

RC: Operating Criteria
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Maintained By: SPP Operating Reliability Working Group
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Approved By:	
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REVISION CHART

Modifications are documented in the following chart.

Version	Revised By	Description of Modifications	Effective Date	Revision Date
0.a		Initial draft	m/d/yyyy	10/12/2010
1.0		Reflects the approval of RR117 and RR58_CRR014.		11/20/2015
1.1		Reflects the approval of RR98.		4/1/2016
1.2		Reflects the approval of RR113, RR146, RR159		10/3/2016
1.3		Reflects the approval of RR134, RR168, RR195, RR213		4/27/2017
1.4		Reflects the approval of RR240		12/11/2017
1.5		Reflects the approval of RR162		2/7/2018
2.0		Reflects the approval of RRs 268, 269, 270		4/30/2018
2.1		Reflects the approval of RR309		10/19/2018
2.2		Reflects the approval of RR349		6/17/2019
3.0		Reflects the approval of RR512, 519, and 520		1/13/2023
4.0		Reflects the approval of RR414		2/16/2023

AUDIENCE

- | | | |
|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> BA Analyst | <input type="checkbox"/> OAPS | <input type="checkbox"/> SE |
| <input type="checkbox"/> BC | <input type="checkbox"/> OIT | <input type="checkbox"/> Seams and AFC |
| <input type="checkbox"/> DA | <input type="checkbox"/> Ops Eng & Analysis Support | <input type="checkbox"/> SS |
| <input checked="" type="checkbox"/> East RC | <input type="checkbox"/> Ops Mgmt | <input type="checkbox"/> System Operations |
| <input type="checkbox"/> EMS MDI | <input type="checkbox"/> Ops Planning | <input type="checkbox"/> Tariff Support |
| <input type="checkbox"/> FC | <input type="checkbox"/> OST | <input type="checkbox"/> Tech Analyst |
| <input type="checkbox"/> Market Support/Analysis | <input type="checkbox"/> QA Analyst | <input type="checkbox"/> TI Analyst |
| <input type="checkbox"/> Model Coordination | <input type="checkbox"/> RTBM | <input type="checkbox"/> WEIS |
| <input checked="" type="checkbox"/> EXTERNAL | <input type="checkbox"/> RTP | <input type="checkbox"/> West RC |

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1. INTRODUCTION

The Operating Criteria contained within this document serves to support the values and principles upon which Southwest Power Pool, Inc. (SPP) is formed. These criteria are reviewed and managed by the Organizational Group structure as described in the SPP Bylaws. Unless stated otherwise in the applicable section of this document, these Operating Criteria shall be reviewed by the Operating Reliability Working Group (ORWG) and any revisions to this document shall be performed pursuant to the approved Revision Request Process and submitted to the Markets and Operations Policy Committee (MOPC) for consideration of approval. The MOPC shall present applicable Revision Requests to the SPP Board of Directors for their review and approval as appropriate.

1.1 Purpose

The Operating Criteria provide background information, guidelines, business rules, and processes for the operation and administration of the various SPP operating reliability functions. Stand-alone governing documents for the purposes of meeting certain NERC Reliability Standards are also referenced in the SPP Operating Criteria.

1.2 Document Relationship

Multiple NERC Reliability Standards require SPP to develop and maintain documents. Such documents can be described by NERC as a 'methodology', 'operating process', or other descriptions. In such cases where required, SPP shall develop and maintain stand-alone governing documents to meet such NERC Reliability Standard requirements. Each of these stand-alone governing documents will be referenced in an appropriate Operating Criteria section. For the purposes of the SPP Bylaws and the SPP Membership Agreement, these stand-alone governing documents shall be considered an extension of these Operating Criteria.

2. OPERATING FUNCTIONS OVERVIEW

SPP's operating reliability functions include: Reliability Coordinator (RC), Balancing Authority (BA), Transmission Service Provider (TSP), and Reserve Sharing Group (RSG) administrator. For the purposes of SPP Operating Criteria and Appendices, these functions are defined by the NERC Glossary of Terms.

2.1 Reliability Coordination

SPP is registered with the North American Electric Reliability Corporation (NERC) as a Reliability Coordinator (RC) for Transmission Operators (TOPs), Generator Operators (GOPs) and Balancing Authorities (BAs).

2.2 Balancing Authority

SPP is registered with NERC as a Balancing Authority (BA) for selected TOPs and GOPs.

2.3 Transmission Service Provider

SPP is registered with NERC as a Transmission Service Provider (TSP) for the SPP Open Access Transmission Tariff. SPP administers the provisions of the Tariff and provides Transmission Service to Transmission Customers under the applicable transmission service agreements.

