made refinements to the purpose statement, R1, M1 and M2 to make the application of R1 clear. Quarterly compliance is included in the violation severity levels and under compliance monitoring period.

In R2, the statement should better reflect the R1 Requirement, and not the subrequirements. I recommend replacing "Generator Operators shall have documentation identifying the number of hours excluded for each requirement in R1.1 through R1.12." with "Generator Operators shall maintain documentation identifying all hours the PSS was not in service, and the verification for any exceptions permitted under requirement R1."

Reply: The drafting team made refinements to the purpose statement, R1, M1 and M2 to make the application of R2 clear.

I recommend adding another M1 sub requirement for the total hours for the reporting quarter.

Reply: The total hours in the reporting quarter is not needed to determine compliance.

Please check that Section D 1.1 is consistent with the FM. I would recommend the use of the proposed Ver4 language.

Reply: NERC has not posted Functional Model Version 4 on its website. Compliance Enforcement Authority is not in version 3.

In Section D 1.4.4 "The standard shall be applied on a machine-by-machine basis (a Generator Operator can be subject to a separate sanction for each noncompliant synchronous generator)."

This can be a significant problem for entities who utilize a single PSS to control multiple units. If a station has one PSS for 10 individual generators, every violation could be interpreted to be multiplied X10. This is not the intent, and could set an inappropriate level of sanction. This standard is not to establish what machines have PSS, but how to operate machines that have PSS.

This item needs to be corrected, clarified, or removed.

Reply: The drafting team made refinements to Section 1 1.4.4 making the standard applicable on a generating unit basis. This means multiple machines that operate as a single unit would be subject to one sanction.

Kevin Conway, GCPUD

## Considerations for VAR-[501]-WECC-1

### Comment on R1.9 and R1.10

It would seem to simplify the standard if these were combined and the 15 month provision retained. In both exceptions, documentation must be submitted to explain the need to have the [PSS] out of service. It is not clear why from system reliability and performance standard perspective, there is a need to distinguishing between replacement parts or system replacement.

Crystal Musselman

Reply: The drafting team extended the time for PSS replacement to 24 months to accommodate design and procurement especially for nuclear units. There is a distinction between the time required to repair a PSS versus replacement.

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The Alberta Electric System Operator (AESO) appreciates the opportunity to comment and would like to offer the following:

- The AESO currently reports PSS data to the WECC on behalf of all Generator Operators in Alberta, instead of each GOP reporting individually.
- It may be worthwhile to review how and if R1.1 fit in the overall R1 requirement together with the other listed "exceptions." It would seem logical, and R1 does seem to imply that, if a generator was operated for less than 5% of time in a calendar quarter, then the generator (versus the time period when PSS was not in service) is to be excluded from the 98% requirement. However, the wording in R1 doesn't quite say that literally. Please review and revise as required.

Thank you.

Anita Lee, P. Eng.  
Manager, Operating Policies and Procedures  
Alberta Electric System Operator

Reply: The drafting team made refinements to R1 to clarify the requirement. If the unit does not operate five percent or more of all hours during a quarter, the hours the unit operated without PSS may be excluded from the in service percentage calculation.

# Western Electricity Coordination Council

## Operating Committee Meeting March 6-7, 2008 Albuquerque, NM Voting Results

1. **Motion:**

*The VAR-002-WECC-1 Standard Drafting Team recommends that the OC approve VAR-002-WECC-1 and that after regulatory approval, it shall supersede VAR-STD-002a-1.*

**Explanation:** To ensure that Automatic Voltage Regulators on synchronous generators and condensers shall be kept in service and controlling voltage to help maintain Bulk Electric System reliability.

VOTING CLASS	YES	NO	ABSTAIN
TRANSMISSION PROVIDERS	28	4	2
TRANSMISSION CUSTOMERS	25	11	11
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>54</b>	<b>15</b>	<b>13</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email– Comments from AVA, BPEC, EPLUW, Mariner Consulting Services, SMUD and TANC

2. **Motion:**

*The VAR-501-WECC-1 Standard Drafting Team recommends that the OC approve VAR-501-WECC-1 and that after regulatory approval, it shall supersede VAR-STD-002b-1.*

**Explanation:** To ensure that Power System Stabilizers (PSS) on synchronous generators shall be kept in service.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	32	1	1
TRANSMISSION CUSTOMERS	33	2	10
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>66</b>	<b>3</b>	<b>11</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from AVA and EPLUW

3. **Motion:**

*The BAL-002-WECC-1 Standard Drafting Team recommends that the OC approve BAL-002-WECC-1 and that after regulatory approval, it shall supersede BAL-STD-002-0.*

**Explanation:** Contingency Reserve is required for the reliable operation of the interconnected power system. Adequate generating capacity must be available at all times to maintain scheduled frequency, and avoid loss of firm load following transmission or generation contingencies. This generating capacity is necessary to replace generating capacity and energy lost due to forced outages of generation or transmission equipment.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	22	6	6
TRANSMISSION CUSTOMERS	36	10	5
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>59</b>	<b>16</b>	<b>11</b>

Result: PASSED

Minority Opinion:

- Talking about a reliability standard, the existing standard with a proven track record of over a few decades is being replaced with one that is based entirely on compromise. The result will be a massive shift in cost without any technical studies to justify the shift to 3% generation and 3% load. The suspicion is an overall reduction of reserves carried in WECC without any technical justification. It is better to spend time on a technical based standard like FRR than putting in place a compromise solution in the interim.
- The standard is based on compromise and reducing reliability
- There are a number of market issues with this standard to the point where the entity is not comfortable supporting the standard even though they think it is the right direction
- Please see Appendix A for comments received via email – Comments submitted by BC Hydro, EPLUW, NCPA, NWMT, Powerex, PGE (TP), PGE (TC), PSEI, SCL, SMUD and TANC

4. **Motion:**

*The PRC-004-WECC-1 Standard Drafting Team recommends that the OC approve PRC-004-WECC-1 and that after regulatory approval, it shall supersede PRC-STD-001-1 and PRC-STD-003-1.*

- **Explanation:** Regional Reliability Standard to ensure all transmission and generation Protection System and Remedial Action Scheme (RAS) Misoperations on Transmission Paths and RAS defined in section 4 are analyzed and/or mitigated.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	30	4	0
TRANSMISSION CUSTOMERS	32	2	12
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>63</b>	<b>6</b>	<b>12</b>

Result: **PASSED**

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from AVA, SMUD and TANC

5. **Motion:**

*The IRO-006-WECC-1 Standard Drafting Team recommends that the OC approve IRO-006-WECC-1 and that after regulatory approval, it shall supersede IRO-STD-006-0.*

**Explanation:** Mitigation of transmission overloads due to unscheduled flow on Qualified Transfer Paths.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	33	0	1
TRANSMISSION CUSTOMERS	39	2	7
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>73</b>	<b>2</b>	<b>8</b>

Result: PASSED

Minority Opinion:

No minority opinions were offered at the meeting and none were received via email.

6. **Motion:**

*The FAC-501-WECC-1 Standard Drafting Team recommends that the OC approve FAC-501-WECC-1 and that after regulatory approval, it shall supersede PRC-STD-005-1.*

**Explanation:** To ensure the Transmission Owner of a transmission path identified in the table titled “Major WECC Transfer Paths in the Bulk Electric System” including associated facilities has a Transmission Maintenance and Inspection Plan (TMIP); and performs and documents maintenance and inspection activities in accordance with the TMIP.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
TRANSMISSION PROVIDERS	28	4	2
TRANSMISSION CUSTOMERS	30	1	14



STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>59</b>	<b>5</b>	<b>16</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from SMUD and TANC

7. **Motion:**

*The TOP-007-WECC-1 Standard Drafting Team recommends that the OC approve TOP-007-WECC-1 and that after regulatory approval, it shall supersede TOP-STD-007-0.*

**Explanation:** When actual flows on Major WECC Transfer Paths exceed System Operating Limits (SOL), their associated schedules and actual flows are not exceeded for longer than a specified time.

VOTING CLASS	YES	NO	ABSTAIN
TRANSMISSION PROVIDERS	30	3	1
TRANSMISSION CUSTOMERS	29	4	13
STATE and PROVINCIAL	1	0	0
<b>TOTALS</b>	<b>60</b>	<b>7</b>	<b>14</b>

Result: PASSED

Minority Opinion:

- Please see Appendix A for comments received via email – Comments from SMUD and TANC

**APPENDIX A**

**REASONS FOR NO VOTES <sup>1</sup>**

**Scott Kinney, Avista Corp. (AVA)**

Here are my reasons for voting no on the following standards:

VAR-002-WECC-1 and VAR-501-WECC-1 - Neither of these standards give the Transmission Operator any discretion to exempt a generator from requiring operation in AVR mode or having PSS in service regardless of the size of the generator or its impact on the BES. The VAR-002-WECC-1 standard applies to any generator connected to the BES. Avista commented during the standard development that the TO should have some discretion (NERC gives the TO some discretion in VAR-002-1) to exempt generators that have no impact on the BES with or without AVR and PSS in service based on their location and/or size. During the standard drafting Avista suggested the standards should require a TO to provide study results to verify there is no impact to the BES and that there should be a MVA size limit on generators that can be exempt from the standards.

PRC-004-WECC-1 - The WECC standard goes way above and beyond the requirements of NERC standard PRC-004-1. Avista does not believe the additional requirements are necessary to ensure that relay and RAS/SPS failures are adequately reviewed. The standard adds additional burden without and inherent benefits.

Thank you for the opportunity to comment.

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**Clement Ma, BC Hydro**

BC Hydro has serious concerns regarding the proposed standard BAL-WECC-002. The team that developed the standard has indicated that the 3% load, 3% generation numbers were proposed as a compromise as opposed to being based on a technical evaluation of reserves from a reliability standpoint. In analyzing the costs of the proposal, the team only looked at aggregate impacts for the WECC and the sub regions. However, this analysis misses the significant cost impact that arises for predominantly hydro based Balancing Authorities. BC has operated reliably using the 5% hydro standard for many years. The proposed standard will result in an increase in BC Hydro's operating reserve requirements by almost 1% (close to 100 MW on winter peak) without any technical justification (nor practical justification in light of our reliable operating history) to justify to its ratepayers the increase in cost of holding this additional operating reserve.

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<sup>1</sup> The reasons for no votes in the appendix were submitted by the individual entities via email after the Operating Committee meeting. The reasons for no votes in the main document were stated at the Operating Committee Meeting in Albuquerque, NM

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**Julie Martin, BP Energy Company (BPEC)**

Of the 7 Standards that were balloted, BP Energy Company (BPEC) voted "No" on 1 Standard. This one Standard was VAR-002-WECC-1 (Automatic Voltage Regulators). BPEC voted "No" on this Standard because we felt the following problems exist in the Standard as proposed:

VAR-002-WECC-1 requires generators to operate in a constant voltage mode at all times, but it does not require the transmission operator ("TOP") to provide the generator with a voltage setting to program into the AVR. To the extent that a TOP provides a reactive power schedule (instead of a voltage setting), it forces the generator operator to manually adjust the voltage settings on the AVR throughout the day in an attempt to maintain the amount of reactive power specified by the TOP.

This places a significant burden on the plant operators since they must manually adjust voltage settings every time the system voltage shifts up or down.

It also poses a significant risk of voltage collapse if plant operators see an increase in reactive output caused by a drop in system voltage caused by a transmission contingency and they manually respond by reducing reactive output to the pre-contingency level. This is exactly the opposite of what is needed when system voltage begins to collapse, even though the generation operators were simply following the reactive power schedule provided by the TOP.

This exposes all parties to a large share of responsibility if a voltage collapse does occur. TOPs will be blamed for failing to provide voltage schedules that would have prevented the manual intervention by generators. Generators will be blamed for doing the wrong thing at the wrong time when they reduced reactive output while the system was collapsing. WECC will be blamed for adopting a flawed standard which authorized TOPs to use this mode of voltage control.

A better alternative to the proposed standard is to include in a WECC standard a requirement that TOPs issue voltage schedules to generators.

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**John Cummings, PPL Energy Plus (EPLUW)**

BAL-002-WECC-1 Contingency Reserves

While EPLUW believes that the redrafted BAL-002 is an improvement, EPLUW voted no because there is an inconsistency between the proposed reliability requirement and the method in which reserves are procured and provided under the existing Open Access Transmission Tariffs (OATT). Transmission Providers (TP) must generally offer operating reserves under their OATTs to Transmission Customers serving load in the TP's Control Area. Otherwise, there is no default supplier of reserves. Further, the implementation of the proposed standard has not been fully explained, and it is unclear if

reserves will be available to all market participants that may be required to procure or provide them in the future. EPLUW would like to see these issues addressed before the standard becomes effective.

VAR-002-WECC-1 Automatic Voltage Regulators

EPLUW voted no because the proposed standard does not have a grandfathering provision to address existing, older generating units that may not meet the proposed requirement.

VAR-501-WECC-1 Power System Stabilizer

EPLUW voted no because the actual reliability standard (not WECC policies) should include an explicit description of which units must have PSS's (including which units are grandfathered), and this criteria should be subject to change in accordance with the standard development process.

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**John Stout, Mariner Consulting Services**

**Why the WECC Automatic Voltage Regulator Standard (VAR-002-WECC-1) Should Not be Approved as Currently Proposed**

At the March OC meeting, a significant number of WECC Generation Operators voted against acceptance of the proposed WECC AVR standard. Most did so because this standard allows Transmission Operators to direct generators to operate in a manner which exposes WECC to a significant and unnecessary risk of voltage collapse, and exposes those generators to increased and unreasonable risk of incurring non-compliance penalties.

One of the important lessons learned in the July/August 1996 WECC blackouts was that operation of generation in a constant reactive power mode increased the risk of voltage collapse and, therefore, should be limited in WECC. The technical reason for this conclusion is the fact that when voltage begins to collapse, increased reactive power output is required in order to raise the voltage and prevent it from collapsing to the point of causing a blackout. Therefore, WECC established a requirement that, with ten exceptions, generation controls had to be operated in the constant voltage mode of operation. In this mode of operation, if voltage declines, the generator automatically increases and maintains its reactive power output until the voltage returns to normal. That requirement is the genesis of the proposed WECC AVR standard.

WECC Generation Operators support the requirement that their AVR's be operated to maintain voltage and automatically respond with increased reactive output to prevent voltage collapse.

However, not all WECC Transmission Operators allow interconnected Generation Operators to provide voltage responsive reactive support. Certain Transmission Operators have refused to provide voltage schedules to their Generation Operators.

They are allowed to do this because the proposed WECC AVR standard does not include a requirement that Transmission Operators provide voltage schedules. Instead, the WECC AVR standard is silent on this issue, allowing Transmission Operators to follow less restrictive NERC standards which afford them the option of providing reactive power schedules rather than voltage schedules. This practice forces Generation Operators to manually adjust their AVR voltage setting by trial and error to find a voltage setting that will provide the exact amount of reactive power directed by the Transmission Operator. Since the voltage on the transmission grid varies throughout the day, the Generation Operator is forced to continuously reset the voltage on the AVR. This is an unnecessary and distracting manual control burden on the Generation Operator. It effectively eliminates the “Automatic” in “Automatic Voltage Regulator.”

NERC VAR-002 requires the Generation Operator to comply exactly with the voltage schedule or reactive power schedule directed by the Transmission Operator. If the Transmission Operator provides a voltage schedule, the AVR can automatically maintain compliance with the NERC standard. If the Transmission Operator refuses to provide a voltage schedule, and instead insists on providing a reactive power schedule, compliance can no longer depend on the automatic operation of the AVR. The proposed WECC AVR standard prohibits the AVR from being switched to a constant reactive power mode of operation. Instead compliance becomes totally dependent on constant attention and readjustment by the Generation Operator. This significantly increases the risk of reliability standard non-compliance for the generator.

Even more disturbing is the fact that this situation (the Transmission Operator specifying a constant reactive power output rather than a constant voltage level) defeats the intended purpose of the WECC AVR standard, to prevent a voltage collapse. If voltage does begin to collapse, the generator AVR, operating in constant voltage mode, will increase the reactive power output from the unit. That increase in reactive output means that the generator will no longer be producing the amount of reactive power specified by the Transmission Operator’s reactive power schedule. Once this occurs, the Generation Operator must immediately reduce the reactive power provided by the generator or risk fines for noncompliance with NERC standard VAR-002, R2. That will result in the generator doing the exact opposite of what is needed to prevent a voltage collapse and exposes WECC to a risk of blackout.

This issue was repeatedly raised during the standards development process, but the drafting team took the position that it was not a problem that needed to be addressed by the WECC AVR standard. During the March vote at the OC, an amendment was proposed to resolve this issue by adding a requirement to the WECC AVR standard that Transmission Operators provide voltage schedules instead of reactive power schedules. No one expressed an opinion that the concerns raised by generators regarding the reliability risk to WECC were invalid, yet the proposed solution was overwhelmingly rejected by the OC. Unfortunately, due to the voting structure of the OC, the concerned Generation Operators are in a minority and could do nothing more to resolve this issue.

The WECC Board should not take the same path as did the drafting team and the Operating Committee. We believe the Board should do at least three things before approving this standard.

First, the WECC Board should ask the OC to report on the validity of the reliability risk and the compliance risk described above. If their response results in a Board conclusion that either risk is valid, the following additional questions should be raised by the Board.

The WECC Board should ask the OC to provide specific information on which Transmission Operator's provide reactive power schedules rather than voltage schedules to their interconnected generators. This information should include the specific reasons why such Transmission Operator's have chosen to provide reactive power schedules and explain why those reasons outweigh the reliability and compliance risk created by reactive power schedules. If the Board concludes those reasons are not sufficiently justified, the Board should remand this AVR standard for inclusion of a voltage schedule requirement.

If valid reasons are provided to the preceding question, the WECC Board should ask the OC to explain why each of those reasons were not included with the ten exceptions already listed under R1 of the WECC AVR standard. If the OC cannot justify why those reasons should not be included in the ten exceptions, the Board should remand the standard until those reasons are included. By adding such reasons to the list of exceptions, Generation Operators should be allowed to place their AVR in the automatic control mode that matches the reactive power schedule provided by the Transmission Operator (i.e. Constant MVAR mode for VAR Schedules or constant Power Factor mode for Power Factor Schedules.)

While Board members may feel a reluctance to not support the OC recommendation to approve the currently proposed AVR standard, each Board member should recognize an important distinction between votes at the OC and votes by the Board. Standing Committee members are entitled to vote in accordance with their self interests. Board members have a different standard. Board Members are obligated to vote what is best for WECC. That difference can cause Board votes to sometimes result in different outcomes than Standing Committee votes. While our position was the minority opinion within the OC, we firmly believe it to be the best path for maintaining the reliability and credibility of WECC.

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**Fred Young, Northern California Power Agency (NCPA)**

NCPA reviewed this standard prior to the OC meeting and from an operating/reliability perspective has no objection to the proposed changes to BAL-STD-002-0. However, based on discussions with our trading personnel and counter-parties, there is significant confusion as to the impacts of the change from 5%hydro/7%thermal to

3%generation/3%load in the calculation of a BA’s Contingency Reserve requirement. The market is saying that the 3% of load portion will be passed on to the LSE irrespective of the LSE’s location, i.e. in the Source BA or Sink BA. This confusion was further reinforced by Mr. David Lemmons response to a question from Powerex concerning cost shifts. Mr. Lemmons’ response is that it is time for the load to carry their share.

This standard, BAL-002-WECC-1 does not contain language that moves any contingency reserve responsibility to the load. It only changes how the Contingency Reserve requirement for a BA or Reserve Sharing Group is calculated. It is evident by one of the author’s comments, Mr. Lemmons, that there are some significant market changes that will result from implementation. Without clarification of these market impacts, NCPA could not support BAL-002-WECC-1.

NCPA fully supports standards that enhance reliability. But reliability at any cost or unknown cost is unacceptable.

The foregoing is why NCPA did not support BAL-002-WECC-1.

Thank you for your consideration.

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**Marc Donaldson, North Western Energy (NWMT)**

Reasons for NorthWestern Energy (NWMT) No Vote on WECC Standard  
BAL-002-WECC-1 – Contingency Reserves

On March 6, 2008, NorthWestern Energy (NWMT) voted No on WECC Standard BAL-002-WECC-1 – Contingency Reserves for the following reasons:

1. Although the amount of required reserves stated in R1.1.2. (sum of three percent of the load and three percent of net generation) may make the determination of required reserves easier than the prior five percent of hydro and seven percent of thermal and, although the previous five and seven percent was determined arbitrarily, the “three plus three” approach is still arbitrary and may negatively impact reliability of the Western Interconnection.
2. The standard may result in an unfair shift of reserve obligation, which may also result in a shift of costs.

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**Mike Ryan, Portland General Electric (PGE), Transmission Provider**

This is in response to your request for the reasons behind NO votes on BAL-002-WECC-1.

As you well know, I have been voicing my concerns over the direction that this drafting team has taken at every opportunity to change the WECC's contingency reserve requirements. I have regularly offered comments on the posted drafts, but have seen little change in the contents.

My comments about the reliability consequences of BAL-002-WECC-1 are these:

- The "Tier One" BAL-STD-002-0 reflects the current WECC MORC by breaking down required operating reserve into four components: regulating reserve, contingency reserve, reserve for on-demand obligations, and reserves for interruptible imports. The proposed BAL-002-WECC-1 narrows the scope to only contingency reserve, which raises the question of what happens to the other components. NERC BAL-002 adequately covers regulating reserve, but includes no provisions for on-demand obligations or interruptible imports. BAL-002-WECC-1 does include some language for on-demand obligations, but only as contingency reserve; no other types of on-demand rights are addressed.

It's not clear to me how the decision to narrow the scope of the WECC BAL-002 standard will affect the current requirements in the WECC MORC. This should have been made clear in the proposal. I hope the Board will make it clear that BA's must still carry additional operating reserves to account for on-demand obligations and interruptible imports.

- The "load responsibility" concept helped characterize the nature of the transactions. For the "sink" BA, it identified those imports that were "firm for the hour". Simplifying the calculation of contingency reserve does NOT relieve the BA from anticipating which imports might be interrupted in-hour, and therefore what additional reserves need to be available. The recently adopted clarification of "load responsibility" and e-tag 1.8 made it easier. Now it seems everyone will be forced to parse the energy codes to infer what's "firm for the hour".

It would be helpful if the Board directed members to continue to use the "load responsibility" feature in e-tag 1.8 to clearly identify those transactions that are not "firm for the hour".

- Despite voiced concern over the difficulty of interpreting "load responsibility", the drafting team saddled WECC BAL-002 with "interruptible load". As a BA, I do not want to be put in a position to judge whether or not loads offered up by an LSE meet the contract requirements of being "interruptible".

I also have a comment not related to reliability. Or rather, a comment that the changes made through BAL-002-WECC-1 don't seem to be prompted by genuine reliability concerns (only thinly disguised in them). At their heart the changes seem to be driven more by the economic interests of some to shift contingency reserve responsibility (i.e. costs) from the generators to the loads (and perhaps the new MIC mantra that transactions



can't have reliability implications). I'd like to think that reliability changes should be driven by technical merit weighed against overall costs, and that the Board will not allow the WECC's standards process to be used as a lever to shift costs among members.

You'll also remember that I've frequently found myself defending the drafting team's right under WECC "due process" to produce their draft as they see fit, however to my eyes the results are far from pretty. This standard, combined with the NERC/FERC ability to trump WECC "due process" (e.g. sanction tables), raises serious doubts in my mind to about the workability of WECC standards process.

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### **JJ Jamieson, Portland General Electric (PGE), Transmission Customer**

Portland General Electric voted against BAL-002-WECC-1 at the 3/6/08 meeting in Albuquerque, New Mexico.

Portland General Electric Merchant posted the following comments 02/21/08 in response to the posting of BAL-002-WECC-1 for review before voting at the upcoming Operating Committee meeting in Albuquerque, New Mexico. Our comments have not been responded to in any forum since posting.

“Portland General Electric Merchant is concerned with the movement toward unnecessary changes to the approved standard proposed in BAL-002-WECC-1 particularly due to the motivation being cited. At no time should the basis of a reliability standard be centered on “a compromise” rather than the requirements of operational reliability.

In public meetings held with / by the BAL-002-WECC-1- drafting team there was no evidence presented that illustrated increased reliability under BAL-002-WECC-1. The meetings showed that in fact BAL-002-WECC-1 could result in a reduced level of reliability in the WECC region.

Why is a reliability entity allowing a compromise on standards that impact reliability?

We are all being held to these standards and they should be defined by what is necessary for reliability, otherwise it isn't a reliability issue and the market will define the products.

The biggest deficiency of this “compromise” is that it assumes that we have a robust and fully functioning market for reserves. To our knowledge most merchants do not have the right to sell reserves, let alone have extra to sell, and there has not been any formal discussion of how cost based entities can function in a WECC region reserves market. We need to agree that reserves are a reliability issue in determining use and level but a market issue when determining responsibility.

The public meetings showed the proposed BAL-002-WECC-1 move towards the creation of a market product rather than a reliability standard.

WECC has been very clear that the definition of market products is not within their mandate “WECC should focus on the interpretation of reliability criteria. It should not define energy market products.” (Load Responsibility July 26, 2007) and it is equally as clear that the proposed BAL-002-WECC-1, while perhaps not intentionally, will result in the definition of a new energy product albeit not named by the standard itself.

Is it WECC’s intention, with BAL-002-WECC-1, to create an energy product leaving only the naming of said product to the WSPP and other like entities?

Portland General Electric Merchant encourages the BAL-002-WECC-1 drafting team to work towards the establishment of a standard that is focused on the reliability of the system rather than a compromise that defines a market product.

Portland General Electric Merchant”

It was communicated at the Operating Committee meeting that we should pass BAL-002-WECC- 1 because ‘WECC doesn’t want to go to FERC and request an extension.’ Is this appropriate reasoning when dealing with issues affecting reliability?

We are concerned that BAL-002-WECC-1 is assuming a robust reserves market in the West. The West doesn’t have a mature reserves market and this will put additional burden on the load serving merchants by forcing them to procure reserves from the generators in order to meet the new standard. How does WECC propose BAL-002-WECC- 1 will be able to sustain a reliable system absent a robust reserves market?

We echo Puget Sound Energy’s concerned that BAL-002-WECC- 1 will result in a cost shift between Market participants without any additional reliability being realized.

Portland General Electric also agrees with Powerex in that there simply was not an appropriate level of analysis down to support a wholesale change in how reserves are handled in the WECC.

Finally, Portland General Electric states again that reliability standards should not be based on compromise but rather careful consideration of what will provide the most reliable and effective system.

Thank you for the opportunity to comment

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**Mike Goodenough, Powerex (PWX)**

Powerex agrees with the explanation for voting "No" to BAL-002 offered by BC Hydro.

In addition, Powerex would add that the proposed standard will require changes in markets that have not yet been considered. While we are supportive of the objectives to bring clarity to how reserve obligations are determined and commend the team for making progress in obtaining that clarity, no consideration was provided for how implementation of the new standard might impact the existing market and transmission tariff structures and what new uncertainties might be created. This should be considered so that we do not incur unnecessary adaption costs, which would then be followed by additional costs to implement the Frequency Response Reserves standard, which is a far more technically sound approach to re-examining the way reserve requirements should be calculated. BC Hydro and Powerex believe that this consideration should occur before the standard is adopted.

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**Gary Nolan, Puget Sound Energy (PSEI)**

PSEI, as a TP, only voted "No" on BAL-002. Our explanation is summed up by the comments Joe Hoerner from PSEM posted on the WECC website with our agreement.

Puget Sound Energy (PSE) appreciates the opportunity to provide comments on the proposed WECC Standard BAL-002-WECC-1 (Contingency Reserve). These comments are provided on behalf of Puget Sound Energy’s transmission and merchant functions.

Upon review and analysis of the proposed Standard BAL-002-WECC-1, PSE can not determine how this standard provides any additional reliability over today’s standard. The proposal alters the calculation for contingency reserves instead of clearly defining how contingency reserves would be activated to ensure system reliability. Furthermore, PSE’s analysis indicates that adoption of this standard will result in significant cost shifts from generators to load-serving entities. PSE’s ratepayers could expect to pay an additional \$14,000,000 more per year in increased contingency reserve obligations without any added reliability benefit. PSE cannot find any legitimate reason as to why our regulating entities could justify our approval of such a cost increase with no benefit. If, in fact, the primary justification for creating the standard is to firmly establish the obligation of where the reserve obligation lies, then we feel it is more appropriate to address this issue in the commercial forum.

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**Pawel Krupa, Seattle City Light (SCL)**

I have to apologize for being late in responding to your e-mail.

