



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.  
V6Z 2N3

Re: *North American Electric Reliability Corporation*

Dear Ms. Hamilton:

The North American Electric Reliability Corporation (“NERC”) hereby submits this notice of one proposed Regional Reliability Standard of the Western Electricity Coordinating Council (“WECC”), TOP-007-WECC-1 — System Operating Limits, contained in **Exhibit A** to this petition. Upon the effective date of TOP-007-WECC-1, NERC will concurrently retire the existing approved TOP-STD-007-0 — Operating Transfer Capability WECC Regional Reliability Standard. The proposed Regional Reliability Standard was approved by the NERC Board of Trustees during its October 29, 2008 meeting.

NERC’s reliability standard notice consists the following:

- This transmittal letter;
- A table of contents for the entire notice;
- A narrative description justifying the proposed Regional Reliability Standard;
- Regional Reliability Standard, TOP-007-WECC-1 — System Operating Limits, submitted for approval (**Exhibit A**);
- The NERC Board of Trustees’ Resolution regarding TOP-007-WECC-1 — System Operating Limits (**Exhibit B**);

Ms. Erica Hamilton  
April 7, 2009  
Page Two

- The complete development record of the proposed Regional Reliability Standard (**Exhibit C**); and
- The Standard Drafting Team roster (**Exhibit D**).

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 PROPOSED WESTERN ELECTRICITY COORDINATING COUNCIL  
REGIONAL RELIABILITY STANDARD  
TOP-007-WECC-1 — SYSTEM OPERATING LIMITS**

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## TABLE OF CONTENTS

I. Introduction	1
II. Notices and Communications	1
III. Background	2
a. Regional Reliability Standards Development Procedure	2
b. Progress in Improving Proposed Reliability Standards	4
IV. Justification of the Proposed Regional Reliability Standard	6
a. Basis and Purpose of TOP-007-WECC-1 — System Operating Limits	7
V. Summary of the Reliability Standard Development Proceedings	19
a. Development History	19
b. Key Issues	23
<b>Exhibit A – Reliability Standard Proposed</b>	
<b>Exhibit B – The NERC Board of Trustees’ Resolution regarding the WECC Regional Reliability Standard</b>	
<b>Exhibit C – Record of Development of Proposed Reliability Standard</b>	
<b>Exhibit D – Standard Drafting Team Roster</b>	

## **I. INTRODUCTION**

The North American Electric Reliability Corporation (“NERC”) hereby submits notice of one Regional Reliability Standard, TOP-007-WECC-1 — System Operating Limits, proposed by the Western Electricity Coordinating Council (“WECC”).

On October 29, 2008, the NERC Board of Trustees approved, with conditions, TOP-007-WECC-1 Regional Reliability Standard proposed by WECC and voted to retire existing TOP-STD-007-0 — Operating Transfer Capability WECC Regional Reliability Standard<sup>1</sup> concurrently with the effective date of the revised standard. **Exhibit A** to this filing sets forth the proposed WECC Regional Reliability Standard. **Exhibit B** is the NERC Board of Trustees’ decision to approve, with conditions, the proposed WECC Regional Reliability Standard. **Exhibit C** contains the record of development for the proposed WECC Regional Reliability Standard 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 Standard and the comments received during the industry-wide comment period that NERC held on the proposed WECC standard. **Exhibit D** includes WECC’s standard drafting team roster.

NERC filed this Regional Reliability Standard with the Federal Energy Regulatory Commission (“FERC”), and is also filing this standard 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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<sup>1</sup> TOP-STD-007-0 is referred to herein as TOP-STD-007-0 or WECC- TOP-STD-007-0.

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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.<sup>2</sup>

Further, Section 311 of the NERC Rules of Procedure 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. Included as **Exhibit C** of the Delegation Agreement between NERC and WECC, WECC's Process for Developing and Approving WECC Standards was approved by FERC order originally on April 19, 2007,<sup>3</sup> approved as amended on March 21, 2008,<sup>4</sup> and approved as amended on December 19, 2008.<sup>5</sup> Section 312 states that "NERC shall rebuttably presume that a

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<sup>2</sup> See NERC's *Reliability Standards Development Procedure*, Approved by the NERC Board of Trustees on March 12, 2007, and Effective June 7, 2007 ("Reliability Standards Development Procedure"), available at [http://www.nerc.com/files/Appendix3A\\_StandardsDevelopmentProcess.pdf](http://www.nerc.com/files/Appendix3A_StandardsDevelopmentProcess.pdf).

<sup>3</sup> *Order Accepting ERO Compliance Filing, Accepting ERO/Regional Entity Delegation Agreements, and Accepting Regional Entity 2007 Business Plans*, 116 FERC ¶ 61,062 at P 469 (2007).

<sup>4</sup> *Order Addressing Revised Delegation Agreements*, 122 FERC ¶ 61,245 at P 225 (2008).

<sup>5</sup> *Order Accepting Compliance Filings, Subject to Conditions*, 125 FERC ¶ 61,330 (2008).

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 Reliability Standards. The 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>6</sup>

On June 10, 2008, WECC submitted a request to NERC to approve, and submit to FERC for approval, TOP-007-WECC-1 — System Operating Limits, the proposed Regional Reliability Standard that is the subject of this petition. WECC developed this standard following its Process for Developing and Approving WECC Standards (“WECC Process”) and therefore, NERC rebuttably presumes it is just, reasonable, and not unduly discriminatory or preferential, and in the public interest. Further, WECC stated and NERC agrees that the proposed WECC Regional Reliability Standard establishes requirements that are more stringent than or covers areas not covered by current NERC Reliability Standards. Upon receipt of WECC’s request, NERC commenced an evaluation of the Regional Reliability Standard and initiated a 45-day public comment period (April 4, 2008 through May 20, 2008), as prescribed by Section 312 of NERC’s Rules of Procedures. On August 13, 2008, WECC responded to the comments presented

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<sup>6</sup> NERC Rules of Procedure, § 312.3.1.

during the NERC posting and requested NERC to present the WECC Regional Reliability Standard for NERC Board of Trustees approval. During the evaluation, NERC identified a shortcoming in the standard that WECC agreed to address by submitting a revised version of the standard for approval by the NERC Board of Trustees after approval of the standard by FERC. NERC's evaluation of the proposed Regional Reliability Standard is available in **Exhibit C**. The proposed WECC Regional Reliability Standard was approved by the NERC Board of Trustees on October 29, 2008 for filing with the applicable governmental authorities.

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

On November 29, 2007, NERC submitted notice of eight proposed Tier One Regional Reliability Standards for WECC. NERC approved the proposed Regional Reliability Standards on the conditions that WECC:

- (1) remove the one-year term limitation;
- (2) address the shortcomings in the standards within one year of approval by the Commission, including removing the sanctions table that conflicts with the NERC Sanction Guidelines;
- (3) until the WECC sanction table is removed, follow the NERC Sanction Guidelines to the maximum extent possible within the limits of the WECC sanction table; and
- (4) monitor and enforce the standards under a delegation agreement between NERC and WECC, once that agreement is approved.

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.<sup>7</sup> In the June 8 Order, FERC directed WECC to develop several

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<sup>7</sup> *North American Electric Reliability Corporation*, "Order Approving Regional Reliability Standards for the Western Interconnection and Directing Modifications," ("June 8 Order"), 119 FERC ¶ 61,260 at P 1 (2007).



modifications to the Regional Reliability Standards when WECC develops, through its Reliability Standards development process, permanent, replacement Reliability Standards. Specifically, FERC directed WECC to meet its commitment to address the shortcomings identified during the NERC review of the standard, TOP-STD-007-0, including the formatting concerns and the inconsistency between the NERC and WECC definition of the term “disturbance.”<sup>8</sup> The standards approved in the Order 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

WECC, supported by the Western Interconnection Regional Advisory Body (“WIRAB”), identified these Regional Reliability 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.

In June 2008, WECC submitted seven proposed Regional Reliability Standards to replace the eight original standards approved in 2007, one of which, TOP-007-WECC-1, is subject of this filing. WECC used its approved WECC Process in developing these proposed standards, and, furthermore, satisfied the conditions under which the original

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<sup>8</sup> June 8 Order at PP 104-110.

Tier 1 standards were approved. NERC confirmed that WECC followed its approved process according to its Regional Delegation Agreement with NERC in developing the replacement standard that is proposed in this filing.

In addition to addressing FERC's concerns noted in the June 8 Order, WECC made substantial technical modifications to the proposed standard TOP-007-WECC-1 on its own accord. However, because WECC followed its approved process in developing these modifications NERC continues to rebuttably presume this standard is just, reasonable, and not unduly discriminatory or preferential, and in the public interest.

WECC is a Regional Entity organized on an Interconnection-wide basis, and the proposed Regional Reliability Standard is to be applicable on an Interconnection-wide basis. As such, NERC rebuttably presumes the proposed standard is 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 Standards. It was 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 this proposed Regional Reliability Standards did not elicit any significant technical objection. Further, considering the proposed standard on its merits NERC staff finds that the proposed standard meets the criteria for consideration and approval as a Regional Reliability Standard.

#### **IV. JUSTIFICATION OF PROPOSED REGIONAL RELIABILITY STANDARD**

This section summarizes the development of the proposed Regional Reliability Standard TOP-007-WECC-1 and provides evidence that the proposed Reliability

Standard meets the criteria for approval, that is, the proposed Reliability Standard is just, reasonable, not unduly discriminatory or preferential and in the public interest. This section describes the reliability objectives to be achieved by approving the Regional Reliability Standard. The following section describes the development history of the standard including how the proposed standard meets the FERC directives, stakeholder ballot results, and how key issues were considered and addressed by the standard drafting team.

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

**a. Basis and Purpose of TOP-007-WECC-1 — System Operating Limits**

The primary purpose of this Regional Reliability Standard is to ensure that actual flows and associated scheduled flows on Major WECC Transfer Paths do not exceed System Operating Limits (“SOL”) for more than 30 minutes. The major paths listed in the Table titled “Major WECC Transfer Paths in the Bulk Electric System” that is attached to the proposed Reliability Standard are significant components for reliable delivery of power in the Western Interconnection. SOLs 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 add emphasis to reducing flows to within SOLs to maintain reliable Western Interconnection operation. This standard is intended to create a permanent replacement standard for TOP-STD-007-0 that was approved by FERC in June, 2007. TOP-007-WECC-1 is designed to implement the directives of FERC from its June 8 Order approving the Regional Reliability Standard, recommendations of NERC when TOP-STD-007-0 was approved as a NERC Reliability Standard and other changes WECC determined were necessary.

As defined in Section 312.1 of NERC's Rules of Procedure, "[r]egional entities may propose regional reliability standards that set more stringent reliability requirements than the NERC reliability standard or cover matters not covered by an existing NERC reliability standard." This proposed WECC Regional Reliability Standard is justified on the basis that the standard requirements cover topics not currently covered by and presents a requirement more stringent than current NERC Reliability Standards.

Whereas, NERC Reliability Standard TOP-007-0 – *Reporting SOL and IROL Violations* Requirement R2 requires the Transmission Operator to return its transmission path flows to within Interconnection Reliability Operating Limits ("IROLs") as soon as possible, but no longer than 30 minutes following a contingency or event, TOP-007-WECC-1 Requirement R1 requires the Transmission Operator of the major WECC transfer paths to take immediate action to return the actual power flow to within SOL such that at no time shall the power flow exceed the SOL for longer than 30 minutes. There is no NERC requirement to return the transmission system to within SOL within a time certain, only a requirement to report to the Reliability Coordinator (TOP-007-0

Requirement R1). Depending on the current system conditions, the limits for the paths identified in this TOP-007-WECC-1 standard are SOLs that would not result in cascading outages. 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 an SOL. TOP-007-WECC-1 Requirement R2 requires the Transmission Operator of the major WECC transfer paths to ensure that Net Scheduled Interchange<sup>9</sup> for power flow over an interconnection or transmission path does not exceed the path's SOL when the Transmission Operator implements its real-time schedules for the next hour. The requirement for maintaining Net Scheduled Interchange within a path's SOL is also not covered in the NERC Reliability Standards. This requirement is important to the Western Interconnection because scheduling transmission paths beyond their limits could adversely affect actual flows on parallel paths by creating unscheduled flow that may jeopardize system reliability.

NERC agrees that the proposed Regional Reliability Standard meets the criteria for approval as a Regional Reliability Standard and serves a valuable reliability purpose.

The proposed Regional Reliability Standard proposes two requirements and one sub-requirement, one of which is more stringent than FERC-approved Reliability Standard TOP-007-0 — Reporting SOL and IROL Violations and one of which is not covered in the TOP-007-0 — Reporting SOL and IROL Violations. The two requirements and one sub-requirement that this Regional Reliability Standard proposes are summarized as follows:

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<sup>9</sup> Net Scheduled Interchange is defined in the NERC Glossary of Terms as “[t]he algebraic sum of all Interchange Schedules across a given path or between Balancing Authorities for a given period or instant in time.”

R1. Requires the Transmission Operators of the major WECC transfer paths to take immediate action to reduce the actual power flow across the path such that at no time should the power flow exceed the SOL for more than 30 minutes.

R2. Ensures that the Transmission Operators of the major WECC transfer paths 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.

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 Schedule Interchange exceeding the new SOL during this 30 minute period will not be a violation of Requirement R2.

**Demonstration that the proposed reliability standard is just, reasonable, not unduly discriminatory or preferential and in the public interest**

**1. Proposed reliability standard is designed to achieve a specified reliability goal**

The proposed Regional Reliability Standard, TOP-007-WECC-1 — System Operating Limits, is designed to achieve the specific reliability goal of reducing actual flows to within SOLs on the Major WECC Transfer Paths (see “Major WECC Transfer Paths in the Bulk Electric System” at Attachment 1 to the proposed Reliability Standard). The proposed standard also achieves the specific reliability goal of limiting Net Scheduled Interchange for power flow over the Major WECC Transfer Paths to the path's SOL when the Transmission Operator implements its real-time schedules for the next hour.

The major paths listed in the Table are significant components for reliable delivery of power throughout the Western Interconnection. SOLs for these paths are critical because the paths are used to transfer energy from remotely located generation to population/load centers. The reliability entities within the Western Interconnection, through studies and operation, agree upon the need for optimizing the capacity of these major paths. Because these paths generally lack redundancy, reliability entities maintain

a high level of scrutiny for them; therefore, Requirement R1 of this proposed standard is designed to add emphasis on reducing flows to within SOL within 30 minutes to maintain reliable Western Interconnection operation.

Requirement R2 ensures that the Net Scheduled Interchange is maintained within a path's SOL and is not covered in the NERC Reliability Standards. Besides the obvious risk of loadings beyond the SOL, scheduling transmission paths beyond their limits could adversely affect actual flows on parallel paths by creating unscheduled flow that may jeopardize system reliability. This requirement is instrumental in achieving this important reliability objective of keeping actual flows to within SOL.