2.4 Reserve Sharing Group

SPP is registered with NERC as a Reserve Sharing Group (RSG).

As the administrator of the SPP RSG, and in coordination with other participating BAs, SPP maintains the SPP Reserve Sharing Group Operating Process (RSGOP). The RSGOP establishes standard terminology and minimum requirements governing the amount and availability of Contingency Reserves. BAs participating in the SPP RSG shall meet the requirements set forth in the *SPP RSGOP*, which can be found on the SPP website.

3. RELIABILITY COORDINATION

Continuous coordinated operation of the Bulk Electric System is essential to maintain reliable electric service to all customers. Reliability coordination procedures are established herein for sharing of operating information and around-the-clock coordination of normal and emergency operating conditions to secure the reliability of the Bulk Electric System.

3.1 SPP Emergency Communication Network

The SPP emergency communication network consists of satellite phones located at the SPP primary and backup control centers, control centers of each member BA and/or TOP. If loss of any primary communication facilities occurs, the SPP emergency communication network may be used to exchange information. Therefore, it is important for operators to be familiar and comfortable with the operation of the satellite phones. The RC can provide training upon request.

BAs, TOPs and RCs shall participate in weekly testing of the SPP emergency communication network. Testing will ensure reliability and it will also give users practice on the system. The RC shall initiate and monitor the SPP satellite phone testing.

During conditions requiring the use of the SPP emergency communication network, the RC shall initiate a group call and quickly determine the extent of the interruption. Communication is vital to an orderly recovery. Operating personnel shall keep conversations concise to keep channels clear. Priority should be given to establishing voice communication paths prior to re-establishing data communication paths.

3.2 Reliability Coordinator Outage Coordination Methodology

The *SPP RC Outage Coordination Methodology* document serves to meet the NERC Reliability Standards that require an outage coordination methodology for the SPP RC Area. Applicable entities in the SPP RC Area shall meet the requirements defined in the *SPP RC Outage Coordination Methodology* document, which can be found on the SPP website.

3.3 Reliability Coordinator Performance Standards

The SPP RC shall have the following performance standards:

1. The SPP RC shall act in accordance with Good Utility Practice including NERC Reliability Standards and SPP Criteria, shall not order SPP members to take any action that would not be in accordance with Good Utility Practice or NERC Reliability Standards, and shall allow SPP members to take any actions required by Good Utility Practice and NERC Reliability Standards.
2. The SPP RC shall not take any action, or direct SPP members to take any action, which would be in violation of any lawful regulation or requirement of any governmental agency or NERC Reliability Standard.
3. The SPP RC shall carry out its responsibilities in at least as prompt and efficient a manner as that required by Good Utility Practice including NERC Reliability Standards and SPP Criteria.
4. The SPP RC shall comply with appropriate standards of conduct to ensure appropriate protection of competitively sensitive information.

3.4 SPP Reliability Coordinator Area SOL Methodology

The *SPP RC Area SOL Methodology* document serves to meet the NERC Reliability Standards that require an SOL methodology for the SPP RC Area. Applicable entities in the SPP RC Area shall meet the requirements defined in the *SPP RC Area SOL Methodology* document, which can be found on the SPP website.

The SPP RC shall coordinate with the Transmission Operators in the SPP RC Area to ensure the SOLs established in the SPP RC Area SOL Methodology are managed in accordance with Good Utility Practice including NERC Reliability Standards and SPP Criteria. The SPP RC will implement the appropriate reliability margins within the SPP RC reliability studies and tools, as described in Appendices OP-1 and OP-2 of the SPP Operating Criteria to minimize the risk of SOL exceedances in the SPP RC Area.

4. COMMUNICATION PROTOCOLS

The *SPP Reliability Coordinator and Balancing Authority Operating Instruction Communications Protocols* document exists to improve communications for the issuance of Operating Instructions to reduce the possibility of miscommunication that could lead to action or inaction harmful to the reliability of the Bulk Electric System. Applicable entities are required to follow the *SPP Reliability Coordinator and Balancing Authority Operating Instruction Communications Protocols* document, which can be found on the SPP website.

5. COMMUNICATION OF DATA

5.1 Providing Required Reliability Data to the Reliability Coordinator and Balancing Authority

The *Required Data Specification for the SPP Reliability Coordinator and the SPP Balancing Authority* (RDS) document defines data required to perform reliability functions.

Applicable entities shall meet the requirements defined in the *Required Data Specification for the SPP Reliability Coordinator and the SPP Balancing Authority* document, which can be found on the SPP website.