On the behalf of SCL I cast NO vote for the BAL-002-WECC-1 standard. In preparation for the OC meeting I attended the BAL-002-WECC-1 workshop in Portland and we discussed this standard internally within SCL. Based on our internal discussions we believed we could not support this standard at its current version. Below are some of the reasons that we are not supporting this proposed standard as currently written:

1. Requirement R.1. The proposed standard changes the amount of contingency reserves required to carry by the BA's to 3% of the BA's total generation and 3% of the BA's total load. The current WECC standard BAL-STD-002-0 requires to carry 5% reserves for load responsibility served by hydro generation and 7 % served by thermal generation. We believe that there is no technical explanation for the new allocation of 3% generation and 3% of load. The 5% and 7% allocation was based on system data collected during the previous system disturbances and it provided safe contingency reserve margin during many severe disturbances in WECC interconnection. During the workshop in Portland drafting team stated that the 3% and 3% allocation was the best compromise the members of the drafting team were able to agreed to. The data presented by the drafting team during the workshop did not support the statement that the amount of contingency reserves available in the WECC Interconnection will not decrease as a result of this new standard. We believe that the reserve allocations should be based on the system studies rather than the ability of the drafting team to reach a compromise.

2. Requirement R.2. This requirement changes the definition of spinning reserve. Under this requirement the spinning reserve doesn't have to be carried by the synchronized generating units. The requirement states that spinning reserve needs to meet two requirements

R.2.1 Initially automatically respond to frequency deviations.

R.2.2. Capable of fully responding within ten minutes.

Based on this definition it is possible to use devices other generators to provide spinning reserves that could meet these requirements. The underfrequency relays for example could meet these new requirements, they will automatically respond to frequency deviation and will definitely respond within 10 minutes. We believe that this is a significant change in the definition of spinning reserves that again could have a detrimental effect on the stability of the WECC Interconnection.

3. R.3.6. This requirement identifies firm load as an acceptable type of reserves during energy emergency. This requirement does not specify if the load could only be used as a reserves by the BA declaring energy emergency. Based on the interpretation it is possible that every BA in the WECC or every BA in the Reserve Sharing Group could use firm load as a source of reserves once the energy emergency is declared by one single BA. This is also significant change from the previous standard and WECC MORC. The firm load was never before consider a source of reserves. I asked this question during the workshop and the drafting team did not provide an explanation why this was included as a acceptable source of contingency reserves.

We understand that there were many comments submitted to the drafting team during development process and we don't believe that all of these comments were addressed by the drafting team. We understand that there were some time limitations to develop and approve this standard, but we don't agree that this standard as currently written addresses all issues related to the contingency reserves in WECC Interconnection.

We believe that the above reasons were sufficient to justify our NO vote for this standard.

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**Vicken Kasarjian, Sacramento Municipal Utility District (SMUD)**

The following are the reasoning behind my “no” vote on VAR-002-WECC-1, BAL-002-WECC-1, FAC-501-WECC-1, TOP-007-WECC-1, and PRC-004-WECC-1.

General comments:

1. Unnecessary additional requirements for WECC Members with higher exposure to violations/sanctions. Without justification, WECC is trying to hold itself to higher standards than the rest of the nation under NERC.
2. The drafting teams did not actually test the proposed standards prior to bringing it to a vote. A 6 month test with some applicable entities would have been quite helpful.
3. No guidance on how to actually be compliant with these standards.

Additional specific comments:

1. BAL-002-WECC-1: 3% has no technical basis – should go with MSSC to retain or enhance reliability
2. FAC-501-WECC-1: Replaces WECC PRC-STD-005-1: Addresses maintenance and test requirements for additional components (CBs, reactive devices, transformers, etc) not addressed in PRC-005; this impacts Transmission Maintenance Inspection Program for the Major WECC Transfer Paths. Also, it uses a justification that states “minimize SOL reductions to maintain reliable Western Interconnection operation” – if this reasoning is true, then it should also be used by NERC.

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**John S. Forman, Transmission Agency of Northern California (TANC)**

In response to the question of why a no vote was made on the standards at the OC meeting, TANC's OC representative voted no on five of the seven proposed standards for one basic reason: The standards require that the WECC be more stringent than the NERC standards. Those entities that have gone through an audit of the standards that are in

effect are finding that they will be sited for something that is not in compliance. In other words, the auditors will keep looking until something is found to be wrong. With the WECC standards higher than NERC, even more compliance problems are anticipated.

We believe that one basic instruction to the drafting teams should be that they need to justify a standard being more stringent than NERC, and that the basic draft should be no more than equal to NERC, unless it's clearly in the interest of the WECC. Our two positive votes on VAR-501 and IRO-006 are in that "best interest of WECC" category. The other standards were not. Basically, we are not sure that always being better than NERC is the right philosophy.

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**Board of Directors  
April 16-18, 2008  
Coronado, CA**

**Voting Summary  
VAR-501-WECC-1**

<b>Last Name</b>	<b>First Name</b>	<b>Organization</b>	<b>Class</b>
Anderson	Bob	Non-affiliated Director	Non-Affiliated
Areghini	David	Salt River Project	Class 1
Barbash	Carolyn	Sierra Pacific Power Company	Class 1
Beyer	Lee	California Public Utilities Commission	Class 5
Brown	Duncan	Calpine Corporation	Class 3
Campbell	Ric	Utah Public Service Commission	Class 5
Cauchois	Scott	CADRA	Class 4
Chamberlain	Bill	California Energy Commission	Class 5
Cleary	Anne	Mirant Americas, Inc.	Class 3
Conway	Teresa	Powerex Corp.	Class 6
Coughlin	John	Non-affiliated Board Member	Non-Affiliated
Dearing	Bill	Grant County PUD	Class 2
Ferreira	Richard	TANC Executive Advisor	Class 2
Grantham-Richards	Maude	Farmington Electric Utility System	Class 2
Gutting	Scott	Energy Strategies, LLC	Class 4
Kelly	Nancy	Utah Committee of Consumer Services	Class 4
King	Jack	Non-affiliated Board Member	Non-Affiliated
LaFond	Steve	The Boeing Company	Class 4
Little	Doug	British Columbia Transmission Corporation	Class 6
McMaster	Dale	Alberta Electrical System Operator	Class 6
Moya	Jesus	Comision Federal de Electricidad	Mexico
Newton	Tim	Non-affiliated Director	Non-Affiliated
Sharpless	Jananne	Non Affiliated Board Member	Non-Affiliated
Smith	Marsha	Idaho Public Utilities Commission	Class 5
Stout	John	Mariner Consulting	Class 3
Tarplee	Gary	Southern California Edison	Class 1
Thuston	Tim	Williams Power	Class 3
Weis	Larry	Turlock Irrigation District	Class 2
VanZandt	Vicki	Bonneville Power Administration	Class 1
Zaozirny	Lori Ann	British Columbia Utilities Commission	Class 6

The Board Members listed above voted whether to approve VAR-501-WECC-1.  
The Regional Reliability Standard was approved unanimously.

**FERC and NERC Directives for a Permanent Replacement Standard  
for VAR-STD-002B-1 Power System Stabilizer (PSS)  
May 1, 2008**

<b>Received From</b>	<b>FERC and NERC Directives for a Permanent Replacement Standard for VAR-STD-002B-1 June 8, 2007</b>	<b>Completed Actions</b>
<b>NERC Staff Common Revisions to WECC “Tier 1” Standards</b>	Remove RMS Sanction Table	The Reliability Management System (RMS) Sanction Table is removed from the standard.
NERC	Include Violation Risk Factors	The drafting team added Violation Risk Factors.
NERC	Include Violation Severity Levels	The drafting team added Violation Severity Levels for each main requirement.
NERC	Include Mitigation Time Horizon	The drafting team added Time Horizon.
NERC	Start date first day of quarter	<b>Effective Date:</b> On the first day of the next quarter, after receipt of applicable regulatory approval.
NERC	Include Applicable functional entity in Requirements and Measures	The drafting team included the applicable functional model entity in requirements and measures.
NERC	Written in Active Voice	The standard is written in an active voice.
NERC	Exclude comments, statements, background and references	The drafting team removed comments, statements, background, and references.
NERC	Individual requirements and measures convey only one main issue	Each requirement and measure conveys only one main issue.
NERC	Each measure refers to clearly to requirement(s) applicable to	There is a measure for each main requirement.
NERC	Include Reset Time Frame	The drafting team included a



Received From	FERC and NERC Directives for a Permanent Replacement Standard for VAR-STD-002B-1 June 8, 2007	Completed Actions
		reset time frame.
NERC	Remove second sentence of data retention	The drafting team removed reference to data retention.
NERC	Exclude Excuse for Performance	The drafting team removed the Excuse for Performance provision.
NERC	Align definitions with NERC definitions	The standard uses the NERC definitions.
NERC	Include functional entity in Additional Compliance Information	Functional model entity information is in the compliance section.
NERC	Clarify reference used for Business Day	The definition for Business Day is removed.
<b>FERC Revisions to VAR-STD-002B-1</b>	No comments.	.
<b>NERC Revisions to VAR-STD-002B-1</b>	Break WR1 into at least 2 requirements and revise Measures accordingly.	The drafting team completely revised WR1. This comment no longer applies.
<b>NERC Revisions to VAR-STD-002B-1</b>	Move paragraph two under Compliance Monitoring Period to Additional Compliance information	The drafting team completely revised the Compliance Monitoring Period section.

**The VAR-501-WECC-1 Drafting Team Completed Actions for a Permanent Replacement Standard  
for VAR-STD-002B-1 Power System Stabilizer (PSS)  
May 1, 2008**

<b>Received From</b>	<b>Previous Comments to Consider for VAR-STD-002B-1 June 8, 2007</b>	<b>The VAR-STD-002B-1 Drafting Team Consideration of Comments</b>	<b>The VAR-501-WECC-1 Drafting Team Completed Actions</b>
<b>NERC Question #1</b>	<b>Was the proposed standard developed in a fair and open process, using the associated Regional Reliability Standards Development Procedure? If not, please explain in the comment area.</b>		
No comments.			
<b>Question #2</b>	<b>Does the proposed standard pose an adverse impact to reliability or commerce in a neighboring region or interconnection?</b>		
No comments.			
<b>Question #3</b>	<b>Does the proposed standard pose a serious and substantial threat to public health, safety, welfare, or national security?</b>		
No comments.			
<b>Question #4</b>	<b>Does the proposed standard pose a serious and substantial burden on competitive markets within the</b>		

Received From	Previous Comments to Consider for VAR-STD-002B-1 June 8, 2007	The VAR-STD-002B-1 Drafting Team Consideration of Comments	The VAR-501-WECC-1 Drafting Team Completed Actions
	<b>interconnection that is not necessary for reliability?</b>		
No comments.			
<b>Question #5</b>	<p><b>Does the proposed regional reliability standard meet at least one of the following criteria?</b></p> <p>The proposed standard has more specific criteria for the same requirements covered in a continent-wide standard. The proposed standard has requirements that are not included in the corresponding continent-wide reliability standard. The proposed regional difference is necessitated by a physical difference in the bulk power system.</p>		
No comments.			
<b>WECC Proposed Tier 1 Standards – Response to Comments</b>	November 7, 2006 – 3-4:30 PM PST <b>Conference call participants:</b> Don Watkins, David Lemons, Ed Hulls, Paul Humberson, Sarah Majok, Brent Kingsford, Steve Cobb		
Paul Rice	In the RMS Reformatted version of VAR-STD-002-1 for Automatic Voltage	Thank you. This has been corrected in the document.	The VAR-501-WECC-1 standard drafting team was not

Received From	Previous Comments to Consider for VAR-STD-002B-1 June 8, 2007	The VAR-STD-002B-1 Drafting Team Consideration of Comments	The VAR-501-WECC-1 Drafting Team Completed Actions
	Regulators, each "Sanction Measure" contains the same following sentence. "There shall be a Level I non-compliance if any of the following conditions exist:" I believe that the statement should be changed in each of 2.2 Level 2, 2.3 Level 3 and 2.4 Level 4 to coincide with the Level it is referring to. In other words, 2.2. Level 2: (should read) "There shall be a Level 2 non-compliance if any of the following conditions exist:" instead of the way it reads, etc.		required to take any action regarding this comment.
Richard Padilla	I have the following comments: 1) The RMS standards are not fully replicated. You have neglected to include the "Excuse for Performance" sections of the RMS. This cannot be allowed. The development of this as a standard could also allow modifications. I have two items for consideration:		
Richard Padilla	a) The "Excuse for Performance" section should also include an order from the transmission operator. Therefore, if the TO refuses to allow work (i.e. no touch day)	Response: You are correct. This general RMS content will be added to each of the Tier 1 standards it applies to.	NERC and FERC directed that Excuse for Performance be removed.

Received From	Previous Comments to Consider for VAR-STD-002B-1 June 8, 2007	The VAR-STD-002B-1 Drafting Team Consideration of Comments	The VAR-501-WECC-1 Drafting Team Completed Actions
	performance should be excused until such time as the required work to restore service for AVR or PSS can be rescheduled.		
Richard Padilla	b) Sub paragraphs c for AVR and g for PSS each include the phrase, "If these changes are outside the control of the owner", this should be stricken since any change that can impact system response will require testing to safely return the equipment to service. The 60 day period to perform testing must be made available.	Response: The standard is intended to exactly preserve the existing RMS meaning. The statement you wish stricken is part of the present RMS requirement and thus included. Changing the RMS standard is outside of the scope of this "Tier 1" standard.	The drafting team removed the requested language when it developed VAR-501-WECC-1.
Richard Padilla	2) The reformatted versions are utilizing the new WECC numbering and naming conventions. These new rules have generated two standards with identical names, namely one addressing Automatic Voltage Regulators and one addressing Power System Stabilizers each titled VAR-STD-002-1. This needs to be resolved. I believe that this problem will get worse since NERC has multiple items in single standards and multiple standards addressing similar issues.	Response: Thank you for identifying this. We will append the standard number with an a, b, c, etc. to account for this	The drafting team separated the Automatic Voltage Regulator (AVR) requirements from the Power System Stabilizer (PSS) by using the names VAR-002-WECC-1 for AVR and VAR-501-WECC-1 for PSS when it developed permanent replacement standards.
Richard Padilla	Given the number of issues, how can due	Response: While this is a new	The drafting team followed the

<b>Received From</b>	<b>Previous Comments to Consider for VAR-STD-002B-1 June 8, 2007</b>	<b>The VAR-STD-002B-1 Drafting Team Consideration of Comments</b>	<b>The VAR-501-WECC-1 Drafting Team Completed Actions</b>
	<p>process be followed and still meet the identified timeline? Due process and the consensus process for standard development should not be circumvented.</p>	<p>circumstance, we believe that we are operating within the applicable WECC rules and guidelines. The following language from the Process For Developing And Approving WECC Standards - Approved by WSCC Board of Trustees – August 24, 1999, page XI-148-9: “In cases requiring expediency, such as in the development of emergency operating procedures, the Market Interface Committee, Operating Committee, or Planning Coordination Committee may approve a new or modified Standard. Any such Standard must have an associated termination date and, even though already implemented, must undergo the formal technical review and approval process. Should this Standard not be formally approved through WECC’s Standards development and approval process it will cease to be in effect upon conclusion of</p>	<p>Process for Developing and Approving WECC Standards when it developed permanent replacement standards.</p>

Received From	Previous Comments to Consider for VAR-STD-002B-1 June 8, 2007	The VAR-STD-002B-1 Drafting Team Consideration of Comments	The VAR-501-WECC-1 Drafting Team Completed Actions
		<p>the process.” Additionally, the WECC By-laws and the current WECC Process for Developing and Approving WECC Standards specify the WECC Board of Directors must approve of all standards. This effort has been build around posting the proposed standards (containing content of approved and implemented RMS standards), allowing 30 days comment before a vote of the WECC OC. The comments are responded to and commensurate changes to the proposed standards completed and posted by the start of the 10 day OC e-mail ballot period. If approved, the standards will be immediately posted for 30 days after which the Board of Directors will vote on them. Both the OC and the board ballots will need to occur outside of scheduled meetings and will be done in accordance with their procedures. If the standard is</p>	

<b>Received From</b>	<b>Previous Comments to Consider for VAR-STD-002B-1 June 8, 2007</b>	<b>The VAR-STD-002B-1 Drafting Team Consideration of Comments</b>	<b>The VAR-501-WECC-1 Drafting Team Completed Actions</b>
		passed it will be submitted to the NERC Board in time for the required posting and comment period in time for their February meeting.	



## **VAR-501-WECC-1 Comparison**

This following document prepared by the drafting team during the development of the WECC Standard VAR-501-WECC-1 – Contingency Reserve compares this proposed regional standard to the existing WECC VAR-STD-002b-1.

The purpose of this document to provide documentation of each proposed change.

<b>WECC Standard VAR-501-WECC-1 – Power System Stabilizer</b>	<b>WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)</b>	<b>Comment</b>
<b>A. Introduction</b>		
<b>1. Title: Power System Stabilizer (PSS)</b>	<b>1. Title: Power System Stabilizer</b>	
<b>2. Number: VAR-501-WECC-1</b>	<b>2. Number: VAR-STD-002b-1</b>	Retired Criteria
<b>3. Purpose:</b> To ensure that Power System Stabilizers (PSS) on synchronous generators shall be kept in service.	<b>3. Purpose:</b> Regional Reliability Standard to ensure that Power System Stabilizers on generators shall be kept in service at all times, unless one of the exemptions listed in Section C (Measures) applies, and shall be properly tuned in accordance with WECC requirements.	Updated to reflect the overall purpose of the proposed revised standard.
<b>4. Applicability</b>	<b>4) Applicability</b>	
<b>4.1. Generator Operators</b>	4.1. The requirements of this criterion apply to all Generator Operators with generators equipped with Power System Stabilizers (PSS) within the Western Interconnection. The criterion shall be applied three months after a generator has achieved commercial operation. The criterion shall be applied on a generator-by-generator basis (i.e., a Responsible Entity can be subject to a separate sanction for each non-compliant generator). This criterion shall not be applicable to any generator for any calendar quarter in which such generator is in service for less than five percent of all hours in such quarter (the owners of the generation shall still be subject to the data reporting requirements for such quarter).	Generator Operators is a defined term in NERC’s Glossary of Terms Used in Reliability Standards so it is used in this standard without being redefined.
<b>5. Effective Date:</b> On the first day of the next quarter, after receipt of applicable regulatory approval.	<b>5. Effective Date:</b> This Western Electricity Coordinating Council Regional Reliability Standard will be effective when approved by the Federal Energy Regulatory Commission under Section 215 of the Federal Power Act. This Regional Reliability Standard shall be in effect for one year from the date of Commission approval or until a North American Standard or a revised Western Electricity	

WECC Standard VAR-501-WECC-1 – Power System Stabilizer	WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)	Comment
	Coordinating Council Regional Reliability Standard goes into place, whichever occurs first. At no time shall this regional Standard be enforced in addition to a similar North American Standard.	
<b>B. Requirements</b>		
<p><b>R.1.</b> Generator Operators shall have PSS in service 98% of all operating hours for synchronous generators equipped with PSS. Generator Operators may exclude hours for R1.1 through R1.12 to achieve the 98% requirement. <i>[Violation Risk Factor: Medium]</i> <i>[Time Horizon: Operations Assessment]</i></p> <p><b>R1.1.</b> The synchronous generator operates for less than five percent of all hours during any calendar quarter.</p> <p><b>R1.2.</b> Performing maintenance and testing up to a maximum of seven calendar days per calendar quarter.</p> <p><b>R1.3.</b> PSS exhibits instability due to abnormal system configuration.</p> <p><b>R1.4.</b> Unit is operating in the synchronous condenser mode (very near zero real power level).</p> <p><b>R1.5.</b> Unit is generating less power than its design limit for effective PSS operation.</p> <p><b>R1.6.</b> Unit is passing through a range of output that is a known “rough zone” (range in which a hydro unit is experiencing excessive vibration).</p> <p><b>R1.7.</b> The generator AVR is not in service.</p>	<p><b>WR1.</b> Power System Stabilizers on generators shall be kept in service at all times, unless one of the exemptions listed in Section C (Measures) applies, and shall be properly tuned in accordance with WECC requirements.</p>	<p>PSS replacement period was increased to 24 months from 15 months to facilitate procurement requirements for Nuclear Power Plants.</p> <p>The reliability authority directs the operation of the generator or synchronous condenser when the PSS is unavailable for service.</p>

WECC Standard VAR-501-WECC-1 – Power System Stabilizer	WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)	Comment
<p><b>R1.8.</b> Due to component failure, the PSS may be out of service up to 60 consecutive days for repair per incident.</p> <p><b>R1.9.</b> Due to a component failure, the PSS may be out of service up to one year provided the Generator Operator submits documentation identifying the need for time to obtain replacement parts and if required to schedule an outage.</p> <p><b>R1.10.</b> Due to a component failure, the PSS may be out of service up to 24 months provided the Generator Operator submits documentation identifying the need for time for PSS replacement and to schedule an outage.</p> <p><b>R1.11.</b> The synchronous generator has not achieved Commercial Operation.</p> <p><b>R1.12.</b> The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the PSS is unavailable for service.</p> <p><b>R.2.</b> Generator Operators shall have documentation identifying the number of hours excluded for each requirement in R1.1 through R1.12.  <i>[Violation Risk Factor: Low] [Time Horizon: Operations Assessment]</i></p>		

<b>WECC Standard VAR-501-WECC-1 – Power System Stabilizer</b>	<b>WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)</b>	<b>Comment</b>
<b>C. Measures</b>	<b>C. Measures WM1.</b>	
<p><b>M1.</b> Generators Operators shall provide quarterly reports to the compliance monitor and have evidence for each synchronous generator of the following:</p> <p><b>M1.1.</b> The number of hours the synchronous generator was on line.</p> <p><b>M1.2.</b> The number of hours the PSS was out of service with generator on line.</p> <p><b>M1.3.</b> The PSS in service percentage</p> <p><b>M1.4.</b> If excluding PSS out of service hours as allowed in R1.1 through R1.12, provide:</p> <p>M1.4.1. The number of hours excluded, and M1.4.2. The adjusted PSS in-service percentage.</p> <p><b>M2.</b> If excluding hours for R1.1 through R1.12, provide:</p> <p><b>M2.1.</b> The date of the outage</p> <p><b>M2.2.</b> Supporting documentation for each requirement that applies</p>	<p><b>WM1.</b> Each generating unit equipped with PSS shall have the PSS in service when the unit is on line with the following exceptions:</p> <p>a) Maintenance and testing, maximum of seven calendar days per quarter.</p> <p>b) PSS exhibits instability due to nonstandard transmission line configuration.</p> <p>c) Unit is operating in the synchronous condenser mode (very near zero real power level).</p> <p>d) Unit is generating less power than its design limit for effective PSS operation.</p> <p>e) Unit is passing through a range of output that is a known “rough zone” (range in which a hydro unit is experiencing excessive vibration).</p> <p>f) AVR is not in service.</p> <p>g) PSS does not operate properly due to a failed component in the PSS or resulting from a change in adjacent equipment whether it is control oriented or physical equipment that defines system response. If these changes are</p>	<p>Measures expended and split into a measure for each main requirement.</p>

WECC Standard VAR-501-WECC-1 – Power System Stabilizer	WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)	Comment
	<p>outside the control of the owner and result in an operating condition that is unsuitable for operation of PSS, an exception shall be granted until the operating condition is once again suitable, but in no event shall the period of operation without PSS exceed 60 days. The PSS must be repaired and returned to service within 60 calendar days or replaced within one year per incident from time of failure (<a href="#">Source: AVR and PSS 60 Day Exclusion</a>). If, during this 60 day or one year period, the decision is made to replace the excitation system, the excitation system, including PSS, must be back in service within one year of commitment to replace.</p> <p>If more than 60 days are needed to repair a PSS or more than one year is needed to replace a PSS or excitation system due to the length of time needed to obtain parts, an extension will be granted upon receipt of documentation by the WECC Staff. Such documentation shall include notice of the need for replacement or repair, the expected time required for the Responsible Entity’s procurement process, plus the manufacturer delivery time, plus 30 days for installation or if an outage is required for installation the date of the next scheduled outage, and the expected completion date of the work. The total amount of time shall not exceed one year for repair of the PSS or fifteen months for replacement of the PSS or excitation system.</p> <p>Participant shall provide the WECC Staff such</p>	

<b>WECC Standard VAR-501-WECC-1 – Power System Stabilizer</b>	<b>WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)</b>	<b>Comment</b>
	documentation as soon as practicable, but no later than the deadline for responding to the initial non-compliance notification letter issued by the WECC Staff. Once repairs are complete, WECC Staff shall be notified with the next quarterly report of the time the PSS is back in service	
<b>D. Compliance</b>	<b>D Compliance</b>	
<b>1 Compliance Monitoring Process</b>	<b>1. Compliance Monitoring Process</b>	
<b>1.1 Compliance Monitoring Responsibility</b> Compliance Enforcement Authority	<b>1.1 Compliance Monitoring Responsibility</b> Western Electricity Coordinating Council (WECC)	
<b>1.2 Compliance Monitoring Period</b> Compliance Enforcement Authority may use one or more of the following methods to assess compliance: <ul style="list-style-type: none"> <li>- Reports submitted quarterly</li> <li>- Spot check audits conducted anytime with 30 days notice</li> <li>- Periodic audit as scheduled by the Compliance Enforcement Authority</li> <li>- Investigations</li> <li>- Other methods as provided for in the Compliance Monitoring Enforcement Program</li> </ul> The Reset Time Frame shall be a calendar quarter.	<b>1.2 Compliance Monitoring Period</b> Quarterly  On or before the twentieth day of the month following the end of a quarter (or such other date specified in Form A.5), a Responsible Entity shall submit to the WECC Staff Power System Stabilizer data in Form A.5 (available on the WECC web site) for the immediately preceding quarter.	Remove specificity for reporting. The Compliance Enforcement Authority will include this detail in its reporting instructions.
<b>1.3 Data Retention Data Retention</b> The Generator Operators shall keep evidence for Measures M1 and M2 for three years plus current year, or since the last audit, whichever is longer.	<b>1.3 Data Retention</b> Data will be retained in electronic form for at least one year. The retention period will be evaluated before expiration of one year to determine if a longer retention period is necessary. If the data is being reviewed to address a question of compliance, the data will be saved beyond the normal retention period until the question is formally resolved.	Data retention period lengthened to 3 years plus the current year to ensure data are kept in a contiguous manner between audit periods.
<b>1.4 Additional Compliance Information</b>	<b>1.4. Additional Compliance Information</b>	No longer needed

<b>WECC Standard VAR-501-WECC-1 – Power System Stabilizer</b>	<b>WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)</b>	<b>Comment</b>
<p><b>1.4.1</b> The sanctions shall be assessed on a calendar quarter basis.</p> <p><b>1.4.2</b> If any of R1.2 through R1.12 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 R1.8 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.</p> <p><b>1.4.3</b> When calculating the adjusted in-service percentage, the PSS out of service hours do not include the time associated with R1.1 through R1.12.</p> <p><b>1.4.4</b> The standard shall be applied on a generating unit by generating unit basis (a Generator Operator can be subject to a separate sanction for each non-compliant synchronous generating unit or to a single sanction for multiple machines that operate as one unit).</p>	<p>The “Sanction Measure” is Synchronous Generating Unit Capability in MVA - and the Specified Period is the most recent calendar quarter. The sanctions shall be assessed on a quarterly basis, but for purposes of determining the applicable column in the <a href="#">Sanction Table</a>, all occurrences within the specified period of the most recent calendar quarter and all immediately preceding consecutive calendar quarters in which at least one instance of non-compliance occurred shall be considered.</p>	<p>because the NERC sanction table is used.</p> <p>The “additional compliance information” clarifies the calculation of the in service percentage that was previously contained in VAR-STD-002b-1.</p>
<p><b>2. Violation Severity Levels</b></p>	<p><b>Levels of Non-Compliance Sanction</b></p>	
	<p><b>Measure: Generating Unit Capability in MVA</b></p> <p><b>Sanction Measure:</b> Synchronous</p> <p>For levels of noncompliance with a specific number of days associated, (e.g., 7 days for maintenance and testing, etc.) the level of noncompliance will be calculated by the maximum number of contiguous calendar days of non-</p>	



WECC Standard VAR-501-WECC-1 – Power System Stabilizer	WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)	Comment
	<p>compliance reached for that incident during the calendar quarter. If an incident 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. When an incident continues from one quarter to another it will be considered a higher level of non-compliance, not a repeat occurrence. (Source: Sanctions)</p> <p>When calculating the in-service percentages in the following levels, do not include the time the PSS is out of service due to the exceptions listed above (Section IV.A.4. a-c).</p>	
<p><b>3. Violation Severity Levels for R2</b></p> <p><b>2.1. Lower:</b> There shall be a Lower Level of non-compliance if the following condition exists:</p> <p><b>2.1.1.</b> PSS is in service less than 98% but at least 90% or more of all hours during which the synchronous generating unit is on line for each calendar quarter.</p> <p><b>2.2. Moderate:</b> There shall be a Moderate Level of non-compliance if the following condition exists:</p> <p><b>2.2.1.</b> PSS is in service less than 90% but at least 80% or more of all hours during which the synchronous generating unit is on line for each calendar quarter.</p> <p><b>2.3. High:</b> There shall be a High Level of non-compliance if the following condition exists:</p> <p><b>2.3.1.</b> PSS is in service less than 80% but at least 70% or more of all hours during which the synchronous generating unit is on line for each</p>	<p><b>2.1. Level 1:</b> There shall be a Level 1 non-compliance if any of the following conditions exist:</p> <p>2.1.1. PSS is in service less than 98% but at least 96% or more of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.1.2. PSS is out of service more than 7 calendar days but not more than 14 calendar days due to maintenance or testing, or</p> <p>2.1.3. PSS is out of service for more than 60 calendar days but not more than 90 calendar days due to failed component, or</p> <p>2.1.4. Following the granting of an extension for repairs, the PSS was returned to service greater than zero days but less than or equal to 30 days beyond the specified extension repair completion date.</p> <p><b>2.2. Level 2:</b> There shall be a Level 2 non-compliance if any of the following conditions exist:</p>	<p>Same non compliance severity violation measure as existing standard except updated to reflect current standard. The exceptions previously listed are excluded in the requirements.</p>