## **2. Proposed reliability standard contains a technically sound method to achieve the goal**

The proposed Regional Reliability Standard was developed by electric power experts from the Western Interconnection and contains a technically sound method to achieve its reliability goal of returning path flows to within limits. Requirement R1 of the proposed standard requires that actual flows on Major WECC Transmission Paths not exceed the SOL for that path. Requirement R2 of the proposed standard requires that scheduled flows across Major WECC Transmission Paths not exceed the SOL for that path. Requirement R1 requires the Transmission Operator to return its actual transmission path flows to within SOL as soon as possible, but no longer than 30 minutes following a contingency or event. Sub-Requirement R2.1 addresses situations in which the SOL decreases within 20 minutes before the start of the hour by requiring that if the 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. The

proposed standard does not specify a specific method (the “how”) for reducing actual flow to within SOL, but requires the Transmission Operator to take immediate action to reduce the flows. Requirement R2 prevents scheduling transmission paths beyond their limits. Over-scheduling adversely affects actual flows on parallel paths by creating unscheduled flow. Large amounts of unscheduled flow may create transmission overloads on paths other than those over which the flows are scheduled. This may jeopardize system reliability.

**3. Proposed reliability standard is applicable to users, owners and operators of the bulk power system, and not others**

The proposed Regional Reliability Standard is applicable only to users, owners and operators of the bulk power system located within WECC, and not others. The proposed standard identifies Transmission Operators of the transmission paths in the most current table located in Attachment 1 to the proposed standard “Major WECC Transfer Paths” as applicable entities. These transmission paths operate entirely in the Western Interconnection. The requirements ensure that only Transmission Operators of the Major WECC Transmission Paths are responsible for complying with the proposed standard. No Transmission Operators outside of WECC or other functional entities within WECC are required to comply with these requirements.

**4. Proposed reliability standard is clear and unambiguous as to what is required and who is required to comply**

The proposed Regional Reliability Standard applies exclusively to WECC Transmission Operators of the Major WECC Transmission Paths. The proposed standard’s two requirements clearly and unambiguously establish the entities’ compliance obligations by: (Requirement R1) identifying that actions must be taken by the



Transmission Operators of Major WECC Transfer Paths when actual power flows exceed the SOL and (Requirement R2) identifying that Transmission Operators of Major WECC Transfer Paths 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.

**5. Proposed reliability standard includes clear and understandable consequences and a range of penalties (monetary and/or non-monetary) for a violation**

The proposed Regional Reliability Standard has a Violation Risk Factor and Violation Severity Level for each main requirement in the proposed standard. The ranges of penalties for violations will be based on the applicable Violation Risk Factor and Violation Severity Level and will be administered based on the sanctions table and supporting penalty determination process described in the NERC Sanction Guidelines, Appendix 4B in NERC's Rules of Procedure.

**6. Proposed reliability standard identifies clear and objective criterion or measure for compliance, so that it can be enforced in a consistent and non-preferential manner**

Each requirement in the proposed Reliability Standard is supported by a measure that clearly identifies what is required and how the requirement will be enforced. These measures will ensure the requirements are clearly administered for enforcement in a consistent manner and without prejudice to any party. These measures are included in Section C of the proposed Reliability Standard. Furthermore, to guide the compliance monitoring processes, a Reliability Standard Audit Worksheet ("RSAW") will be developed for this proposed Reliability Standard if it includes the Reliability Standard, once approved, in the list of actively monitored Reliability Standards for a particular compliance program year. As these RSAWs are guides, they assist the applicable entity

in understanding what they are expected to provide in support of the particular measures to demonstrate compliance.

Proposed Measure M1 identifies that evidence must be provided that actual power flow has not exceeded the SOL for the specified time limit in Requirement R1. Measure M2 indicates the evidence that Net Scheduled Interchange has not exceeded the SOL when the Transmission Operator implements real-time schedules as required by Requirement R2. Sub-Measure M2.1 identifies that evidence that the Net Scheduled Interchange was at or below a new SOL within 30 minutes of when the SOL decreased as required by Sub-Requirement R2.1. These measures will ensure the requirements are enforced in a clear, consistent, and non-preferential manner.

**7. Proposed reliability standard achieves a reliability goal effectively and efficiently - but does not reflect “best practices” without regard to implementation cost**

The proposed Regional Reliability Standard assists the industry in effectively and efficiently achieving the stated reliability goal by introducing a consistent 30-minute limit over which actual flow may not exceed SOL for all Major WECC Transfer Paths noted in Attachment 1 to the proposed Regional Reliability Standard regardless of whether the path is thermally or stability-limited.

The existing interim standard identifies two different times that the actual flow shall not exceed the SOL: 20 minutes for stability-limited paths and 30 minutes for thermally-rated paths. Because some paths have ratings that change from stability limits to thermal limits for specific outages or operating conditions, the variation in time limits has caused confusion among Transmission Operators and Reliability Coordinators. These differing time limits also complicate system operation, causing delays in responding to path overloads and potentially causing path operators to implement more

drastic actions than would otherwise be necessary simply to respond to a contingency. This confusion puts the system at greater risk, particularly during heavy load periods. In contrast, under the proposed standard, following a system disturbance, the system operators will be better able to identify what generation to ramp or other actions to take in order to effectively mitigate the overload and to coordinate with others before implementing the adjustments. The change in the proposed standard provides clarity and eliminates the need found in the existing standard to determine the limiting condition when the contingency occurs since there are two different time limits that actual flow shall not exceed the SOL in the existing standard, thereby allowing the Transmission Operator to concentrate upon resolving the overload condition.

**8. Proposed reliability standard is not “lowest common denominator,” *i.e.*, does not reflect a compromise that does not adequately protect bulk power system reliability**

The requirement to reduce actual flows to within SOLs in the proposed Regional Reliability Standard TOP-007-WECC-1 — System Operating Limits is currently not covered in the NERC TOP-007-0 — Reporting SOL and IROL Violations Reliability Standard. As a result, the proposed Regional Reliability Standard cannot be said to reflect a “lowest common denominator” approach. Instead, as noted above, the proposed standard provides clarity and eliminates the need found in the existing standard to determine the limiting condition when the contingency occurs, thereby allowing the Transmission Operator to concentrate on resolving the overload condition.

In addition, the proposed standard prohibits the Net Scheduled Interchange power flow over the Major WECC Transfer Paths from exceeding the path’s SOL when the Transmission Operator implements its real-time schedules for the next hour. This requirement is currently not covered by a requirement in the NERC body of standards.

**9. Proposed reliability standard considers costs to implement for smaller entities but not at consequence of less than excellence in operating system reliability**

The requirements in the existing standard have been in place in WECC since September 1, 1999, initially through the WECC Reliability Management System and more recently through enforcement of the existing Regional Reliability Standard. Adoption of the proposed standard will not impose new cost burdens on entities in the Western Interconnection, regardless of their size because the proposed standard is not introducing new requirements.

The proposed Regional Reliability Standard was neither developed nor adopted solely to protect against the imposition of reasonable expenses. Furthermore, the proposed standard will apply equally to all applicable entities in a consistent manner. The record of development in **Exhibit C** demonstrates that no stakeholder offered comments pertaining to the cost impact of the standard relative to the size of the entity. In addition and in particular, no small entity commented expressing a concern on cost to implement.

**10. Proposed reliability standard is designed to apply throughout North America to the maximum extent achievable with a single reliability standard while not favoring one area or approach**

The proposed Regional Reliability Standard applies throughout the Western Interconnection and does not favor one area or approach.

A Reliability Standard proposed by a Regional Entity must meet the same standards that NERC's Reliability Standards must meet, *i.e.*, the Regional Reliability Standard must be shown to be just, reasonable, not unduly discriminatory or preferential, and in the public interest.

FERC's Order No. 672 establishes two additional criteria that a Regional Reliability Standard must satisfy. A regional difference from a continent-wide Reliability Standard must either be:

- More stringent than the continent-wide reliability standard (which includes a regional standard that addresses matters that the continent-wide standard does not), or
- A Regional Reliability Standard that is necessitated by a physical difference in the bulk-power system.

The proposed standard satisfies these criteria by addressing matters not covered by a NERC standard and by proposing a requirement that is more stringent than a NERC requirement. Requirement R1 of the proposed standard requires the Transmission Operator to reduce actual power flows when they exceed an SOL. The Transmission Operator must return the flows to below the SOL within 30 minutes. NERC TOP-007-0 — Reporting SOL and IROL Violations, on the other hand, requires the Transmission Operator to return its transmission system to within the IROL, not the more limiting SOL, within 30 minutes. Requirement R2 of the proposed standard requires that 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. Currently, there is no such requirement in any NERC standard.

**11. Proposed reliability standard causes no undue negative effect on competition or restriction of the grid**

The proposed Regional Reliability Standard does not restrict the available transmission capability or limit the use of the Bulk-Power System in a preferential manner. Indeed, as noted above, the proposed standard's requirements have been in

place in WECC for almost a decade and so impose no additional restrictions or limitations on the Bulk-Power System.

**12. The implementation time for the proposed reliability standard is reasonable.**

Because the requirements of the proposed standard have been in place in the Western Interconnection since September 1, 1999, approval of the proposed standard will have no direct impact on current practice in the Western Interconnection.

**13. The reliability standard development process was open and fair**

The proposed Regional Reliability Standard was developed in accordance with the Process for Developing and Approving WECC Standards, which provides for a fair and open Regional Reliability Standards development process. Specifically, this process included drafting by an open and inclusive standards drafting team; consideration of industry comments received during three WECC public posting and comment periods; approval by the WECC Operating Committee; approval by the WECC Board of Directors; WECC response to comments received by NERC as a result of NERC public posting; WECC response to comments by FERC Staff; WECC response to comments by NERC Staff; and production of other supporting documentation in response to various public and staff questions or concerns.

**14. Proposed reliability standard balances with other vital public interests**

Neither NERC nor WECC believe there are any competing public interests with respect to the request for approval of this proposed Regional Reliability Standard. No comments were received that indicated the proposed standard conflicts with other vital public interests.

**15. Proposed reliability standard considers any other relevant factors**

NERC does not propose any additional factors for consideration at this time.

**V. SUMMARY OF THE RELIABILITY STANDARD DEVELOPMENT PROCEEDINGS**

**a. Development History**

In September 2007, WECC posted the initial draft of TOP-007-WECC-1 for industry comment. The drafting team reviewed and responded to initial comments in November 2007. During the first comment period WECC received comments from 16 entities. The majority of comments focused on two topics. The first topic was the time limit for returning flows to within SOLs. Requirement R1.1 of the first draft of the standard posted for comment required that power flow for the Transmission path shall not exceed the SOL for more than 30 minutes for SOLs based on Facility Ratings or System Voltage Limits. Requirement R1.2 of the first draft of the standard posted for comment required that power flow for the Transmission path shall not exceed the SOL for more than 20 minutes for SOLs based on Transient Stability Ratings or Voltage Stability Ratings. Comments indicated that the difference of 10 minutes was not based on any technically sound reasoning and would create an additional operational step to determine the cause of the limit before taking corrective action. These comments also indicated that utilizing one consistent time limit improves reliability by simplifying procedures for System Operators and providing the additional time necessary for coordinating an orderly response to system trouble. Comments indicated that having different response times for paths complicates operation of the system and that the more drastic actions needed to respond to a contingency within 20 minutes may put the system at greater risk. Based on these comments the drafting team modified the second draft of the TOP-007-WECC-1 standard to have one consistent 30 minute time limit for returning actual flows to within

SOLs. The second topic was the requirement identified in Requirement R2 that required that net schedules for power flow shall not exceeding the path's SOL for more than 30 minutes. Some comments argued for the removal of the requirement, while other comments expressed support for the requirement. Those opposed to the requirement indicated that scheduling issues were accounting/Open Access Same Time Information Service ("OASIS") issues. Those opposed to the requirement also indicated that as long as the actual flow is below the SOL, there is no reliability issue. Those in favor of the requirement noted that scheduling paths beyond their limit could impact actual flows on parallel paths. The drafting team responded to these comments by modifying Requirement R2 in the second draft of TOP-002-WECC-1 to require the Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour. WECC did not make any other significant conforming changes to the standard as a result of the comments. **Exhibit C** of this filing contains the record of development of the proposed Reliability Standard including the comments received during the first public posting of the proposed standard and the drafting team responses to 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 five entities. WECC supplied NERC with its response to comments on June 10, 2008. One comment indicated Requirement R2 requiring Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour was not needed. Three comments relating to the timing of reducing Net Scheduled Interchange to be within path limits were received. The drafting team



responded to these comments by refining Requirement R2 in the third draft of TOP-007-WECC-1 to limit the compliance period for the Net Scheduled Interchange to the real-time schedules for the next hour and to permit 30 minutes to adjust Net Scheduled Interchange when SOLs reduce within 20 minutes of the start of the hour. WECC did not make any other significant conforming changes to the standards as a result of the comments. **Exhibit C** of this filing contains the record of development of the proposed Reliability Standard including the comments received during the second public posting of the proposed standard and the drafting team responses to the comments.

In March, 2008, the WECC Operating Committee voted on TOP-007-WECC-1. The standard received 60 votes in favor, 7 no votes and 14 abstentions. In April, 2008, the WECC Board of Directors unanimously approved TOP-007-WECC-1.

Concurrent with WECC Board consideration of the proposed Regional Reliability Standard in April, 2008 and as permitted by NERC's Rules of Procedure, WECC submitted and NERC posted TOP-007-WECC-1 for the required 45-day public posting that took place from April 4, 2008 through May 20, 2008. During the NERC 45-day posting no substantial technical comments were made. WECC submitted the proposed Regional Reliability Standard to NERC in June, 2008 along with the drafting team's Consideration of Comments.

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 Regional Reliability Standard TOP-007-WECC-1 — System Operating Limits on July 30, 2008 and identified several concerns. NERC's general observation was that the proposed standard was

significantly modified from that of the existing TOP-STD-007-0 standard. Specifically, NERC commented on the technical modification of the requirement in the existing standard TOP-STD-007-0 found in Section WM1. Part C that the actual power flow on all transmission paths shall at no time exceed the operating transfer capability for more than 20 minutes for paths that are stability limited or for more than 30 minutes for paths that are thermally limited. It was unclear whether the proposed requirement was still more stringent than the NERC requirements. WECC clarified in its response that 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 IROL under NERC's TOP-007-0 — Reporting SOL and IROL Violations standard. The TOP-007-WECC-1 — System Operating Limits Regional Reliability Standard was created 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. In addition, WECC clarified that the existing standard, TOP-STD-007-0, created confusion during system operations 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.

Lastly, NERC noted that the Violation Severity Levels in the proposed standard do not conform to the NERC format. WECC agreed to address this formatting issue during the next revision of the standard in its response to the NERC evaluation submitted in August, 2008. NERC's comments and WECC's response are included in **Exhibit C** of this filing.