5.2 Node Connectivity Requirement

SPP operates Inter-Control Center Communications Protocol (ICCP) nodes at both the primary and backup sites. Both the primary and backup site ICCP nodes feed real-time data to their primary and backup site Energy Management Systems concurrently. To ensure maximum availability of ICCP data required for reliability, the following connectivity requirements are required for entities registered with NERC as a GOP or TOP within the SPP RC Area:

- All TOPs are required to configure their ICCP nodes to connect to the SPP primary and backup sites concurrently and to make the same Block 1 and Block 2 data available to both nodes.
- All TOPs and GOPs are required to configure two ICCP nodes so that, in the event of a failure of their active ICCP node, their alternate ICCP node reconnects to SPP's ICCP nodes within 240 seconds.
 - If the TOP or GOP has a third party contract for their ICCP connections, then the third party should be able to reconnect within 240 seconds.
- All GOPs with more than 1500 MW of net aggregate generation or fifteen capacity resources in the SPP BA Area are required to configure two ICCP nodes to read their Integrated Marketplace resource set point instructions from both SPP's primary and secondary ICCP nodes concurrently.

In the event of an outage on ICCP Nodes:

- Planned maintenance outages should comply with the Outage Scheduling Information of the RDS (Telemetry and Control System Status). For forced or unplanned outages, the TOP or GOP should contact SPP and follow the Outage Scheduling Information of the RDS (Telemetry and Control System Status).

5.3 Synchrophasor Data Communication System – Phase I

Synchrophasor technology enables greater visibility into grid conditions by detecting and recording events that supervisory control and data acquisition (SCADA) data may miss. SPP's Synchrophasor System allows SPP to collect, analyze, and archive time-synchronized data from phasor measurement units (PMU) or other phasor measurement recording devices with similar capabilities. SPP is focused on creating a more reliable electric grid by using PMU data to gain a better understanding of the dynamic nature of the grid resulting in increased model accuracy that enables reliable and efficient use of the existing transmission assets.

In Phase I of SPP's Synchrophasor System project, the PMU devices and the associated data will be used to (a) analyze oscillation modes in the region, (b) analyze and benchmark voltage stability assessments against actual recorded data, (c) record phase angle differences to understand transmission system stress from a wide-area overview, (d) perform model validation for operations and planning system stability studies and, (e) provide enhanced insight while researching grid events in post-event analysis. Any change in use may introduce compliance impacts for member companies. The PMU devices and associated data in the SPP Synchrophasor System will not be used for any of the following purposes:

- Operational Planning Analysis;
- Real-time Assessments; or
- Real-time monitoring for purposes of making operational decisions within a 15 minute time horizon.

Prior to implementing subsequent phases of the Synchrophasor System project, this language in this section shall be updated. If SPP relies on the PMU devices for purposes of control and monitoring, it will notify SPP member companies in adherence to CIP-002-5, Attachment 1 Criteria

6. SPP RELIABILITY COMMUNICATIONS TOOL (R-COMM)

6.1 Connectivity Requirements

Entities required to use R-Comm for one or more of the functions described in section 6.2 shall meet the following connectivity requirements.

- A) Entities shall maintain a connection to the R-Comm tool. When an entity is aware it is or will be unable to maintain a connection to the R-Comm tool, it shall inform the SPP RC without intentional delay.

- B) If an entity identifies any degradation to the functionality of the R-Comm tool, it shall inform the SPP RC.
- C) Entities shall utilize voice communications as an alternate means of communication in the event of the R-Comm tool being unavailable.

SPP will inform impacted entities for any actual or planned loss of connectivity.

6.2 Required R-Comm Functions

6.2.1 SPP BA Load Shed Instructions and Responses

The R-Comm tool shall be the primary means for responsible entities to receive and acknowledge load shed instructions issued by the SPP BA. The load shed process is defined in the SPP BA Emergency Operating Plan.

7. BEHIND-THE-METER, DEMAND RESPONSE, AND REAL-TIME AVAILABILITY REPORTING

7.1 Controllable or Dispatchable Behind-The-Meter Generation

Behind-The-Meter Generation is a generation unit as defined in Attachment AE of the SPP Tariff. This Section 7.1 is not intended to apply to Behind-the-Meter Generation that is registered in the Integrated Marketplace.

Load Responsible Entity (LRE) is an entity as defined in Attachment AA of the SPP Tariff.