WECC Standard VAR-501-WECC-1 – Power System Stabilizer	WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)	Comment
<p>calendar quarter.</p> <p><b>2.4. Severe:</b> There shall be a Severe Level of non-compliance if the following condition exists:</p> <p><b>2.4.1.</b> PSS is in service less than 70% of all hours during which the synchronous generating unit is on line for each calendar quarter.</p>	<p>2.2.1. PSS is in service less than 96% but at least 94% or more of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.2.2. PSS is out of service for more than 90 calendar days but not more than 120 calendar days due to failed component, or</p> <p>2.2.3. Following the granting of an extension for repairs, the PSS was returned to service greater than 30 days but less than or equal to 60 days beyond the specified extension repair completion date.</p> <p><b>2.3. Level 3:</b> There shall be a Level 3 non-compliance if any of the following conditions exist:</p> <p>2.3.1. PSS is in service less than 94% but at least 92% or more of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.3.2. PSS is out of service for more than 120 calendar days but not more than 150 calendar days due to failed component, or</p> <p>2.3.3. Following the granting of an extension for repairs, the PSS was returned to service greater than 60 days but less than or equal to 90 days beyond the specified extension repair completion date.</p> <p><b>2.4. Level 4:</b> There shall be a Level 4 non-compliance if</p>	

WECC Standard VAR-501-WECC-1 – Power System Stabilizer	WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)	Comment
	<p>any of the following conditions exist:</p> <p>2.4.1. PSS is in service less than 92% of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.4.2. PSS is out of service more than 14 calendar days due to maintenance or testing, or</p> <p>2.4.3. PSS is out of service for more than 150 calendar days due to failed component, or</p> <p>2.4.4. Following the granting of an extension for repairs the PSS was not returned to service or was returned to service greater than 90 days beyond the specified extension repair completion date, or</p> <p>2.4.5. Following the granting of an extension for replacement of the excitation system, the PSS is not in service after the specified extension replacement completion date.</p>	
<p><b>3. Violation Severity Levels for R2</b></p>		
<p><b>3.1. Lower:</b> There shall be a Lower Level of non-compliance if documentation is incomplete with any requirement R1.1 through R1.12.</p> <p><b>3.2. Moderate:</b> There shall be a Moderate Level of non-compliance if the Generator Operator does not have documentation to demonstrate compliance with any requirement R1.1 through R1.12.</p> <p><b>3.3. High:</b> Not Applicable</p> <p><b>3.4. Severe:</b> Not Applicable</p>		<p>Documentation requirements were added to the standard. Violation severity levels were added for documentation.</p>

<b>WECC Standard VAR-501-WECC-1 – Power System Stabilizer</b>	<b>WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)</b>	<b>Comment</b>

## **WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

### **Standard Development Roadmap**

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

#### **Development Steps Completed:**

<b>Completed Actions</b>	<b>Completion Date</b>
1. Post Draft Standard for initial industry comments	September 26, 2007
2. Drafting Team to review and respond to initial industry comments	November 30, 2007
3. Post second Draft Standard for industry comments	November 30, 2007
4. Drafting Team to review and respond to industry comments	January 25, 2008
5. Post Draft Standard for Operating Committee approval	January 25, 2008
6. Operating Committee ballots proposed standard	March 6, 2008
7. Post Draft Standard for WECC Board approval	March 12, 2008
8. Post Draft Standard for NERC comment period	April 14, 2008
9. WECC Board approved proposed standard	April 16, 2008
10. NERC comment period ended	May 20, 2008
11. Drafting Team to review and respond to industry comments	May 30, 2008

#### **Description of Current Draft:**

The purpose of this standard is to create a permanent replacement standard for VAR-STD-002b-1. VAR-501-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when VAR-STD-002b-1 was approved as a NERC reliability standard.

In the Western Interconnection, System Operating Limits for transmission paths in the Bulk Electric System assume that Power System Stabilizers are in service to enhance system damping. The requirements in VAR-501-WECC-1 are to ensure that the generator provides the proper damping to maintain system stability when generation and transmission outages occur.

This version of the VAR-501-WECC-1 standard is for NERC Board of Trustee ballot. The WECC Board of Directors approved the standard April 16, 2008. WECC Operating Committee approved the standard March 6, 2008. The WECC Board of Directors and Operating Committee request that the NERC Board of Trustees approve the VAR-501-WECC-1 Standard as a permanent replacement standard for VAR-STD-002b-1 and that the NERC Board of Trustees submits the standard to FERC for approval and replacement of VAR-STD-002b-1.

**WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

**Future Development Plan:**

<b>Anticipated Actions</b>	<b>Anticipated Date</b>
1. Submit NERC Board approval request	June 2008
2. Request FERC approval	June 2008

## **WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

### **Definitions of Terms Used in Standard**

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*

**Commercial Operation** - Achievement of this designation indicates that the Generator Operator or Transmission Operator of the synchronous generator or synchronous condenser has received all approvals necessary for operation after completion of initial start-up testing.

## **WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

### **A. Introduction**

- 1. Title:** Power System Stabilizer (PSS)
- 2. Number:** VAR-501-WECC-1
- 3. Purpose:** To ensure that Power System Stabilizers (PSS) on synchronous generators shall be kept in service.
- 4. Applicability**
  - 4.1. Generator Operators
- 5. Effective Date:** On the first day of the first quarter, after applicable regulatory approval.

### **B. Requirements**

- R1.** Generator Operators shall have PSS in service 98% of all operating hours for synchronous generators equipped with PSS. Generator Operators may exclude hours for R1.1 through R1.12 to achieve the 98% requirement. *[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]*
- R1.1.** The synchronous generator 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.** PSS exhibits instability due to abnormal system configuration.
  - R1.4.** Unit is operating in the synchronous condenser mode (very near zero real power level).
  - R1.5.** Unit is generating less power than its design limit for effective PSS operation.
  - R1.6.** Unit is passing through a range of output that is a known “rough zone” (range in which a hydro unit is experiencing excessive vibration).
  - R1.7.** The generator AVR is not in service.
  - R1.8.** Due to component failure, the PSS may be out of service up to 60 consecutive days for repair per incident.
  - R1.9.** Due to a component failure, the PSS may be out of service up to one year provided the Generator Operator submits documentation identifying the need for time to obtain replacement parts and if required to schedule an outage.
  - R1.10.** Due to a component failure, the PSS may be out of service up to 24 months provided the Generator Operator submits documentation identifying the need for time for PSS replacement and to schedule an outage.
  - R1.11.** The synchronous generator has not achieved Commercial Operation.
  - R1.12.** The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the PSS is unavailable for service.
- R2.** Generator Operators shall have documentation identifying the number of hours excluded for each requirement in R1.1 through R1.12. *[Violation Risk Factor: Low] [Time Horizon: Operations Assessment]*

### **C. Measures**

- M1.** Generators Operators shall provide quarterly reports to the compliance monitor and have evidence for each synchronous generator of the following:



## **WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

- M1.1** The number of hours the synchronous generator was on line.
- M1.2** The number of hours the PSS was out of service with generator on line.
- M1.3** The PSS in service percentage
- M1.4** If excluding PSS out of service hours as allowed in R1.1 through R1.12, provide:
  - M1.4.1** The number of hours excluded, and
  - M1.4.2** The adjusted PSS in-service percentage.

**M2.** If excluding hours for R1.1 through R1.12, provide:

- M2.1** The date of the outage
- M2.2** Supporting documentation for each requirement that applies

### **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 shall keep evidence for Measures M1 and M2 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 R1.12 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 R1.8 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.

## **WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

- 1.4.3** When calculating the adjusted in-service percentage, the PSS out of service hours do not include the time associated with R1.1 through R1.12.
- 1.4.4** The standard shall be applied on a generating unit by generating unit basis (a Generator Operator can be subject to a separate sanction for each non-compliant synchronous generating unit or to a single sanction for multiple machines that operate as one unit).

### **2. Violation Severity Levels**

**2.1. Lower:** There shall be a Lower Level of non-compliance if the following condition exists:

- 2.1.1.** PSS is in service less than 98% but at least 90% or more of all hours during which the synchronous generating unit is on line for each calendar quarter.

**2.2. Moderate:** There shall be a Moderate Level of non-compliance if the following condition exists:

- 2.2.1.** PSS is in service less than 90% but at least 80% or more of all hours during which the synchronous generating unit is on line for each calendar quarter.

**2.3. High:** There shall be a High Level of non-compliance if the following condition exists:

- 2.3.1.** PSS is in service less than 80% but at least 70% or more of all hours during which the synchronous generating unit is on line for each calendar quarter.

**2.4. Severe:** There shall be a Severe Level of non-compliance if the following condition exists:

- 2.4.1.** PSS is in service less than 70% of all hours during which the synchronous generating unit is on line for each calendar quarter.

### **3. Violation Severity Levels for R2**

**3.1. Lower:** There shall be a Lower Level of non-compliance if documentation is incomplete with any requirement R1.1 through R1.12.

**3.2. Moderate:** There shall be a Moderate Level of non-compliance if the Generator Operator does not have documentation to demonstrate compliance with any requirement R1.1 through R1.12.

**3.3. High:** Not Applicable

**3.4. Severe:** Not Applicable

### **E. Regional Differences**

#### **Version History – Shows Approval History and Summary of Changes in the Action Field**

<b>Version</b>	<b>Date</b>	<b>Action</b>	<b>Change Tracking</b>
1	April 16, 2008	Permanent Replacement Standard for VAR-STD-002b-1	



**Regional Reliability Standard Submittal Request**

**Region: Western Electricity Coordinating Council**

**Regional Standard Number: VAR-501-WECC-1**

**Regional Standard Title: Power System Stabilizer**

**Date Submitted: June 10, 2008**

**Regional Contact Name: Steven L. Rueckert**

**Regional Contact Title: Director of Standards**

**Regional Contact Telephone Number: (801) 582-0353**

**Request (check all that apply):**

- 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 (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)):**

- Yes April 16, 2008
- No

**[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:**

The purpose of this standard is to create a permanent replacement standard for VAR-STD-002b-1. VAR-501-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when VAR-STD-002b-1 was approved as a NERC reliability standard.

**Concise statement of the justification of the request:**

The VAR-501-WECC-1 regional reliability standard is more stringent than the continent-wide reliability standard (Standard VAR-002-1a — Generator Operation for Maintaining Network Voltage Schedules). A power system stabilizer is part of the excitation control system of a generator used to increase power transfer levels by improving power system dynamic performance. In the Western Interconnection, System Operating Limits for transmission paths in the Bulk Electric System assume that Power System Stabilizers are in service to enhance system damping. The requirements in VAR-501-WECC-1 are to ensure that the generator provides the proper damping to maintain system stability when generation and transmission outages occur. Therefore in the Western Interconnection, Power System Stabilizers are only permitted to be out of service under very specific predefined conditions. The NERC VAR-002-1a only requires that a generator operator notify its transmission operator when it removes the Power System Stabilizer from service and does not limit the amount of time for operating generators without Power System Stabilizer in service.

**Other – please attach or include as separate files:**

- **The text of the regional reliability standard in MS Word format that:**
  - **has either been, or is anticipated to be, approved by the regional entity's board, and**
  - **is in a format consistent with the NERC template for reliability standards.**
- **An implementation plan.**
- **The regional entity standard drafting team roster.**
- **The names and affiliations of the ballot pool members or names and affiliations of the committee and committee members that approved the submittal of the standard.**
- **The final ballot results, including a list of significant minority issues that were not resolved, and**
- **For each public comment period, a copy of each comment submitted and its associated response along with the associated changes made to the standard.**

## **Comment Report Form for WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

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The VAR-501-WECC-1 Standard Drafting Team thanks all commenters who submitted comments on the VAR-501-WECC-1 Standard. This Standard was posted for a 45-day public comment period from April 4, 2008 through May 20, 2008. NERC distributed the notice for this posting on April 7, 2008. The Standard Drafting Team asked stakeholders to provide feedback on the standard through a special Standard Comment Form. There were two sets of comments from three companies representing four of the ten Industry Segments as shown in the table on the following pages.

In this 'Consideration of Comments' document stakeholder comments have been organized so that it is easier to see the responses associated with each question. All comments received on the Standard can be viewed in their original format at:

[http://www.nerc.com/~filez/regional\\_standards/regional\\_reliability\\_standards\\_under\\_development.html](http://www.nerc.com/~filez/regional_standards/regional_reliability_standards_under_development.html)

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you can contact the Manager of Regional Standards, Stephanie Monzon at [Stephanie.monzon@nerc.net](mailto:Stephanie.monzon@nerc.net). In addition, there is a NERC Reliability Standards Appeals Process.<sup>1</sup>

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<sup>1</sup> The appeals process is described in the NERC Regional Reliability Standards Development Procedure: [ftp://www.nerc.com/pub/sys/all\\_updl/sac/rrswg/NERC\\_Regional\\_Reliability\\_Standards\\_Development\\_Procedure\\_Version%200-0%202007-06-15\\_dwt.pdf](ftp://www.nerc.com/pub/sys/all_updl/sac/rrswg/NERC_Regional_Reliability_Standards_Development_Procedure_Version%200-0%202007-06-15_dwt.pdf)

**Comment Report Form for WECC Standard WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

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The Industry Segments are:

- 1 – Transmission Owners
- 2 – RTOs, ISOs
- 3 – Load-serving Entities
- 4 – Transmission-dependent Utilities
- 5 – Electric Generators
- 6 – Electricity Brokers, Aggregators, and Marketers
- 7 – Large Electricity End Users
- 8 – Small Electricity End Users
- 9 – Federal, State, Provincial Regulatory or other Government Entities
- 10 – Regional Reliability Organizations, Regional Entities

Commenter		Organization	Industry Segment										
			1	2	3	4	5	6	7	8	9	10	
1.	Denise Koehn	Bonneville Power Administration (BPA)	✓		✓		✓	✓					
2.	Annette Bannon, Tom Olson, and Gus Wilkins	PPL Generation, LLC, PPL Montana, LLC					✓	✓					
3.													
4.													
5.													

**Index to Questions, Comments, and Responses**

- 1. Was the WECC Standard VAR-501-WECC-1 – Power System Stabilizer developed in a fair and open process, using the Process for Developing and Approving WECC Standards? page 4**
- 2. Does the WECC Standard VAR-501-WECC-1 – Power System Stabilizer pose an adverse impact to reliability or commerce in a neighboring region or interconnection? page 4**
- 3. Does the WECC Standard VAR-501-WECC-1 – Power System Stabilizer pose a serious and substantial threat to public health, safety, welfare, or national security? page 4**
- 4. Does the WECC Standard VAR-501-WECC-1 – Power System Stabilizer pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability? page 5**
- 5. Does the WECC Standard VAR-501-WECC-1 – Power System Stabilizer meet at least one of the following criteria? page 5**
  - The proposed standard has more specific criteria for the same requirements covered in a continent-wide standard**
  - The proposed standard has requirements that are not included in the corresponding continent-wide reliability standard**
  - The proposed regional difference is necessitated by a physical difference in the bulk power system.**

**Comment Report Form for WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

**1. Was the WECC Standard VAR-501-WECC-1 – Power System Stabilizer developed in a fair and open process, using the Process for Developing and Approving WECC Standards?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Denise Koehn	X		
<a href="#">Response: Thank you.</a>			
Annette Bannon, Tom Olson, and Gus Wilkins			
<a href="#">Response:</a>			
<a href="#">Response:</a>			

**2. Does the WECC Standard VAR-501-WECC-1 – Power System Stabilizer pose an adverse impact to reliability or commerce in a neighboring region or interconnection?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Denise Koehn		X	
<a href="#">Response: Thank you.</a>			
Annette Bannon, Tom Olson, and Gus Wilkins			
<a href="#">Response:</a>			
<a href="#">Response:</a>			

**3. Does the WECC Standard VAR-501-WECC-1 – Power System Stabilizer pose a serious and substantial threat to public health, safety, welfare, or national security?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Denise Koehn		X	



**Comment Report Form for WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

Commenter	Yes	No	Comment
<a href="#">Response: Thank you.</a>			
Annette Bannon, Tom Olson, and Gus Wilkins			
<a href="#">Response:</a>			
<a href="#">Response:</a>			

**4. Does the WECC Standard VAR-501-WECC-1 – Power System Stabilizer pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Denise Koehn		X	
<a href="#">Response: Thank you.</a>			
Annette Bannon, Tom Olson, and Gus Wilkins	X		PPL suggests that the actual reliability standard (not WECC policies) should include an explicit description of which units must have PSS's (including which units are grandfathered), and this criteria should be subject to change in accordance with the standard development process.
<a href="#">Response: The VAR-501-WECC-1 applies to generators equipped with power system stabilizers. The drafting team implemented the VAR-501-WECC standard similar to the VAR-STD-002b-1 standard and did not include a description of which units are required to have power system stabilizers. The drafting team did not identify a need to permit a grandfather provision for the power system stabilizer standard as it only applies to generators equipped with power system stabilizers. The drafting team will recommend that when the VAR-501-WECC-1 standard is reviewed, the new drafting team should address this comment.</a>			
<a href="#">Response:</a>			

**5. Does the WECC Standard VAR-501-WECC-1 – Power System Stabilizer meet at least one of the following criteria?**

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

**Comment Report Form for WECC Standard VAR-501-WECC-1 – Power System Stabilizer**

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**Summary Consideration:**

Commenter	Yes	No	Comment
Denise Koehn	X		
<a href="#">Response: Thank you.</a>			
Annette Bannon, Tom Olson, and Gus Wilkins			
<a href="#">Response:</a>			
<a href="#">Response:</a>			

## NERC Evaluation of Western Electricity Coordinating Council (WECC) Regional Standards

### Executive Summary July 30, 2008

On June 11, 2007, the WECC submitted the following seven regional standards for NERC evaluation to replace eight original WECC regional standards approved by NERC and FERC in 2007:

- BAL-002-WECC-1 — Contingency Reserves,
- FAC-501-WECC-1 — Transmission Maintenance,
- IRO-006-WECC-1 — Qualified Transfer Path Unscheduled Flow (USF) Relief,
- PRC-004-WECC-1 — Protection System and Remedial Action Scheme Misoperation,
- TOP-007-WECC-1 — System Operating Limits,
- VAR-002-WECC-1 — Automatic Voltage Regulators and
- VAR-501-WECC-1 — Power System Stabilizer

NERC posted these seven proposed regional standards for a 45-day public posting beginning April 4–May 20, 2008. The standards received several comments during the NERC public posting. WECC supplied NERC with its responses to the comments on June 11, 2008. WECC did not make conforming changes to the standards as a result of the comments received during the NERC posting. WECC submitted these standards for NERC evaluation on June 11, 2008.

In accordance with NERC's *Rules of Procedure* and the *Regional Reliability Standards Evaluation Procedure* approved by the Regional Reliability Standards Working Group, NERC performed a review of the WECC proposed standards. The intent of this document is to provide WECC with NERC's feedback regarding their regional standards.

In this review, NERC presents a summary of observations for each proposed WECC regional standard. In Appendix A, NERC includes a redlined copy of each proposed regional standard with detailed comments included. NERC believes WECC has satisfied its procedural obligations as outlined in Appendix C of its Regional Delegation Agreement. However, NERC offers concerns and suggestions regarding several of the proposed regional standards that are discussed below..

## Summary of Findings

### BAL-002-WECC-1 — Contingency Reserves

In the review of BAL-002-WECC-1, NERC identified several areas for either clarification or opportunities for improvement. Some of the findings point out approaches potentially inconsistent with FERC either directives or concerns with the clarity of the standard. Other NERC comments simply offer areas for improvement.

1. This standard contains a method for Reserve Sharing Groups or Balancing Authorities (BA) that are not members of a Reserve Sharing Group to maintain a level of Contingency Reserves and the standard describes in Requirement 1.1. how to determine the amount of reserves. NERC suggests that instead of describing the formula narratively (Requirements R1.1.1. to R1.1.2.) WECC include the actual equation in the requirement to reduce ambiguity.
2. Requirement R2 is of concern because it is unclear whether the requirement limits the use of Demand Side Resources (DSM) to fifty percent of the Contingency Reserves. Requirement R2. states:

**R2.** Each Reserve Sharing Group or Balancing Authority that is not a member of a Reserve Sharing Group shall maintain at least half of the Contingency Reserve in R1.1 as Spinning Reserve. Any Spinning Reserve specified in R1 shall meet the following requirements. [*Violation Risk Factor: High*] [*Time Horizon: Real-time Operations*]

**R2.1.** Immediately and automatically responds proportionally to frequency deviations, e.g. through the action of a governor or other control systems.

**R2.2.** Capable of fully responding within ten minutes.

In the first instance, the NERC Glossary of Terms defines Spinning Reserve as “(u)nloaded generation that is synchronized and ready to serve additional demand.” In this regard, spinning reserve, as a component of contingency reserves, is limited to the use of generation. In Order 693 at Paragraph 333, the Commission directed NERC to “treat DSM comparably to conventional generation as a resource for contingency reserves.” In addition, the Commission in Paragraph 335 of Order No. 693 directs “the ERO to explicitly allow DSM as a resource for contingency reserves...” NERC believes that the proposed regional standard is in potential conflict with the Commission’s directive regarding the use of DSM. In order to eliminate this potential conflict, NERC suggests that WECC explicitly include DSM in Requirement R3. as an additional sub-requirement in the list of acceptable types of reserves in support of the FERC directive. Alternately, NERC requests that WECC clarify how the proposed regional standard supports FERC’s directives.

3. In Requirement R1., the proposed standard changes the amount of the contingency reserves that a BA is required to the sum of 3 percent of the total load plus 3 percent of the total generation.

This replaces the existing 5 and 7 percent load responsibility served by hydro and thermal generation, respectively. WECC did not provide an explanation for the change and NERC requests that WECC provide information to support this modification.

4. While the standard does contain Violation Severity Levels (VSLs) NERC suggests that for consistency with the continent-wide standards, the VSLs should be presented in table format.

#### **FAC-501-WECC-1 — Transmission Maintenance**

It appears that WECC has addressed the NERC and FERC directives in FAC-501-WECC-1.

1. NERC suggests capitalizing defined terms such as Transmission Facilities in the standard.
2. The proposed standard contains clear Violation Severity Levels; however, NERC suggests utilizing the VSL table format to be consistent with the continent-wide standards.

#### **IRO-006-WECC-1 — Qualified Transfer Path Unscheduled Flow (USF) Relief**

1. NERC is concerned that the technical elements of the proposed standard have been removed from the current FERC-approved version of the regional standard. As presented, the proposed standard does not require the mitigation of an overload, which is the express purpose of the standard. The current version of the standard in effect, IRO-STD-006-0, contains technical provisions for the mitigation of an overload that supports the purpose statement. These provisions have not been translated into the proposed replacement standard. NERC requests that a technical rationale be provided for the removal of the technical details in the proposed standard because as proposed it is unclear that the revised standard meets the purpose of the standard, “(m)itigation of transmission overloads due to unscheduled flow on Qualified Transfer Paths.”
2. The proposed standard includes the term Transfer Distribution Factor (TDF) that is a defined term in the NERC Glossary. The NERC definition is “(t)he portion of an Interchange Transaction, typically expressed in per unit that flows across a transmission facility (Flowgate).” The WECC proposed definition for TDF is “(t)he percentage of USF that flows across a Qualified Transfer Path when an Interchange Transaction (Contributing Schedule) is implemented.” *[See the WECC Unscheduled Flow Mitigation Summary of Actions Table (Attachment 1 WECC IRO-006-WECC-1).]*

There are inconsistencies between the two definitions that must be resolved. It is not clear if there are intended differences between the NERC and WECC definitions. If not, NERC suggests removing the WECC proposed term from the standard. If there are intentional differences, NERC requests that WECC determine if they are able to utilize the NERC definition, and if not, to define a new term to accomplish the desired objectives.

3. The proposed standard contains clear Violation Severity Levels; however, NERC suggests utilizing the VSL table format to be consistent with the continent-wide standards.

### **PRC-004-WECC-1 — Protection System and Remedial Action Scheme Misoperation**

1. The PRC-004-WECC-1 proposed standard contains explanatory text in the Applicability section that is redundant with text in the Requirements section. NERC suggests resolving this redundancy by removing the explanatory text in the Requirements section.
2. In Requirement R1., R1.1., and R1.2. NERC suggests that while System Protection personnel may perform the tasks required, the requirement should only apply to the responsible entity specified in the Applicability section to reduce ambiguity. The responsible entity should determine how best and who should perform the activity in practice.
3. Requirement R2. contains text that WECC might consider placing in a footnote as explanatory text.
4. Technical clarity is suggested in R2., R2.1., R2.2.1., and R2.2.2. There is sufficient ambiguity in the interplay between the main and sub-requirements that NERC suggests be addressed by streamlining the requirement language. In addition, this appears to be a set of sequential requirements that would benefit from an optional flowchart for applicable entities use as a reference.

### **TOP-007-WECC-1 — System Operating Limits**

1. The proposed regional standard serves to eliminate a number of the requirements in the previously approved version in effect today. As such, the proposed standard lacks the basis to be a regional standard in that it no longer provides the more stringent requirements necessary to ensure reliable operation within the Western Interconnection as the legacy requirements now reside in existing NERC standards. For the two requirements that remain, WECC should consider enhancing the current Regional Differences in the continent-wide FAC standards to include the SOL 30 minute operating limitation and net schedule adjustment.
2. The proposed standard refines the time limit for stability limited paths to 30 minutes which is different than originally stated in WM1 of TOP-STD-007-0. NERC requests WECC to provide the basis for this refinement as it was not included. Further, it is unclear whether this is a more stringent requirement or standard than presented in the existing TOP-STD-007-0 standard.

### **VAR-002-WECC-1 — Automatic Voltage Regulators**

1. It is unclear why WECC has selected 98 percent of all operating hours as the compliance threshold for synchronous generators equipped with AVR and automatic voltage control mode in Requirement R1. when an itemized list of 12 exceptions are identified? The current FERC-approved version of the standard does not include such in service goal but expects that AVR on generators shall be kept in service at all times and in automatic voltage control mode unless otherwise directed by the Transmission Operator. NERC requests that WECC clarify the 98 percent goal for in service mode in Requirement R1. of the proposed standard, with specific discussion on the relationship between the 98 percent threshold and the exceptions noted.

More importantly, given this 98 percent limitation, NERC is seriously concerned that the proposed regional standard is not more stringent than the NERC continent-wide standard VAR-002-1, and therefore, fails the statutory criteria to be considered a regional standard.

2. In addition, NERC has concerns with R1.1. that excludes the hours attributed to the synchronous generator or condenser that operates for less than five percent of all hours during any calendar quarter. WECC did not present a justification for this exclusion in the hours to achieve the 98 percent in service mode goal. NERC requests that WECC provide information to support this requirement.
3. The proposed standard contains clear Violation Severity Levels, however, NERC suggests utilizing the VSL table format to be consistent with the continent-wide standards.

#### **VAR-501-WECC-1 — Power System Stabilizer**

1. NERC has comments on VAR-501-WECC-1 similar to the comments for VAR-002-WECC-1. It is unclear why WECC has selected 98 percent of all operating hours as the compliance threshold for synchronous generators equipped with Power System Stabilizer in Requirement R1. when an itemized list of 12 exceptions are identified? The current FERC-approved version of the standard does not include such in service goal but expects that Power System Stabilizers on generators shall be kept in service at all times. NERC requests that WECC clarify the 98 percent goal for in service mode in Requirement R1. of the proposed standard, with specific discussion on the relationship between the 98 percent threshold and the exceptions noted.
2. In addition, NERC has concerns with R1.1. that excludes the hours attributed to the synchronous generator that operates for less than five percent of all hours during any calendar quarter. WECC did not present a justification for this exclusion in the hours to achieve the 98 percent in service mode goal. NERC requests that WECC provide information to support this requirement.
3. The proposed standard contains clear Violation Severity Levels, however, NERC suggests utilizing the VSL table format to be consistent with the continent-wide standards.

#### **Conclusion**

NERC appreciates the opportunity to provide feedback to WECC regarding the seven proposed regional standards WECC submitted on June 11 2007. In some instances, NERC requests additional clarification on the issues and concerns outlined in this document. Others provide suggestions for improving the quality of the proposed regional standards. NERC has included detailed comments directly in the standards that can be found in Appendix A to this document. NERC has also provided comments directly into the comparison mapping documents WECC submitted along with the seven proposed standards in its submittal request.