The TOP-007-WECC-1 — System Operating Limits Regional Reliability Standard was approved by the NERC Board of Trustees on October 29, 2008. **Exhibit B** of this filing contains the NERC Board of Trustees' resolution on the WECC Regional Reliability Standard.

#### **b. Key Issues**

##### **FERC Directives**

FERC approved TOP-STD-007-0 — Operating Transfer Capability Regional Reliability Standard in its June 8 Order A. In the June 8 Order, FERC directed WECC to develop several specific modifications to the Regional Reliability Standard when WECC

develops, through its Reliability Standards development process, permanent, replacement Reliability Standards. FERC directed WECC to meet its commitment to address the shortcomings identified during the NERC review of the standard including the formatting concerns and the inconsistency between the NERC and WECC definition of the term “disturbance.”

The proposed Regional Reliability Standard TOP-007-WECC-1 — System Operating Limits addresses the formatting concerns that NERC identified in its evaluation. In addition, WECC removed the definition of “disturbance” and noted that differences in the definitions are not significant to the interpretation of the standard.

#### **Key Issues during Standard Development**

Two key issues were identified during the development of the proposed TOP-007-WECC-1 — System Operating Limits Regional Reliability Standard that were reflected in the majority of the comments received during the first two public comment posting periods.

The first issue called to question whether or not the two different time limits for returning actual flows to within limits, depending on whether the limits were based on Facility Rating or system voltage limits (thermal) or transient stability ratings or voltage stability limits (stability) improved or reduced reliability. The WECC stakeholders supported a single time limit, thereby removing confusion, and exhibited strong support that simplified procedures would lead to increased reliability when weighed against the insignificant probability of a next contingency occurring in the extended ten-minute time period. This led the drafting team to include a single time limit of 30 minutes as identified in Requirement R1 of TOP-007-WECC-1.

The second key issue identified was the need for Requirement R2, which places limits on Net Scheduled Interchange. Some commenters argued that only actual flows are a reliability issue. Other commenters argued that if Net Scheduled Interchange was allowed to exceed limits, the potential for impacting the actual flows on parallel paths existed. The resulting standard recognizes the potential for Net Schedules that exceed the path's limit to adversely impact parallel paths, and therefore requires the Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour (Requirement R2).

WECC did not identify other key issues to the standard as a result of the comments submitted or the minority opinions provided from its Standing Committee vote. **Exhibit C** of this filing contains the record of development of the proposed reliability standard including the minority opinions expressed from the Operating Committee vote received before the WECC Board of Directors balloted TOP-007-WECC-1.

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Respectfully submitted,

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**Exhibit A**

**Reliability Standard Proposed for Approval**

## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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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:**

<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 16, 2007
3. Post second Draft Standard for industry comments	November 16, 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 completed 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 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

## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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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 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.



## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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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.*

### 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.

### 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.

### C. Measures

- M1.** Evidence that actual power flow has not exceeded the SOL for the specified time limit in R1.
- M2.** Evidence that Net Scheduled Interchange has not exceeded the SOL when the Transmission Operator implements real-time schedules as required by R2.
  - M2.1.** Evidence that Net Scheduled Interchange was at or below the new SOL within 30-minutes of when the SOL decreased.

### 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:

- 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.

### 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.

## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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2.4 **Severe:** None

### **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 TOP-STD-007-0	

## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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### **Attachment 1 – TOP-007-WECC-1**

#### **Violation Severity Level Table**

Percentage by which SOL is exceeded*	Limit exceeded for more than 30 minutes, up to 35 minutes	Limit exceeded for more than 35 minutes, up to 40 minutes	Limit exceeded for more than 40 minutes, up to 45 minutes	Limit exceeded for more than 45 minutes
greater than 0%, up to and including 5%	Lower	Moderate	Moderate	High
greater than 5%, up to and including 10%	Moderate	Moderate	High	High
greater than 10%, up to and including 15%	Moderate	High	High	Severe
greater than 15%, up to and including 20%	High	High	Severe	Severe
greater than 20%, up to and including 25%	High	Severe	Severe	Severe
greater than 25%	Severe	Severe	Severe	Severe

\* Measured after 30 continuous minutes of actual flows in excess of SOL.

**Exhibit B**

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



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 Standard**

Comments Received to the First Posting of TOP-007-WECC-1  
November 16, 2007

Requirement R2 is an accounting/OASIS issue. Why do we care what a schedule is (for pure reliability purposes) as long as the actual flow is handled properly based on the applicable standards? R1 adequately deals with the WECC specific distinction for thermal vs. stability limits. Grant recommends the drafting team delete R2 and M2 from the standard.

Greg Lange  
Public Utility District No. 2 of Grant County

*Reply: The standard drafting team made refinements to R2 to require Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour. Scheduling paths beyond their limits could adversely affect actual flows on parallel paths that may jeopardize system reliability. R2 is more than an accounting/OASIS issue.*

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R2, M2 - Net Schedule should be determined/measured solely on a pre-schedule basis and not include any after-the-fact adjustments.

John Appel  
Chelan PUD

*Reply: The standard drafting team made refinements to R2 to require Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour.*

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R1.2 implies that following a contingency, the flows must be reduced to the new limit of the degraded system (which could be significantly lower) within 20 minutes. Reducing the time requirement from 30 minutes to 20 minutes is not based upon any sound reasoning would create operational strain. Following a system disturbance, the operators may have many other things to worry about. It takes time to figure out which generation ramp down would be effective, coordinate with others, and then it would take some time for the generators to actually ramp down.

Our recommendation would be change time to 30 minutes.

Tom Glock, Baj Agrawal  
Arizona Public Service Co.

*Reply: The drafting agrees to make the recommended refinement (see revised standard).*

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While I agree that a transfer path should not be pre-scheduled to a level in excess of its SOL, the primary intent of this reliability standard ought to be focused upon the condition of actual path flows exceeding the SOL. In that regard, the Requirement R2 - when viewed after the fact - is primarily a transaction accounting mechanism, and should not be used to determine if a transfer path was operated reliably. I recommend deletion of both R2 and its associated Measure M2. If it must stay, then re-word it to be applicable to the net interchange that was pre-scheduled rather than ATF.

*Reply: The standard drafting team made refinements to R2 to require Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour. Scheduling paths beyond their limits could adversely affect actual flows on parallel paths that may jeopardize system reliability.*

I notice that in proposed R1.1 and R1.2, the familiar terminology of “Thermally Limited Paths” and “Stability Limited Paths” has been replaced by “Facility Ratings or System Voltage Limits” and “Transient Stability Ratings or Voltage Stability Ratings”. If this NERC terminology is to be used, I think the Major WECC Transfer Path listing needs to have a column added to reflect which type of rating is applicable for each Path. Today, we can tell if the 20 or 30 minutes applies based on the statements in the Path Rating Catalog, which classify each of the Paths as either Stability limited or thermally limited.

*Reply: The drafting team removed the NERC terminology to incorporate other recommended refinements.*

With regard to the referenced Table of Major WECC Transfer Paths, I question how it is determined that a particular path gets placed on this list, and how one can be removed. What process exists or will exist to ensure that these paths are the ones truly regarded as “Major?” 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 make up 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 table may be outside the scope of the Drafting Team, it nonetheless influences my acceptance of this Standard as an issue of applicability.

I appreciate the opportunity to comment on this Standard.

Rich Salgo  
Sierra Pacific Resources Transmission

*Reply: Reliability Coordinators recommended the original Table of Major WECC Transfer Paths contained in the Reliability Management System Agreement. WECC*

*made refinements to the table through the Reliability Management System amendment process. In the future, any entity may recommend refinements to the table by following the Process for Developing and Approving WECC Standards. For the table WECC Board approval would be required, but NERC and FERC approvals are not required.*

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Requirement R2 and measure M2 are accounting issues. They should not be included in reliability standard and have no bearing on actual flow or measurement of flow. R1 and M1 are adequate

Net schedule should be measurement solely on a preschedule base and not included in any after the fact adjustment.

Transmission paths have bi-directional SOL's. If schedule power flow is used for measurement purpose, then one must look at the direction and the associated directional SOL solely on a pre-schedule base.

Devinder Ghangass  
British Columbia Transmission Corporation

*Reply: The standard drafting team made refinements to R2 to require Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour. Scheduling paths beyond their limits could adversely affect actual flows on parallel paths that may jeopardize system reliability.*

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BPA agrees with the need to maintain a WECC regional standard that strengthens the NERC requirement of responding to IROL violations within 30 min. By extending the applicability of TOP-007 to SOL violations for specific, critical, WECC paths, the WECC standard improves reliability of the western interconnection.

### **Remove Requirement R2 and measure M2**

When a contingency or other real time operating condition results in path loading over the SOL, System Operators should respond immediately to restore actual flow to below the operating limit. Requirement R1 and Measure M1 address this issue adequately. However, expending the same effort to return net schedules to within the operating limit is not only unnecessary from a reliability point of view, but could be detrimental by interfering with the actions taken in response to the actual flow violation or by placing the system at greater risk during high loading periods.

While BPA acknowledges that net schedules should be less than the path limit on entering the hour, the reality is that a net schedule exceeding the SOL poses little real-time risk to the transmission system and is an equity issue rather than a reliability issue. Removing R2 and M2 will not affect response time for the real reliability issue, actual flow above SOL, and may improve reliability by allowing System Operators to address actual flow without the added distraction of dealing with a non-reliability accounting problem.

BPA recommends eliminating R2 and M2.

If R2 is retained, the requirement should be modified to consider only net schedules going into the hour. Once in the hour, the major reliability concern is actual flow over the SOL. System Operators should not be distracted from this task to deal with what are essentially equity issues. In addition, the term “net schedules” is vague and should be defined. The definition should be based solely on the pre-schedule, without any after-the-fact adjustment, and if paths are bi-directionally limited, the net schedule should reflect the direction.

*Reply: The standard drafting team made refinements to R2 to require Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour. Scheduling paths beyond their limits could adversely affect actual flows on parallel paths that may jeopardize system reliability.*

**Change the time limit for stability limited paths to 30 minutes.**

The shorter time limit for stability limited paths was originally adopted by WECC to address the perception that a path limited by stability criteria is more likely to result in cascading (should the next contingency occur) than a path limited by thermal criteria. The reasoning was that you don't have time to respond to a stability problem so your risk is larger with a stability limited path than a thermally limited path where you may have time to manually intervene.

The reduced response time of 20 min for stability limited paths was chosen based on an assumption that reduced response time reduces the probability of incurring the next contingency and therefore the risk of cascading outage.

BPA asserts that the difference between 20 minute and 30 minute response time is insignificant in terms of probability of a next contingency occurring and therefore does not affect the risk the system is exposed to by a next contingency during the response period. Further, having now had several years of experience operating the system to the shorter time frame following a contingency, BPA contends that having different response times for paths (and sometimes for the same path depending on current outage conditions) complicates operation of the system and that the more drastic actions needed to respond to a contingency within 20 minutes may put the system at greater risk, particularly during heavy load periods such as summer.

BPA believes using a consistent 30 minute response time for all SOL violations improves reliability by simplifying procedures for System Operators and providing the additional time necessary for coordinating an orderly response to system trouble.

*Reply: The drafting agrees to make the recommended refinement (see revised standard).*

**Modify R2 to include only scheduled paths in the table.**

BPA agrees with the standard drafting team regarding the restriction of applicability of this standard to the paths that have been widely accepted as most significant to the interconnection, as identified by the Major WECC paths table.

BPA strongly supports removing R2 from the standard (see comments above). If R2 is retained, it should only apply to paths with established interchange schedules and not internal paths listed in Attachment 2.

*Reply: The drafting team made refinements to R2 to exclude internal paths that are not scheduled.*

In addition, BPA suggests that the following changes be made to the list of paths in Attachment 2:

Modify the list of paths to remove BPA internal transfer paths with no schedules. West Of Cascades - North, West of Cascades - South, and North of John Day should be removed because they are not scheduled paths.

BPA also suggests removal of item 40 which refers to the nomogram operation of COI/PDCI and NJD. COI and PDCI are already captured in items 35 and 34, respectively.

*Reply: WECC made refinements to the table through the Reliability Management System amendment process. In the future, any entity may recommend refinements to the table by following the Process for Developing and Approving WECC Standards. For the table WECC Board approval would be required, but NERC and FERC approvals are not required.*

Brian Tuck  
Bonneville Power Administration

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Thank you for the opportunity to further comment (see Brian Tuck's earlier comments).

In order to assure awareness of potential problems and time criticality and to assure the RC has the information they need in determining if and when to issue directives, we recommend adding a requirement such as:

The Transmission operator shall identify all stability limited paths and assure that these are known to their System Operators and Reliability Authority.

Donald Watkins  
Bonneville Power Administration

*Reply: The OTC (SOL) process requires the Transmission Operator to identify the nature of the limit of the path. The drafting team believes this recommendation is not needed with one 30-minute uniform response requirement.*

---

R2

Should this portion of the standard remain, magnitude of over-schedule should be considered in addition to duration of over-schedule when determining the violation severity.

*Reply: The drafting team made refinements to the violation severity levels for R2 to include magnitude of schedule.*

It seems that deletion of R2 from the standard could lead to gross over-scheduling of transmission paths, which could create overload problems on parallel paths. However, strict adherence to the standard could also be detrimental to the reliability of the transmission system during emergency conditions. The severity index may be a good tool to allow for some degree of over-schedule to compensate for needed transfer capability during some emergency circumstances and still prevent gross manipulation of the transmission system.

Jared Griffiths  
Western Area Power Administration-RMR

*Reply: The standard drafting team made refinements to R2 to require Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour. Scheduling paths beyond their limits could adversely affect actual flows on parallel paths that may jeopardize system reliability.*

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Sacramento Municipal Utility District, System Operations and Reliability recommend removal of R2 and M2 from the proposed standard.

Phillip B. O'Donnell  
Sacramento Municipal Utility District

*Reply: The standard drafting team made refinements to R2 to require Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour. Scheduling paths beyond their limits could adversely affect actual flows on parallel paths that may jeopardize system reliability.*

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Idaho Power would disagree with the removal of R2 but instead believes that the scope of its time frame should end at the "prior to the next hour" real-time scheduling deadline (XX: 40). This would eliminate the possibility of after-the-fact schedule changes creating a violation. Scheduling paths beyond their limit could impact actual flows on parallel paths.  
Thank you for your efforts.

Greg Travis  
Idaho Power

*Reply: The standard drafting team made the recommended refinements to R2 to require Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour. Scheduling paths beyond their limits*

*could adversely affect actual flows on parallel paths that may jeopardize system reliability.*

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Certain words are capitalized within the document (e.g., System Voltage Limit). Please define the term.