1. Each LRE, or its third party Market Participant that will provide its capacity adequacy reporting, shall submit the following information for non-intermittent and non-registered controllable or dispatchable Behind-The-Meter Generation that has qualified as accredited capacity pursuant to Attachment AA of the SPP Tariff: Availability data in accordance with Table 1 shown below where Total Available Capacity is the total utilized and unutilized capacity for the Behind-The-Meter Generation and Planned Unutilized Available Capacity is the estimated MW range that is not planned to be utilized but is available to the Balancing Authority for deployment (e.g., Resource Max MW – Expected Actual MW). The remaining energy is the total amount of energy remaining based on fuel limitations and other run time restrictions. The remaining energy should be the total MW hours in the weekly horizon and submitted the same for each hour in the horizon. Remaining energy is expected to be capped at the amount of load at the discrete point-of-delivery in accordance with Behind-The-Meter SPP Business Practice guidelines.

Table 1: Non-Intermittent, Non-Registered Controllable Behind-The-Meter Generation Availability Data

Submittal Category	Monthly Actuals Submittal	*Advisory / Alert Period Submittal
<i>Frequency</i>	Monthly, by the 15 th of the subsequent month	Submitted within 120-minutes of initial Advisory/Alert and as changes occur, or when advisory is extended beyond original week submittal
<i>Time-Granularity</i>	Hourly	Hourly
<i>Time Horizon</i>	1 month	1 week
<i>Required Data</i>	Total Available Capacity	1) Planned Unutilized Available Capacity 2) Remaining Energy 3) **Maximum Daily Energy 4) ***Start-Up Time
<i>Is output limited to actual load at the discrete point-of-delivery (Y/N)</i>	(Y/N) Describe	
<i>MW Granularity</i>	Total by Resource	Total by Resource
<i>Method of Submission</i>	Secure FTP(GlobalScape)	Secure FTP (GlobalScape)

**During Conservative Operations Advisory and/or Energy Emergency Alerts*

***Maximum Daily Energy is as defined in Integrated Marketplace Protocols*

****Start-Up Time is as defined in Attachment AE*

7.2 Controllable or Dispatchable Demand Response

Demand response for this section is any measurable load reduction program(s) capable of being controlled or dispatched by a Load Responsible Entity or a Market Participant and is classified as a Demand Response Program pursuant to Attachment AA of the SPP Tariff.

This Section 7.2 is not intended to apply to demand response that is registered in the Integrated Marketplace.

Load Responsible Entity (LRE) is an entity as defined in Attachment AA of the SPP Tariff.

1. Each LRE, or its third party Market Participant, that will provide its capacity adequacy reporting, shall submit the following information for measurable load reduction program(s) capable of being controlled or dispatched by a Load Responsible Entity or a Market Participant and is classified as a Demand Response Program pursuant to Attachment AA of the SPP Tariff: Availability data in accordance with Table 1 shown below where Total Available Load Reduction is the total utilized and unutilized load reduction for the demand response and Planned Unutilized Available Load Reduction is the estimated MW range that is not planned to be utilized but is available to the Balancing Authority (e.g., Load Reduction Max MW – Expected Load Reduction MW). The remaining load reduction is the total amount of load reduction based any deployment restrictions. The remaining load reduction should be the total MW hours in the weekly horizon and submitted the same for each hour in the horizon.

Table 1: Non-Intermittent, Non-Registered Controllable Load Reduction Availability Data

Submittal Category	Monthly Actuals Submittal	*Advisory / Alert Period Submittal
<i>Frequency</i>	Monthly, by the 15 th of the subsequent month	Submitted within 120-minutes of initial Advisory/Alert and as changes occur, or when advisory is extended beyond original week submittal
<i>Time-Granularity</i>	Hourly	Hourly
<i>Time Horizon</i>	1 month	1 week
<i>Required Data</i>	Total Available Load Reduction	1) Planned Unutilized Available Load Reduction 2) Remaining Load Reduction 3) Maximum Daily Load Reduction 4) Deployment time
<i>MW Granularity</i>	Total by reduction program	Total by reduction program
<i>Method of Submission</i>	Secure FTP(GlobalScape)	Secure FTP (GlobalScape)

**During Conservative Operations Advisory and/or Energy Emergency Alerts*

7.3 Annual Resource Real-Time Availability Reporting

7.3.1 Annual Reporting

Each year by March 31st, SPP Staff shall produce a report with supporting documentation that will analyze the effectiveness of accreditation methods and market mechanisms used to incentivize real-time availability. The report will evaluate the availability of resources from real-time operations compared to actual resource accreditation, and will identify availability shortfalls and the potential causes. Stakeholders may recommend adjustments to the scope of the report.

SPP shall provide the report and recommendations to the applicable groups, including the MWG, ORWG, CAWG, SAWG, MOPC, RSC, and the SPP Board of Directors for review.