NERC looks forward to WECC's response to these comments and ultimately, for WECC's decision on whether to request the NERC Board to approve these proposed regional standards.



**Appendix A**

**Standard Development Roadmap**

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

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**Development Steps Completed:**

Completed Actions	Completion Date
1. Post Draft Standard for initial industry comments	September 14, 2007
2. Drafting Team to review and respond to initial industry comments	November 20, 2007
3. Post second Draft Standard for industry comments	November 20, 2007
4. Drafting Team to review and respond to industry comments	January 25, 2008
5. Post Draft Standard for Operating Committee approval	January 25, 2008
6. Operating Committee approved proposed standard	March 6, 2008
7. Post Draft Standard for WECC Board approval	March 12, 2008
8. Post Draft Standard for NERC comment period	April 14, 2008
9. WECC Board approved proposed standard	April 16, 2008
10. NERC comment period ended	May 20, 2008
11. Drafting Team completes review and consideration of NERC industry comments	May 30, 2008

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**Description of Current Draft:**

The purpose of this standard is to create a permanent replacement standard for BAL-STD-002-0. BAL-002-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when BAL-STD-002-0 was approved as a NERC reliability standard. The drafting team implemented in the standard additional refinements to address concerns as explained in the document titled, “WECC Standard BAL-002-WECC-1 Contingency Reserves.” To assist in understanding the refinements made to the standard, the drafting team has developed a document that compares BAL-002-WECC-1, the permanent replacement standard, with the existing BAL-STD-002-0 (see BAL-002-WECC-1 Comparison).

This version of the BAL-002-WECC-1 standard is for NERC Board of Trustee ballot. The WECC Board of Directors approved the standard April 16, 2008. WECC Operating Committee approved the standard March 6, 2008. The WECC Board of Directors and



## **WECC Standard BAL-002-WECC-1 - Contingency Reserves**

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Operating Committee request that the NERC Board of Trustees approve the BAL-002-WECC-1 Standard as a permanent replacement standard for BAL-STD-002-0 and that the NERC Board of Trustees submits the standard to FERC for approval and replacement of BAL-STD-002-0.

**Future Development Plan:**

<b>Anticipated Actions</b>	<b>Anticipated Date</b>
1. NERC Board approval request	June 2008
2. Request FERC approval	June 2008

## DEFINITIONS OF TERMS USED IN STANDARD

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*

**A. Introduction**

- 1. Title:** Contingency Reserves
- 2. Number:** BAL-002-WECC-1
- 3. Purpose:** Contingency Reserve is required for the reliable operation of the interconnected power system. Adequate generating capacity must be available at all times to maintain scheduled frequency, and avoid loss of firm load following transmission or generation contingencies. This generating capacity is necessary to replace generating capacity and energy lost due to forced outages of generation or transmission equipment.
- 4. Applicability**
  - 4.1 Balancing Authority
  - 4.2 Reserve Sharing Group
- 5. Effective Date:** On the first day of the next quarter, after receipt of applicable regulatory approval.

**B. Requirements**

**R1.** Each Reserve Sharing Group or Balancing Authority that is not a member of a Reserve Sharing Group shall maintain as a minimum Contingency Reserve that is the sum of the following: *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*

**Comment [AJR1]:** Suggest this be written as a formula. This prose is somewhat confusing, as we are saying that the “sum” is the greater of 1.1.1 and 1.1.2, plus a really long paragraph, plus another really long paragraph. Hard to follow.

**R1.1.** The greater of the following:

**R1.1.1.** An amount of reserve equal to the loss of the most severe single contingency; or

**R1.1.2.** An amount of reserve equal to the sum of three percent of the load (generation minus station service minus Net Actual Interchange) and three percent of net generation (generation minus station service).

**Comment [AJR2]:** Why is this done as two terms? Note that you deduct station service twice. i.e.  $R = (.03 \times G) - S - NAI + ((.03 \times G) - S) = (.06 \times G) - NAI - 2S$ . Was that the intent? Or should this really be  $(.06 \times G) - NAI - S$ ?

**R1.2.** If the Source Balancing Authority designates an Interchange Transaction(s) as part of its Non-Spinning Contingency Reserve, the Sink Balancing Authority shall carry an amount of additional Non-Spinning Contingency Reserve equal to the Interchange Transaction(s). This type of transaction cannot be designated as Spinning Reserves by the source BA. If the Source Balancing Authority does not designate the Interchange Transaction as part of its Contingency Reserve, the Sink Balancing Authority is not required to carry any additional Contingency Reserves under this Requirement.

**R1.3.** If the Sink Balancing Authority is designating an Interchange Transaction(s) as part of its Contingency Reserve either Spinning or Non-Spinning, the Source Balancing Authority shall increase its Contingency Reserves equal in amount and type, to the capacity transaction(s) where the Sink Balancing Authority is designating the transaction(s) as a resource to meet its Contingency Reserve requirements. These types of transactions could be designated as either spinning or non-spinning reserves. If designated as Spinning Reserves, all of the requirements of section R2.1 & R2.2 must be met.

**Comment [AJR3]:** I think I know what this is trying to say, but I suggest there could be a better way to say it.. See previous comment on use of a formula to try to make more clear.

**R2.** Each Reserve Sharing Group or Balancing Authority that is not a member of a Reserve Sharing Group shall maintain at least half of the Contingency Reserve in R1.1 as Spinning Reserve. Any Spinning Reserve specified in R1 shall meet the following requirements. *[Violation Risk Factor: High] [Time Horizon: Real-time Operations]*

**R2.1.** Immediately and automatically responds proportionally to frequency deviations, e.g. through the action of a governor or other control systems.

**R2.2.** Be capable of fully responding within ten minutes.

**R3.** Each Reserve Sharing Group or Balancing Authority shall use the following acceptable types of reserve-Contingency Reserve which must be fully deployable within 10 minutes of notification to meet R1: *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*

**Comment [sm4]:** Order 693 directs that DSM be treated comparably with generator resources for contingency reserves. This requirement could be interpreted to exclude the use of DSM (specifically R4.1)

**R3.1.** Spinning Reserve

**R3.2.** Interruptible Load;

**R3.3.** Interchange Transactions designated by the source Balancing Authority as non-spinning contingency reserve;

**R3.4.** Contingency Reserve held by other entities by agreement that is deliverable on Firm Transmission Service;

**R3.5.** An amount of off-line generation which can be synchronized and generating; or

**R3.6.** Load, other than Interruptible Load, once the Reliability Coordinator has declared a capacity or energy emergency.

**C. Measures**

- M1.** The Reserve Sharing Group or Balancing Authority that is not a member of a Reserve Sharing Group has documentation that it maintained 100% of required Contingency Reserve levels based upon data integrated over each clock hour except within the first 105 minutes (15 minute Disturbance Recovery Period, plus 90 minute Contingency Reserve Restoration Period) following an event requiring the activation of Contingency Reserves. For each hour Reserve Sharing Group or Balancing Authority shall have and provide upon request their Contingency Reserve Requirement in MW, how the requirement was calculated, and amount of Contingency Reserve available in MW. E-tags and/or contracts shall be provided to document any transactions under R1.2 and R1.3.
  
- M2.** The Reserve Sharing Group or Balancing Authority that is not a member of a Reserve Sharing Group has documentation that it maintained at least 100% of minimum Spinning Contingency Reserve required based upon data averaged over each clock hour except within the first 105 minutes following an event requiring the activation of Contingency Reserves. For each hour, Reserve Sharing Group or Balancing Authority that is not a member of a Reserve Sharing Group shall have and provide upon request the Spinning Reserve Requirement in MW and amount of Spinning Reserve available in MW that is automatically responsive to frequency and can be fully deployed in 10 minutes.
  
- M3.** The Reserve Sharing Group or Balancing Authority that is not a member of a Reserve Sharing Group has documentation that it used the acceptable types of reserve for each hour to meet R3.

**M3.14.4.** Any Reserve Sharing Group or Balancing Authority utilizing Load other than Interruptible Load shall submit documentation demonstrating that the Reliability Coordinator declared a Capacity and/or Energy Emergency prior to utilizing Load for Contingency Reserves.

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**D. Compliance**

**1. Compliance Monitoring Process**

**1.1 Compliance Monitoring Responsibility**

Compliance Enforcement Authority

**1.2 Compliance Monitoring Period**

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

- Reports conducted quarterly
- Spot check audits conducted anytime with 30 days notice given to prepare

- Periodic audit as scheduled by the Compliance Enforcement Authority
- Investigations
- Other methods as provided for in the Compliance Monitoring Enforcement Program

Reserve Sharing Groups and Balancing Authorities shall submit to their Compliance Enforcement Authority a Contingency Reserve verification report on or before the tenth business day following the end of each calendar quarter.

**1.2.1** Compliance Monitoring Period: One Clock Hour.

**1.2.2** The Performance-reset Period is calendar quarter.

### **1.3 Data Retention**

Reserve Sharing Groups and Balancing Authorities shall keep evidence for Measure M.1 through M3 for three years plus current, or since the last audit, whichever is longer.

### **1.4. Additional Compliance Information**

- 1.4.1.** This Standard shall apply to a Reserve Sharing Group that has registered with the WECC as provided in Section 1.4.2, and each Balancing Authority identified in the registration shall be responsible for compliance with this Standard through its participation in the Reserve Sharing Group and not on an individual basis.
- 1.4.2.** A Reserve Sharing Group may register as the Responsible Entity for purposes of compliance with this Standard by providing written notice to the WECC (a) indicating that the Reserve Sharing Group is registering as the Responsible Entity for purposes of compliance with this Standard, (b) identifying each Balancing Authority that is a member of the Reserve Sharing Group, and (c) identifying the person or organization that will serve as agent on behalf of the Reserve Sharing Group for purposes of communications and data submissions related to or required by this Standard.
- 1.4.3.** If an agent properly designated in accordance with Section 1.4.2 identifies individual Balancing Authorities within the Reserve Sharing Group responsible for noncompliance at the time of data submission, together with the percentage of responsibility attributable to each identified Balancing Authority, then, except as may otherwise be finally determined through a duly conducted review or appeal of the initial finding of noncompliance, (a) any penalties assessed for

noncompliance by the Reserve Sharing Group shall be allocated to the individual Balancing Authorities identified in the applicable data submission in proportion to their respective percentages of responsibility as specified in the data submission, (b) each Balancing Authority shall be solely responsible for all penalties allocated to it according to its percentage of responsibility as provided in subsection (a) of this Section 1.4.3, and (c) neither the Reserve Sharing Group nor any member of the Reserve Sharing Group shall be responsible for any portion of a penalty assessed against another member of the Reserve Sharing Group in accordance with subsection (a) of this Section 1.4.3 (even if the member of Reserve Sharing Group against which the penalty is assessed is not subject to or otherwise fails to pay its allocated share of the penalty).

- 1.4.4.** If an agent properly designated in accordance with Section 1.4.2 fails to identify individual Balancing Authorities within the Reserve Sharing Group responsible for noncompliance at the time of data submission or fails to specify percentages of responsibility attributable to each identified Balancing Authority, any penalties for noncompliance shall be assessed against the agent on behalf of the Reserve Sharing Group, and it shall be the responsibility of the members of the Reserve Sharing Group to allocate responsibility for such noncompliance.
- 1.4.5.** Any Balancing Authority that is a member of a Reserve Sharing Group that has failed to register as provided in Section 1.4.2 shall be subject to this Standard on an individual basis.

## **2. Violation Severity Levels for Requirement R1**

**Comment [sm5]:** These VSLs should be in table format as opposed to the format proposed.

- 2.1. Lower:** There shall be a Lower Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority's or the Reserve Sharing Group's Contingency Reserve is less than 100% but greater than or equal to 90% of the required Contingency Reserve.
- 2.2. Moderate:** There shall be a Moderate Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority's or the Reserve Sharing Group's Contingency Reserve is less than 90% but greater than or equal to 80% of the required Contingency Reserve.
- 2.3. High:** There shall be a High Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority's or the Reserve Sharing Group's Contingency Reserve is less than 80% but greater than or equal to 70% of the required Contingency Reserve.
- 2.4. Severe:** There shall be a Severe Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority's or the



Reserve Sharing Group's Contingency Reserve is less than 70% of the required Contingency Reserve.

**3. Violation Severity Level for Requirement R2**

- 3.1 Lower:** There shall be a Lower Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority's or the Reserve Sharing Group's Spinning Reserve is less than 100% but greater than or equal to 90% of the required Spinning Reserve.
- 3.2 Moderate:** There shall be a Moderate Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority's or the Reserve Sharing Group's Spinning Reserve is less than 90% but greater than or equal to 80% of the required Spinning Reserve.
- 3.3 High:** There shall be a High Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority's or the Reserve Sharing Group's Spinning Reserve is less than 80% but greater than or equal to 70% of the required Spinning Reserve.
- 3.4 Severe:** There shall be a Severe Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority's or the Reserve Sharing Group's Spinning Reserve is less than 70% of the required Spinning Reserve.

**4. Violation Severity Level for Requirement R3**

- 4.1 Lower:** Not Applicable
- 4.2 Moderate:** Not Applicable
- 4.3 High:** There shall be a High Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority or Reserve Sharing Group used unacceptable resources for Contingency Reserves.

**~~4.5. 4.4.~~ Severe:** Not Applicable

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**WECC Standard BAL-002-WECC-1 - Contingency Reserves**

<b>Requirment</b>	<b>Lower VSL</b>	<b>Moderate VSL</b>	<b>High VSL</b>	<b>Severe VSL</b>
R2	<p><u>There shall be a Lower Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority's or the Reserve Sharing Group's Spinning Reserve is less than 100% but greater than or equal to 90% of the required Spinning Reserve.</u></p>	<p><u>There shall be a Moderate Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority's or the Reserve Sharing Group's Spinning Reserve is less than 90% but greater than or equal to 80% of the required Spinning Reserve.</u></p>	<p><u>There shall be a High Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority's or the Reserve Sharing Group's Spinning Reserve is less than 80% but greater than or equal to 70% of the required Spinning Reserve.</u></p>	<p><u>There shall be a Severe Level of non-compliance if there is one hour during a calendar month in which the Balancing Authority's or the Reserve Sharing Group's Spinning Reserve is less than 70% of the required Spinning Reserve.</u></p>

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## **WECC Standard BAL-002-WECC-1 - Contingency Reserves**

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**Version History** – Shows Approval History and Summary of Changes in the Action Field

<b>Version</b>	<b>Date</b>	<b>Action</b>	<b>Change Tracking</b>
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## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **Standard Development Roadmap**

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

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#### **Development Steps Completed:**

<u>1.</u> Post Draft Standard for initial industry comments	September 4, 2007	Formatted: Bullets and Numbering
<u>2.</u> Drafting Team to review and respond to initial industry comments	November 1, 2007	Formatted: Bullets and Numbering
<u>3.</u> Post second Draft Standard for industry comments	November 9, 2007	Formatted: Bullets and Numbering
<u>4.</u> Drafting Team to review and respond to industry comments	January 7, 2008	Formatted: Bullets and Numbering
<u>5.</u> Post Draft Standard for Operating Committee approval	January 17, 2008	Formatted: Bullets and Numbering
<u>6.</u> Operating Committee approved proposed standard	March 6, 2008	Formatted: Bullets and Numbering
<u>7.</u> Post Draft Standard for WECC Board approval	March 12, 2008	Formatted: Bullets and Numbering
<u>8.</u> Post Draft Standard for NERC comment period	April 14, 2008	Formatted: Bullets and Numbering
<u>9.</u> WECC Board approved proposed standard	April 16, 2008	Formatted: Bullets and Numbering
<u>10.</u> NERC comment period ended	May 20, 2008	Formatted: Bullets and Numbering
<u>11.</u> Drafting Team completes review and consideration of NERC industry comments	May 30, 2008	Formatted: Bullets and Numbering

#### **Description of Current Draft:**

The purpose of this standard is to create a permanent replacement standard for PRC-STD-005-1. In response to comments, the drafting team changed the name of the standard from PRC-005-WECC-1 to FAC-501-WECC-1 to better align with the NERC numbering system. FAC-501-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when PRC-STD-005-1 was approved as a NERC reliability standard. This version of the FAC-501-WECC-1 standard is for NERC Board of Trustee ballot. The WECC Board of Directors approved the standard April 16, 2008. WECC Operating Committee approved the standard March 6, 2008. The WECC Board of Directors and Operating Committee request that the NERC Board of Trustees approve the FAC-501-WECC-1 Standard as a permanent replacement standard for PRC-STD-005-1 and that the NERC Board of Trustees submits the standard to FERC for approval and replacement of PRC-STD-005-1.

#### **Justification for a Regional Standard**

The NERC standard PRC-005-1 has requirements for equipment maintenance and inspection of relay and backup power systems. FAC-003-1 has requirements for vegetation management. The NERC standards do not have any maintenance and test requirements for the additional components such as breakers, reactive devices, transformers and the associated transmission line. The 40 major paths listed in the Attachment 1-FAC-501-WECC-1 are significant components for reliable delivery of power in the Western Interconnection. Breaker, transformer, and insulator failures cause reductions to the System Operating Limits (SOL) for those paths, and thus limit transfers between

**WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

remotely located generation in the Western Interconnection and population/load centers. The entities of the Western Interconnection through study and operation see optimizing the capacity for these paths as critical to the reliability of the Western Interconnection. The lack of redundant transmission in these corridors raises the level of scrutiny for the components and facilities associated with these paths; therefore, this standard is designed to minimize the SOL reductions required to maintain reliable Western Interconnection operation.

**Future Development Plan:**

<b>Anticipated Actions</b>	<b>Anticipated Date</b>
1. NERC Board approval request	June 2008
2. Request FERC approval	June 2008

## **DEFINITIONS OF TERMS USED IN STANDARD**

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **A. Introduction**

- 1. Title:** Transmission Maintenance
- 2. Number:** FAC-501-WECC-1
- 3. Purpose:** To ensure the Transmission Owner of a transmission path identified in the table titled “Major WECC Transfer Paths in the Bulk Electric System” including associated ~~facilities~~ Facilities has a Transmission Maintenance and Inspection Plan (TMIP); and performs and documents maintenance and inspection activities in accordance with the TMIP.

### **4. Applicability**

- 4.1. Transmission Owners that maintain the transmission paths in the most current table titled “Major WECC Transfer Paths in the Bulk Electric System” provided at:

<http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc>.

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

### **B. Requirements**

- R.1.** Transmission Owners shall have a TMIP detailing their inspection and maintenance requirements that apply to all ~~t~~ Transmission facilities ~~Facilities~~ necessary for System Operating Limits associated with each of the transmission paths identified in table titled “Major WECC Transfer Paths in the Bulk Electric System.” *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*

**R1.1.** Transmission Owners shall annually review their TMIP and update as required. *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*

- R.2.** Transmission Owners shall include the maintenance categories in Attachment 1-FAC-501-WECC-1 when developing their TMIP. *[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]*

- R.3.** Transmission Owners shall implement and follow their TMIP. *[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]*

### **C. Measures**

~~M1-M4.~~ Transmission Owners shall have a documented TMIP per R.1.

~~M1-R3.1.~~ Transmission Owners shall have evidence they have annually reviewed their TMIP and updated as needed.

~~M2-M5.~~ Transmission Owners shall have evidence that their TMIP addresses the required maintenance details of R.2.

~~M3-M6.~~ Transmission Owners shall have records that they implemented and followed their TMIP as required in R.3. The records shall include:

1. The person or crew responsible for performing the work or inspection,
2. The date(s) the work or inspection was performed,
3. The ~~transmission-Transmission facility~~ Facility on which the work was performed, and
4. A description of the inspection or maintenance performed.

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**WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

**D. Compliance**

**1. Compliance Monitoring Process**

**1.1 Compliance Monitoring Responsibility**

Compliance Enforcement Authority

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**1.2 Compliance Monitoring Period and Enforcement Processes**

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

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- Self-certifications  
\* conducted annually
- Spot check audits  
\* conducted anytime with 30 days notice given to prepare
- Periodic Compliance audits  
as scheduled by the Compliance Enforcement Authority
- Compliance violation investigations
- Complaints
- Self-reporting Other methods as provided for in the Compliance Monitoring Enforcement Program

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The Reset Time Frame shall be one year.

**1.3 Data Retention**

The Transmission Owners shall keep evidence for Measure M1 through M3 for three years plus the current year, or since the last audit, whichever is longer.

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

**1.4 Additional Compliance Information**

No additional compliance information.



## WECC Standard FAC-501-WECC-1 – Transmission Maintenance

### 2. Violation Severity Levels

~~2.1. Lower: There shall be a Lower Level of non-compliance if any of the following conditions exist:~~

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**Version History** – Shows Approval History and Summary of Changes in the Action Field

## **WECC Standard FAC-501-WECC-1 – Transmission Maintenance**

### **Attachment 1-FAC-501-WECC-1 Transmission Line and Station Maintenance Details**

The maintenance practices in the TMIP may be performance-based, time-based, conditional based, or a combination of all three. The TMIP shall include:

1. A list of Facilities and associated Elements necessary to maintain the SOL for the transfer paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System;”
2. The scheduled interval for any time-based maintenance activities and/or a description supporting condition or performance-based maintenance activities including a description of the condition based trigger;
3. Transmission Line Maintenance Details:
  - a. Patrol/~~Inspection~~–inspection
  - b. Contamination ~~Control~~control
  - c. Tower and wood pole structure management
4. Station Maintenance Details:
  - a. Inspections
  - b. Contamination ~~Control~~control
  - c. Equipment ~~Maintenance~~–maintenance for the following:
    - Circuit ~~Breakers~~breakers
    - Power ~~Transformers~~–transformers (including phase-shifting transformers)
    - Regulators
    - Reactive ~~Devices~~–devices (including, but not limited to, Shunt Capacitors, Series ~~Capacitors~~capacitors, ~~Synchronous~~–synchronous ~~Condensers~~ondensers, ~~Shunt~~–shunt ~~Reactors~~reactors, and ~~Tertiary~~–tertiary ~~Reactors~~reactors)

## WECC Standard IRO-006-WECC-1 – Qualified Transfer Path Unscheduled Flow Relief

### Standard Development Roadmap

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

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### Development Steps Completed:

Completed Actions	Completion Date
1. Post Draft Standard for initial industry comments	September 21, 2007
2. Drafting Team to review and respond to initial industry comments	November 30, 2007
3. Post Draft Standard for industry comments	November 30, 2007
4. Drafting Team to review and respond to industry comments	January 17, 2008
5. Post Draft Standard for Operating Committee approval	January 17, 2008
6. Operating Committee approved proposed standard	March 6, 2008
7. Post Draft Standard for WECC Board approval	March 12, 2008
8. Post Draft Standard for NERC comment period	April 14, 2008
9. WECC Board approved proposed standard	April 16, 2008
10. NERC comment period ends	May 20, 2008
11. Drafting Team to review and respond to industry comments	May 31, 2008

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### Description of Current Draft:

The purpose of this standard is to create a permanent replacement standard for IRO-STD-006-0. IRO-006-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when IRO-STD-006-0 was approved as a NERC reliability standard.

This version of the IRO-006-WECC-1 standard is for NERC Board of Trustee ballot. The WECC Board of Directors approved the standard April 16, 2008. WECC Operating Committee approved the standard March 6, 2008. The WECC Board of Directors and Operating Committee request that the NERC Board of Trustees approve the IRO-006-WECC-1 Standard as a permanent replacement standard for IRO-STD-006-0 and that the NERC Board of Trustees submits the standard to FERC for approval and replacement of IRO-STD-006-0.

**WECC Standard IRO-006-WECC-1 – Qualified Transfer Path Unscheduled  
Flow Relief**

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**Future Development Plan:**

<b>Anticipated Actions</b>	<b>Anticipated Date</b>
1. NERC Board approval request	June 2008
2. Request FERC approval	June 2008

## DEFINITIONS OF TERMS USED IN STANDARD

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*

### DEFINITIONS:

**Contributing Schedule** is defined as a Schedule not on the Qualified Transfer Path between a Source Balancing Authority and a Sink Balancing Authority that contributes unscheduled flow across the Qualified Transfer Path.

**Qualified Transfer Path:** A transfer path designated by the WECC Operating Committee as being qualified for WECC unscheduled flow mitigation.

**Qualified Controllable Device:** A controllable device installed in the Interconnection for controlling energy flow, and the WECC Operating Committee has approved using the device for controlling the USF on the Qualified Transfer Paths.

**Qualified Transfer Path Curtailment Event:** Each hour that a Transmission Operator calls for Step 4 or higher for one or more consecutive hours (see Attachment 1-IRO-006-WECC-1) during which the curtailment tool is functional.

**Transfer Distribution Factor (TDF):** The percentage of USF that flows across a Qualified Transfer Path when an Interchange Transaction (Contributing Schedule) is implemented. [See the WECC Unscheduled Flow Mitigation Summary of Actions Table (Attachment 1 WECC IRO-006-WECC-1).]

**Comment [sm6]:** This term is in the NERC Glossary of Terms and is inconsistent with the definition. NERC suggests either conforming to the NERC definition or removing this for the Defined Terms.

**Relief Requirement:** The expected amount of the unscheduled flow reduction on the Qualified Transfer Path that would result by curtailing each Sink Balancing Authority's Contributing Schedules by the percentages listed in the columns of WECC Unscheduled Flow Mitigation Summary of Actions Table in Attachment 1 WECC IRO-006-WECC-1.

# WECC Standard IRO-006-WECC-1 – Qualified Transfer Path Unscheduled Flow Relief

## A. Introduction

1. **Title:** Qualified Transfer Path Unscheduled Flow (USF) Relief
2. **Number:** IRO-006-WECC-1
3. **Purpose:** Mitigation of transmission overloads due to unscheduled flow on Qualified Transfer Paths.
4. **Applicability**
  - 4.1. Balancing Authorities
  - 4.2. Reliability Coordinators
5. **Effective Date:** The first day of the first quarter after applicable regulatory approvals.

## B. Requirements

- R.1. Upon receiving a request of Step 4 or greater (see Attachment 1-IRO-006-WECC-1) from the Transmission Operator of a Qualified Transfer Path, the Reliability Coordinator shall approve (actively or passively) or deny that request within five minutes. *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*
- R.2. The Balancing Authorities shall approve curtailment requests to the schedules as submitted, implement alternative actions, or a combination there of that collectively meets the Relief Requirement. *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*

## C. Measures

- ~~M1-M7.~~ The Reliability Coordinator shall have evidence that it approved or denied the request within five minutes in accordance with R1.
- ~~M2-M8.~~ The Balancing Authorities shall have evidence that they provided the Relief Requirement through Contributing Schedules curtailments, alternative actions, or a combination that collectively meets the Relief Requirement as directed in R.2.

**Comment [AJR7]:** Quite frankly, I don't see this as having much use. This doesn't mandate the use of UFAS, or mitigation of the overload or anything. It needs a lot more requirements. For example "when facing an overload, the TOP shall implement the following steps in the following order until such time as the overload is alleviated."

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## D. Compliance

### 1. Compliance Monitoring Process

#### 1.1 Compliance Monitoring Responsibility

Compliance Enforcement Authority

#### 1.2. Compliance Monitoring Period and Reset

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

- Reviews conducted monthly
- Spot check audits conducted anytime with 30 days notice given to prepare

## WECC Standard IRO-006-WECC-1 – Qualified Transfer Path Unscheduled Flow Relief

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- Periodic audit as scheduled by the Compliance Enforcement Authority
- Investigations
- Other methods as provided for in the Compliance Monitoring Enforcement Program

1.2.1 Compliance Monitoring Period: A Qualified Transfer Path Curtailment Event

1.2.2 The Performance-reset Period is one calendar month.

### 1.3. Data Retention

Reliability Coordinators and Balancing Authorities shall keep evidence for Measure M.1 through M2 for three years plus current, or since the last audit, whichever is longer.

### 1.4. Additional Compliance Information

Compliance shall be determined by a single event, per path, per calendar month (at a minimum) provided at least one event occurs in that month.

## 2. Violation Severity Levels of Non-Compliance for Requirement R1

**Comment [sm8]:** These VSLs are not in table format.

- 2.1. **Lower:** There shall be a Lower Level of non-compliance if there is one instance during a calendar month in which the Reliability Coordinator approved (actively or passively) or denied a Step 4 or greater request greater than five minutes after receipt of notification from the Transmission Operator of a Qualified Transfer Path.
- 2.2. **Moderate:** Not Applicable
- 2.3. **High:** Not Applicable
- 2.4. **Severe:** Not Applicable

## 3. Violation Severity Levels of Non-Compliance for Requirement R2

- 3.1. **Lower:** There shall be a Lower Level of non-compliance if there is less than 100% Relief Requirement provided but greater than or equal to 90% Relief Requirement provided or the Relief Requirement was less than 5 MW and was not provided.
- 3.2. **Moderate:** There shall be a Moderate Level of non-compliance if there is less than 90% Relief Requirement provided but greater than or equal to 75% Relief Requirement provided and the Relief Requirement was greater than 5 MW and was not provided.
- 3.3. **High:** There shall be a High Level of non-compliance if there is less than 75% Relief Requirement provided but greater than or equal to 60% Relief Requirement provided and the Relief Requirement was greater than 5 MW and was not provided.
- 3.4. **Severe:** There shall be a Severe Level of non-compliance if there is less than 60% Relief Requirement provided and the Relief Requirement was greater than 5 MW and was not provided.