Anonymous

*Reply: NERC defines the capitalized term used in TOP-007-WECC-1 in its reliability standards (see definition for System Operating Limit).*

R.2. and M2. Should be removed because they are accounting measures. Actual power flow should be the measure for SOL violations. NWMT has had experiences when it curtailed all schedules on a path to zero, with no effect on actual power flow. The schedule has nothing to do with the dynamics of the system – regardless of schedules, it is the physical system, including load and generation levels that determine how much and where power will flow. Even the OTCSDT states that it believes net schedules in excess of reliability limits will create “very little reliability risk to the bulk electric system.”

*Reply: The standard drafting team made refinements to R2 to require Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour. Scheduling paths beyond their limits could adversely affect actual flows on parallel paths that may jeopardize system reliability.*

R1.1. and R1.2. Should be combined, with no differentiation between Facility Rating System Voltage Limits and Transient or Voltage Stability Rating such that a 30 minute limit applies to all SOLs. This supported by OTCSDT who states there is, “no substantial difference between thermally limited and stability limited paths when considering risk to the transmission system...” NWMT has paths that will change from stability limited ratings to thermal limited ratings for specific outages, and the variation in time limits has caused confusion even at the Reliability Coordinator level. With a single time limit for any rating, this confusion is removed.

*Reply: The drafting agrees to make the recommended refinement.*

Leland McMillian  
NorthWestern Energy

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Requirements: Clarify that these requirements apply to the paths identified in the tables. As written, it says it applies to the Operators, but doesn't say it applies to only to the major paths.



Scott Peterson  
San Diego Gas & Electric

*Reply: Section 4 Applicability clearly identifies that the standard only applies to the paths listed in the table.*

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The CAISO requests consideration of the following comments on the proposed TOP-007-WECC-1:

R2 and M2

The CAISO believes that R2 and M2 should be removed or modified to apply only to the pre-scheduled value for the identified paths.

Reliability requires that actual values be maintained below the SOL on the WECC paths identified. Even if a schedule remained above a SOL mid-hour when the SOL values changed in real-time, as long as the actual flow is below the SOL, there is no reliability issue. Actual flows are the key to maintaining reliability.

If the drafting team elects to keep a version of R2 and M2 in the standard, the requirement and measure should focus on the pre-schedule value, not in hour schedules.

Also, if the drafting team elects to keep a version of R2 and M2 in the final version of this standard, the list of paths that this requirement applies to should be edited to only include those paths that are actually scheduled. The current list includes many paths that are not scheduled paths, so to prove compliance or non-compliance would be impossible.

*Reply: The standard drafting team made refinements to R2 to require Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour. Scheduling paths beyond their limits could adversely affect actual flows on parallel paths that may jeopardize system reliability.*

The paths that are included on the list in the CAISO area but are not scheduled are Path 15, Path 26, & SCIT.

*Reply: The drafting team made refinements to R2 to exclude internal paths that are not scheduled.*

Anonymous  
California Independent System Operator

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The Purpose of this standard is to ensure the reliability of the interconnected system by keeping actual flows on the critically defined WECC paths within approved operating

limits. Requirement R1 requires the System Operator to take appropriate actions to restore the system to within approved operating conditions in the allotted time frame. The requirement to keep net schedules below operating limits within the hour does nothing to ensure the reliable operating of the system. Removing R2 and M2 allows the System Operator more time to deal with the important issue at hand, actual flow.

Scott Kinney  
Avista Corp.

*Reply: The standard drafting team made the recommended refinements to R2 to require Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour. Scheduling paths beyond their limits could adversely affect actual flows on parallel paths that may jeopardize system reliability.*

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The Alberta Electric System Operator (AESO) appreciates the opportunity to comment on the proposed standard and commends the drafting team for the work it has done.

Like many other commenters, the AESO has concerns regarding R2 and M2 where the net schedule over an interconnection or Path is limited to its SOL. In situations of delivery of emergency energy or contingency reserve, this requirement limits the potential use of the unused portion of the SOL and hence limits the ability of other areas to render assistance to the area that is in need. This seems to go against the principle of interconnection reliability operation.

The AESO would respectfully ask the drafting team to reconsider this requirement.

Anita Lee, P. Eng.  
Manager, Operating Policies and Procedures  
Alberta Electric System Operator (AESO)

*Reply: The standard drafting team made the recommended refinements to R2 to require Net Scheduled Interchange to be within path limits when the Transmission Operator implements its real-time schedules for the next hour. Scheduling paths beyond their limits could adversely affect actual flows on parallel paths that may jeopardize system reliability.*

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PacifiCorp Energy Commercial & Trading submits the following comments pursuant to WECC's request of September 21, 2007 for comments:

The WECC Standard TOP-007-WECC-1 - System Operating Limits, section R.2. and M2. Require further clarification. The R2. Refers to "net schedule for power flow" and the M2. Refers to "net power flow schedules." We should avoid using the word actual

power flow and scheduled in the same definition. It has and will continue to cause ambiguity.

The following modifications would clear this conflict.

Proposed R2.

Transmission Operators shall not have actual power flow over an Interconnection or Transmission Path above the path's SOL for more than 30 minutes.

Proposed M2.

Evidence that actual power flow has not exceeded the SOL for more than 30 minutes as required by R2.

PacifiCorp Trading

*Reply: The standard drafting team made refinements to clarify R2 and M2. The drafting team replaced the confusing terms with the NERC defined term "Net Scheduled Interchange."*

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Consideration of Comments for TOP-007-WECC-1 – System Operating Limits  
Comments were due January 2, 2008  
January 24, 2008

The TOP-007-WECC-1 Standard Drafting Team thanks all commenters who submitted comments on the WECC TOP-007-WECC-1 Standard. This Standard was posted for a public comment period from November 16, 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 five 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**

### **B. Requirements**

#### **R.2.**

"Implements its real-time schedules for the next hour" does not set a definitive time frame. Does implement mean when the schedules go in just before the ramp or does it mean once the ramp is finished? Technically, over-schedules before the ramp period is done may not be in effect and thus may not be adversely impacting any transmission path.

Proposed change:

The Transmission Operator shall not have the Net Scheduled Interchange for power flow over an interconnection or Transmission path above the path's SOL immediately following the end of the WECC ramp period for the hour.

Jared Griffiths  
WAPA, RMR

[Reply: The requirements for implementing a schedule are covered in NERC Reliability Standards INT-005 thru INT-009. The drafting team made refinements to R2 to permit 30 minutes to adjust Net Scheduled Interchange for a decrease in the SOL.](#)

From: [fleblanc@ci.burbank.ca.us](mailto:fleblanc@ci.burbank.ca.us)

It should at all times be unacceptable to permit net schedules to exceed the System Operating Limit (SOL). For instance, if the California-Oregon Intertie (COI) is de-rated from 4800 MW N-S to 3200 MW at 5 minutes into the operating hour no schedules need to be cut (this assumes that the actual loading is within the new SOL of 3200 MW. What is not contemplated is that additional circuit interruptions or loss of generation can push the loading well above the SOL when through prudent pre-contingency operator action, schedules could have been curtailed to reflect that revised operating limit. The scheduling above the SOL presents a reliability issue that can and must be avoided. Also, the present language does not consider that if the contingency occurs just before schedules are implemented for the next hour there will be a violation because the schedules will be above the new SOL.

This is the present language: "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]

I propose changing it to: "Following a contingency resulting in the transmission path or interconnection being de-rated, the Transmission Operator shall not have the Net Scheduled Interchange for power flow over an interconnection or Transmission path above the path's SOL for more than 30 minutes before ramp initiation. 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]

This change will always permit approximately 30 minutes to revise schedules. It limits exposure to additional events and works no matter when the contingency occurs.

Submitted on behalf of Fred le Blanc, Manager, Energy Control Center, Burbank Water & Power

By Xavier Baldwin, BURB OC member

[Reply: The requirements for implementing a schedule are covered in NERC Reliability Standards INT-005 thru INT-009. The drafting team made refinements to R2 to permit 30 minutes to adjust Net Scheduled Interchange for a decrease in the SOL.](#)

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NorthWestern Energy is in favor of this standard now that the changes have been made.

Leland McMillan

[Reply: Thank you](#)

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TOP-007-WECC-1

CAISO comments

The CAISO wishes to thank the drafting team for the improvements made to the WECC standard TOP-007-WECC-1 with this draft. The CAISO asks the standards drafting team to consider the following comments that the CAISO offers to improve the standard.

R2. If a line were to relay or a dynamic SOL limit were to change just prior to schedules being implemented (the ramp), the lack of a grace period could prevent a Transmission Operator from implementing their schedules (starting their ramp) to avoid violation of this requirement. Such a requirement without a grace period would be a detriment to reliability.

Brent Kingsford  
California ISO

Reply: Reply: The requirements for implementing a schedule are covered in NERC Reliability Standards INT-005 thru INT-009. The drafting team made refinements to R2 to permit 30 minutes to adjust Net Scheduled Interchange for a decrease in the SOL.

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The Alberta Electric System Operator (AESO) appreciates the opportunity to comment and would like to offer the following:

- The AESO is still of the opinion that SOL, by definition, defines how much power can be transferred over a transmission path while meeting system reliability criteria. It is the actual power transfer that should be monitored, not the scheduled power transfer. To apply SOL in a scheduling application does not seem to make sense for the proper application of SOL.

Respectfully,

Anita Lee, P. Eng.  
Manager, Operating Policies and Procedures  
Alberta Electric System Operator

Reply: Scheduling paths beyond their limits could adversely affect actual flows on parallel paths that may jeopardize system reliability. The requirements for implementing a schedule are covered in NERC Reliability Standards INT-005 thru INT-009. The drafting team made refinements to R2 to permit 30 minutes to adjust Net Scheduled Interchange for a decrease in the SOL.

# *Western Electricity Coordination Council*

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

1. **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.

<b>VOTING CLASS</b>	<b>YES</b>	<b>NO</b>	<b>ABSTAIN</b>
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

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

**Voting Summary  
TOP-007-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 TOP-007-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.

**FERC and NERC Directives for a Permanent Replacement Standard  
for TOP-STD-007-0 Operating Transfer Capability  
May 1, 2008**

<b>Received From</b>	<b>FERC and NERC Directives for a Permanent Replacement Standard for TOP-STD-007-0 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 TOP-STD-007-0 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 TOP-STD-007-0</b>	Clarify that limits are not associated with N-1 causing cascading outages	The drafting team clarified.
<b>NERC Revisions to TOP-STD-007-0</b>	Break WR1 into at least 3 requirements and revise Measures accordingly.	The drafting team completely revised WR1. This comment no longer applies.
<b>NERC Revisions to TOP-STD-007-0</b>	Address applicability in last paragraph of WR1.	The drafting team chose to remove this paragraph because it repeated existing NERC FAC requirements.
<b>NERC Revisions to TOP-STD-007-0</b>	Move paragraph two under Compliance Monitoring Period to Additional Compliance information	The drafting team completely revised the Compliance Monitoring Period section.

**The TOP-007-WECC-1 Drafting Team Completed Actions for a Permanent Replacement Standard  
for TOP-STD-007-0 Operating Transfer Capability  
May 1, 2008**

<b>Received From</b>	<b>Previous Comments to Consider for TOP-STD-007-0 June 8, 2007</b>	<b>The TOP-STD-007-0 Drafting Team Consideration of Comments</b>	<b>The TOP-007-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 TOP-STD-007-0 June 8, 2007	The TOP-STD-007-0 Drafting Team Consideration of Comments	The TOP-007-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		
Nick Klemm, Western Area Power	From Nick Klemm, Western Area Power Administration -- Comment on "NERC	Thank you. This has been corrected to properly reflect the	The TOP-007-WECC-1 standard drafting team was not

Received From	Previous Comments to Consider for TOP-STD-007-0 June 8, 2007	The TOP-STD-007-0 Drafting Team Consideration of Comments	The TOP-007-WECC-1 Drafting Team Completed Actions
Administration --	<p>Title" version: TOP-STD-006-0 Transmission Maintenance, I believe that there are incorrect references to "Transmission Operator" in section B c (ii) and on the Appendix B Reporting Form. "Transmission Operator" should be replaced with "Responsible Entity". I believe that each Responsible Entity who maintains all or part of a transmission path should be responsible for their own plan, record keeping and reporting. The WECC Reformatted form reflects this properly but not the NERC Title form. The Transmission Operator should not be responsible for maintaining records of other entities' maintenance plans or implementation nor should the Transmission Operator be expected to report compliance for other entities.</p>	RMS meaning.	required to take any action regarding this comment.

## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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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:**

<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 16, 2007
3. Post second Draft Standard for industry comments	November 16, 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 completed 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 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

## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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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 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.



## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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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.*

**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.

**Comment [Edd1]:** The revised NERC standards for TOP are emphasizing monitoring/reporting for SOL but exceedances only for IROL.

**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.

**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]*

**Comment [Edd2]:** 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>.

**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]*

**Comment [Edd3]:** 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.

**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.

**C. Measures**

**M1.** 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.)*

**Comment [Edd4]:** 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.

**M2.** Evidence that Net Scheduled Interchange has not exceeded the SOL when the Transmission Operator implements real-time schedules as required by R2.

**M2.1.** Evidence that Net Scheduled Interchange was at or below the new SOL within 30-minutes of when the SOL decreased.

**Comment [Edd5]:** 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**

- 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 [Edd6]:** 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.

## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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2.4 Severe: None

### **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 TOP-STD-007-0	

## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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### **Attachment 1 – TOP-007-WECC-1**

#### **Violation Severity Level Table**

Percentage by which SOL is exceeded*	Limit exceeded for more than 30 minutes, up to 35 minutes	Limit exceeded for more than 35 minutes, up to 40 minutes	Limit exceeded for more than 40 minutes, up to 45 minutes	Limit exceeded for more than 45 minutes
greater than 0%, up to and including 5%	Lower	Moderate	Moderate	High
greater than 5%, up to and including 10%	Moderate	Moderate	High	High
greater than 10%, up to and including 15%	Moderate	High	High	Severe
greater than 15%, up to and including 20%	High	High	Severe	Severe
greater than 20%, up to and including 25%	High	Severe	Severe	Severe
greater than 25%	Severe	Severe	Severe	Severe

\* Measured after 30 continuous minutes of actual flows in excess of SOL.

## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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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:**

<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 16, 2007
3. Post second Draft Standard for industry comments	November 16, 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 completed 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 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

## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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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 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.



## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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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.*

### A. Introduction

1. **Title:** System Operating Limits
2. **Number:** TOP-007-WECC-1
3. **Purpose:** **To ensure that** ~~When~~ 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.

### 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 [sm1]:** This explanatory text should be included as a footnote.

### C. Measures

- M1. Evidence that actual power flow has not exceeded the SOL for the specified time limit in R1.
- M2. Evidence that Net Scheduled Interchange has not exceeded the SOL when the Transmission Operator implements real-time schedules as required by R2.
  - M2.1. Evidence that Net Scheduled Interchange was at or below the new SOL within 30-minutes of when the SOL decreased.