APPENDIX OP-1 VOLTAGE STABILITY ASSESSMENT AND MONITORING

METHODOLOGY

Change History

Modifications are documented in the following chart.

Date	Description
04/27/2017	Initial version

Purpose

1. Study Models

- a. SPP utilizes both the EMS model and the approved Planning Base Cases for establishing, calculating and monitoring SOLs/IROLs in the operating horizons. These cases are updated periodically to reflect expected system topology changes based on reported facility outages or upgrades.

2. Real Time and Post Contingent Voltage Stability Limits

- a. The SPP RC will perform a voltage stability assessment for identified areas and paths that have a reasonable potential to cause real-time and post-contingency voltage instability.
- b. The SPP RC may identify and establish voltage stability limits based on the voltage stability assessment results and will coordinate the voltage stability limits with the affected TOPs. Voltage stability limits may require development of new temporary flowgates.
- c. Voltage stability real-time and single-contingency limits will include a 5% MW margin.
- d. Voltage stability multiple-contingency limits will include a 2.5 % MW margin.
- e. A voltage stability limit more restrictive than an existing SOL will be identified as the revised SOL and communicated to affected entities prior to implementation in congestion management procedures.
- f. If system conditions in conjunction with real-time voltage stability assessments are determined to be stable, conditions within the 5% MW margin of the voltage stability limit than was previously defined, then the SPP RC may adjust the limit after coordinating an agreement with the affected TOPs.
- g. The RC will coordinate with the impacted TOPs to establish necessary mitigations and operating plans.

Appendix OP-2: RC Congestion Management and Effective Limits

Change History:

07/12/2021	Initial version upon RR approval at MOPC
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Purpose

The purpose of this appendix is to provide clarification to Transmission Operators, Generator Operators, and SPP staff related to SPP congestion management. Upon activation, and during real-time Congestion Management Events (CME), the CME Upper Limit, or “Effective Limit” of the active flowgate may require adjustment to reliably maintain flowgate flow that respects Transmission Owner Facility Ratings and minimizes the risk of SOL exceedances.

Background

Congestion Management Event (CME) is an event during which constraints are activated in the Real-Time Balancing Market (RTBM) to re-dispatch the system to reduce congestion/loading on a particular flowgate, or to re-dispatch the system to remove projected limit violations on flowgate(s).

For each flowgate, the Reliability Coordinator (RC) ensures the Effective Limit is set to maintain the loading at or below 100% of the Transmission Owner Facility Rating, or “Source Limit”. The Effective Limit may need to be manually adjusted in real time to maintain actual flowgate loading below the Source Limit.

Recommended Initial Effective Limits

SPP Operations may set a recommended initial fallback value, as a percentage of the Source Limit, for new and unknown flowgate Effective Limits upon manual and auto-activation. The initial recommended fallback value for flowgate Effective Limits is primarily to account for new and unknown flowgates, and is intended to prepare for uncertainty upon initial activations.

SPP Operations may set recommended initial individual flowgate Effective Limits that supersede the fallback value based upon operating experience and historical analysis

with an individual flowgate or by request of the Transmission Operator responsible for the SOL.

For manual and auto-activated flowgates, this allows the SPP RC to utilize an Effective Limit that is based upon previous experience of analysis when flowgates are activated in real time.

To efficiently utilize the transmission system while respecting the SOL, SPP may implement automated logic of utilized manual operator action, to adjust Effective Limits to more closely match actual flowgate flow to the flowgate Source Limits. This can reduce the divergence of limits used in real-time, and increase convergence in upstream systems.

To reduce modeling inconsistencies between real-time and upstream systems, SPP staff will ensure that recommended initial Effective Limits, distribution of Effective Limits, and/or distribution of resultant flows, are accounted for appropriately in upstream systems.

Review Processes

To maintain transparency, SPP will develop a stakeholder review process with the affected SPP Working Groups to review, at least annually, the global Auto-Activation threshold, the fallback recommended initial Effective Limit values, individual flowgate recommended initial Effective Limit values, and relevant historical data.

To satisfactorily maintain and establish adjusted recommended initial Effective Limit values, at least monthly, SPP staff will review and revise the initial recommended Effective Limit values based on historical flowgate congestion data, including initial limits used, the distribution of Effective Limits used, and the distribution of flowgate flow values.

The recommended initial Effective Limit values will be revised by SPP Operations in coordination with the applicable Transmission Operator(s) as needed to maintain reliability.

SPP will make the Effective Limit available systematically to all Transmission Operators in the SPP RC Area via real-time RC-TOP communications tool (R-COMM).

SPP will make the recommended initial Effective Limits available publicly on the SPP Portal.