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**Version History – Shows Approval History and Summary of Changes in the Action Field**

**Attachment 1 WECC IRO-006-WECC-1  
WECC UNSCHEDULED FLOW MITIGATION  
SUMMARY OF ACTIONS**

<b>Step</b>	<b>Action Description</b>	Unscheduled Flow Accommodation across Path	<b>Equivalent Percent Curtailment Required in Contributing Schedule -Based on amount of Unscheduled Flow across the Qualified Transfer Path (Transfer Distribution Factor)</b>
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### **Standard Development Roadmap**

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

#### **Development Steps Completed:**

#### **Description of Current Draft:**

The purpose of this standard is to create a permanent replacement standard for PRC-STD-001-1 and PRC-STD-003-1. PRC-004-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when PRC-STD-001-1 and PRC-STD-003-1 were approved as NERC reliability standards. The new standard addresses the following areas:

1. Requirements for investigating operations to check for Misoperations.
2. Mitigation requirements after security-based Misoperations for redundant or non-redundant Protection Systems or Remedial Action Schemes.
3. Mitigation requirements after dependability-based Misoperations that do not adversely affect the reliability of the Bulk Electric System.

Several significant changes were made to PRC-STD-001 and PRC-STD-003 and they are itemized here:

1. PRC-STD-003 was renumbered to PRC-004-WECC-1. This makes both the PRC-004 and the Regional PRC-004-WECC-1 standards applicable to similar entities. PRC-003 is applicable to the RRO.
2. Standard PRC-STD-001 will be retracted because the requirements are covered by other standards per description below:
  - a. PRC-STD-001 requirements B-WR1-a,b,c are covered under PRC-001
  - b. PRC-STD-001 requirement B-WR1-d is covered in this standard PRC-004-WECC-1
  - c. PRC-STD-001 requirement B-WR1-e is covered under TOP-005-1

The WECC Operating Committee approved the PRC-004-WECC-1 standard as a permanent replacement standard for PRC-STD-001-1 and PRC-STD-003-1 on March 6, 2008. The WECC Board of Directors approved this standard April 16, 2008. The WECC Board of Directors recommends that the NERC Board of Trustees approve the PRC-004-WECC-1 as a permanent replacement standard for PRC-STD-001-1 and PRC-STD-003-1. In addition, the WECC Board of Directors recommends that the NERC Board of Trustees submits the standard to FERC for approval.

#### **Justification for a Regional Standard**

## **WECC Standard PRC-004-WECC-1 – Protection System and Remedial Action Scheme Misoperation**

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The NERC standard PRC-003-1 has requirements for Regional Reliability Organizations to establish procedures for review, analysis, reporting, and mitigation of transmission and generation Protection System Misoperations but does not address the owners of the transmission and generation facilities. The NERC standard PRC-004-1 has requirements for Protection System Misoperations but does not provide for the additional requirements as listed in PRC-004-WECC-1. The WECC Transmission Paths listed in the table titled “Major WECC Transfer Paths in the Bulk Electric System” and WECC RAS listed in table titled “Major WECC Remedial Action Schemes (RAS)” of PRC-004-WECC-1 are significant components for reliable delivery of power in the Western Interconnection. Protection System Misoperations and failures can cause reductions to the System Operating Limits (SOL) for those paths, and thus limit transfers between remotely located generation in the Western Interconnection and population/load centers. WECC identified the need for the timely mitigation of relaying problems and implemented such actions under the Reliability Management System (RMS). PRC-004-WECC-1 incorporates the RMS criteria and provides:

1. More robust requirements for review and analysis of all operations of those elements by operating and system protection personnel, and
2. Timely actions that must be taken to ensure that Misoperations of those elements are not repeated.

This standard is designed to minimize the SOL reductions required to maintain reliable Western Interconnection operation.

### **Future Development Plan:**

## **DEFINITIONS OF TERMS USED IN STANDARD**

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*

**Functionally Equivalent Protection System (FEPS):** A Protection System that provides performance as follows:

- Each Protection System can detect the same faults within the zone of protection and provide the clearing times and coordination needed to comply with all Reliability Standards.
- Each Protection System may have different components and operating characteristics.

**Functionally Equivalent RAS (FERAS):** A Remedial Action Scheme (RAS) that provides the same performance as follows:

- Each RAS can detect the same conditions and provide mitigation to comply with all Reliability Standards.
- Each RAS may have different components and operating characteristics.

**Security-Based Misoperation:** A Misoperation caused by the incorrect operation of a Protection System or RAS. Security is a component of reliability and is the measure of a device's certainty not to operate falsely.

**Dependability-Based Misoperation:** Is the absence of a Protection System or RAS operation when intended. Dependability is a component of reliability and is the measure of a device's certainty to operate when required.

## A. Introduction

- 1. Title:** Protection System and Remedial Action Scheme Misoperation
- 2. Number:** PRC-004-WECC-1
- 3. Purpose:** Regional Reliability Standard to ensure all transmission and generation Protection System and Remedial Action Scheme (RAS) Misoperations on Transmission Paths and RAS defined in section 4 are analyzed and/or mitigated.

### 4. Applicability

- 4.1.** Transmission Owners of selected WECC major transmission path facilities and RAS listed in tables titled “Major WECC Transfer Paths in the Bulk Electric System” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc> and “Major WECC Remedial Action Schemes (RAS)” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc>.
- 4.2.** Generator Owners that own RAS listed in the Table titled “Major WECC Remedial Action Schemes (RAS)” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc>.
- 4.3.** Transmission Operators that operate major transmission path facilities and RAS listed in Tables titled “Major WECC Transfer Paths in the Bulk Electric System” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc> and “Major WECC Remedial Action Schemes (RAS)” provided at <http://www.wecc.biz/Docs/Documents/Table%20Major%20RAS%204-28-08.doc>.
- 5. Effective Date:** On the first day of the second quarter following applicable regulatory approval.

**Comment [sm9]:** This qualifier is redundant with the text prior to the first requirement. I suggest removing from the Applicability section.

## B. Requirements

The requirements below only apply to the major transmission paths facilities and RAS listed in the tables titled “Major WECC Transfer Paths in the Bulk Electric System” and “Major WECC Remedial Action Schemes (RAS).”

- R.1.** System Operators and System Protection personnel of the Transmission Owners and Generator Owners shall analyze all Protection System and RAS operations. *[Violation Risk Factor: Lower] [Time Horizon: Operations Assessment]*
- R1.1.** System Operators shall review all tripping of transmission elements and RAS operations to identify apparent Misoperations within 24

**Comment [sm10]:** The requirement should be clearer on who is performing the action – this requirement leads with System Operators and SP personnel both of which are not in the Applicability.

**Comment [sm11]:** Use the responsible entity name in the Applicability section – same comment for R1.2

hours.

**R1.2.** System Protection personnel shall analyze all operations of Protection Systems and RAS within 20 business days for correctness to characterize whether a Misoperation has occurred that may not have been identified by System Operators. Not sure is this meant to be identified ahead of time? (i.e. such as by simulation)

**R.2.** Transmission Owners and Generator Owners shall perform the following actions for each Misoperation of the Protection System or RAS. It is not intended that Requirements R2.1 through R2.4 apply to Protection System and/or RAS actions (operations?) that appear to be entirely reasonable and correct at the time of occurrence and associated system performance that is fully compliant with NERC Reliability Standards. If the Transmission Owner or Generator Owner later finds the Protection System or RAS operation to be incorrect through System Protection personnel analysis, the requirements of R2.1 through R2.4 become applicable at the time the Transmission Owner or Generator Owner identifies the Misoperation:

**Comment [sm12]:** NERC agrees with this exception in concept but suggest a more concise description of the exception.

**R2.1.** If the Protection System or RAS has a Security-Based Misoperation and two or more Functionally Equivalent Protection Systems (FEPS) or Functionally Equivalent RAS (FERAS) remain in service to ensure Bulk Electric System (BES) reliability, the Transmission Owners or Generator Owners shall remove from service the Protection System or RAS that misoperated within 22 hours following identification of the Misoperation, and ~~R~~repair or replacement ~~of~~ the failed Protection System or RAS ~~is~~ at the Transmission Owners' and Generator Owners' discretion. *[Violation Risk Factor: High] [Time Horizon: Same-day Operations]*  
How long do they have to replace the failed system? Is it 20 business days the same as in R2.2.2?  
If it is the same what's the difference between R2.1 and R2.2?

**Comment [sm13]:** NERC has concerns with the interaction between the parent requirements and sub-requirements. This concern is manifested by the redline comment inserted in R2.1.

**R2.2.** If the Protection System or RAS has a Security-Based Misoperation and only one FEPS or FERAS remains in service to ensure BES reliability, the Transmission Owner or Generator Owner shall perform the following. *[Violation Risk Factor: High] [Time Horizon: Same-day Operations]*

**R2.2.1.** Following identification of the Protection System or RAS Misoperation, Transmission Owners and Generator Owners shall remove from service within 22 hours for repair or modification the Protection System or RAS that misoperated. Check to see if anything remains in service in other words is the FEPS or FERAS a backup that becomes primary?





- R3.2.** Completion of repairs or the replacement of Protection System and/or RAS that misoperated.

### **C. Measures**

Each measure below applies directly to the requirement by number.

- M1.** Transmission Owners and Generation Owners shall have evidence that they reported and analyzed all Protection System and RAS operations.
  - M1.1** Transmission Owners and Generation Owners shall have evidence that System Operating personnel reviewed all operations of Protection System and RAS within 24 hours.
  - M1.2** Transmission Owners and Generation Owners shall have evidence that System Protection personnel analyzed all operations of Protection System and RAS for correctness within 20 business days.
- M2.** Transmission Owners and Generation Owners shall have evidence for the following.
  - M2.1** Transmission Owners and Generation Owners shall have evidence that they removed the Protection System or RAS that misoperated from service within 22 hours following identification of the Protection System or RAS Misoperation.
  - M2.2** Transmission Owners and Generation Owners shall have evidence that they removed from service and repaired the Protection System or RAS that misoperated per measurements M2.2.1 through M2.2.2.
    - M2.2.1** Transmission Owners and Generation Owners shall have evidence that they removed the Protection System or RAS that misoperated from service within 22 hours following identification of the Protection System or RAS Misoperation.
    - M2.2.2** Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated within 20 business days or either removed the Element from service or disabled the RAS.
  - M2.3** The Transmission Owners and Generation Owners shall have evidence that they repaired the Protection System or RAS that

misoperated within 22 hours following identification of the Protection System or RAS Misoperation.

**M2.3.1** The Transmission Owner shall have evidence that it removed the associated Element from service.

**M2.3.2** The Generator Owners and Transmission Operators shall have documentation describing all actions taken that adjusted generation or SOLs and operated facilities within established limits.

**M2.4** Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated including documentation that describes the actions taken.

**M2.4.1** Transmission Owners and Generation Owners shall have evidence that they repaired or replaced the Protection System or RAS that misoperated within 20 business days of the misoperation identification.

**M2.4.2** Transmission Owners and Generation Owners shall have evidence that they removed the associated Element or RAS from service.

**M3.** Transmission Owners and Generation Owners shall have evidence that they reported the following within 10 business days.

**M3.1** Identification of all Protection System and RAS Misoperations and corrective actions taken or planned.

**M3.2** Completion of repair or replacement of Protection System and/or RAS that misoperated.

## **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:

- Misoperation Reports
- Reports submitted quarterly
- Spot check audits conducted anytime with 30 days notice given to prepare
- Periodic audit as scheduled by the Compliance Enforcement Authority
- Investigations
- Other methods as provided for in the Compliance Monitoring Enforcement Program

**1.2.1** The Performance-reset Period is one calendar month.

**1.3 Data Retention**

Reliability Coordinators, Transmission Owners, and Generation Owners shall keep evidence for Measures M1 and M2 for five calendar years plus year to date.

**1.4. Additional Compliance Information**

None.

**2. Violation Severity Levels**

R1

R2.1 and R2.2.1

R2.3

R2.2.2 and R2.4

R3.1

R3.2

**Version History** – Shows Approval History and Summary of Changes in the Action Field

### Standard Development Roadmap

*This section is maintained by the drafting team during the development of the standard and will be removed when the standard becomes effective.*

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#### Development Steps Completed:

#### Description of Current Draft:

The purpose of this standard is to create a permanent replacement standard for TOP-STD-007-0. TOP-007-WECC-1 is designed to implement the directives of FERC and recommendations of NERC when TOP-STD-007-0 was approved as a NERC reliability standard.

This draft standard incorporates the following refinements to the first draft of TOP-007-WECC-1 in response to comments received during the first comment period that ended November 5, 2007 and the second comment period that ended January 2, 2008.

1. Refine R1 to remove the requirement to return a path to within its limit in 20 minute for SOLs based upon Transient Stability and Voltage Stability.
2. Refine R2 to limit the compliance period for the Net Scheduled Interchange to the real-time schedules for the next hour.
3. Refine R2 to permit 30 minutes to adjust Net Scheduled Interchange when SOLs reduce within 20 minutes of the start of the hour.
4. Change M2 based upon the refinements to R2.
5. Base the violation severity levels for R2 upon magnitude.

This version of the TOP-007-WECC-1 standard is for NERC Board of Trustee ballot. The WECC Board of Directors approved the standard April 16, 2008. WECC Operating Committee approved the standard March 6, 2008. The WECC Board of Directors and Operating Committee request that the NERC Board of Trustees approve the TOP-007-WECC-1 Standard as a permanent replacement standard for TOP-STD-007-0 and that the NERC Board of Trustees submits the standard to FERC for approval and replacement of TOP-STD-007-0.

#### Justification for a Regional Standard

The NERC standard (TOP-STD-007-0) has requirements for reducing actual flows to within System Operating Limits (SOL) on Major WECC Transfer Paths in the Bulk Electric System. The major paths listed in the Table titled “Major WECC Transfer Paths in the Bulk Electric System” are significant components for reliable delivery of power in the Western Interconnection. System Operating Limits for these paths are critical because they transfer energy from remotely located generation to population/load centers. The entities of the Western Interconnection through studies and operation see the need for optimizing the capacity of these paths. The lack of redundant transmission in these corridors raises the level of scrutiny for these paths; therefore, this standard is designed to

## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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add emphasis to reducing flows to within SOL to maintain reliable Western Interconnection operation.

NERC TOP-007-0 (R2) requires the Transmission Operator to return its transmission path flows to within Interconnection Reliability Operating Limits (IROL) as soon as possible, but no longer than 30 minutes following a contingency or event. This requirement applies only to those limits that are defined as IROL. Depending on the current system conditions, the limits for the paths identified in this TOP-007-WECC-1 standard are SOL that would not result in cascading outages. There is no NERC requirement to return the transmission system to within SOL limits, only a requirement to report to the Reliability Coordinator. TOP-007-WECC-1 specifically applies to the major paths in the Western Interconnection regardless of whether the limit is defined as an IROL or the less severe SOL.

In Order No. 693 and Docket No. RR07-11-000, the FERC expressed concern that TOP-007-0 could be interpreted as allowing a system operator to respect IROLs in one of two ways: (1) allowing IROL to be exceeded during normal operations, *i.e.*, prior to a contingency, provided that corrective actions are taken within 30 minutes; or (2) allowing IROL to be exceeded only after a contingency and subsequently returning the system to a secure condition as soon as possible, but no longer than 30 minutes. FERC explained that the system could be one contingency away from potential cascading failure if operated under the first interpretation and two contingencies away from cascading failure under the second interpretation. FERC directed NERC to conduct a survey on IROL practices and actual operating experiences of managing within IROL. The survey results will provide guidance on the frequency, duration, and magnitude of IROL violations and whether these IROL violations occur during normal or contingency conditions.

WECC and NERC responded to FERC's June 8, 2007 Order (Docket No. RR007-11-000) in its compliance filing of July 9, 2007. The compliance filing document is posted with this standard for reference. On November 2, 2007, FERC accepted NERC's and WECC's filing and indicated that the filing satisfactorily responds to the Commission's directive, *Order Approving Regional Reliability Standards for the Western Interconnection and Directing Modifications*, 119 FERC ¶ 61,260 (2007) at P 108.

**Future Development Plan:**

## DEFINITIONS OF TERMS USED IN STANDARD

*This section includes all newly defined or revised terms used in the proposed standard. 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 standard is approved. When the standard becomes effective, these definitions will be removed from the standard and added to the Glossary.*



A. Introduction

- 1. **Title:** System Operating Limits
- 2. **Number:** TOP-007-WECC-1
- 3. **Purpose:** When actual flows on Major WECC Transfer Paths exceed System Operating Limits (SOL), their associated schedules and actual flows are not exceeded for longer than a specified time.
- 4. **Applicability**
  - 4.1. Transmission Operators for the transmission paths in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” provided at:  
<http://www.wecc.biz/Docs/Documents/Table%20Major%20Paths%204-28-08.doc>.
- 5. **Effective Date:** On the first day of the first quarter, after applicable regulatory approval.

**Comment [Edd14]:** The revised NERC standards for TOP are emphasizing monitoring/reporting for SOL but exceedances only for IROL.

B. Requirements

- R1. When the actual power flow exceeds an SOL for a Transmission path, the Transmission Operators shall take immediate action to reduce the actual power flow across the path such that at no time shall the power flow for the Transmission path exceed the SOL for more than 30 minutes. *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*
- R2. The Transmission Operator shall not have the Net Scheduled Interchange for power flow over an interconnection or Transmission path above the path’s SOL when the Transmission Operator implements its real-time schedules for the next hour. For paths internal to a Transmission Operator Area that are not scheduled, this requirement does not apply. *[Violation Risk Factor: Low] [Time Horizon: Real-time Operations]*
  - R2.1. If the path SOL decreases within 20 minutes before the start of the hour, the Transmission Operator shall adjust the Net Scheduled Interchange within 30 minutes to the new SOL value. Net Scheduled Interchange exceeding the new SOL during this 30-minute period will not be a violation of R2.

**Comment [Edd15]:** Wording such as immediate or without delay is being deleted from the revised NERC standards as unmeasurable and unnecessary as the time limits cited (in this case, 30 minutes) provide you with the measurable quantity needed. As noted above, the NERC standards are moving to IROL, not SOL. Therefore, the 30 minute time limit in the old standards is being replaced with IROL T<sub>v</sub>.

**Comment [Edd16]:** I don’t know all of the differences between WECC and the East but on the surface, this statement doesn’t make any sense. NSI is normally an aggregate or total value for a company or entity. Therefore, you can’t have an NSI that is above SOL – you can only have an NSI that causes a line to exceed its SOL. That is, unless WECC has an NSI for each and every line.

C. Measures

- M1.M9. Evidence that actual power flow has not exceeded the SOL for the specified time limit in R1. *(Examples of the types of acceptable evidence are usually supplied here.)*
- M2.M10. Evidence that Net Scheduled Interchange has not exceeded the SOL when the Transmission Operator implements real-time schedules as required by R2.
  - M2.1-a. Evidence that Net Scheduled Interchange was at or below the new SOL within 30-minutes of when the SOL decreased.

**Comment [Edd17]:** The revised NERC standards do not specify any restrictions on what lines are in play – all BES Transmission lines are covered. Why would WECC only consider transfer paths? This would also seem to contradict R1 which does not place such limits – it includes all Transmission paths.

**Comment [Edd18]:** I have the same problem here with the use of NSI and SOL but even if there is an NSI for every line, this is belt and suspenders writing. If R1 gives you 30 minutes, then R2.1 isn’t needed. Regardless of the type of line involved, you have 30 minutes to relieve the problem.

D. Compliance

1. Compliance Monitoring Process

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**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:

- Self-report for each incident within three-business day
- Self-report quarterly
- Spot check audits conducted anytime with 30 days notice given to prepare
- Periodic audit as scheduled by the Compliance Enforcement Authority
- Investigations
- Other methods as provided for in the Compliance Monitoring Enforcement Program

Reset Period: One calendar month.

**1.3 Data Retention**

The Transmission Operators shall keep evidence for Measure M.1 through M2 for three years plus current, or since the last audit, whichever is longer.

**1.4 Additional Compliance Information**

**2. Violation Severity Levels**

**For Requirement R1:**

- 2.1. Lower:** There shall be a Lower Level of non-compliance for Transmission Operators as set forth in the table in Attachment 1– TOP-007-WECC-1.
- 2.2. Moderate:** There shall be a Moderate Level of non-compliance for Transmission Operators as set forth in the table in Attachment 1– TOP-007-WECC-1.
- 2.3. High:** There shall be a High Level of non-compliance for Transmission Operators as set forth in the table in Attachment 1– TOP-007-WECC-1.
- 2.4. Severe:** There shall be a Severe Level of non-compliance for Transmission Operators as set forth in the table in Attachment 1– TOP-007-WECC-1.

**Comment [Edd19]:** This format is not consistent with what we have been asked to use for national standards and is very confusing.

**For Requirement R2:**

- 2.1. Lower:** There shall be a Lower Level of non-compliance for Transmission Operators when the net schedule for power flow over an interconnection or Transmission path is above the path’s SOL but is less than or equal to 105% of the path’s SOL.
- 2.2. Moderate:** There shall be a Moderate Level of non-compliance for Transmission Operators when the net schedule for power flow over an interconnection or Transmission path is above 105% of the path’s SOL but less than or equal to 110% of the path’s SOL.

- 2.3. **High:** There shall be a High Level of non-compliance for Transmission Operators when the net schedule for power flow over an interconnection or Transmission path is above 110% of the path's SOL.
- 2.4 **Severe:** None

**Version History – Shows Approval History and Summary of Changes in the Action Field**

**Attachment 1 – TOP-007-WECC-1**

**Violation Severity Level Table**

\* Measured after 30 continuous minutes of actual flows in excess of SOL.

**Regional Reliability Standard  
Submittal Review Checklist**

**Region:** Western Electricity Coordination Council

**Regional Standard Number:** FAC-501-WECC-1

**Regional Standard Title:** Transmission Maintenance

**Date Standard Received:** 6/11/08

**Date Region Notified of Receipt:** 6/17/08

**Date NERC Evaluation Completed:** 7/30/2008

**Submittal Review Status:**

Complete

Incomplete

**Reviewed by:**

Stephanie Monzon, Manager of Regional Standards

Maureen Long, Standards Process Manager

Gerry Adamski, Vice President and Director of Standards

**Approved by:**

**Review of Request for Completeness:**

1. Was a concise statement of the basis and purpose (scope) of request supplied?  
 Yes  
 No
2. Was a concise statement of the justification of the request supplied?  
 Yes  
 No
3. Was the text of the regional reliability standard supplied in MS Word format?  
 Yes  
 No
4. Was an implementation plan supplied?  
 Yes  
 No
5. Was the regional entity standard drafting team roster supplied?  
 Yes  
 No
6. Were the names and affiliations of the ballot pool members or names and affiliations of the committee and committee members that approved the submittal of the standard supplied?  
 Yes  
 No
7. Were the final ballot results, including a list of significant minority issues that were not resolved, supplied?  
 Yes  
 No
8. For each public comment period, was a copy of each comment submitted and its associated response along with the associated changes made to the standard supplied?  
 Yes  
 No

**Review of Standard for Completeness:**

**Title**

9. Is there a title that provides a brief, descriptive phrase identifying the topic of the standard?

- Yes
- No

**Number**

10. Does the standard have a unique identification number not already used by any NERC reliability standard?

- Yes
- No

**Purpose**

11. Does the purpose explicitly state what reliability-related outcome will be achieved by the adoption of the standard?

- Yes
- No

**Applicability**

12. Does this reliability standard clearly identify the functional classes of entities responsible for complying with the reliability standard, with any specific additions or exceptions noted?

- Yes
- No

13. Does this reliability standard identify the geographic applicability of the standard, such as the entire interconnection, or within a regional entity area?

- Yes
- No

14. Does this reliability standard identify any limitations on the applicability of the standard based on electric facility characteristics, such as generators with a nameplate rating of 20 MW or greater, or transmission facilities energized at 200 kV or greater or some other criteria?

- Yes
- No

**Effective Date**

15. Does the effective date start on the 1<sup>st</sup> day of the 1<sup>st</sup> quarter after entities are expected to be compliant?
- Yes  
 No
16. Does the effective date provide time to file with applicable regulatory authorities and provide notice to responsible entities of the obligation to comply?
- Yes  
 No Unsure whether the revisions to this standard require implementation time. .

**Requirements**

17. Does each requirement identify the functional entity that is responsible and the action to be performed or the outcome to be achieved?
- Yes  
 No
18. Does this reliability standard state one or more performance requirements, which if achieved by the applicable entities, will provide for a reliable bulk power system, consistent with good utility practices and the public interest?
- Yes  
 No
19. Are the requirements free of additional comments or statements for which compliance is not mandatory, such as background or explanatory information?
- Yes  
 No

**Violation Risk Factors**

20. Is there a Violation Risk Factor (High, Medium, Lower) for each requirement?
- Yes  
 No

**Time Horizons**

21. Is there a Mitigation Time Horizon (Long-term Planning; Operations Planning; Same-day Operations; Real-time Operations; Operations Assessment) for each requirement?
- Yes  
 No



### Measures

22. Does each measure identify to whom the measure applies and the expected level of performance or outcomes required to demonstrate compliance?
- Yes  
 No
23. Is each measure tangible, practical, and as objective as is practical?
- Yes  
 No
24. Does each measure clearly refer to the requirement(s) to which it applies?
- Yes
25. Is there a measure for each requirement?
- Yes  
 No

### Compliance Monitoring Responsibility

26. Is the 'Electric Reliability Organization' identified as the Compliance Monitor?
- Yes  
 No The Compliance Enforcement Authority is identified as the Compliance Monitor.

### Compliance Monitoring Period

27. Does the standard identify the time period in which performance or outcomes is measured, evaluated, and then reset?
- Yes  
 No

### Data Retention

28. Does the standard identify the data retention requirements and assignment of responsibility for data archiving?
- Yes  
 No

### Additional Compliance Information

29. Does the standard identify the process that will be used to evaluate data or information for the purpose of assessing performance or outcomes?
- Yes  
 No

30. Does the standard identify the specific data or information that is required to measure performance or outcomes?

Yes

No

31. Does the standard identify the entity that is responsible for providing data or information for measuring performance or outcomes?

Yes

No

### **Violation Severity Levels**

32. Is there a Violation Severity Level (lower, moderate, high, severe) for violation of each of the requirements?

Yes While there are violation severity levels for the Requirements, the VSLs are not consistent with the table format being used in the current standards.

No

### **Associated Documents**

33. If there are standards or forms that are referenced within a standard, are the full names and numbers of the standard identified under, 'Associated Documents'.

Yes

No

### **Definitions**

34. Are the definitions used and provided in the standard consistent with the NERC definitions.

Yes

No

### **Other Observations:**

35. Are there any additional comments?

Yes

No

## **FAC-501-WECC-1 Comparison**

**Comment [ga1]:** I have no comments on this standard.

This following document prepared by the drafting team during the development of the WECC Standard FAC-501-WECC-1 – Contingency Reserve compares this proposed regional standard to the existing WECC PRC-STD-005-1.

The purpose of this document to provide documentation of each proposed change.