### 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:

- 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**

**Comment [sm2]:** These should be in table format.

**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.

**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.

**WECC Standard TOP-007-WECC-1 – System Operating Limits**

2.4 Severe: None

<u>Requirement</u>	<u>Lower VSL</u>	<u>Moderate VSL</u>	<u>High VSL</u>	<u>Severe VSL</u>
<u>R1</u>	<u>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.</u>	<u>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.</u>	<u>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.</u>	<u>There shall be a Severe of non-compliance for Transmission Operators as set forth in the table in Attachment 1– TOP-007-WECC-1.</u>
<u>R2</u>	<u>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.</u>	<u>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.</u>	<u>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.</u>	<u>None</u>

Formatted Table

**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 TOP-STD-007-0	

## **WECC Standard TOP-007-WECC-1 – System Operating Limits**

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### **Attachment 1 – TOP-007-WECC-1**

#### **Violation Severity Level Table**

Percentage by which SOL is exceeded*	Limit exceeded for more than 30 minutes, up to 35 minutes	Limit exceeded for more than 35 minutes, up to 40 minutes	Limit exceeded for more than 40 minutes, up to 45 minutes	Limit exceeded for more than 45 minutes
greater than 0%, up to and including 5%	Lower	Moderate	Moderate	High
greater than 5%, up to and including 10%	Moderate	Moderate	High	High
greater than 10%, up to and including 15%	Moderate	High	High	Severe
greater than 15%, up to and including 20%	High	High	Severe	Severe
greater than 20%, up to and including 25%	High	Severe	Severe	Severe
greater than 25%	Severe	Severe	Severe	Severe

\* Measured after 30 continuous minutes of actual flows in excess of SOL.

## Comparison of WECC Standard TOP-STD-007-0 to proposed WECC Standard TOP-007-WECC-1

The following table has been created by the Operating Transfer Capability Standard Drafting Team (OTCSDT) to summarize the changes proposed by the drafting team. The first two columns contain the text of the current WECC Standard TOP-STD-007-0 and the corresponding text of the proposed WECC Standard TOP-007-WECC-1 that would replace it (the numbering of the standard was changed to be consistent with the NERC Standard template). The third column contains a summary of the change and the reason offered by the OTCSDT for it.

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
<p>DEFINITIONS</p> <p>Operating Transfer Capability Limit or OTC means the maximum value of the most critical system operating parameter(s) which meets: (a) precontingency criteria as determined by equipment loading capability and acceptable voltage conditions, (b) transient criteria as determined by equipment loading capability and acceptable voltage conditions, (c) transient performance criteria, and (d) post-contingency loading and voltage criteria.</p> <p>In <b>B. REQUIREMENTS, WR1. OPERATING TRANSFER CAPABILITY LIMIT CRITERIA</b>, OTC is defined as:</p> <p>The OTC is the maximum amount of actual power that can be transferred over direct or parallel transmission elements comprising:</p> <ul style="list-style-type: none"> <li>• An interconnection from one Transmission</li> </ul>	<p>DEFINITIONS <i>(The following definition can be found in the Glossary of Terms section of the NERC Reliability Standards. It is here for comparison only, and will not appear in TOP-007-WECC-1.)</i></p> <p>System Operating Limit (SOL): The value (such as MW, MVar, Amperes, Frequency or Volts) that satisfies the most limiting of the prescribed operating criteria for a specified system configuration to ensure operation within acceptable reliability criteria. System Operating Limits are based upon certain operating criteria. These include, but are not limited to:</p> <ul style="list-style-type: none"> <li>▪ Facility Ratings (Applicable pre- and post-Contingency equipment or facility ratings)</li> <li>▪ Transient Stability Ratings (Applicable pre- and post-Contingency Stability Limits)</li> <li>▪ Voltage Stability Ratings (Applicable pre- and</li> </ul>	<p>Removed definition of OTC and replaced OTC with SOL throughout standard. Reasons include:</p> <ol style="list-style-type: none"> <li>1. Consistency with NERC standards, definitions, and language.</li> <li>2. WECC Operating Committee adopted the document “WECC Philosophy of SOL &amp; IROL Conditions” which states that a WECC operates only under SOL conditions. This statement is interpreted as declaring that a WECC OTC is an SOL.</li> <li>3. Removes ambiguity regarding applicability of other NERC standards.</li> </ol> <p>Removed definition of disturbance from standard. The differences in the two definitions are highlighted below and are not significant to the interpretation of the standard.</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
<p>Operator area to another Transmission Operator area; or</p> <ul style="list-style-type: none"> <li>• A transfer path within a Transmission Operator area.</li> </ul> <p>WECC Table 2 means the table maintained by the WECC identifying those transfer paths monitored by the WECC regional Reliability coordinators. As of the date set out therein, the transmission paths identified in Table 2 are as listed in Attachment A to this Standard.</p> <p>Disturbance means (i) any perturbation to the electric system, or (ii) the unexpected change in ACE that is caused by the sudden loss of generation or interruption of load.</p>	<p>post-Contingency Voltage Stability)</p> <ul style="list-style-type: none"> <li>▪ System Voltage Limits (Applicable pre- and post-Contingency Voltage Limits)</li> </ul>	<p>Definition of disturbance in TOP-007-WECC-0:</p> <ul style="list-style-type: none"> <li>(i) any perturbation to the electric system, or</li> <li>(ii) the unexpected change in ACE that is caused by the sudden <b>loss</b> of generation or interruption of load.</li> </ul> <p>Definition of disturbance in NERC Standards</p> <ol style="list-style-type: none"> <li>1. <b>An unplanned event that produces an abnormal system condition.</b></li> <li>2. Any perturbation to the electric system.</li> <li>3. The unexpected change in ACE that is caused by the sudden <b>failure</b> of generation or interruption of load.</li> </ol> <p>Removed definitions for Business Day (a unique definition is not needed), Extraordinary Contingency (no longer used in standard), and Normal Path Rating (no longer used in standard).</p>
<p><b>A. Introduction</b></p> <p><b>4. Applicability</b></p> <p>4.1. This criterion applies to each Transmission Operator of a transmission path in the Attachment A – WECC Table 2 (Source: Participants Subject to Criterion)</p>	<p><b>A. Introduction</b></p> <p><b>4. Applicability</b></p> <p>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:  <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></p>	<p>The list of paths found in WECC Table 2 has been retained leaving the applicability of the standard unchanged.</p> <p>The OTCSDT is recommending moving WECC Table 2 from where it appears now, as an attachment to the standard, to a location on the WECC website.</p> <p>As an attachment to the standard, revisions to WECC Table 2 must be made through the standards process.</p>



Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		By making WECC Table 2 a changing the referenced document in the WECC library, it opens the possibility of the table being changed through a WECC process without the need for changing the standard itself (for example, by recommendation of the OTCPC and approval by the Board). A similar approach to referencing an external document can be seen in IRO-006-2.
<p><b>B. Requirements</b></p> <p><b>WR1. Operating Transfer Capability Limit Criteria</b></p> <p>Actual power flow and net scheduled power flow over an interconnection or transfer path shall be maintained within Operating Transfer Capability Limits (“OTC”).</p> <p>The OTC is the maximum amount of actual power that can be transferred over direct or parallel transmission elements comprising:</p> <ul style="list-style-type: none"> <li>• An interconnection from one Transmission Operator area to another Transmission Operator area; or</li> <li>• A transfer path within a Transmission Operator area.</li> </ul>	<p><b>B. Requirements</b></p> <p><b>R.1.</b> 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. <i>[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]</i></p>	<p>WR1 was divided into several segments with the requirements clarified based on the information in measure WM1. This was done to simplify the text and address a single issue under each requirement.</p> <p>(a) Actual power flow shall be maintained within Operating Transfer Capability Limits</p> <p>Retained the same concept in requirement R1 and measure M1. The following</p> <ul style="list-style-type: none"> <li>• retains the time limit for thermally limited paths originally stated in WM1</li> <li>• refine the time limit for stability limited paths to 30 minutes which is different than originally stated in WM1</li> </ul> <p>When FERC approved TOP-STD-007-0 (<i>Order Approving Regional Reliability Standards for the Western Interconnection and Directing Modifications</i>, 119 FERC ¶ 61,260 (2007) (“June 8 Order”)), the Commission expressed in Paragraph 108 of its Order it</p>

**Comment [ga1]:** On what basis is this being made? Is it still more stringent than NERC standards?

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p>is “concerned regarding the circumstances under which WECC_TOP_STD-007-0 would be implemented and the amount of time an entity is allowed to be in violation of an IROL without the possibility of being found in noncompliance.”</p> <p>NERC responded to this concern (<i>COMPLIANCE FILING OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION IN RESPONSE TO PARAGRAPH 108 OF ORDER APPROVING REGIONAL RELIABILITY STANDARDS FOR THE WESTERN INTERCONNECTION AND DIRECTING MODIFICATIONS (July 9, 2007)</i>) with the argument that “WECC utilizes procedure <i>RC-003-1 WECC Reliability Coordinator Monitoring and Directives Procedure</i> to implement regional Reliability Standard WECC-TOP-STD-007-0. This procedure requires reliability coordinator action to be taken immediately when a transfer path exceeds its System Operating Limit (SOL) or Interconnection Reliability Operating Limit (IROL).” Further, that “If, however, there is a flow that exceeds the OTC limit, the transmission operator must take (proactive) immediate corrective action within 20 minutes for stability-limited paths and 30 minutes for thermally limited paths to return the system to below the OTC limit, thus protecting the system from potential cascading for a subsequent contingency.”</p> <p>The word <b>immediate</b> was added to requirements R1.1</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p>and R1.2 to be consistent with the argument in the filing made by NERC on the behalf of WECC, and to reinforce the intent that the system is not to be operated under normal circumstances above the SOL.</p> <p>(b) Net scheduled power flow shall be maintained within Operating Transfer Capability Limits</p> <p>Retained in requirement R2 and measure M2, see next section for further comments. (This requirement is also found in the RMS agreement, approved by FERC)</p> <p>The <b>Violation Risk Factor</b> for this requirement was assigned the value 'Medium' based on the definition found in the NERC Sanction Guidelines:</p> <p>b. Medium Risk Factor — Violations of requirements assigned a Medium risk factor generally have or had the potential to directly affect the electrical state or the capability of the bulk power system, or the ability to effectively monitor and control the bulk power system, up to but excluding bulk power system instability, separation, or cascading failures.</p> <p>A Medium risk factor was considered appropriate since, under normal conditions, post-contingency conditions for a credible contingency will meet WECC minimum operating criteria and cascading will not occur.</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p>The <b>Time Horizon</b> for this requirement was assigned the value 'Real-Time Operations'.</p> <p>The definition for OTC included under WR1 was removed as no longer appropriate.</p>
<p><b>B. Requirements</b></p> <p><b>WR1. Operating Transfer Capability Limit Criteria</b></p> <p>The net schedule over an interconnection or transfer path within a Transmission Operator area shall not exceed the OTC, regardless of the prevailing actual power flow on the interconnection or transfer path.</p>	<p><b>R.2.</b> 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. <i>[Violation Risk Factor: Low] [Time Horizon: Real-time Operations]</i></p> <p><b>R2.1.</b> 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.</p>	<p>The requirement that net schedule not exceed the SOL is retained in requirement R2 and measure M2. (This requirement is also found in the RMS agreement, approved by FERC).</p> <p>The OTCSDT opinion is that it is important to maintain net schedules less than the transmission path SOL during real-time operations. Scheduling over the SOL when actual flow is below the limit means that the scheduled power is flowing over other paths potentially resulting in SOL violations in other areas of WECC.</p> <p>The requirement was modified in 2.1 to allow time to adjust schedules which SOLs change just before the hour begins. Once the operating hour begins operators monitor only actual flow across the path.</p> <p>It should be noted that there is a NERC requirement for TTC / ATC processes to respect SOLs stated in IRO-005-1 R14. However, there is no measure associated with this requirement.</p> <p>The <b>Violation Risk Factor</b> for this requirement was assigned the value 'Low' based on the definition found in the NERC Sanction Guidelines:</p>

Comment [ga2]: There will be soon.

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p>a. Lower Risk Factor — Requirements assigned a Lower risk factor are generally not expected to affect the electrical state or capability of the bulk power system, or the ability to effectively monitor and control the bulk power system. Many requirements with a Lower risk factor are administrative in nature.</p> <p>The OTCSDT is of the opinion that when net schedules exceed the path limit, and there is no violation of actual flow over the path limit (or on parallel paths), there is very little reliability risk to the BES, and that in this case requiring net schedules to respect path SOL is in the nature of an equity issue rather than one of reliability. Therefore, while retaining the requirement, the OTCSDT considered a violation risk factor of 'lower' to be appropriate, and reduced the violation severity table to eliminate the severe category.</p> <p>In addition, the OTCSDT is of the opinion that there is no substantial difference between thermally limited paths and stability limited paths when considering risk to the transmission system resulting from path net schedules over the path limit (excluding when the actual flow is over the path limit, which is addressed by R1), therefore, only one time limit has been used, 30 minutes, corresponding to the response time for thermally limited paths.</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		The <b>Time Horizon</b> for this requirement was assigned the value 'Real-Time Operations'.
<p><b>B. Requirements</b></p> <p><b>WR1. Operating Transfer Capability Limit Criteria</b></p> <p><b>a. Operating limits.</b> No elements within the interconnection shall be scheduled above continuous operating limits. An element is defined as any generating unit, transmission line, transformer, bus, or piece of electrical equipment involved in the transfer of power within an interconnection.</p>		<p>This requirement was not included in the revision of TOP-007-WECC-1 as inclusion would be redundant with similar criteria addressed in other NERC standards, specifically:</p> <p><b>FAC-011-1</b></p> <p><b>R2.1.</b> In the pre-contingency state, the BES shall demonstrate transient, dynamic and voltage stability; all Facilities shall be within their Facility Ratings and within their thermal, voltage and stability limits. In the determination of SOLs, the BES condition used shall reflect current or expected system conditions and shall reflect changes to system topology such as Facility outages.</p> <p><b>FAC-014-1</b></p> <p><b>R2.</b> The Transmission Operator shall establish SOLs (as directed by its Reliability Coordinator) for its portion of the Reliability Coordinator Area that are consistent with its Reliability Coordinator's SOL Methodology.</p>
<p><b>B. Requirements</b></p> <p><b>WR1. Operating Transfer Capability Limit Criteria</b></p>		<p>This requirement was not included in the revision of TOP-007-WECC-1 as inclusion would be redundant with similar criteria addressed in other NERC</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
<p><b>b. Stability.</b> The interconnected power system shall remain stable upon loss of any one single element without system cascading that could result in the successive loss of additional elements. The system voltages shall be within acceptable limits defined in the WECC Reliability Criteria for Transmission System Planning. If a single event could cause loss of multiple elements, these shall be considered in lieu of a single element outage. This could occur in exceptional cases such as two lines on the same right-of-way next to an airport. In either case, loss of either single or multiple elements should not cause uncontrolled, widespread collapse of the interconnected power system. For purposes of this Section, stability shall include transient stability, post transient stability or dynamic stability whichever is most limiting to OTC.</p>		<p>standards, specifically:</p> <p><b>FAC-011</b></p> <p><b>R2.2.</b> Following the single Contingencies identified in Requirement 2.2.1 through Requirement 2.2.3, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.</p> <p><b>Regional Differences</b></p> <p><b>1.</b> The following Interconnection-wide Regional Difference shall be applicable in the Western Interconnection:</p> <p><b>1.1.</b> As governed by the requirements of R3.3, starting with all Facilities in service, shall require the evaluation of the following multiple Facility Contingencies when establishing SOLs:</p> <p style="padding-left: 40px;"><b>1.1.5</b> A non-three phase Fault with Normal Clearing on common mode Contingency of two adjacent circuits on separate towers unless the event frequency is determined to be less than one in thirty years.</p> <p style="padding-left: 40px;"><b>1.1.6</b> A common mode outage of two generating units connected to the same switchyard, not otherwise addressed by FAC-011.</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p><b>1.1.7</b> The loss of multiple bus sections as a result of failure or delayed clearing of a bus tie or bus sectionalizing breaker to clear a permanent Phase to Ground Fault.</p> <p><b>1.2.</b> SOLs shall be established such that for multiple Facility Contingencies in E1.1.1 through E1.1.5 operation within the SOL shall provide system performance consistent with the following:</p> <p style="padding-left: 40px;"><b>1.2.1</b> All Facilities are operating within their applicable Post-Contingency thermal, frequency and voltage limits.</p> <p style="padding-left: 40px;"><b>1.2.2</b> Cascading Outages do not occur.</p> <p style="padding-left: 40px;"><b>1.2.3</b> Uncontrolled separation of the system does not occur.</p> <p style="padding-left: 40px;"><b>1.2.4</b> The system demonstrates transient, dynamic and voltage stability.</p> <p><b>1.3.</b> SOLs shall be established such that for multiple Facility Contingencies in E1.1.6 through E1.1.7 operation within the SOL shall provide system performance consistent with the following with respect to impacts on other systems:</p> <p style="padding-left: 40px;"><b>1.3.1</b> Cascading Outages do not occur.</p> <p><b>FAC-014-1</b></p> <p><b>R2.</b> The Transmission Operator shall establish SOLs</p>



Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p>(as directed by its Reliability Coordinator) for its portion of the Reliability Coordinator Area that are consistent with its Reliability Coordinator’s SOL Methodology</p> <p><b>TOP-004</b></p> <p><b>R1.</b> Each Transmission Operator shall operate within the Interconnection Reliability Operating Limits (IROLs) and System Operating Limits (SOLs).</p> <p><b>R2.</b> Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the most severe single contingency.</p> <p><b>R3.</b> Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy</p>
<p><b>B. Requirements</b></p> <p><b>WR1. Operating Transfer Capability Limit Criteria</b></p> <p><b>c. System contingency response.</b> Following the outage and before adjustments can be made:</p> <p>(i) No remaining element shall exceed its short-time emergency rating.</p> <p>(ii) The steady-state system voltages shall be within</p>		<p>This requirement was not included in the revision of TOP-007-WECC-1 as inclusion would be redundant with similar criteria addressed in other NERC standards, specifically:</p> <p><b>FAC-011</b></p> <p><b>R2.2.</b> Following the single Contingencies identified in Requirement 2.2.1 through Requirement 2.2.3, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
<p>emergency limits.</p>		<p>their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.</p> <p><b>Regional Differences</b></p> <p><b>1.2.</b> SOLs shall be established such that for multiple Facility Contingencies in E1.1.1 through E1.1.5 operation within the SOL shall provide system performance consistent with the following:</p> <p style="padding-left: 40px;"><b>1.2.1</b> All Facilities are operating within their applicable Post-Contingency thermal, frequency and voltage limits.</p> <p><b>FAC-014-1</b></p> <p><b>R2.</b> The Transmission Operator shall establish SOLs (as directed by its Reliability Coordinator) for its portion of the Reliability Coordinator Area that are consistent with its Reliability Coordinator’s SOL Methodology</p>
<p><b>B. Requirements</b></p> <p><b>WR1. Operating Transfer Capability Limit Criteria</b></p> <p><b>c. System contingency response.</b></p> <p>The limiting event shall be determined by conducting power flow and stability studies while simulating various operating conditions. These studies shall be updated as system configurations introduce</p>		<p>This requirement was not included in the revision of TOP-007-WECC-1 as inclusion would be redundant with similar criteria addressed in other NERC standards, specifically:</p> <p><b>FAC-011</b></p> <p><b>R2.1.</b> In the pre-contingency state, the BES shall demonstrate transient, dynamic and voltage stability; all Facilities shall be within their Facility Ratings and within their thermal, voltage and stability limits. In the</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
significant changes in the interconnection.(Source: WECC Criterion)		<p>determination of SOLs, the BES condition used shall reflect current or expected system conditions and shall reflect changes to system topology such as Facility outages.</p> <p><b>R3.</b> The Reliability Coordinator’s methodology for determining SOLs, shall include, as a minimum, a description of the following, along with any reliability margins applied for each:</p> <p><b>R3.2.</b> Selection of applicable Contingencies</p> <p><b>R3.3.</b> A process for determining which of the stability limits associated with the list of multiple contingencies (provided by the Planning Authority in accordance with FAC-014 Requirement 6) are applicable for use in the operating horizon given the actual or expected system conditions.</p> <p style="padding-left: 40px;"><b>R3.3.1.</b> This process shall address the need to modify these limits, to modify the list of limits, and to modify the list of associated multiple contingencies.</p> <p><b>FAC-014-1</b></p> <p><b>R2.</b> The Transmission Operator shall establish SOLs (as directed by its Reliability Coordinator) for its portion of the Reliability Coordinator Area that are consistent with its Reliability Coordinator’s SOL Methodology</p> <p><b>TOP-002-2</b></p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p><b>R11.</b> The Transmission Operator shall perform seasonal, next-day, and current-day Bulk Electric System studies to determine SOLs. Neighboring Transmission Operators shall utilize identical SOLs for common facilities. The Transmission Operator shall update these Bulk Electric System studies as necessary to reflect current system conditions; and shall make the results of Bulk Electric System studies available to the Transmission Operators, Balancing Authorities (subject to confidentiality requirements), and to its Reliability Coordinator.</p>
<p><b>C. Measures</b></p> <p><b>WM1.</b></p> <p>Actual power flow on all transmission paths shall at no time exceed the OTC for more than 20 minutes for paths that are stability limited, or for more than 30 minutes for paths that are thermally limited. (Source: Compliance Standard)</p>	<p><b>C. Measures</b></p> <p><b>M1.</b> Evidence that actual power flow has not exceeded the SOL for specified time limits in R1.</p> <p><b>M2.</b> Evidence that net power flow schedules have not exceeded the SOL for more than 30 minutes as required by R2.</p>	<p>The original WM1 had two time requirements that have been moved into the requirements section:</p> <p>(a) Actual Power Flow not to exceed OTC for more than 20 min if a stability limited path Retained in requirement R1.1 and measure M1</p> <p>(b) Actual Power Flow not to exceed OTC for more than 30 min if a thermally limited path Retained in requirement R1.2 and measure M1</p> <p>A new measure M2 was added corresponding to Requirement R2.</p> <p>The OTCSDT suggests that an example of evidence may include historical PI data for the period.</p>
<p><b>D. 1. Compliance Monitoring Process</b></p>	<p><b>D. 1. Compliance Monitoring Process</b></p>	<p>The requirement to report when incidents occur and quarterly was retained, with additional reporting</p>

<b>Current WECC Standard TOP-STD-007-0 Operating Transfer Capability</b>	<b>Proposed WECC Standard TOP-007-WECC-1 System Operating Limits</b>	<b>Proposed Change and impact</b>
<p><b>1.2 Compliance Monitoring Period</b></p> <p>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.4(a)), a Transmission Operator identified in Section A.4.1 shall submit to the WECC office operating transfer capability data in Form A.4(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.4(b)), the Transmission Operator identified in Section A.4.1 (including Transmission Operators with no reported instances of non-compliance) shall submit to the WECC office a completed OTC summary compliance Form A.4(b) (available on the WECC web site) for the immediately preceding calendar quarter.</p>	<p><b>1.2 Compliance Monitoring Period</b></p> <p>Compliance Monitor may use one or more of the following methods to assess compliance:</p> <ul style="list-style-type: none"> <li>- Self-report for each incident within three-business day</li> <li>- Self-report quarterly</li> <li>- Spot check audits conducted anytime with 30 days notice given to prepare</li> <li>- Periodic audit as scheduled by the Compliance Monitor</li> <li>- Investigations</li> <li>- Other methods as provided for in the Compliance Monitoring Enforcement Program</li> </ul> <p>Reset Period: One calendar month.</p>	<p>information to be consistent with the WECC compliance program.</p> <p>The period allowed for self-reporting of incidents was extended to 3 business days.</p>
<p><b>D. Compliance</b></p> <p><b>2. Levels of Non-Compliance</b></p> <p>For each separate incident violating the OTC compliance Standard, the level of the violation shall be as set forth in the following table: (Source: Non-Compliance Levels)</p> <p>&lt;violation severity table&gt;</p> <p>* measured after 20 continuous minutes of net</p>	<p><b>2. Violation Severity Levels</b></p> <p><b>For Requirement R1:</b></p> <p>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.</p> <p>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-</p>	<p>Levels of Non-Compliance have been translated to 'Violation Severity Levels' per the NERC Standard template.</p> <p>For violations of R1 (actual flow over the SOL), the violation severity table has been retained unchanged.</p> <p>For violations of R2 (net schedule over the SOL), the violation severity table has been reduced.</p> <p>The OTCSDT is of the opinion that when net schedules exceed the path limit, and there is no</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
scheduled or actual flows in excess of OTC.	<p>WECC-1.</p> <p>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.</p> <p>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.</p> <p>* Measured after 20 continuous minutes of actual flows in excess of SOL for paths with Transient Stability Ratings or Voltage Stability Ratings and after 30 continuous minutes of actual flows in excess of SOL for paths with Facility Ratings or System Voltage Limits.</p> <p><b>For Requirement R2:</b></p> <p><b>2.1 Lower:</b> 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 was above the path’s SOL for more than 30 minutes but less than of equal to 45 minutes.</p> <p><b>2.2. Moderate:</b> There shall be a Moderate Level of non-compliance for Transmission Operators</p>	violation of actual flow over the path limit (or on parallel paths), there is very little reliability risk to the BES, and that in this case requiring net schedules to respect path SOL is in the nature of an equity issue rather than one of reliability. Therefore, in addition to setting the violation risk factor of R2 to ‘Lower’, the OTCSDT has modified the violation severity table for R2 to reflect 15 min time periods and lower levels of non-compliance, which the OTCSDT considered more appropriate to the risk represented by the violation.

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
	<p>when the net schedule for power flow over an interconnection or Transmission path was above the path's SOL for more than 45 minutes but less than of equal to 60 minutes.</p> <p><b>2.3. High:</b> 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 was above the path's SOL for more than 60 minutes</p>	
<p><b>D. 1. Compliance Monitoring Process</b></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 most recent calendar month.(Source: Sanctions)</p>		<p>Replaced with NERC sanction table, per NERC and FERC guidance. The NERC sanction table is required by the NERC standard template.</p>
<p><b>EXCUSE OF PERFORMANCE</b></p> <p><b>A. Excused Non-Compliance</b></p> <p>Non-compliance with any of the reliability criteria contained in this Standard shall be excused and no sanction applied if such non-compliance results directly from one or more of the actions or events listed below.</p> <p>B. Specific Excuses</p>	<p>Removed</p>	<p>Removed per NERC guidance. The NERC standard template does not allow for excused non-compliance. Mitigating factors such as these are addressed in the sanction assessment process.</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
1. Governmental Order 2. Order of Reliability Coordinator 3. Protection of Facilities 4. Extraordinary Contingency 5. Participation in Field Testing		
<b>ATTACHMENT A</b> <b>Table 2</b> Existing WECC Transfer Paths (BTP) (Revised February 1, 2006)	<b>Attachment 1 – TOP-007-WECC-1</b> Existing WECC Transfer Paths of Bulk Electric System (Revised September 1, 2007)	The OTCSDT is recommending moving WECC Table 2 from where it appears now, as an attachment to the standard, to a location on the WECC website.  As an attachment to the standard, revisions to WECC Table 2 must be made through the standards process. By making WECC Table 2 a changing the referenced document in the WECC library, it opens the possibility of the table being changed through a WECC process without the need for changing the standard itself (for example, by recommendation of the OTCPC and approval by the Board). A similar approach to referencing an external document can be seen in IRO-006-2.



## Comparison of WECC Standard TOP-STD-007-0 to proposed WECC Standard TOP-007-WECC-1

The following table has been created by the Operating Transfer Capability Standard Drafting Team (OTCSDT) to summarize the changes proposed by the drafting team. The first two columns contain the text of the current WECC Standard TOP-STD-007-0 and the corresponding text of the proposed WECC Standard TOP-007-WECC-1 that would replace it (the numbering of the standard was changed to be consistent with the NERC Standard template). The third column contains a summary of the change and the reason offered by the OTCSDT for it.