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<b>A. Introduction</b>		
<b>1. Title:</b> Transmission Maintenance	<b>1. Title:</b> Transmission Maintenance	
<b>2. Number:</b> FAC-501-WECC-1	<b>2. Number:</b> PRC-STD-005-1	Title updated to reflect revised titling criteria
<b>3. Purpose:</b> To ensure the Transmission Owner of a transmission path identified in the table titled “Major WECC Transfer Paths in the Bulk Electric System” including associated facilities has a Transmission Maintenance and Inspection Plan (TMIP); and performs and documents maintenance and inspection activities in accordance with the TMIP.	<b>3. Purpose:</b> Regional Reliability Standard to ensure the Transmission Operator or Owner of a transmission path identified in Attachment A perform maintenance and inspection on identified paths as described by its transmission maintenance plan.	Updated to reflect the overall purpose of the proposed revised standard.
<b>4. Applicability</b>	<b>4) Applicability</b>	
4.1 Transmission Owners that maintain the transmission paths in the most current table titled “Major WECC Transfer Paths in the Bulk Electric System” provided at:	4.1. This Standard is applicable to Transmission Owners or Operators that maintain the transmission paths in Attachment A – WECC Table 2 and is applicable only to those facilities associated with each of the paths identified.	Transmission Owners is a defined term in NERC’s Functional Model, so it is used in this standard without being redefined.
<b>5. Effective Date:</b> On the first day of the next quarter, after receipt of applicable regulatory approval.	<b>5. Effective Date:</b> This Western Electricity Coordinating Council Regional Reliability Standard will be effective when approved by the Federal Energy Regulatory Commission under Section 215 of the Federal Power Act. This Regional Reliability Standard shall be in effect for one year from the date of Commission approval or until a North American Standard or a revised Western Electricity Coordinating Council Regional Reliability Standard goes into place, whichever occurs first. At no time shall this regional	

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
	Standard be enforced in addition to a similar North American Standard.	
<b>B. Requirements</b>	<b>B. Requirements</b>	
<p><b>R.1.</b> Transmission Owners shall have a TMIP detailing their inspection and maintenance requirements that apply to all transmission facilities necessary for System Operating Limits associated with each of the transmission paths identified in table titled “Major WECC Transfer Paths in the Bulk Electric System.” <i>[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]</i></p> <p><b>R1.1.</b> Transmission Owners shall annually review their TMIP and update as required. <i>[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]</i></p> <p><b>R.2.</b> Transmission Owners shall include the maintenance categories in Attachment 1-FAC-501-WECC-1 when developing their TMIP. <i>[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]</i></p> <p><b>R.3.</b> Transmission Owners shall implement and follow their TMIP. <i>[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]</i></p> <p><b>Attachment 1-FAC-501-WECC-1</b></p>	<p><b>WR1</b></p> <p>All bulk power transmission elements (i.e. lines, stations and rights of way) included as part of the transmission facilities (or required to maintain transfer capability) impacting each of the transmission paths listed in Attachment A – WECC Table 2 shall be inspected and maintained in accordance with this criterion, taking into consideration diverse environmental and climatic conditions, terrain, equipment, maintenance philosophies, and design practices.</p> <p><b>a. General</b></p> <p>This Transmission Maintenance Standard requires each Responsible Entity identified in Section A.4.1 to develop and implement a Transmission Maintenance and Inspection Plan (TMIP) detailing the Responsible Entity’s inspection and maintenance activities applicable to the transmission facilities comprising each of the transmission paths identified in Attachment A – Table 2.</p> <p><b>b. Standard Requirements (i) TMIP</b></p> <p>To comply with this Standard, each Responsible Entity identified in Section A4.1 must develop and implement a TMIP.</p> <ul style="list-style-type: none"> <li>• Because maintenance and inspection practices vary, it is the intent of this Transmission Maintenance Standard to allow flexibility in inspection and</li> </ul>	<p>R.1 and WR1 are intended to perform the same function.</p> <p>The drafting team removed relay maintenance from Attachment 1 because NERC protection system reliability standards exist.</p>

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<p><b>Transmission Line and Station Maintenance Details</b></p> <p>The maintenance practices in the TMIP may be performance-based, time-based, conditional based, or a combination of all three. The TMIP shall include:</p> <ol style="list-style-type: none"> <li>1. A list of Facilities and associated Elements necessary to maintain the SOL for the transfer paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System;”</li> <li>2. The scheduled interval for any time-based maintenance activities and/or a description supporting condition or performance-based maintenance activities including a description of the condition based trigger;</li> <li>3. Transmission Line Maintenance Details: <ol style="list-style-type: none"> <li>a. Patrol/Inspection</li> <li>b. Contamination Control</li> <li>c. Tower and wood pole structure management</li> </ol> </li> <li>4. Station Maintenance Details: <ol style="list-style-type: none"> <li>a. Inspections</li> <li>b. Contamination Control</li> <li>c. Equipment Maintenance for the following: <ul style="list-style-type: none"> <li>• Circuit Breakers</li> </ul> </li> </ol> </li> </ol>	<p>maintenance practices while still requiring a description of certain specific inspection and maintenance practices.</p> <p>(a) <b>TMIP Contents</b>  The TMIP may be performance-based, time-based, conditional based, or a combination of all three as may be appropriate. The TMIP shall:</p> <ul style="list-style-type: none"> <li>• Identify the facilities for which it is covering by listing the names of each transmission path and the quantities of each equipment component, such as; circuit breaker, relay scheme, transmission line;</li> <li>• Include the scheduled interval (e.g., every two years) for any time-based maintenance activities and a description of conditions that will initiate any condition or performance-based activities;</li> <li>• Describe the maintenance, testing and inspection methods for each activity or component listed under Transmission Line Maintenance and Station Maintenance;</li> <li>• Provide any checklists or forms, or reports used for maintenance activities;</li> <li>• Provide criteria to be used to assess the condition of a transmission facility or component;</li> <li>• Specify condition assessment criteria and the requisite response to each condition as may be</li> </ul>	

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<ul style="list-style-type: none"> <li>• Power Transformers (including phase-shifting transformers)</li> <li>• Regulators</li> <li>• Reactive Devices (including, but not limited to, Shunt Capacitors, Series Capacitors, Synchronous Condensers, Shunt Reactors, and Tertiary Reactors)</li> </ul>	<p>appropriate for each specific type of component or feature of the transmission facilities;</p> <ul style="list-style-type: none"> <li>• Include specific details regarding Transmission Line and Station Maintenance practices as per subsections (1) and (2) below. <ul style="list-style-type: none"> <li>(1) Transmission Line Maintenance Details <p>The TMIP shall, at a minimum, describe the Responsible Entity’s practices for the following transmission line maintenance activities:</p> <ul style="list-style-type: none"> <li>• Patrol/Inspection;</li> <li>• Contamination Control (Insulator Washing)</li> </ul> </li> <li>(2) Station Maintenance Details <p>The TMIP shall describe the Responsible Entity’s maintenance practices for the following station equipment:</p> <ul style="list-style-type: none"> <li>• Circuit Breakers</li> <li>• Power Transformers (including phase-shifting transformers)</li> <li>• Regulators</li> <li>• Protective Relay Systems and associated Communication RAS Systems and associated</li> </ul> </li> </ul> </li> </ul>	

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
	<p style="text-align: center;">Communication Equipment</p> <ul style="list-style-type: none"> <li>• Reactive Devices (including, but not limited to, Shunt Capacitors, Series Capacitors, Synchronous Condensers, Shunt Reactors, and Tertiary Reactors)</li> </ul>	
<b>C. Measures</b>	<b>C. Compliance Measures</b>	
<p><b>M1.</b> Transmission Owners shall have a documented TMIP per R.1.</p> <p><b>M1.1.</b> Transmission Owners shall have evidence they have annually reviewed their TMIP and updated as needed.</p> <p><b>M2.</b> Transmission Owners shall have evidence that their TMIP addresses the required maintenance details of R.2.</p> <p><b>M3.</b> Transmission Owners shall have records that they implemented and followed their TMIP as required in R.3. The records shall include:</p> <ol style="list-style-type: none"> <li>1. The person or crew responsible for performing the work or inspection,</li> <li>2. The date(s) the work or inspection was performed,</li> <li>3. The transmission facility on which the work was performed, and</li> <li>4. A description of the inspection or maintenance performed.</li> </ol>	<p>This section defines the items that will be reviewed by WECC Staff to monitor and measure each Responsible Entity’s compliance with this Standard, and the compliance levels that will be assessed in the review process.</p> <p><b>(i) TMIP Certification</b></p> <p>Each Responsible Entity identified in Section A.4.1 shall annually certify to WECC Staff that it has developed, documented, and implemented a TMIP.</p> <p><b>(ii) WECC Staff Review</b></p> <p>WECC Staff will assess performance in the three broad areas described in Paragraph 8 of the Certification Form. These areas are:</p> <ol style="list-style-type: none"> <li>(1) Development and documentation of the TMIP;</li> <li>(2) Performing maintenance in accordance with the TMIP;</li> <li>(3) Maintaining maintenance records as required by</li> </ol>	<p>Measures were simplified to correspond with each main requirement.</p>



FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
	<p>this Standard.</p> <p><b>(iii) Review Triggers</b></p> <p>The WECC Staff will conduct a review of the Responsible Entity’s TMIP, maintenance and inspection practices and maintenance records when triggered as described below.</p> <p>(a) Disturbance Report. If a WECC Disturbance Report identifies that transmission maintenance and inspection activities were a substantial contributing factor in the disturbance, WECC Staff may request a review of the Responsible Entity.</p> <p>(b) Recommendation by CMWG team. If in its tri-annual review, the CMWG review team notes areas in transmission availability or maintenance that warrant further review, they may recommend a review by the WECC Staff.</p> <p>(c) Incomplete Annual Certification. If the Responsible Entity identified in Section A.4.1 fails to certify one or more categories of paragraph 8 of the Certification Plan, WECC Staff may request a review of the Responsible Entity.</p> <p>(d) Random Audit. The WECC Staff shall randomly select two or three Responsible Entities each year for review. When a review is requested, the Responsible Entity shall make its TMIP and all</p>	

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
	<p style="text-align: center;">maintenance records for the facilities that are part of RMS available to the WECC Staff for review within 30 calendar days from the request date.</p> <p>C. Measures WM1</p> <p>Each Responsible Entity identified in Section A.4.1 shall develop, document and implement a TMIP, perform maintenance in accordance with that TMIP, and maintain maintenance records as required by this Transmission Maintenance Standard. (Source: Compliance Standard)</p> <p>Full compliance:</p> <ol style="list-style-type: none"> <li>1. The Responsible Entity identified in Section A.4.1 has developed and documented a transmission maintenance, testing and inspection plan that meets the requirements of the Transmission Maintenance Standard.</li> <li>2. The Responsible Entity identified in Section A.4.1 is performing maintenance, testing and inspections in accordance with its TMIP.</li> <li>3. The Responsible Entity identified in Section A.4.1 is maintaining maintenance and inspection records as required by the Transmission Maintenance Standard.</li> </ol>	
<b>D. Compliance</b>	<b>D Compliance</b>	
<b>1 Compliance Monitoring Process</b>	<b>1. Compliance Monitoring Process</b>	
<b>1.1 Compliance Monitoring Responsibility</b> Compliance Enforcement Authority	<b>1.1 Compliance Monitoring Responsibility</b> Western Electricity Coordinating Council (WECC)	
<b>1.2 Compliance Monitoring Period</b> The Compliance Enforcement Authority may use one	<b>1.2 Compliance Monitoring Period</b> At Occurrence and Yearly  Each Responsible Entity identified in Section A.4.1 shall	Remove specificity for reporting. The Compliance

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<p>or more of the following methods to assess compliance:</p> <ul style="list-style-type: none"> <li>- Self-certification conducted annually</li> <li>- Spot check audits conducted anytime with 30 days notice given to prepare</li> <li>- Periodic audit as scheduled by the Compliance Enforcement Authority</li> <li>- Investigations</li> <li>- Other methods as provided for in the Compliance Monitoring Enforcement Program</li> </ul> <p>The Reset Time Frame shall be one year.</p>	<p>certify to the WECC Staff on or before January 15 of each year, that it has implemented a TMIP in compliance with this Transmission Maintenance Standard by submitting a completed Transmission Maintenance Certification Form (Form A.12).</p> <p>If a review is triggered according to Section B.c (iii), a Responsible Entity identified in Section A.4.1 shall make its TMIP and maintenance records for those facilities available to the WECC Staff within 30 calendar days from the date requested. The WECC Staff may have to visit several maintenance headquarters or offices to review the maintenance records.</p> <p>Each Responsible Entity identified in Section A.4.1 shall submit the completed form(s) by e-mail to the WECC Staff at the address specified in the form. Electronic data submittal forms for use in preparing a customized form specifically for your organization are available from the WECC web site or by email from WECC Staff at the e-mail address specified on the WECC web site.</p>	<p>Enforcement Authority will include this detail in its reporting instructions.</p>
<p><b>1.3 Data Retention Data Retention</b></p> <p>The Transmission Owners shall keep evidence for Measure M1 through M3 for three years plus the current year, or since the last audit, whichever is longer.</p>	<p><b>Maintenance Record Keeping</b></p> <p>M1. Each Responsible Entity identified in Section A.4.1 must retain all pertinent maintenance and inspection records that support the TMIP according to the following guidelines:</p> <ul style="list-style-type: none"> <li>• The Responsible Entity shall maintain records of all maintenance and inspection activities for at least five years.</li> </ul>	<p>Data retention period lengthened to 3 years plus the current year to ensure data are kept in a contiguous manner between audit periods.</p>

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
	<ul style="list-style-type: none"> <li>• Each Responsible Entity’s maintenance and inspection records shall identify, at a minimum:               <ul style="list-style-type: none"> <li>o The person(s) responsible for performing the work or inspection;</li> <li>o The date(s) the work or inspection was performed;</li> <li>o The transmission facility on which the work was performed, and</li> <li>o A description of the inspection or maintenance performed.</li> </ul> </li> </ul> <p>The Transmission Owner or Operator shall maintain (and make available on request) records for maintenance or inspection pertaining to the items listed in subsections (a) and (b) below.</p> <p>(a) Transmission Line Maintenance Records</p> <ul style="list-style-type: none"> <li>• Patrol/Inspection</li> <li>• Contamination Control (Insulator Washing)</li> </ul> <p>(b) Station Maintenance Records</p> <ul style="list-style-type: none"> <li>• Circuit Breakers</li> <li>• Power Transformers</li> <li>• Regulators</li> </ul>	

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
	<ul style="list-style-type: none"> <li>• Protective Relay Systems and associated Communication Equipment</li> <li>• RAS Systems and associated Communication Equipment</li> <li>• Reactive Devices</li> </ul> <p><b>1.3 Data Retention</b> Data will be retained in electronic form for at least four years. The retention period will be evaluated before expiration of four years to determine if a longer retention period is necessary. If the data are being reviewed to address a question of compliance, the data will be saved beyond the normal retention period until the question is formally resolved.</p>	
<p><b>1.4 Additional Compliance Information</b></p> <p>No additional compliance information.</p>	<p><b>1.4. Additional Compliance Information</b></p> <p>For purposes of applying the sanctions specified in the WECC Reliability Standard for violations of this criterion, the “Sanction Measure” is Normal Path Rating and the “Specified Period” is the four most recent calendar years. The sanctions shall be assessed on an annual basis, but for purposes of determining the applicable column in the Sanctions Table, all occurrences within the specified period of the most recent calendar year and all immediately preceding consecutive calendar years in which at least one instance of non-compliance occurred shall be considered.</p>	<p>No longer needed because the NERC sanction table is used.</p>
<p><b>2. Violation Severity Levels for Requirements</b></p>	<p><b>Levels of Non-Compliance Sanction</b></p>	
	<p><b>Sanction Measure:</b> Normal Path Rating</p>	
<p><b>2.1. Lower:</b> There shall be a Lower Level of non-compliance if any of the following conditions exist:</p> <p><b>2.1.1</b> The TMIP does not include associated Facilities for one of the Paths</p>	<p><b>2.1. Level 1:</b> There shall be a Level 1 non-compliance if any of the following conditions exist:</p> <p>2.1.1 The Responsible Entity certifies that it has developed and documented a TMIP (8a from Certification Form) and certifies that it is fulfilling only one of the following two</p>	<p>Lower Severity Levels defined for each requirement.</p>

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<p>identified in Attachment 1 FAC-501-WECC-1 as required by R.1 but Transmission Owners are performing maintenance and inspection for the missing Facilities.</p> <p><b>2.1.2</b> Transmission Owners did not review their TMIP annually as required by R.1.1.</p> <p><b>2.1.3</b> The TMIP does not include one maintenance category identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.</p> <p><b>2.1.4</b> Transmission Owners do not have maintenance and inspection records as required by R.3 but have evidence that they are implementing and following their TMIP.</p>	<p>requirements:</p> <ul style="list-style-type: none"> <li>• Performing maintenance, testing and inspections in accordance with its TMIP (8b from Certification Form), or</li> <li>• Maintaining maintenance and inspection records as required by the Transmission Maintenance Standard (8c from Certification Form).</li> </ul>	
<p><b>2.2. Moderate:</b> There shall be a Moderate Level of non-compliance if any of the following conditions exist:</p> <p><b>2.2.1</b> The TMIP does not include associated Facilities for two of the Paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” as required by R.1 and Transmission Owners are</p>	<p><b>2.2. Level 2:</b> There shall be a Level 2 non-compliance if any of the following conditions exist:</p> <p>2.2.1 The Responsible Entity certifies that it has developed and documented a TMIP (8a from Certification Form) and has not certified that it is fulfilling the following two requirements:</p> <ul style="list-style-type: none"> <li>• Performing maintenance, testing and inspections in accordance with its TMIP (8b</li> </ul>	<p>Moderate Severity Levels defined for each requirement.</p>

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<p>not performing maintenance and inspection for the missing Facilities.</p> <p><b>2.2.2</b> The TMIP does not include two maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.</p> <p><b>2.2.3</b> Transmission Owners are not performing maintenance and inspection for one maintenance category identified in Attachment 1 FAC-501-WECC-1 as required in R3.</p>	<p>from Certification Form), and</p> <ul style="list-style-type: none"> <li>Maintaining maintenance and inspection records as required by the Transmission Maintenance Standard (8c from Certification Form).</li> </ul>	
<p><b>2.3. High:</b> There shall be a High Level of non-compliance if any of the following condition exists:</p> <p><b>2.3.1</b> The TMIP does not include associated Facilities for three of the Paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” as required by R.1 and Transmission Owners are not performing maintenance and inspection for the missing Facilities.</p> <p><b>2.3.2</b> The TMIP does not include three maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission</p>	<p><b>2.3. Level 3:</b> There shall be a Level 3 non-compliance if any of the following conditions exist:</p> <p>2.3.1 The Responsible Entity does not have a TMIP but has submitted a mitigation plan to achieve full compliance.</p>	<p>High Severity Levels defined for each requirement.</p>

FAC-501-WECC-1 - Transmission Maintenance	WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings	Comment
<p>Owners are performing maintenance and inspection for the missing maintenance categories.</p> <p><b>2.3.3</b> Transmission Owners are not performing maintenance and inspection for two maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required in R3.</p>		
<p><b>2.4. Severe:</b> There shall be a Severe Level of non-compliance if any of the following condition exists:</p> <p><b>2.4.1</b> The TMIP does not include associated Facilities for more than three of the Paths identified in the most current Table titled “Major WECC Transfer Paths in the Bulk Electric System” as required by R.1 and Transmission Owners are not performing maintenance and inspection for the missing Facilities.</p> <p><b>2.4.2</b> The TMIP does not exist or does not include more than three maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required by R.2 but Transmission Owners are performing maintenance and inspection for the missing maintenance categories.</p> <p><b>2.4.3</b> Transmission Owners are not performing maintenance and inspection for more than two</p>	<p><b>2.4. Level 4:</b> There shall be a Level 4 non-compliance if any of the following conditions exist:</p> <p>2.4.1 The Responsible Entity does not have a TMIP and has not submitted a mitigation plan to achieve full compliance.</p>	<p>Severe Severity Levels defined for each requirement.</p>



<b>FAC-501-WECC-1 - Transmission Maintenance</b>	<b>WECC Standard PRC-STD-001 – Certification of Protective Relay Applications and Settings</b>	<b>Comment</b>
maintenance categories identified in Attachment 1 FAC-501-WECC-1 as required in R3.		

**Regional Reliability Standard  
Submittal Review Checklist**

**Region:** Western Electricity Coordination Council

**Regional Standard Number:** PRC-004-WECC-1

**Regional Standard Title:** Protection System and Remedial Action Scheme  
Misoperation

**Date Standard Received:** 6/11/08

**Date Region Notified of Receipt:** 6/17/08

**Date NERC Evaluation Completed:** 7/30/2008

**Submittal Review Status:**

Complete

Incomplete

**Reviewed by:**

Stephanie Monzon, Manager of Regional Standards

Al Calafiore, Standards Coordinator

Gerry Adamski, Vice President and Director of Standards

**Approved by:**

**Review of Request for Completeness:**

1. Was a concise statement of the basis and purpose (scope) of request supplied?  
 Yes  
 No
2. Was a concise statement of the justification of the request supplied?  
 Yes  
 No
3. Was the text of the regional reliability standard supplied in MS Word format?  
 Yes  
 No
4. Was an implementation plan supplied?  
 Yes  
 No
5. Was the regional entity standard drafting team roster supplied?  
 Yes  
 No
6. Were the names and affiliations of the ballot pool members or names and affiliations of the committee and committee members that approved the submittal of the standard supplied?  
 Yes  
 No
7. Were the final ballot results, including a list of significant minority issues that were not resolved, supplied?  
 Yes  
 No
8. For each public comment period, was a copy of each comment submitted and its associated response along with the associated changes made to the standard supplied?  
 Yes  
 No

**Review of Standard for Completeness:**

**Title**

9. Is there a title that provides a brief, descriptive phrase identifying the topic of the standard?

- Yes
- No

**Number**

10. Does the standard have a unique identification number not already used by any NERC reliability standard?

- Yes
- No

**Purpose**

11. Does the purpose explicitly state what reliability-related outcome will be achieved by the adoption of the standard?

- Yes
- No

**Applicability**

12. Does this reliability standard clearly identify the functional classes of entities responsible for complying with the reliability standard, with any specific additions or exceptions noted?

- Yes
- No

13. Does this reliability standard identify the geographic applicability of the standard, such as the entire interconnection, or within a regional entity area?

- Yes
- No

14. Does this reliability standard identify any limitations on the applicability of the standard based on electric facility characteristics, such as generators with a nameplate rating of 20 MW or greater, or transmission facilities energized at 200 kV or greater or some other criteria?

- Yes
- No

**Effective Date**

15. Does the effective date start on the 1<sup>st</sup> day of the 1<sup>st</sup> quarter after entities are expected to be compliant?
- Yes  
 No
16. Does the effective date provide time to file with applicable regulatory authorities and provide notice to responsible entities of the obligation to comply?
- Yes  
 No Unsure whether the revisions to this standard require implementation time. .

**Requirements**

17. Does each requirement identify the functional entity that is responsible and the action to be performed or the outcome to be achieved?
- Yes  
 No
18. Does this reliability standard state one or more performance requirements, which if achieved by the applicable entities, will provide for a reliable bulk power system, consistent with good utility practices and the public interest?
- Yes  
 No
19. Are the requirements free of additional comments or statements for which compliance is not mandatory, such as background or explanatory information?
- Yes  
 No

**Violation Risk Factors**

20. Is there a Violation Risk Factor (High, Medium, Lower) for each requirement?
- Yes  
 No

**Time Horizons**

21. Is there a Mitigation Time Horizon (Long-term Planning; Operations Planning; Same-day Operations; Real-time Operations; Operations Assessment) for each requirement?
- Yes  
 No

### Measures

22. Does each measure identify to whom the measure applies and the expected level of performance or outcomes required to demonstrate compliance?
- Yes  
 No
23. Is each measure tangible, practical, and as objective as is practical?
- Yes  
 No
24. Does each measure clearly refer to the requirement(s) to which it applies?
- Yes
25. Is there a measure for each requirement?
- Yes  
 No

### Compliance Monitoring Responsibility

26. Is the 'Electric Reliability Organization' identified as the Compliance Monitor?
- Yes  
 No The Compliance Enforcement Authority is identified as the Compliance Monitor.

### Compliance Monitoring Period

27. Does the standard identify the time period in which performance or outcomes is measured, evaluated, and then reset?
- Yes  
 No

### Data Retention

28. Does the standard identify the data retention requirements and assignment of responsibility for data archiving?
- Yes  
 No

### Additional Compliance Information

29. Does the standard identify the process that will be used to evaluate data or information for the purpose of assessing performance or outcomes?
- Yes  
 No

30. Does the standard identify the specific data or information that is required to measure performance or outcomes?

Yes

No

31. Does the standard identify the entity that is responsible for providing data or information for measuring performance or outcomes?

Yes

No

### **Violation Severity Levels**

32. Is there a Violation Severity Level (lower, moderate, high, severe) for violation of each of the requirements?

Yes While there are violation severity levels for the Requirements, the VSLs are not consistent with the table format being used in the current standards.

No

### **Associated Documents**

33. If there are standards or forms that are referenced within a standard, are the full names and numbers of the standard identified under, 'Associated Documents'.

Yes

No

### **Definitions**

34. Are the definitions used and provided in the standard consistent with the NERC definitions.

Yes

No

### **Other Observations:**

35. Are there any additional comments?

Yes

No

**Regional Reliability Standard  
Submittal Review Checklist**

**Region:** Western Electricity Coordination Council

**Regional Standard Number:** VAR-002-WECC-1

**Regional Standard Title:** Automatic Voltage Regulators

**Date Standard Received:** 6/11/08

**Date Region Notified of Receipt:** 6/17/08

**Date NERC Evaluation Completed:** 7/30/2008

**Submittal Review Status:**

Complete

Incomplete

**Reviewed by:**

Stephanie Monzon, Manager of Regional Standards

Steve Crutchfield, Standards Coordinator

Gerry Adamski, Vice President and Director of Standards

**Approved by:**



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- Yes  
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- Yes  
 No
19. Are the requirements free of additional comments or statements for which compliance is not mandatory, such as background or explanatory information?
- Yes  
 No

**Violation Risk Factors**

20. Is there a Violation Risk Factor (High, Medium, Lower) for each requirement?
- Yes  
 No

**Time Horizons**

21. Is there a Mitigation Time Horizon (Long-term Planning; Operations Planning; Same-day Operations; Real-time Operations; Operations Assessment) for each requirement?
- Yes  
 No

### Measures

22. Does each measure identify to whom the measure applies and the expected level of performance or outcomes required to demonstrate compliance?
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23. Is each measure tangible, practical, and as objective as is practical?
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 No

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- Yes  
 No

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Yes

No

### **Definitions**

34. Are the definitions used and provided in the standard consistent with the NERC definitions.

Yes

No

### **Other Observations:**

35. Are there any additional comments?

Yes

No

### **VAR-002-WECC-1 Comparison**

This following document prepared by the drafting team during the development of the WECC Standard VAR-002-WECC-1 – Automatic Voltage Regulator compares this proposed regional standard to the existing WECC VAR-STD-002a-1.

The purpose of this document to provide documentation of each proposed change.

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
<b>A. Introduction</b>		
<b>1. Title:</b> Automatic Voltage Regulators (AVR)	<b>1. Title:</b> Automatic Voltage Regulators (AVR)	
<b>2. Number:</b> VAR-002-WECC-1	<b>2. Number:</b> VAR-STD-002a-1	Retired Criteria
<b>3. Purpose:</b> To ensure that Automatic Voltage Regulators on synchronous generators and condensers shall be kept in service and controlling voltage. .	<b>3. Purpose:</b> Regional Reliability Standard to ensure that automatic voltage control equipment on synchronous generators shall be kept in service at all times, unless one of the exemptions listed in Section C (Measures) applies, with outages coordinated to minimize the number out of service at any one time. All synchronous generators with automatic voltage control equipment shall normally be operated in voltage control mode and set to respond effectively to voltage deviations.	Updated to reflect the overall purpose of the proposed revised standard.
<b>4. Applicability</b>		
<b>4.1.</b> Generator Operators	<b>4.1. Applicability</b> 4.1. The requirements of this criterion apply to all Generator Operators of synchronous generating units equipped with Automatic Voltage Regulators (AVR) within the Western Interconnection. The criterion shall be applied after a synchronous generator has achieved commercial operation. The criterion shall be applied on a generator-by-generator basis (a Responsible Entity can be subject to a separate sanction for each non-compliant synchronous generator). This criterion shall not be applicable to any synchronous generator for any calendar quarter in which	Generator Operators is a defined term in NERC's Glossary of Terms Used in Reliability Standards so it is used in this standard without being redefined.

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 <b>Automatic Voltage Regulators (AVR)</b>	<b>Comment</b>
	such synchronous generator is in service for less than five percent of all hours in such quarter (the owners of the synchronous generator shall still be subject to the data reporting requirements for such quarter).	
<b>4.2</b> Transmission Operators that operate synchronous condensers.		
<b>4.3</b> This VAR-002-WECC-1 Standard only applies to synchronous generators and synchronous condensers that are connected to the Bulk Electric System.		
<b>5. Effective Date:</b> On the first day of the next quarter, after receipt of applicable regulatory approval.	<b>5. Effective Date:</b> This Western Electricity Coordinating Council Regional Reliability Standard will be effective when approved by the Federal Energy Regulatory Commission under Section 215 of the Federal Power Act. This Regional Reliability Standard shall be in effect for one year from the date of Commission approval or until a North American Standard or a revised Western Electricity Coordinating Council Regional Reliability Standard goes into place, whichever occurs first. At no time shall this regional Standard be enforced in addition to a similar North American Standard.	
<b>B. Requirements</b>		
<b>R1.</b> 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	<b>WR1.</b> Automatic voltage control equipment on synchronous generators shall be kept in service at all times, unless one of the exemptions listed in Section C	AVR replacement period was increased to 24 months from 15 months to facilitate procurement requirements for Nuclear Power Plants.

**Comment [ga1]:** Seems inconsistent to me why only 98% is the goal when you are allowing so many exclusions? Need a basis for this threshold.

On this basis, I would also like to hear the explanation of why this standard is more stringent than NERC standards to justify it as a regional standard.

Further, the original WECC standard say the AVR should be in service at all times. This is a step back that is not explained.



VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
<p>through R1.10 to achieve the 98% requirement. <i>[Violation Risk Factor: Medium] [Time Horizon: Operations Assessment]</i></p> <p><b>R1.1.</b> The synchronous generator or synchronous condenser operates for less than five percent of all hours during any calendar quarter.</p> <p><b>R1.2.</b> Performing maintenance and testing up to a maximum of seven calendar days per calendar quarter.</p> <p><b>R1.3.</b> AVR exhibits instability due to abnormal system configuration.</p> <p><b>R1.4.</b> Due to component failure, the AVR may be out of service up to 60 consecutive days for repair per incident.</p> <p><b>R1.5.</b> 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.</p> <p><b>R1.6.</b> 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.</p> <p><b>R1.7.</b> The synchronous generator or synchronous condenser has not achieved Commercial Operation.</p>	<p>(Measures) applies, with outages coordinated to minimize the number out of service at any one time. All synchronous generators with automatic voltage control equipment shall normally be operated in voltage control mode and set to respond effectively to voltage deviations.</p>	<p>The reliability authority directs the operation the generator or synchronous condenser when the AVR is unavailable for service.</p> <p>Permits operation of the generator when the AVR exhibits instability due to operation of a Load Tap Changer (LTC) transformer in the area.</p>

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
<p><b>R1.8.</b> The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the AVR is unavailable for service.</p> <p><b>R1.9.</b> The Reliability Coordinator directs Transmission Operator to operate the synchronous condenser, and the AVR is unavailable for service.</p> <p><b>R1.10.</b> 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.</p> <p><b>R2.</b> Generator Operators and Transmission Operators shall have documentation identifying the number of hours excluded for each requirement in R1.1 through R1.10. <i>[Violation Risk Factor: Low] [Time Horizon: Operations Assessment]</i></p>		
<b>C. Measures</b>	<b>C. Measures WM1.</b>	
<p><b>M1.</b> 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:</p> <p><b>M1.1.</b> The actual number of hours the synchronous generator or synchronous condenser was on line.</p> <p><b>M1.2.</b> The actual number of hours the AVR was out of service.</p>	<p>WM1. Each synchronous generating unit equipped with AVR shall have the AVR in service when the unit is on line with the following exceptions:</p> <p>a) Maintenance and testing, maximum of seven calendar days per quarter.</p> <p>b) AVR exhibits instability due to nonstandard transmission line configuration.</p> <p>c) AVR does not operate properly due</p>	<p>Measures expended and split into a measure for each main requirement.</p>

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
<p><b>M1.3.</b> The AVR in service percentage.</p> <p><b>M1.4.</b> If excluding AVR out of service hours as allowed in R1.1 through R1.10, provide:</p> <p style="padding-left: 40px;">M1.4.1. The number of hours excluded, and</p> <p style="padding-left: 40px;">M1.4.2. The adjusted AVR in-service percentage.</p> <p><b>M2.</b> If excluding hours for R1.1 through R1.10, provide the date of the outage, the number of hours out of service, and supporting documentation for each requirement that applies.</p>	<p>to a failed component in the AVR or resulting from a change in adjacent equipment, whether it is control oriented or physical equipment that defines system response. If these changes are outside the control of the owner and result in an operating condition that is unsuitable for operation of an AVR, an exception shall be granted until the operating condition is once again suitable, but in no event shall the period of operation without AVR exceed 60 days, AVR must be repaired and returned to service within 60 calendar days per incident from time of failure (Source: <a href="#">AVR and PSS 60 Day Exclusion</a>). If, during this 60 day period, the decision is made to replace the excitation system, 1/ the excitation system, including AVR, must be back in service within one year of commitment to replace.</p> <p>If more than 60 days are needed to repair an AVR or more than one year is needed to replace an excitation system due to the length of time needed to obtain parts, an extension will be granted upon receipt of documentation by the WECC. Such documentation shall include notice of the need for replacement or repair, the</p>	

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 <b>Automatic Voltage Regulators (AVR)</b>	<b>Comment</b>
	<p>expected time required for the Entity’s procurement process, plus the manufacturer delivery time, plus 30 days for installation or if an outage is required for installation the date of the next scheduled outage, and the expected completion date of the work. The total amount of time shall not exceed one year for repair of the AVR or fifteen months for replacement of the excitation system.</p> <p>Responsible Entities shall provide the WECC such documentation as soon as practicable, but no later than the deadline for responding to the initial non-compliance notification letter issued by the WECC. Once repairs are complete, the WECC shall be notified with the next quarterly report of the time the AVR is back in service.</p>	
<b>D. Compliance</b>	<b>D Compliance</b>	
<b>1 Compliance Monitoring Process</b>	<b>1. Compliance Monitoring Process</b>	
<b>1.1 Compliance Monitoring Responsibility</b> Compliance Enforcement Authority	<b>1.1 Compliance Monitoring Responsibility</b> Western Electricity Coordinating Council (WECC)	
<b>1.2 Compliance Monitoring Period</b> Compliance Enforcement Authority may use one or more of the following methods to assess compliance: <ul style="list-style-type: none"> <li>- Reports submitted quarterly</li> <li>- Spot check audits conducted anytime with 30 days notice</li> </ul>	<b>1.2 Compliance Monitoring Period</b>  Quarterly On or before the twentieth day of the month following the end of a quarter (or such other date specified in Form A.5),	Remove specificity for reporting. The Compliance Enforcement Authority will include this detail in its reporting instructions.

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 <b>Automatic Voltage Regulators (AVR)</b>	<b>Comment</b>
<ul style="list-style-type: none"> <li>- Periodic audit as scheduled by the Compliance Enforcement Authority</li> <li>- Investigations</li> <li>- Other methods as provided for in the Compliance Monitoring Enforcement Program</li> </ul> <p>The Reset Time Frame shall be a calendar quarter.</p>	<p>a Responsible Entity shall submit to the WECC Staff Automatic Voltage Regulator data in Form A.5 (available on the WECC web site) for the immediately preceding quarter. (Source: Data Reporting Requirement)</p>	
<p><b>1.3 Data Retention</b></p> <p>The Generator Operators and Transmission Operators shall keep evidence for Measures M1 and M2 for three years plus current year, or since the last audit, whichever is longer.</p>	<p><b>1.3 Data Retention</b></p> <p>Data will be retained in electronic form for at least one year. The retention period will be evaluated before expiration of one year to determine if a longer retention period is necessary. If the data is being reviewed to address a question of compliance, the data will be saved beyond the normal retention period until the question is formally resolved.</p>	<p>Data retention period lengthened to 3 years plus the current year to ensure data are kept in a contiguous manner between audit periods.</p>
<p><b>1.4 Additional Compliance Information</b></p> <p><b>1.4.1</b> The sanctions shall be assessed on a calendar quarter basis.</p> <p><b>1.4.2</b> 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.</p> <p><b>1.4.3</b> When calculating the in-service percentages, do not include the time the AVR is out of service due to R1.1 through R1.10.</p>	<p><b>1.4 Additional Compliance Information</b></p> <p>The “Sanction Measure” is Synchronous Generating Unit Capability in MVA - and the Specified Period is the most recent calendar quarter. The sanctions shall be assessed on a quarterly basis, but for purposes of determining the applicable column in the <a href="#">Sanction Table</a>, all occurrences within the specified period of the most recent calendar quarter and all immediately preceding consecutive calendar quarters in which at least one</p>	<p>No longer needed because the NERC sanction table is used.</p> <p>The “additional compliance information” clarifies the calculation of the in service percentage that was previously contained in VAR-STD-002a-1.</p>

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 <b>Automatic Voltage Regulators (AVR)</b>	<b>Comment</b>
<p><b>1.4.4</b> 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).</p>	<p>instance of non-compliance occurred shall be considered.</p>	
<p><b>2. Violation Severity Levels for R1</b></p>	<p><b>2. Levels of Non-Compliance</b></p>	
	<p><b>Sanction Measure:</b> Synchronous Generating Unit Capability in MVA For levels of noncompliance with a specific number of days associated, (e.g., 7 days for maintenance and testing, etc.) the level of noncompliance will be calculated by the maximum number of contiguous calendar days of non-compliance reached for that incident during the calendar quarter. If an incident 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. When an incident continues from one quarter to another it will be considered a higher level of non-compliance, not a repeat occurrence.</p>	
<p><b>2.1. Lower:</b> There shall be a Lower Level of non-compliance if the following condition exists:</p> <p><b>2.1.1.</b> AVR is in service less than 98% but at least 90% or more of all hours during which the synchronous</p>	<p>When calculating the in-service percentages in the following levels, do not include the time the AVR is out of service due to the exceptions listed above (Section C Measures).</p>	<p>Same non compliance severity violation measure as existing standard except updated to reflect current standard. The exceptions previously listed are</p>

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
<p>generating unit or synchronous condenser is on line for each calendar quarter.</p> <p><b>2.2. Moderate:</b> There shall be a Moderate Level of non-compliance if the following condition exists:</p> <p><b>2.2.1.</b> 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.</p> <p><b>2.3. High:</b> There shall be a High Level of non-compliance if the following condition exists:</p> <p><b>2.3.1.</b> 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.</p> <p><b>2.4. Severe:</b> There shall be a Severe Level of non-compliance if the following condition exists:</p> <p><b>2.4.1.</b> 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.</p>	<p><b>2.1. Level 1:</b> There shall be a Level 1 non-compliance if any of the following conditions exist:</p> <p>2.1.1. AVR is in service less than 98% but at least 96% or more of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.1.2. AVR is out of service more than 7 calendar days but not more than 14 calendar days due to maintenance or testing, or</p> <p>2.1.3. AVR is out of service for more than 60 calendar days but not more than 90 calendar days due to failed component, or</p> <p>2.1.4. Following the granting of an extension for repairs, the AVR was returned to service greater than zero days but less than or equal to 30 days beyond the specified extension repair completion date.</p> <p><b>2.2. Level 2:</b> There shall be a Level 2 non-compliance if any of the following conditions exist:</p> <p>2.2.1. AVR is in service less than 96% but at least 94% or more of all hours during which the</p>	<p>excluded in the requirements.</p>

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
	<p>synchronous generating unit is on line for each calendar quarter, or</p> <p>2.2.2. AVR is out of service for more than 90 calendar days but not more than 120 calendar days due to failed component, or</p> <p>2.2.3. Following the granting of an extension for repairs, the AVR was returned to service greater than 30 days but less than or equal to 60 days beyond the specified extension repair completion date.</p> <p><b>2.3. Level 3:</b> There shall be a Level 3 non-compliance if any of the following conditions exist:</p> <p>2.3.1. AVR is in service less than 94% but at least 92% or more of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.3.2. AVR is out of service for more than 120 calendar days but not more than 150 calendar days due to failed component, or</p> <p>2.3.3. Following the granting of an</p>	



VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
	<p>extension for repairs, the AVR was returned to service greater than 60 days but less than or equal to 90 days beyond the specified extension repair completion date.</p> <p><b>2.4. Level 4:</b> There shall be a Level 4 non-compliance if any of the following conditions exist:</p> <p>2.4.1. AVR is in service less than 92% of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.4.2. AVR is out of service more than 14 calendar days due to maintenance or testing, or</p> <p>2.4.3. AVR is out of service for more than 150 calendar days due to failed component, or</p> <p>2.4.4. Following the granting of an extension for repairs the AVR was not returned to service or was returned to service greater than 90 days beyond the specified extension repair completion date, or</p> <p>2.4.5. Following the granting of an</p>	

VAR-002-WECC-1 – Automatic Voltage Regulators (AVR)	WECC Standard VAR-STD-002a-1 Automatic Voltage Regulators (AVR)	Comment
	extension for replacement of the excitation system, the AVR is not in service after the specified extension replacement completion date.	
<b>3. Violation Severity Levels for R2</b>		
<p><b>3.1. Lower:</b> There shall be a Lower Level of non-compliance if documentation is incomplete with any requirement R1.1 through R1.10.</p> <p><b>3.2. Moderate:</b> There shall be a Moderate Level of non-compliance if the Generator Operator does not have documentation to demonstrate compliance with any requirement R1.1 through R1.10.</p> <p><b>3.3. High:</b> Not Applicable</p> <p><b>3.4. Severe:</b> Not Applicable</p>		Documentation requirements were added to the standard. Violation severity levels were added for documentation.

**Regional Reliability Standard  
Submittal Review Checklist**

**Region:** Western Electricity Coordination Council

**Regional Standard Number:** VAR-501-WECC-1

**Regional Standard Title:** Power System Stabilizer

**Date Standard Received:** 6/11/08

**Date Region Notified of Receipt:** 6/17/08

**Date NERC Evaluation Completed:** 7/30/2008

**Submittal Review Status:**

Complete

Incomplete

**Reviewed by:**

Stephanie Monzon, Manager of Regional Standards

Steve Crutchfield, Standards Coordinator

Gerry Adamski, Vice President and Director of Standards

**Approved by:**

**Review of Request for Completeness:**

1. Was a concise statement of the basis and purpose (scope) of request supplied?  
 Yes  
 No
2. Was a concise statement of the justification of the request supplied?  
 Yes  
 No
3. Was the text of the regional reliability standard supplied in MS Word format?  
 Yes  
 No
4. Was an implementation plan supplied?  
 Yes  
 No
5. Was the regional entity standard drafting team roster supplied?  
 Yes  
 No
6. Were the names and affiliations of the ballot pool members or names and affiliations of the committee and committee members that approved the submittal of the standard supplied?  
 Yes  
 No
7. Were the final ballot results, including a list of significant minority issues that were not resolved, supplied?  
 Yes  
 No
8. For each public comment period, was a copy of each comment submitted and its associated response along with the associated changes made to the standard supplied?  
 Yes  
 No

**Review of Standard for Completeness:**

**Title**

9. Is there a title that provides a brief, descriptive phrase identifying the topic of the standard?

- Yes
- No

**Number**

10. Does the standard have a unique identification number not already used by any NERC reliability standard?

- Yes
- No

**Purpose**

11. Does the purpose explicitly state what reliability-related outcome will be achieved by the adoption of the standard?

- Yes
- No

**Applicability**

12. Does this reliability standard clearly identify the functional classes of entities responsible for complying with the reliability standard, with any specific additions or exceptions noted?

- Yes
- No

13. Does this reliability standard identify the geographic applicability of the standard, such as the entire interconnection, or within a regional entity area?

- Yes
- No

14. Does this reliability standard identify any limitations on the applicability of the standard based on electric facility characteristics, such as generators with a nameplate rating of 20 MW or greater, or transmission facilities energized at 200 kV or greater or some other criteria?

- Yes
- No

**Effective Date**

15. Does the effective date start on the 1<sup>st</sup> day of the 1<sup>st</sup> quarter after entities are expected to be compliant?
- Yes  
 No
16. Does the effective date provide time to file with applicable regulatory authorities and provide notice to responsible entities of the obligation to comply?
- Yes  
 No Unsure whether the revisions to this standard require implementation time. .

**Requirements**

17. Does each requirement identify the functional entity that is responsible and the action to be performed or the outcome to be achieved?
- Yes  
 No
18. Does this reliability standard state one or more performance requirements, which if achieved by the applicable entities, will provide for a reliable bulk power system, consistent with good utility practices and the public interest?
- Yes  
 No
19. Are the requirements free of additional comments or statements for which compliance is not mandatory, such as background or explanatory information?
- Yes  
 No

**Violation Risk Factors**

20. Is there a Violation Risk Factor (High, Medium, Lower) for each requirement?
- Yes  
 No

**Time Horizons**

21. Is there a Mitigation Time Horizon (Long-term Planning; Operations Planning; Same-day Operations; Real-time Operations; Operations Assessment) for each requirement?
- Yes  
 No

### Measures

22. Does each measure identify to whom the measure applies and the expected level of performance or outcomes required to demonstrate compliance?
- Yes  
 No
23. Is each measure tangible, practical, and as objective as is practical?
- Yes  
 No
24. Does each measure clearly refer to the requirement(s) to which it applies?
- Yes
25. Is there a measure for each requirement?
- Yes  
 No

### Compliance Monitoring Responsibility

26. Is the 'Electric Reliability Organization' identified as the Compliance Monitor?
- Yes  
 No The Compliance Enforcement Authority is identified as the Compliance Monitor.

### Compliance Monitoring Period

27. Does the standard identify the time period in which performance or outcomes is measured, evaluated, and then reset?
- Yes  
 No

### Data Retention

28. Does the standard identify the data retention requirements and assignment of responsibility for data archiving?
- Yes  
 No

### Additional Compliance Information

29. Does the standard identify the process that will be used to evaluate data or information for the purpose of assessing performance or outcomes?
- Yes  
 No

30. Does the standard identify the specific data or information that is required to measure performance or outcomes?

Yes

No

31. Does the standard identify the entity that is responsible for providing data or information for measuring performance or outcomes?

Yes

No

### **Violation Severity Levels**

32. Is there a Violation Severity Level (lower, moderate, high, severe) for violation of each of the requirements?

Yes While there are violation severity levels for the Requirements, the VSLs are not consistent with the table format being used in the current standards.

No

### **Associated Documents**

33. If there are standards or forms that are referenced within a standard, are the full names and numbers of the standard identified under, 'Associated Documents'.

Yes

No

### **Definitions**

34. Are the definitions used and provided in the standard consistent with the NERC definitions.

Yes

No

### **Other Observations:**

35. Are there any additional comments?

Yes

No



### **VAR-501-WECC-1 Comparison**

This following document prepared by the drafting team during the development of the WECC Standard VAR-501-WECC-1 – Contingency Reserve compares this proposed regional standard to the existing WECC VAR-STD-002b-1.

The purpose of this document to provide documentation of each proposed change.

<b>WECC Standard VAR-501-WECC-1 – Power System Stabilizer</b>	<b>WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)</b>	<b>Comment</b>
<b>A. Introduction</b>		
<b>1. Title:</b> Power System Stabilizer (PSS)	<b>1. Title:</b> Power System Stabilizer	
<b>2. Number:</b> VAR-501-WECC-1	<b>2. Number:</b> VAR-STD-002b-1	Retired Criteria
<b>3. Purpose:</b> To ensure that Power System Stabilizers (PSS) on synchronous generators shall be kept in service.	<b>3. Purpose:</b> Regional Reliability Standard to ensure that Power System Stabilizers on generators shall be kept in service at all times, unless one of the exemptions listed in Section C (Measures) applies, and shall be properly tuned in accordance with WECC requirements.	Updated to reflect the overall purpose of the proposed revised standard.
<b>4. Applicability</b>	<b>4) Applicability</b>	
<b>4.1.</b> Generator Operators	4.1. The requirements of this criterion apply to all Generator Operators with generators equipped with Power System Stabilizers (PSS) within the Western Interconnection. The criterion shall be applied three months after a generator has achieved commercial operation. The criterion shall be applied on a generator-by-generator basis (i.e., a Responsible Entity can be subject to a separate sanction for each non-compliant generator). This criterion shall not be applicable to any generator for any calendar quarter in which such generator is in service for less than five percent of all hours in such quarter (the owners of the generation shall still be subject to the data reporting requirements for such quarter).	Generator Operators is a defined term in NERC’s Glossary of Terms Used in Reliability Standards so it is used in this standard without being redefined.
<b>5. Effective Date:</b> On the first day of the next quarter, after receipt of applicable regulatory approval.	<b>5. Effective Date:</b> This Western Electricity Coordinating Council Regional Reliability Standard will be effective when approved by the Federal Energy Regulatory Commission under Section 215 of the Federal Power Act. This Regional Reliability Standard shall be in effect for one year from the date of Commission approval or until a North American Standard or a revised Western Electricity	

WECC Standard VAR-501-WECC-1 – Power System Stabilizer	WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)	Comment
	Coordinating Council Regional Reliability Standard goes into place, whichever occurs first. At no time shall this regional Standard be enforced in addition to a similar North American Standard.	
<b>B. Requirements</b>		
<p><b>R.1.</b> Generator Operators shall have PSS in service 98% of all operating hours for synchronous generators equipped with PSS. Generator Operators may exclude hours for R1.1 through R1.12 to achieve the 98% requirement. <i>[Violation Risk Factor: Medium]</i> <i>[Time Horizon: Operations Assessment]</i></p> <p><b>R1.1.</b> The synchronous generator operates for less than five percent of all hours during any calendar quarter.</p> <p><b>R1.2.</b> Performing maintenance and testing up to a maximum of seven calendar days per calendar quarter.</p> <p><b>R1.3.</b> PSS exhibits instability due to abnormal system configuration.</p> <p><b>R1.4.</b> Unit is operating in the synchronous condenser mode (very near zero real power level).</p> <p><b>R1.5.</b> Unit is generating less power than its design limit for effective PSS operation.</p> <p><b>R1.6.</b> Unit is passing through a range of output that is a known “rough zone” (range in which a hydro unit is experiencing excessive vibration).</p> <p><b>R1.7.</b> The generator AVR is not in service.</p>	<p><b>WR1.</b> Power System Stabilizers on generators shall be kept in service at all times, unless one of the exemptions listed in Section C (Measures) applies, and shall be properly tuned in accordance with WECC requirements.</p>	<p>PSS replacement period was increased to 24 months from 15 months to facilitate procurement requirements for Nuclear Power Plants.</p> <p>The reliability authority directs the operation of the generator or synchronous condenser when the PSS is unavailable for service.</p>

**Comment [ga1]:** Same comment as other VAR standard.

**Comment [ga2]:** This applies to the other VAR standard as well. Why are these hours being excluded just because it runs less than 5% of the time?

WECC Standard VAR-501-WECC-1 – Power System Stabilizer	WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)	Comment
<p><b>R1.8.</b> Due to component failure, the PSS may be out of service up to 60 consecutive days for repair per incident.</p> <p><b>R1.9.</b> Due to a component failure, the PSS may be out of service up to one year provided the Generator Operator submits documentation identifying the need for time to obtain replacement parts and if required to schedule an outage.</p> <p><b>R1.10.</b> Due to a component failure, the PSS may be out of service up to 24 months provided the Generator Operator submits documentation identifying the need for time for PSS replacement and to schedule an outage.</p> <p><b>R1.11.</b> The synchronous generator has not achieved Commercial Operation.</p> <p><b>R1.12.</b> The Transmission Operator directs the Generator Operator to operate the synchronous generator, and the PSS is unavailable for service.</p> <p><b>R.2.</b> Generator Operators shall have documentation identifying the number of hours excluded for each requirement in R1.1 through R1.12.  <i>[Violation Risk Factor: Low] [Time Horizon: Operations Assessment]</i></p>		

<b>WECC Standard VAR-501-WECC-1 – Power System Stabilizer</b>	<b>WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)</b>	<b>Comment</b>
<b>C. Measures</b>	<b>C. Measures WM1.</b>	
<p><b>M1.</b> Generators Operators shall provide quarterly reports to the compliance monitor and have evidence for each synchronous generator of the following:</p> <p><b>M1.1.</b> The number of hours the synchronous generator was on line.</p> <p><b>M1.2.</b> The number of hours the PSS was out of service with generator on line.</p> <p><b>M1.3.</b> The PSS in service percentage</p> <p><b>M1.4.</b> If excluding PSS out of service hours as allowed in R1.1 through R1.12, provide:</p> <p style="padding-left: 40px;">M1.4.1. The number of hours excluded, and</p> <p style="padding-left: 40px;">M1.4.2. The adjusted PSS in-service percentage.</p> <p><b>M2.</b> If excluding hours for R1.1 through R1.12, provide:</p> <p><b>M2.1.</b> The date of the outage</p> <p><b>M2.2.</b> Supporting documentation for each requirement that applies</p>	<p><b>WM1.</b></p> <p>Each generating unit equipped with PSS shall have the PSS in service when the unit is on line with the following exceptions:</p> <ul style="list-style-type: none"> <li>a) Maintenance and testing, maximum of seven calendar days per quarter.</li> <li>b) PSS exhibits instability due to nonstandard transmission line configuration.</li> <li>c) Unit is operating in the synchronous condenser mode (very near zero real power level).</li> <li>d) Unit is generating less power than its design limit for effective PSS operation.</li> <li>e) Unit is passing through a range of output that is a known “rough zone” (range in which a hydro unit is experiencing excessive vibration).</li> <li>f) AVR is not in service.</li> <li>g) PSS does not operate properly due to a failed component in the PSS or resulting from a change in adjacent equipment whether it is control oriented or physical equipment that defines system response. If these changes are</li> </ul>	<p>Measures expended and split into a measure for each main requirement.</p>

WECC Standard VAR-501-WECC-1 – Power System Stabilizer	WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)	Comment
	<p>outside the control of the owner and result in an operating condition that is unsuitable for operation of PSS, an exception shall be granted until the operating condition is once again suitable, but in no event shall the period of operation without PSS exceed 60 days. The PSS must be repaired and returned to service within 60 calendar days or replaced within one year per incident from time of failure (<a href="#">Source: AVR and PSS 60 Day Exclusion</a>). If, during this 60 day or one year period, the decision is made to replace the excitation system, the excitation system, including PSS, must be back in service within one year of commitment to replace.</p> <p>If more than 60 days are needed to repair a PSS or more than one year is needed to replace a PSS or excitation system due to the length of time needed to obtain parts, an extension will be granted upon receipt of documentation by the WECC Staff. Such documentation shall include notice of the need for replacement or repair, the expected time required for the Responsible Entity’s procurement process, plus the manufacturer delivery time, plus 30 days for installation or if an outage is required for installation the date of the next scheduled outage, and the expected completion date of the work. The total amount of time shall not exceed one year for repair of the PSS or fifteen months for replacement of the PSS or excitation system.</p> <p>Participant shall provide the WECC Staff such</p>	

<b>WECC Standard VAR-501-WECC-1 – Power System Stabilizer</b>	<b>WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)</b>	<b>Comment</b>
	documentation as soon as practicable, but no later than the deadline for responding to the initial non-compliance notification letter issued by the WECC Staff. Once repairs are complete, WECC Staff shall be notified with the next quarterly report of the time the PSS is back in service	
<b>D. Compliance</b>	<b>D Compliance</b>	
<b>1 Compliance Monitoring Process</b>	<b>1. Compliance Monitoring Process</b>	
<b>1.1 Compliance Monitoring Responsibility</b> Compliance Enforcement Authority	<b>1.1 Compliance Monitoring Responsibility</b> Western Electricity Coordinating Council (WECC)	
<b>1.2 Compliance Monitoring Period</b> Compliance Enforcement Authority may use one or more of the following methods to assess compliance: <ul style="list-style-type: none"> <li>- Reports submitted quarterly</li> <li>- Spot check audits conducted anytime with 30 days notice</li> <li>- Periodic audit as scheduled by the Compliance Enforcement Authority</li> <li>- Investigations</li> <li>- Other methods as provided for in the Compliance Monitoring Enforcement Program</li> </ul> <p>The Reset Time Frame shall be a calendar quarter.</p>	<b>1.2 Compliance Monitoring Period</b> Quarterly  On or before the twentieth day of the month following the end of a quarter (or such other date specified in Form A.5), a Responsible Entity shall submit to the WECC Staff Power System Stabilizer data in Form A.5 (available on the WECC web site) for the immediately preceding quarter.	Remove specificity for reporting. The Compliance Enforcement Authority will include this detail in its reporting instructions.
<b>1.3 Data Retention Data Retention</b> The Generator Operators shall keep evidence for Measures M1 and M2 for three years plus current year, or since the last audit, whichever is longer.	<b>1.3 Data Retention</b> Data will be retained in electronic form for at least one year. The retention period will be evaluated before expiration of one year to determine if a longer retention period is necessary. If the data is being reviewed to address a question of compliance, the data will be saved beyond the normal retention period until the question is formally resolved.	Data retention period lengthened to 3 years plus the current year to ensure data are kept in a contiguous manner between audit periods.
<b>1.4 Additional Compliance Information</b>	<b>1.4. Additional Compliance Information</b>	No longer needed

<b>WECC Standard VAR-501-WECC-1 – Power System Stabilizer</b>	<b>WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)</b>	<b>Comment</b>
<p><b>1.4.1</b> The sanctions shall be assessed on a calendar quarter basis.</p> <p><b>1.4.2</b> If any of R1.2 through R1.12 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 R1.8 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.</p> <p><b>1.4.3</b> When calculating the adjusted in-service percentage, the PSS out of service hours do not include the time associated with R1.1 through R1.12.</p> <p><b>1.4.4</b> The standard shall be applied on a generating unit by generating unit basis (a Generator Operator can be subject to a separate sanction for each non-compliant synchronous generating unit or to a single sanction for multiple machines that operate as one unit).</p>	<p>The “Sanction Measure” is Synchronous Generating Unit Capability in MVA - and the Specified Period is the most recent calendar quarter. The sanctions shall be assessed on a quarterly basis, but for purposes of determining the applicable column in the <a href="#">Sanction Table</a>, all occurrences within the specified period of the most recent calendar quarter and all immediately preceding consecutive calendar quarters in which at least one instance of non-compliance occurred shall be considered.</p>	<p>because the NERC sanction table is used.</p> <p>The “additional compliance information” clarifies the calculation of the in service percentage that was previously contained in VAR-STD-002b-1.</p>
<p><b>2. Violation Severity Levels</b></p>	<p><b>Levels of Non-Compliance Sanction</b></p>	
	<p><b>Measure: Generating Unit Capability in MVA</b></p> <p><b>Sanction Measure:</b> Synchronous</p> <p>For levels of noncompliance with a specific number of days associated, (e.g., 7 days for maintenance and testing, etc.) the level of noncompliance will be calculated by the maximum number of contiguous calendar days of non-</p>	