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
<p>DEFINITIONS</p> <p>Operating Transfer Capability Limit or OTC means the maximum value of the most critical system operating parameter(s) which meets: (a) precontingency criteria as determined by equipment loading capability and acceptable voltage conditions, (b) transient criteria as determined by equipment loading capability and acceptable voltage conditions, (c) transient performance criteria, and (d) post-contingency loading and voltage criteria.</p> <p>In <b>B. REQUIREMENTS, WR1. OPERATING TRANSFER CAPABILITY LIMIT CRITERIA</b>, OTC is defined as:</p> <p>The OTC is the maximum amount of actual power that can be transferred over direct or parallel transmission elements comprising:</p> <ul style="list-style-type: none"> <li>• An interconnection from one Transmission</li> </ul>	<p>DEFINITIONS <i>(The following definition can be found in the Glossary of Terms section of the NERC Reliability Standards. It is here for comparison only, and will not appear in TOP-007-WECC-1.)</i></p> <p>System Operating Limit (SOL): The value (such as MW, MVar, Amperes, Frequency or Volts) that satisfies the most limiting of the prescribed operating criteria for a specified system configuration to ensure operation within acceptable reliability criteria. System Operating Limits are based upon certain operating criteria. These include, but are not limited to:</p> <ul style="list-style-type: none"> <li>▪ Facility Ratings (Applicable pre- and post-Contingency equipment or facility ratings)</li> <li>▪ Transient Stability Ratings (Applicable pre- and post-Contingency Stability Limits)</li> <li>▪ Voltage Stability Ratings (Applicable pre- and</li> </ul>	<p>Removed definition of OTC and replaced OTC with SOL throughout standard. Reasons include:</p> <ol style="list-style-type: none"> <li>1. Consistency with NERC standards, definitions, and language.</li> <li>2. WECC Operating Committee adopted the document “WECC Philosophy of SOL &amp; IROL Conditions” which states that a WECC operates only under SOL conditions. This statement is interpreted as declaring that a WECC OTC is an SOL.</li> <li>3. Removes ambiguity regarding applicability of other NERC standards.</li> </ol> <p>Removed definition of disturbance from standard. The differences in the two definitions are highlighted below and are not significant to the interpretation of the standard.</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
<p>Operator area to another Transmission Operator area; or</p> <ul style="list-style-type: none"> <li>• A transfer path within a Transmission Operator area.</li> </ul> <p>WECC Table 2 means the table maintained by the WECC identifying those transfer paths monitored by the WECC regional Reliability coordinators. As of the date set out therein, the transmission paths identified in Table 2 are as listed in Attachment A to this Standard.</p> <p>Disturbance means (i) any perturbation to the electric system, or (ii) the unexpected change in ACE that is caused by the sudden loss of generation or interruption of load.</p>	<p>post-Contingency Voltage Stability)</p> <ul style="list-style-type: none"> <li>▪ System Voltage Limits (Applicable pre- and post-Contingency Voltage Limits)</li> </ul>	<p>Definition of disturbance in TOP-007-WECC-0:</p> <ul style="list-style-type: none"> <li>(i) any perturbation to the electric system, or</li> <li>(ii) the unexpected change in ACE that is caused by the sudden <b>loss</b> of generation or interruption of load.</li> </ul> <p>Definition of disturbance in NERC Standards</p> <ol style="list-style-type: none"> <li>1. <b>An unplanned event that produces an abnormal system condition.</b></li> <li>2. Any perturbation to the electric system.</li> <li>3. The unexpected change in ACE that is caused by the sudden <b>failure</b> of generation or interruption of load.</li> </ol> <p>Removed definitions for Business Day (a unique definition is not needed), Extraordinary Contingency (no longer used in standard), and Normal Path Rating (no longer used in standard).</p>
<p><b>A. Introduction</b></p> <p><b>4. Applicability</b></p> <p>4.1. This criterion applies to each Transmission Operator of a transmission path in the Attachment A – WECC Table 2 (Source: Participants Subject to Criterion)</p>	<p><b>A. Introduction</b></p> <p><b>4. Applicability</b></p> <p>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:  <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></p>	<p>The list of paths found in WECC Table 2 has been retained leaving the applicability of the standard unchanged.</p> <p>The OTCSDT is recommending moving WECC Table 2 from where it appears now, as an attachment to the standard, to a location on the WECC website.</p> <p>As an attachment to the standard, revisions to WECC Table 2 must be made through the standards process.</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		By making WECC Table 2 a changing the referenced document in the WECC library, it opens the possibility of the table being changed through a WECC process without the need for changing the standard itself (for example, by recommendation of the OTCP and approval by the Board). A similar approach to referencing an external document can be seen in IRO-006-2.
<p><b>B. Requirements</b></p> <p><b>WR1. Operating Transfer Capability Limit Criteria</b></p> <p>Actual power flow and net scheduled power flow over an interconnection or transfer path shall be maintained within Operating Transfer Capability Limits (“OTC”).</p> <p>The OTC is the maximum amount of actual power that can be transferred over direct or parallel transmission elements comprising:</p> <ul style="list-style-type: none"> <li>• An interconnection from one Transmission Operator area to another Transmission Operator area; or</li> <li>• A transfer path within a Transmission Operator area.</li> </ul>	<p><b>B. Requirements</b></p> <p><b>R.1.</b> 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. <i>[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]</i></p>	<p>WR1 was divided into several segments with the requirements clarified based on the information in measure WM1. This was done to simplify the text and address a single issue under each requirement.</p> <p>(a) Actual power flow shall be maintained within Operating Transfer Capability Limits</p> <p>Retained the same concept in requirement R1 and measure M1. The following</p> <ul style="list-style-type: none"> <li>• retains the time limit for thermally limited paths originally stated in WM1</li> <li>• refine the time limit for stability limited paths to 30 minutes which is different than originally stated in WM1</li> </ul> <p>When FERC approved TOP-STD-007-0 (<i>Order Approving Regional Reliability Standards for the Western Interconnection and Directing Modifications</i>, 119 FERC ¶ 61,260 (2007) (“June 8 Order”)), the Commission expressed in Paragraph 108 of its Order it</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p>is “concerned regarding the circumstances under which WECC_TOP_STD-007-0 would be implemented and the amount of time an entity is allowed to be in violation of an IROL without the possibility of being found in noncompliance.”</p> <p>NERC responded to this concern (<i>COMPLIANCE FILING OF THE NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION IN RESPONSE TO PARAGRAPH 108 OF ORDER APPROVING REGIONAL RELIABILITY STANDARDS FOR THE WESTERN INTERCONNECTION AND DIRECTING MODIFICATIONS (July 9, 2007)</i>) with the argument that “WECC utilizes procedure <i>RC-003-1 WECC Reliability Coordinator Monitoring and Directives Procedure</i> to implement regional Reliability Standard WECC-TOP-STD-007-0. This procedure requires reliability coordinator action to be taken immediately when a transfer path exceeds its System Operating Limit (SOL) or Interconnection Reliability Operating Limit (IROL).” Further, that “If, however, there is a flow that exceeds the OTC limit, the transmission operator must take (proactive) immediate corrective action within 20 minutes for stability-limited paths and 30 minutes for thermally limited paths to return the system to below the OTC limit, thus protecting the system from potential cascading for a subsequent contingency.”</p> <p>The word <b>immediate</b> was added to requirements R1.1</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p>and R1.2 to be consistent with the argument in the filing made by NERC on the behalf of WECC, and to reinforce the intent that the system is not to be operated under normal circumstances above the SOL.</p> <p>(b) Net scheduled power flow shall be maintained within Operating Transfer Capability Limits</p> <p>Retained in requirement R2 and measure M2, see next section for further comments. (This requirement is also found in the RMS agreement, approved by FERC)</p> <p>The <b>Violation Risk Factor</b> for this requirement was assigned the value 'Medium' based on the definition found in the NERC Sanction Guidelines:</p> <p>b. Medium Risk Factor — Violations of requirements assigned a Medium risk factor generally have or had the potential to directly affect the electrical state or the capability of the bulk power system, or the ability to effectively monitor and control the bulk power system, up to but excluding bulk power system instability, separation, or cascading failures.</p> <p>A Medium risk factor was considered appropriate since, under normal conditions, post-contingency conditions for a credible contingency will meet WECC minimum operating criteria and cascading will not occur.</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p>The <b>Time Horizon</b> for this requirement was assigned the value 'Real-Time Operations'.</p> <p>The definition for OTC included under WR1 was removed as no longer appropriate.</p>
<p><b>B. Requirements</b></p> <p><b>WR1. Operating Transfer Capability Limit Criteria</b></p> <p>The net schedule over an interconnection or transfer path within a Transmission Operator area shall not exceed the OTC, regardless of the prevailing actual power flow on the interconnection or transfer path.</p>	<p><b>R.2.</b> 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. <i>[Violation Risk Factor: Low] [Time Horizon: Real-time Operations]</i></p> <p><b>R2.1.</b> 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.</p>	<p>The requirement that net schedule not exceed the SOL is retained in requirement R2 and measure M2. (This requirement is also found in the RMS agreement, approved by FERC).</p> <p>The OTCSDT opinion is that it is important to maintain net schedules less than the transmission path SOL during real-time operations. Scheduling over the SOL when actual flow is below the limit means that the scheduled power is flowing over other paths potentially resulting in SOL violations in other areas of WECC.</p> <p>The requirement was modified in 2.1 to allow time to adjust schedules which SOLs change just before the hour begins. Once the operating hour begins operators monitor only actual flow across the path.</p> <p>It should be noted that there is a NERC requirement for TTC / ATC processes to respect SOLs stated in IRO-005-1 R14. However, there is no measure associated with this requirement.</p> <p>The <b>Violation Risk Factor</b> for this requirement was assigned the value 'Low' based on the definition found in the NERC Sanction Guidelines:</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p>a. Lower Risk Factor — Requirements assigned a Lower risk factor are generally not expected to affect the electrical state or capability of the bulk power system, or the ability to effectively monitor and control the bulk power system. Many requirements with a Lower risk factor are administrative in nature.</p> <p>The OTCSDT is of the opinion that when net schedules exceed the path limit, and there is no violation of actual flow over the path limit (or on parallel paths), there is very little reliability risk to the BES, and that in this case requiring net schedules to respect path SOL is in the nature of an equity issue rather than one of reliability. Therefore, while retaining the requirement, the OTCSDT considered a violation risk factor of 'lower' to be appropriate, and reduced the violation severity table to eliminate the severe category.</p> <p>In addition, the OTCSDT is of the opinion that there is no substantial difference between thermally limited paths and stability limited paths when considering risk to the transmission system resulting from path net schedules over the path limit (excluding when the actual flow is over the path limit, which is addressed by R1), therefore, only one time limit has been used, 30 minutes, corresponding to the response time for thermally limited paths.</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		The <b>Time Horizon</b> for this requirement was assigned the value 'Real-Time Operations'.
<p><b>B. Requirements</b></p> <p><b>WR1. Operating Transfer Capability Limit Criteria</b></p> <p><b>a. Operating limits.</b> No elements within the interconnection shall be scheduled above continuous operating limits. An element is defined as any generating unit, transmission line, transformer, bus, or piece of electrical equipment involved in the transfer of power within an interconnection.</p>		<p>This requirement was not included in the revision of TOP-007-WECC-1 as inclusion would be redundant with similar criteria addressed in other NERC standards, specifically:</p> <p><b>FAC-011-1</b></p> <p><b>R2.1.</b> In the pre-contingency state, the BES shall demonstrate transient, dynamic and voltage stability; all Facilities shall be within their Facility Ratings and within their thermal, voltage and stability limits. In the determination of SOLs, the BES condition used shall reflect current or expected system conditions and shall reflect changes to system topology such as Facility outages.</p> <p><b>FAC-014-1</b></p> <p><b>R2.</b> The Transmission Operator shall establish SOLs (as directed by its Reliability Coordinator) for its portion of the Reliability Coordinator Area that are consistent with its Reliability Coordinator's SOL Methodology.</p>
<p><b>B. Requirements</b></p> <p><b>WR1. Operating Transfer Capability Limit Criteria</b></p>		This requirement was not included in the revision of TOP-007-WECC-1 as inclusion would be redundant with similar criteria addressed in other NERC



Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
<p><b>b. Stability.</b> The interconnected power system shall remain stable upon loss of any one single element without system cascading that could result in the successive loss of additional elements. The system voltages shall be within acceptable limits defined in the WECC Reliability Criteria for Transmission System Planning. If a single event could cause loss of multiple elements, these shall be considered in lieu of a single element outage. This could occur in exceptional cases such as two lines on the same right-of-way next to an airport. In either case, loss of either single or multiple elements should not cause uncontrolled, widespread collapse of the interconnected power system. For purposes of this Section, stability shall include transient stability, post transient stability or dynamic stability whichever is most limiting to OTC.</p>		<p>standards, specifically:</p> <p><b>FAC-011</b></p> <p><b>R2.2.</b> Following the single Contingencies identified in Requirement 2.2.1 through Requirement 2.2.3, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.</p> <p><b>Regional Differences</b></p> <p><b>1.</b> The following Interconnection-wide Regional Difference shall be applicable in the Western Interconnection:</p> <p><b>1.1.</b> As governed by the requirements of R3.3, starting with all Facilities in service, shall require the evaluation of the following multiple Facility Contingencies when establishing SOLs:</p> <p style="padding-left: 40px;"><b>1.1.5</b> A non-three phase Fault with Normal Clearing on common mode Contingency of two adjacent circuits on separate towers unless the event frequency is determined to be less than one in thirty years.</p> <p style="padding-left: 40px;"><b>1.1.6</b> A common mode outage of two generating units connected to the same switchyard, not otherwise addressed by FAC-011.</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p><b>1.1.7</b> The loss of multiple bus sections as a result of failure or delayed clearing of a bus tie or bus sectionalizing breaker to clear a permanent Phase to Ground Fault.</p> <p><b>1.2.</b> SOLs shall be established such that for multiple Facility Contingencies in E1.1.1 through E1.1.5 operation within the SOL shall provide system performance consistent with the following:</p> <p><b>1.2.1</b> All Facilities are operating within their applicable Post-Contingency thermal, frequency and voltage limits.</p> <p><b>1.2.2</b> Cascading Outages do not occur.</p> <p><b>1.2.3</b> Uncontrolled separation of the system does not occur.</p> <p><b>1.2.4</b> The system demonstrates transient, dynamic and voltage stability.</p> <p><b>1.3.</b> SOLs shall be established such that for multiple Facility Contingencies in E1.1.6 through E1.1.7 operation within the SOL shall provide system performance consistent with the following with respect to impacts on other systems:</p> <p><b>1.3.1</b> Cascading Outages do not occur.</p> <p><b>FAC-014-1</b></p> <p><b>R2.</b> The Transmission Operator shall establish SOLs</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p>(as directed by its Reliability Coordinator) for its portion of the Reliability Coordinator Area that are consistent with its Reliability Coordinator's SOL Methodology</p> <p><b>TOP-004</b></p> <p><b>R1.</b> Each Transmission Operator shall operate within the Interconnection Reliability Operating Limits (IROLs) and System Operating Limits (SOLs).</p> <p><b>R2.</b> Each Transmission Operator shall operate so that instability, uncontrolled separation, or cascading outages will not occur as a result of the most severe single contingency.</p> <p><b>R3.</b> Each Transmission Operator shall, when practical, operate to protect against instability, uncontrolled separation, or cascading outages resulting from multiple outages, as specified by Regional Reliability Organization policy</p>
<p><b>B. Requirements</b></p> <p><b>WR1. Operating Transfer Capability Limit Criteria</b></p> <p><b>c. System contingency response.</b> Following the outage and before adjustments can be made:</p> <p>(i) No remaining element shall exceed its short-time emergency rating.</p> <p>(ii) The steady-state system voltages shall be within</p>		<p>This requirement was not included in the revision of TOP-007-WECC-1 as inclusion would be redundant with similar criteria addressed in other NERC standards, specifically:</p> <p><b>FAC-011</b></p> <p><b>R2.2.</b> Following the single Contingencies identified in Requirement 2.2.1 through Requirement 2.2.3, the system shall demonstrate transient, dynamic and voltage stability; all Facilities shall be operating within</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
<p>emergency limits.</p>		<p>their Facility Ratings and within their thermal, voltage and stability limits; and Cascading Outages or uncontrolled separation shall not occur.</p> <p><b>Regional Differences</b></p> <p><b>1.2.</b> SOLs shall be established such that for multiple Facility Contingencies in E1.1.1 through E1.1.5 operation within the SOL shall provide system performance consistent with the following:</p> <p style="padding-left: 40px;"><b>1.2.1</b> All Facilities are operating within their applicable Post-Contingency thermal, frequency and voltage limits.</p> <p><b>FAC-014-1</b></p> <p><b>R2.</b> The Transmission Operator shall establish SOLs (as directed by its Reliability Coordinator) for its portion of the Reliability Coordinator Area that are consistent with its Reliability Coordinator’s SOL Methodology</p>
<p><b>B. Requirements</b></p> <p><b>WR1. Operating Transfer Capability Limit Criteria</b></p> <p><b>c. System contingency response.</b></p> <p>The limiting event shall be determined by conducting power flow and stability studies while simulating various operating conditions. These studies shall be updated as system configurations introduce</p>		<p>This requirement was not included in the revision of TOP-007-WECC-1 as inclusion would be redundant with similar criteria addressed in other NERC standards, specifically:</p> <p><b>FAC-011</b></p> <p><b>R2.1.</b> In the pre-contingency state, the BES shall demonstrate transient, dynamic and voltage stability; all Facilities shall be within their Facility Ratings and within their thermal, voltage and stability limits. In the</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
<p>significant changes in the interconnection.(Source: WECC Criterion)</p>		<p>determination of SOLs, the BES condition used shall reflect current or expected system conditions and shall reflect changes to system topology such as Facility outages.</p> <p><b>R3.</b> The Reliability Coordinator’s methodology for determining SOLs, shall include, as a minimum, a description of the following, along with any reliability margins applied for each:</p> <p><b>R3.2.</b> Selection of applicable Contingencies</p> <p><b>R3.3.</b> A process for determining which of the stability limits associated with the list of multiple contingencies (provided by the Planning Authority in accordance with FAC-014 Requirement 6) are applicable for use in the operating horizon given the actual or expected system conditions.</p> <p style="padding-left: 40px;"><b>R3.3.1.</b> This process shall address the need to modify these limits, to modify the list of limits, and to modify the list of associated multiple contingencies.</p> <p><b>FAC-014-1</b></p> <p><b>R2.</b> The Transmission Operator shall establish SOLs (as directed by its Reliability Coordinator) for its portion of the Reliability Coordinator Area that are consistent with its Reliability Coordinator’s SOL Methodology</p> <p><b>TOP-002-2</b></p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
		<p><b>R11.</b> The Transmission Operator shall perform seasonal, next-day, and current-day Bulk Electric System studies to determine SOLs. Neighboring Transmission Operators shall utilize identical SOLs for common facilities. The Transmission Operator shall update these Bulk Electric System studies as necessary to reflect current system conditions; and shall make the results of Bulk Electric System studies available to the Transmission Operators, Balancing Authorities (subject to confidentiality requirements), and to its Reliability Coordinator.</p>
<p><b>C. Measures</b></p> <p><b>WM1.</b></p> <p>Actual power flow on all transmission paths shall at no time exceed the OTC for more than 20 minutes for paths that are stability limited, or for more than 30 minutes for paths that are thermally limited. (Source: Compliance Standard)</p>	<p><b>C. Measures</b></p> <p><b>M1.</b> Evidence that actual power flow has not exceeded the SOL for specified time limits in R1.</p> <p><b>M2.</b> Evidence that net power flow schedules have not exceeded the SOL for more than 30 minutes as required by R2.</p>	<p>The original WM1 had two time requirements that have been moved into the requirements section:</p> <p>(a) Actual Power Flow not to exceed OTC for more than 20 min if a stability limited path</p> <p>Retained in requirement R1.1 and measure M1</p> <p>(b) Actual Power Flow not to exceed OTC for more than 30 min if a thermally limited path</p> <p>Retained in requirement R1.2 and measure M1</p> <p>A new measure M2 was added corresponding to Requirement R2.</p> <p>The OTCSDT suggests that an example of evidence may include historical PI data for the period.</p>
<p><b>D. 1. Compliance Monitoring Process</b></p>	<p><b>D. 1. Compliance Monitoring Process</b></p>	<p>The requirement to report when incidents occur and quarterly was retained, with additional reporting</p>

<b>Current WECC Standard TOP-STD-007-0 Operating Transfer Capability</b>	<b>Proposed WECC Standard TOP-007-WECC-1 System Operating Limits</b>	<b>Proposed Change and impact</b>
<p><b>1.2 Compliance Monitoring Period</b></p> <p>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.4(a)), a Transmission Operator identified in Section A.4.1 shall submit to the WECC office operating transfer capability data in Form A.4(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.4(b)), the Transmission Operator identified in Section A.4.1 (including Transmission Operators with no reported instances of non-compliance) shall submit to the WECC office a completed OTC summary compliance Form A.4(b) (available on the WECC web site) for the immediately preceding calendar quarter.</p>	<p><b>1.2 Compliance Monitoring Period</b></p> <p>Compliance Monitor may use one or more of the following methods to assess compliance:</p> <ul style="list-style-type: none"> <li>- Self-report for each incident within three-business day</li> <li>- Self-report quarterly</li> <li>- Spot check audits conducted anytime with 30 days notice given to prepare</li> <li>- Periodic audit as scheduled by the Compliance Monitor</li> <li>- Investigations</li> <li>- Other methods as provided for in the Compliance Monitoring Enforcement Program</li> </ul> <p>Reset Period: One calendar month.</p>	<p>information to be consistent with the WECC compliance program.</p> <p>The period allowed for self-reporting of incidents was extended to 3 business days.</p>
<p><b>D. Compliance</b></p> <p><b>2. Levels of Non-Compliance</b></p> <p>For each separate incident violating the OTC compliance Standard, the level of the violation shall be as set forth in the following table: (Source: Non-Compliance Levels)</p> <p>&lt;violation severity table&gt;</p> <p>* measured after 20 continuous minutes of net</p>	<p><b>2. Violation Severity Levels</b></p> <p><b>For Requirement R1:</b></p> <p>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.</p> <p>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-</p>	<p>Levels of Non-Compliance have been translated to ‘Violation Severity Levels’ per the NERC Standard template.</p> <p>For violations of R1 (actual flow over the SOL), the violation severity table has been retained unchanged.</p> <p>For violations of R2 (net schedule over the SOL), the violation severity table has been reduced.</p> <p>The OTCSDT is of the opinion that when net schedules exceed the path limit, and there is no</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
<p>scheduled or actual flows in excess of OTC.</p>	<p>WECC-1.</p> <p>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.</p> <p>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.</p> <p>* Measured after 20 continuous minutes of actual flows in excess of SOL for paths with Transient Stability Ratings or Voltage Stability Ratings and after 30 continuous minutes of actual flows in excess of SOL for paths with Facility Ratings or System Voltage Limits.</p> <p><b>For Requirement R2:</b></p> <p><b>2.1 Lower:</b> 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 was above the path’s SOL for more than 30 minutes but less than of equal to 45 minutes.</p> <p><b>2.2. Moderate:</b> There shall be a Moderate Level of non-compliance for Transmission Operators</p>	<p>violation of actual flow over the path limit (or on parallel paths), there is very little reliability risk to the BES, and that in this case requiring net schedules to respect path SOL is in the nature of an equity issue rather than one of reliability. Therefore, in addition to setting the violation risk factor of R2 to ‘Lower’, the OTCSDT has modified the violation severity table for R2 to reflect 15 min time periods and lower levels of non-compliance, which the OTCSDT considered more appropriate to the risk represented by the violation.</p>



Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
	<p>when the net schedule for power flow over an interconnection or Transmission path was above the path's SOL for more than 45 minutes but less than of equal to 60 minutes.</p> <p><b>2.3. High:</b> 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 was above the path's SOL for more than 60 minutes</p>	
<p><b>D. 1. Compliance Monitoring Process</b></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 most recent calendar month.(Source: Sanctions)</p>		<p>Replaced with NERC sanction table, per NERC and FERC guidance. The NERC sanction table is required by the NERC standard template.</p>
<p><b>EXCUSE OF PERFORMANCE</b></p> <p><b>A. Excused Non-Compliance</b></p> <p>Non-compliance with any of the reliability criteria contained in this Standard shall be excused and no sanction applied if such non-compliance results directly from one or more of the actions or events listed below.</p> <p>B. Specific Excuses</p>	<p>Removed</p>	<p>Removed per NERC guidance. The NERC standard template does not allow for excused non-compliance. Mitigating factors such as these are addressed in the sanction assessment process.</p>

Current WECC Standard TOP-STD-007-0 Operating Transfer Capability	Proposed WECC Standard TOP-007-WECC-1 System Operating Limits	Proposed Change and impact
1. Governmental Order 2. Order of Reliability Coordinator 3. Protection of Facilities 4. Extraordinary Contingency 5. Participation in Field Testing		
<b>ATTACHMENT A</b> <b>Table 2</b> Existing WECC Transfer Paths (BPTP) (Revised February 1, 2006)	<b>Attachment 1 – TOP-007-WECC-1</b> Existing WECC Transfer Paths of Bulk Electric System (Revised September 1, 2007)	<p>The OTCSDT is recommending moving WECC Table 2 from where it appears now, as an attachment to the standard, to a location on the WECC website.</p> <p>As an attachment to the standard, revisions to WECC Table 2 must be made through the standards process. By making WECC Table 2 a changing the referenced document in the WECC library, it opens the possibility of the table being changed through a WECC process without the need for changing the standard itself (for example, by recommendation of the OTCPC and approval by the Board). A similar approach to referencing an external document can be seen in IRO-006-2.</p>

## **Comment Report Form for WECC Standard TOP-007-WECC-1 – System Operating Limits**

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The TOP-007-WECC-1 Standard Drafting Team thanks all commenters who submitted comments on the TOP-007-WECC-1. 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 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 TOP-007-WECC-1 – System Operating Limits**

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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.	Chuck Westbrook	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 TOP-007-WECC-1 – System Operating Limits developed in a fair and open process, using the Process for Developing and Approving WECC Standards? page 4**
- 2. Does the WECC Standard TOP-007-WECC-1 – System Operating Limits pose an adverse impact to reliability or commerce in a neighboring region or interconnection? page 4**
- 3. Does the WECC Standard TOP-007-WECC-1 – System Operating Limits pose a serious and substantial threat to public health, safety, welfare, or national security? page 4**
- 4. Does the WECC Standard TOP-007-WECC-1 – System Operating Limits 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 TOP-007-WECC-1 – System Operating Limits 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 TOP-007-WECC-1 – System Operating Limits**

**1. Was the WECC Standard TOP-007-WECC-1 – System Operating Limits developed in a fair and open process, using the Process for Developing and Approving WECC Standards?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Chuck Westbrook	X		
Response: Thank you.			
Annette Bannon, Jon Williamson, John Cummings, and Tom Olson	X		PPL believes this standard provides useful clarification of operating limits.
Response: Thank you for your support.			
Response:			

**2. Does the WECC Standard TOP-007-WECC-1 – System Operating Limits pose an adverse impact to reliability or commerce in a neighboring region or interconnection?**

**Summary Consideration:**

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

**3. Does the WECC Standard TOP-007-WECC-1 – System Operating Limits pose a serious and substantial threat to public health, safety, welfare, or national security?**

**Summary Consideration:**

Commenter	Yes	No	Comment
Chuck Westbrook		X	

**Comment Report Form for WECC Standard TOP-007-WECC-1 – System Operating Limits**

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

**4. Does the WECC Standard TOP-007-WECC-1 – System Operating Limits pose a serious and substantial burden on competitive markets within the interconnection that is not necessary for reliability?**

**Summary Consideration:**

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

**5. Does the WECC Standard TOP-007-WECC-1 – System Operating Limits 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
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**Comment Report Form for WECC Standard TOP-007-WECC-1 – System Operating Limits**

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





**Regional Reliability Standard Submittal Request**

**Region: Western Electricity Coordinating Council**

**Regional Standard Number: TOP-007-WECC-1**

**Regional Standard Title: System Operating Limits**

**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 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.

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

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 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.

The requirement for keeping Net Scheduled Interchange within a path’s SOL is not covered in the NERC Reliability Standards. Scheduling transmission paths beyond their limits could adversely affect actual flows on parallel paths by creating unscheduled flow that may jeopardize system reliability.

**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.**

## NERC Evaluation of Western Electricity Coordinating Council (WECC) Regional Standards

### Executive Summary July 30, 2008

On June 10, 2008, 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 10, 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 10, 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

### 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.

## 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.

**Regional Reliability Standard  
Submittal Review Checklist**

**Region:** Western Electricity Coordination Council

**Regional Standard Number:** TOP-007-WECC-1

**Regional Standard Title:** System Operating Limits

**Date Standard Received:** 6/10/08

**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

Edd Dobrowolski, 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



**Steven L. Rueckert**  
Director of Standards

801.582.0353 ext. 6878  
[steve@wecc.biz](mailto:steve@wecc.biz)

August 18, 2008

Gerard Adamski  
Vice President and Director of Standards  
North American Electric Reliability Corporation  
116-390 Village Boulevard  
Princeton, New Jersey 08540-5721

RE: WECC's response to NERC's initial evaluation of seven WECC regional reliability standards

Dear Gerry,

WECC appreciated the opportunity to discuss NERC staff's initial evaluation of the seven WECC regional reliability standards in conference calls on August 4 and August 5. Attached are WECC's written clarifications and responses to the concerns and issues identified in NERC's written evaluation on July 30 and the subsequent conference calls.

We trust that WECC's responses, along with the supporting documentation contained in WECC's submissions, provide the NERC staff a comprehensive basis for recommending NERC Board of Trustees approval of the seven proposed regional reliability standards. Please direct any questions relating to WECC's response to WECC's Director of Standards, Steve Rueckert at [steve@wecc.biz](mailto:steve@wecc.biz) or (801) 883-6878 or Ken Wilson at [ken@wecc.biz](mailto:ken@wecc.biz) or (801) 883-6886.

Sincerely yours,

*Steve Rueckert*

Steven L. Rueckert

SR:

Attachment

Cc: Stephanie Monzon, NERC  
Thomas J Schneider, WECC

**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

#### **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.

### **(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 Roster**

**Drafting Team TOPSTD007**

FIRST_NAME	LAST_NAME	COMPANY
Shannon	Black	Sacramento Municipal Utility District
Steve	Gillespie	California Independent System Operator
Jared	Griffiths	Westren Area Power Administration WACM
Richard	Hydzik	Avista Corp
Tom	Isham	Arizona Public Service Company
Don	Johnson	PacifiCorp West
Ken	Wilson	Western Electricity Coordinating Council
Brian	Tuck	Bonneville Power Administration
James	Tucker	Deseret Generation & Transmission Cooperative
Gregory	Van Pelt	California Independent System Operator