WECC Standard VAR-501-WECC-1 – Power System Stabilizer	WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)	Comment
	<p>compliance reached for that incident during the calendar quarter. If an incident 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. When an incident continues from one quarter to another it will be considered a higher level of non-compliance, not a repeat occurrence. (Source: Sanctions)</p> <p>When calculating the in-service percentages in the following levels, do not include the time the PSS is out of service due to the exceptions listed above (Section IV.A.4. a-c).</p>	
<p><b>3. Violation Severity Levels for R2</b></p> <p><b>2.1. Lower:</b> There shall be a Lower Level of non-compliance if the following condition exists:</p> <p><b>2.1.1.</b> PSS is in service less than 98% but at least 90% or more of all hours during which the synchronous generating unit is on line for each calendar quarter.</p> <p><b>2.2. Moderate:</b> There shall be a Moderate Level of non-compliance if the following condition exists:</p> <p><b>2.2.1.</b> PSS is in service less than 90% but at least 80% or more of all hours during which the synchronous generating unit is on line for each calendar quarter.</p> <p><b>2.3. High:</b> There shall be a High Level of non-compliance if the following condition exists:</p> <p><b>2.3.1.</b> PSS is in service less than 80% but at least 70% or more of all hours during which the synchronous generating unit is on line for each</p>	<p><b>2.1. Level 1:</b> There shall be a Level 1 non-compliance if any of the following conditions exist:</p> <p>2.1.1. PSS is in service less than 98% but at least 96% or more of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.1.2. PSS is out of service more than 7 calendar days but not more than 14 calendar days due to maintenance or testing, or</p> <p>2.1.3. PSS is out of service for more than 60 calendar days but not more than 90 calendar days due to failed component, or</p> <p>2.1.4. Following the granting of an extension for repairs, the PSS was returned to service greater than zero days but less than or equal to 30 days beyond the specified extension repair completion date.</p> <p><b>2.2. Level 2:</b> There shall be a Level 2 non-compliance if any of the following conditions exist:</p>	<p>Same non compliance severity violation measure as existing standard except updated to reflect current standard. The exceptions previously listed are excluded in the requirements.</p>

WECC Standard VAR-501-WECC-1 – Power System Stabilizer	WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)	Comment
<p>calendar quarter.</p> <p><b>2.4. Severe:</b> There shall be a Severe Level of non-compliance if the following condition exists:</p> <p><b>2.4.1.</b> PSS is in service less than 70% of all hours during which the synchronous generating unit is on line for each calendar quarter.</p>	<p>2.2.1. PSS is in service less than 96% but at least 94% or more of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.2.2. PSS is out of service for more than 90 calendar days but not more than 120 calendar days due to failed component, or</p> <p>2.2.3. Following the granting of an extension for repairs, the PSS was returned to service greater than 30 days but less than or equal to 60 days beyond the specified extension repair completion date.</p> <p><b>2.3. Level 3:</b> There shall be a Level 3 non-compliance if any of the following conditions exist:</p> <p>2.3.1. PSS is in service less than 94% but at least 92% or more of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.3.2. PSS is out of service for more than 120 calendar days but not more than 150 calendar days due to failed component, or</p> <p>2.3.3. Following the granting of an extension for repairs, the PSS was returned to service greater than 60 days but less than or equal to 90 days beyond the specified extension repair completion date.</p> <p><b>2.4. Level 4:</b> There shall be a Level 4 non-compliance if</p>	

WECC Standard VAR-501-WECC-1 – Power System Stabilizer	WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)	Comment
	<p>any of the following conditions exist:</p> <p>2.4.1. PSS is in service less than 92% of all hours during which the synchronous generating unit is on line for each calendar quarter, or</p> <p>2.4.2. PSS is out of service more than 14 calendar days due to maintenance or testing, or</p> <p>2.4.3. PSS is out of service for more than 150 calendar days due to failed component, or</p> <p>2.4.4. Following the granting of an extension for repairs the PSS was not returned to service or was returned to service greater than 90 days beyond the specified extension repair completion date, or</p> <p>2.4.5. Following the granting of an extension for replacement of the excitation system, the PSS is not in service after the specified extension replacement completion date.</p>	
<p><b>3. Violation Severity Levels for R2</b></p>		
<p><b>3.1. Lower:</b> There shall be a Lower Level of non-compliance if documentation is incomplete with any requirement R1.1 through R1.12.</p> <p><b>3.2. Moderate:</b> There shall be a Moderate Level of non-compliance if the Generator Operator does not have documentation to demonstrate compliance with any requirement R1.1 through R1.12.</p> <p><b>3.3. High:</b> Not Applicable</p> <p><b>3.4. Severe:</b> Not Applicable</p>		<p>Documentation requirements were added to the standard. Violation severity levels were added for documentation.</p>

<b>WECC Standard VAR-501-WECC-1 – Power System Stabilizer</b>	<b>WECC Standard VAR-STD-002b-1 – Power System Stabilizer (PSS)</b>	<b>Comment</b>

**WECC's Response to NERC's Comments**  
**August 13, 2008**  
**Draft**

**INTRODUCTION**

WECC appreciates NERC staff's evaluation of the proposed WECC Regional Reliability Standards (RRSs) in accordance with NERC's Regional Reliability Standards Evaluation Procedure. These proposed WECC RRSs were developed as permanent replacements for the eight WECC Tier 1 RRSs that previously were approved by NERC and FERC. WECC asserts that the seven proposed standards contain all the performance elements of a Reliability Standard that are contained in the NERC Reliability Standards Development Procedure. In addition, the seven proposed standards address and implement the refinements directed by FERC's order on June 8, 2007 (see FERC Docket No. RR07-11-000) and requested by NERC in its letter dated January 9, 2007. Finally, these proposed standards implement refinements to the approved WECC Tier 1 RRSs which were recommended during the previous expedited direct translation standard development processes.

The attached WECC responses individually address each NERC comment. However, many of the comments submitted by NERC staff relate to refinements that NERC has made to the format of its Reliability Standard Template. These refinements have not been formally approved by NERC, nor have they been transmitted to the regions for comment or additional information, and were therefore unavailable to WECC during the development process. Consequently, WECC has determined not to reopen the standards development process at this stage to address these non-substantive formatting concerns. In addition, during the standards development process, WECC staff twice requested that NERC staff review the proposed WECC standards. WECC did this to ensure that the WECC standard drafting teams were complying with NERC's Regional Reliability Standards Evaluation Procedure as well as its Reliability Standards Development Procedure. NERC did not perform the evaluation of these proposed standards until WECC had completed its Process for Developing and Approving WECC Standards. WECC intends to implement the requested formatting refinements and any potential FERC-directed changes during the next revision of these standards or the next FERC compliance filing.

The proposed WECC RRSs were considered and adopted pursuant to the Process for Developing and Approving WECC Standards. Unless they are approved in their current form, WECC will have to reinitiate the entire process. The consequences of rejecting these WECC RRSs in their entirety would be counterproductive to reliability in the Western Interconnection.

The proposed WECC RRSs will enhance reliability in the Western Interconnection and they will significantly improve the existing eight WECC RRSs because they:

1. Implement ordered NERC and FERC refinements to the existing standards ordered;

2. Eliminate conflicting NERC and WECC requirements contained in the existing RRSs;
3. Include all the Performance Elements of a Reliability Standard;
4. Clarify existing WECC RRSs;
5. Align better with NERC's Functional Model, and
6. Address industry stakeholder concerns.

Therefore, WECC requests the NERC staff recommend approval of these standards to the NERC Board and FERC.

**WECC's responses to NERC's initial evaluation are provided in Attachment 1.**

## Attachment 1

NERC's Written Comments  
July 30, 2008  
WECC's Written Responses  
August 13, 2008

### Summary of Findings

#### **BAL-002-WECC-1 — CONTINGENCY RESERVES**

##### **NERC COMMENT:**

In the review of BAL-002-WECC-1, NERC identified several areas for either clarification or opportunities for improvement. Some of the findings point out approaches potentially inconsistent with FERC either directives or concerns with the clarity of the standard. Other NERC comments simply offer areas for improvement.

1. This standard contains a method for Reserve Sharing Groups or Balancing Authorities (BA) that are not members of a Reserve Sharing Group to maintain a level of Contingency Reserves and the standard describes in Requirement 1.1. how to determine the amount of reserves. NERC suggests that instead of describing the formula narratively (Requirements R1.1.1. to R1.1.2.) WECC include the actual equation in the requirement to reduce ambiguity.

##### **WECC RESPONSE:**

1. The requirements in the BAL-002-WECC-1 Standard as written are clear. Industry stakeholders did not submit any comments questioning the clarity of the standard, nor did they identify a need for an equation. The drafting team does not believe there is any ambiguity in the requirements.

##### **NERC COMMENT:**

2. Requirement R2 is of concern because it is unclear whether the requirement limits the use of Demand Side Resources (DSM) to fifty percent of the Contingency Reserves. Requirement R2. states:  
  
**R2.** Each Reserve Sharing Group or Balancing Authority that is not a member of a Reserve Sharing Group shall maintain at least half of the Contingency Reserve in R1.1 as Spinning Reserve. Any Spinning Reserve specified in R1 shall meet the following requirements. [*Violation Risk Factor: High*] [*Time Horizon: Real-time Operations*]  
  
**R2.1.** Immediately and automatically responds proportionally to frequency deviations, e.g. through the action of a governor or other control systems.  
  
**R2.2.** Capable of fully responding within ten minutes.

**WECC RESPONSE:**

2. The drafting team wrote the BAL-002-WECC-1 Standard to permit load, Demand-Side Management (DSM), generation, or another resource technology that qualifies as Spinning Reserve or Contingency Reserve to be used as such. In the case of DSM, the declared amount would be required to respond automatically to frequency deviations and be capable of fully responding in 10 minutes. Loads and DSM are not allowed as Spinning Reserve because it is not permitted by the NERC Spinning Reserve definition. NERC requires that the BAL-002-WECC-1 Standard drafting team use NERC's Spinning Reserve definition. If NERC were to modify its Spinning Reserve definition to allow frequency responsive load tripping as part of a Balancing Authority's DSM, then its use would be permitted under the requirements of the BAL-002-WECC-1 Standard as proposed.

**NERC COMMENT (continued):**

In the first instance, the NERC Glossary of Terms defines Spinning Reserve as “(u)nloaded generation that is synchronized and ready to serve additional demand.” In this regard, spinning reserve, as a component of contingency reserves, is limited to the use of generation. In Order 693 at Paragraph 333, the Commission directed NERC to “treat DSM comparably to conventional generation as a resource for contingency reserves.” In addition, the Commission in Paragraph 335 of Order No. 693 directs “the ERO to explicitly allow DSM as a resource for contingency reserves...” NERC believes that the proposed regional standard is in potential conflict with the Commission's directive regarding the use of DSM. In order to eliminate this potential conflict, NERC suggests that WECC explicitly include DSM in Requirement R3. as an additional sub-requirement in the list of acceptable types of reserves in support of the FERC directive. Alternately, NERC requests that WECC clarify how the proposed regional standard supports FERC's directives.

**WECC RESPONSE (continued):**

DSM that is deployable within 10 minutes is a subset of Interruptible Load. Interruptible load is defined in requirement R3.2 as an acceptable type of Contingency Reserve. As described previously, if NERC modifies its Spinning Reserve and Interruptible Load definitions, then it would be clear that qualifying DSM is permitted as part of Spinning and Contingency Reserves.

**NERC COMMENT:**

3. In Requirement R1., the proposed standard changes the amount of the contingency reserves that a BA is required to the sum of 3 percent of the total load plus 3 percent of the total generation. This replaces the existing 5 and 7 percent load responsibility served by hydro and thermal generation, respectively. WECC did not provide an explanation for the change and NERC requests that WECC provide information to support this modification.



**WECC RESPONSE:**

3. The drafting team wrote a paper titled “WECC Standard BAL-002-WECC-1 Contingency Reserves” that provides an explanation supporting the modification. The paper was included as part of the standards approval package filed on June 11, 2008 with NERC.

**NERC COMMENT:**

4. While the standard does contain Violation Severity Levels (VSLs) NERC suggests that for consistency with the continent-wide standards, the VSLs should be presented in table format.

**WECC RESPONSE:**

4. WECC recognizes the unapproved NERC Reliability Standard Template requires the placement of VSLs in a table. As stated previously, WECC intends to implement this refinement during the next revision of this standard or the next FERC compliance filing.

**FAC-501-WECC-1 — TRANSMISSION MAINTENANCE**

**NERC COMMENT:**

It appears that WECC has addressed the NERC and FERC directives in FAC-501-WECC-1.

1. NERC suggests capitalizing defined terms such as Transmission Facilities in the standard.

**WECC RESPONSE:**

1. “Transmission Facilities” is not a NERC-defined term in the NERC “Glossary of Terms Used in Reliability Standards” document, although “Transmission” and “Facility” are. The standard drafting team did not capitalize “transmission facilities” because it believes that the combination of these two defined terms was too limiting. WECC recognizes that this may create confusion and it proposes to address this issue during the next revision of these standards or the next FERC compliance filing.

**NERC COMMENT:**

2. The proposed standard contains clear Violation Severity Levels; however, NERC suggests utilizing the VSL table format to be consistent with the continent-wide standards.

**WECC RESPONSE:**

2. WECC recognizes the unapproved NERC Reliability Standard Template requires the placement of VSLs in a table. As stated previously, WECC intends to implement this refinement during the next revision of this standard or the next FERC compliance filing.

**IRO-006-WECC-1 — QUALIFIED TRANSFER PATH UNSCHEDULED FLOW (USF) RELIEF**

**NERC COMMENT:**

1. NERC is concerned that the technical elements of the proposed standard have been removed from the current FERC-approved version of the regional standard. As presented, the proposed standard does not require the mitigation of an overload, which is the express purpose of the standard. The current version of the standard in effect, IRO-STD-006-0, contains technical provisions for the mitigation of an overload that supports the purpose statement. These provisions have not been translated into the proposed replacement standard. NERC requests that a technical rationale be provided for the removal of the technical details in the proposed standard because as proposed it is unclear that the revised standard meets the purpose of the standard, “(m)itigation of transmission overloads due to unscheduled flow on Qualified Transfer Paths.”

**WECC RESPONSE:**

1. The proposed IRO-006-WECC-1 Standard contains all the key reliability requirements and technical elements from the Unscheduled Flow Mitigation Plan (UFMP) that were included in IRO-STD-006-0. The proposed IRO-006-WECC-1 Standard uses NERC’s Functional Model terminology to mitigate unscheduled flow during the next operating hour. It is not necessary to reference the remainder of the UFMP because the remaining items contain procedural requirements explaining “how,” not “what.” The proposed IRO-006-WECC-1 Standard includes requirements to reduce schedules, which then require adjustments to generation patterns. This prevents potential overloads during the next operating hour. Importantly, the requirements for mitigation of an actual (real-time) overload are contained in TOP-007-WECC-1.

**NERC COMMENT:**

2. The proposed standard includes the term Transfer Distribution Factor (TDF) that is a defined term in the NERC Glossary. The NERC definition is “(t)he portion of an Interchange Transaction, typically expressed in per unit that flows across a transmission facility (Flowgate).” The WECC proposed definition for TDF is “(t)he percentage of USF that flows across a Qualified Transfer Path when an Interchange Transaction (Contributing Schedule) is implemented.” *[See the WECC Unscheduled Flow Mitigation Summary of Actions Table (Attachment 1 WECC IRO-006-WECC-1).]*

There are inconsistencies between the two definitions that must be resolved. It is not clear if there are intended differences between the NERC and WECC definitions. If not, NERC suggests removing the WECC proposed term from the standard. If there are intentional differences, NERC requests that WECC determine if they are able to utilize the NERC definition, and if not, to define a new term to accomplish the desired objectives.

**WECC RESPONSE:**

2. WECC acknowledges the difference between the NERC and WECC definitions for Transfer Distribution Factor (TDF). This is caused by the differences between the Eastern Interconnection Transmission Loading Relief process and the Western

Interconnection UFMP. This difference in definitions exists even today between the existing FERC-approved IRO-STD-006-0 Standard and the NERC Glossary. Rejecting the proposed standard will not resolve this difference. WECC will work with NERC to resolve this and intends to make any necessary refinements during the next revision of this standard or the next FERC compliance filing. Despite the difference in the TDF definitions, **the proposed standard corrects a basic difference between the existing FERC-approved IRO-STD-006-0 Standard, which places reliability responsibilities upon the Load Serving Entities (LSEs), and the NERC Functional Model.** LSEs do not have the ability to ensure the implementation of the schedule adjustments required in the existing FERC-approved IRO-STD-006-0 Standard.

**NERC COMMENT:**

3. The proposed standard contains clear Violation Severity Levels; however, NERC suggests utilizing the VSL table format to be consistent with the continent-wide standards.

**WECC RESPONSE:**

3. WECC recognizes the unapproved NERC Reliability Standard Template requires the placement of VSLs in a table. As stated previously, WECC intends to implement this refinement during the next revision of this standard or the next FERC compliance filing.

**PRC-004-WECC-1 — PROTECTION SYSTEM AND REMEDIAL ACTION SCHEME MISOPERATION**

**NERC COMMENT:**

1. The PRC-004-WECC-1 proposed standard contains explanatory text in the Applicability section that is redundant with text in the Requirements section. NERC suggests resolving this redundancy by removing the explanatory text in the Requirements section.

**WECC RESPONSE:**

1. WECC recognizes that the standard drafting team included explanatory text in the requirement section in an attempt to clarify the requirements. However, the duplication does not adversely impact the applicability, clarity, or the requirements. WECC will address this recommendation during the next revision of this standard or the next FERC compliance filing.

**NERC COMMENT:**

2. In Requirement R1., R1.1., and R1.2. NERC suggests that while System Protection personnel may perform the tasks required, the requirement should only apply to the responsible entity specified in the Applicability section to reduce ambiguity. The responsible entity should determine how best and who should perform the activity in practice.

**WECC RESPONSE:**

2. WECC recognizes that the standard drafting team included System Operators and System Protection personnel in the requirements. R1. of PRC-004-WECC-1 states that, “**System Operators and System Protection personnel of the Transmission Owners and Generator Owners shall analyze all Protection Systems and RAS operations.**” As written the requirement is sufficiently clear and well-defined to be enforceable on the entities in the Western Interconnection. WECC will address this recommendation during the next revision of this standard or the next FERC compliance filing.

**NERC COMMENT:**

3. Requirement R2. contains text that WECC might consider placing in a footnote as explanatory text.

**WECC RESPONSE:**

3. WECC recognizes that the standard drafting team included explanatory text in the requirement section that might be more appropriately included as a footnote. However, the text clarifies the requirements. WECC will address this recommendation during the next revision of this standard or the next FERC compliance filing.

**NERC COMMENT:**

4. Technical clarity is suggested in R2., R2.1., R2.2.1., and R2.2.2. There is sufficient ambiguity in the interplay between the main and sub-requirements that NERC suggests be addressed by streamlining the requirement language. In addition, this appears to be a set of sequential requirements that would benefit from an optional flowchart for applicable entities use as a reference.

**WECC RESPONSE:**

4. The requirements in the PRC-004-WECC-1 Standard are clearly written. Industry stakeholders did not submit any comments questioning the clarity of the standard. The alternative standard drafting formats or language used in this standard, are applicable exclusively to the Western Interconnection. These stylistic differences do not affect others and should not be a consideration for NERC approval.

**TOP-007-WECC-1 — SYSTEM OPERATING LIMITS (SOLs)**

**NERC COMMENT:**

1. The proposed regional standard serves to eliminate a number of the requirements in the previously approved version in effect today. As such, the proposed standard lacks the basis to be a regional standard in that it no longer provides the more stringent requirements necessary to ensure reliable operation within the Western Interconnection as the legacy requirements now reside in existing NERC standards. For the two requirements that remain, WECC should consider enhancing the current Regional Differences in the continent-wide FAC standards to include the SOL 30 minute operating limitation and net schedule adjustment.

**WECC RESPONSE:**

1. In the Western Interconnection, SOLs are designed so that during steady-state operations, with all lines in service, the system is at least two contingencies away from cascading. Therefore, exceeding an SOL for the 40 major paths identified in the TOP-007-WECC-1 Standard would not typically qualify as an Interconnection Reliability Operating Limit (IROL) under NERC's TOP-007-0 Standard. The standard drafting team created the TOP-007-WECC-1 Standard to limit the amount of time that a SOL may be exceeded for these very important paths, which makes the TOP-007-WECC-1 Standard more stringent than the NERC standard.

**NERC COMMENT:**

2. The proposed standard refines the time limit for stability limited paths to 30 minutes which is different than originally stated in WM1 of TOP-STD-007-0. NERC requests WECC to provide the basis for this refinement as it was not included. Further, it is unclear whether this is a more stringent requirement or standard than presented in the existing TOP-STD-007-0 standard.

**WECC RESPONSE:**

2. The existing standard created confusion during system operation because system conditions may change the limiting conditions on a path. This is because the limit depends upon whether thermal, stability, or post transient limitations are the limiting factor. In addition, having different response times for paths (and sometimes for the same path depending on current outage conditions), complicates system operation, causing delays in responding to the path overload. This resulted in path operators implementing more drastic actions to respond to a contingency within 20 minutes, which may put the system at greater risk, particularly during heavy load periods such as summer. The standard drafting team determined that changing the standard from a 20-minute to a 30-minute response time is insignificant in terms of the probability of a next contingency occurring. Moreover, the drafting team believes that following a system disturbance, the system operators will be better able to identify what generation to ramp in order to be effective in mitigating the overload. This will also allow them to coordinate with others before implementing the generation ramps. Therefore, the simplification of the standard to one consistent 30-minute period improves reliability. It is important to recognize that in spite of extending the recovery period, the refinement should improve system reliability.

**VAR-002-WECC-1 — AUTOMATIC VOLTAGE REGULATORS (AVRs)**

**NERC COMMENT:**

1. It is unclear why WECC has selected 98 percent of all operating hours as the compliance threshold for synchronous generators equipped with AVR and automatic voltage control mode in Requirement R1. when an itemized list of 12 exceptions are identified? The current FERC-approved version of the standard does not include such in service goal but expects that AVR on generators shall be kept in service at all times and in automatic voltage control mode unless otherwise directed by the Transmission Operator. NERC requests that WECC clarify the 98 percent goal for in service mode in

Requirement R1. of the proposed standard, with specific discussion on the relationship between the 98 percent threshold and the exceptions noted.

**WECC RESPONSE:**

1. There is no change in the basic 98 percent requirement between the existing standard and the proposed standard. The proposed VAR-002-WECC-1 Standard clarifies the requirement and “Levels of Non-Compliance” contained in the existing VAR-STD-002a-1 Standard. The 98 percent in Requirement R1. of VAR-002-WECC-1 was contained in the “Levels of Non-Compliance” in the existing VAR-STD-002a-1 Standard. The drafting team made this clarification to better align with the essential attributes of a reliability standard contained in the NERC Reliability Standards Development Procedure. The two percent allowed before requiring the AVR to be in service provides for time to start up generating facilities. It also allows for evaluation when the Generator Operators respond to unforeseen events.

**NERC COMMENT (continued):**

More importantly, given this 98 percent limitation, NERC is seriously concerned that the proposed regional standard is not more stringent than the NERC continent-wide standard VAR-002-1, and therefore, fails the statutory criteria to be considered a regional standard.

**WECC RESPONSE (continued):**

NERC VAR-002-1a R1. permits the Generator Operator to operate in different modes by simply notifying the Transmission Operator. There are no restrictions on the length of time or reasons for operating in other modes. The WECC 1996 outage reports identified the lack of reactive support from generators with AVRs operating in modes other than voltage control as one of the causes of the WECC 1996 outages. The VAR-002-WECC-1 Standard limits the reasons and time for operating a generator without the AVR in service and controlling voltage, therefore it is more stringent than the NERC VAR-002-1a Standard.

**NERC COMMENT**

2. In addition, NERC has concerns with R1.1. that excludes the hours attributed to the synchronous generator or condenser that operates for less than five percent of all hours during any calendar quarter. WECC did not present a justification for this exclusion in the hours to achieve the 98 percent in service mode goal. NERC requests that WECC provide information to support this requirement.

**WECC RESPONSE:**

2. There is no change in the basic five percent threshold between the existing standard and the proposed standard. Peaking units often operate, for short periods, at low megawatt levels (below where manufactures recommend placing the AVR in service). The use of peaking units adds to overall system reliability, especially during peak system conditions. The five percent threshold during a calendar quarter permits the continued practice of allowing the operation of peaking units below manufacture recommendations.

**NERC COMMENT:**

3. The proposed standard contains clear Violation Severity Levels, however, NERC suggests utilizing the VSL table format to be consistent with the continent-wide standards.

**WECC RESPONSE:**

3. WECC recognizes the unapproved NERC Reliability Standard Template requires the placement of VSLs in a table. As stated previously, WECC intends to implement this refinement during the next revision of this standard or the next FERC compliance filing.

**VAR-501-WECC-1 — POWER SYSTEM STABILIZER (PSS)**

**NERC COMMENT:**

1. NERC has comments on VAR-501-WECC-1 similar to the comments for VAR-002-WECC-1. It is unclear why WECC has selected 98 percent of all operating hours as the compliance threshold for synchronous generators equipped with Power System Stabilizer in Requirement R1. when an itemized list of 12 exceptions are identified? The current FERC-approved version of the standard does not include such in service goal but expects that Power System Stabilizers on generators shall be kept in service at all times. NERC requests that WECC clarify the 98 percent goal for in service mode in Requirement R1. of the proposed standard, with specific discussion on the relationship between the 98 percent threshold and the exceptions noted.

**WECC RESPONSE:**

1. There is no change in the basic 98 percent requirement between the existing standard and the proposed standard. The proposed VAR-501-WECC-1 Standard clarifies the requirement and “Levels of Non-Compliance” contained in the existing VAR-STD-002b-1 Standard. The 98 percent in Requirement R1. of VAR-501-WECC-1 was contained in the “Levels of Non-Compliance” in the existing VAR-STD-002b-1 Standard. The drafting team made this clarification to better align with the essential attributes of a reliability standard contained in the NERC Reliability Standards Development Procedure. The two percent allowed before requiring PSS to be in service provides time for evaluation and to start up generating facilities when Generator Operators respond to unforeseen events.

**NERC COMMENT:**

2. In addition, NERC has concerns with R1.1. that excludes the hours attributed to the synchronous generator that operates for less than five percent of all hours during any calendar quarter. WECC did not present a justification for this exclusion in the hours to achieve the 98 percent in service mode goal. NERC requests that WECC provide information to support this requirement.

**WECC RESPONSE:**

2. There is no change in the basic five percent threshold between the exiting standard and the proposed standard. Peaking units often operate, for short periods, at low megawatt levels (below where manufactures recommend placing the PSS in-service). Operating

at low megawatt levels makes the PSS ineffective. The use of peaking units adds to over-all system reliability, especially during peak system conditions. The five percent threshold during a calendar quarter permits the continued practice of allowing the operation of peaking units below manufacture PSS in service recommendations.

**NERC COMMENT:**

3. The proposed standard contains clear Violation Severity Levels; however, NERC suggests utilizing the VSL table format to be consistent with the continent-wide standards.

**WECC RESPONSE:**

3. WECC recognizes that the unapproved NERC Reliability Standard Template requires the placement of VSLs in a table. As stated previously, WECC intends to implement this refinement during the next revision of this standard or the next FERC compliance filing.

**(NERC) CONCLUSION**

NERC appreciates the opportunity to provide feedback to WECC regarding the seven proposed regional standards WECC submitted on June 11 2007. In some instances, NERC requests additional clarification on the issues and concerns outlined in this document. Others provide suggestions for improving the quality of the proposed regional standards. NERC has included detailed comments directly in the standards that can be found in Appendix A to this document. NERC has also provided comments directly into the comparison mapping documents WECC submitted along with the seven proposed standards in its submittal request.

NERC looks forward to WECC's response to these comments and ultimately, for WECC's decision on whether to request the NERC Board to approve these proposed regional standards.

**WECC RESPONSE**

WECC appreciates the opportunity to discuss NERC staff's initial evaluation and report in conference calls on August 4 and 5, 2008 and to provide the written clarifications and responses contained herein. We trust that WECC's responses, along with all the supporting documentation contained in WECC's submissions, provide the NERC staff a comprehensive basis for recommending NERC Board of Trustees approval of all proposed standards. Please direct any questions relating to WECC's response to WECC Director of Standards, Steve Rueckert at [steve@wecc.biz](mailto:steve@wecc.biz) or (801) 883-6878.



**Exhibit D**

**Standard Drafting Team Rosters**

## Drafting Team FAC501

FIRST_NAME	LAST_NAME	COMPANY
John	Bocka	Southern California Edison Company
Donald	Bryce	DOI - Bureau of Reclamation
Jay	Campbell	Sierra Pacific Resources Transmission
Edward	Hulls	Western Area Power Administration (WACM)
Mike	Gugerty	Southern California Edison
David	James	Avista Corp.
Ken	Wilson	WECC
Greg	Lange	Public Utility District No. 2 of Grant County
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