

**RC GUIDELINES
FOR
SEASONAL ASSESSMENT AND
COORDINATION PROCESS**

Rev. 1.2

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Table of Contents

Purpose	3
1. Applicability.....	3
2. Introduction.....	3
3. Scope of the RC Seasonal Process.....	4
4. Studies Out of Scope of the RC Seasonal Process	4
5. RC Seasonal Process Overview.....	5
A. Determine the Studies to be Performed.....	5
B. Develop the Study Plan.....	6
C. Develop the Case(s) for Use in the Studies	6
D. Execute the Study Plan (Perform the Studies)	6
E. Review, Accept and Publish Study Reports	7
F. Develop/Review and Publish Associated Operating Plans	7
6. Communicating Identified Instability, Cascading or Uncontrolled Separation.....	7
7. Roles and Responsibilities of the Subregional Groups, RC and members.....	8
A. Peer Review and Acceptance Criteria.....	9
B. Coordination Responsibilities with Impacted Entities/TOPs	10
C. Resolution of Outstanding Reliability Issues.....	10
D. Role of the RCs in the RC Seasonal Process.....	10
E. Role of TOPs in the RC Seasonal Process	11
F. Role of the WECC RE in development of Base Cases	12
8. Supporting Information	12
Operationally Affected Parties	12
References	12
Definitions.....	12
Version History	13
9. Periodic Review Procedure	13
Review Criteria & Incorporation of Changes.....	13
Frequency	13
Attachment I: RC Seasonal Process – Study Timelines.....	14
Attachment II: RC Seasonal Process – Study Plan Outline.....	16
Attachment III: RC Seasonal Process – Study Checklist	18
Attachment IV: RC Seasonal Process – Study Report Outline.....	20
Attachment V: RC Seasonal Process – Operating Plan Checklist.....	23
Attachment VI: Principles of the RC Seasonal Process	24

Attachment VII – RC Seasonal Process – Definitions.....25

1. Impacted Entity/TOP..... 25
2. Study Seasons..... 25
3. Contingencies..... 25
4. Facility Outages..... 26

Purpose

The purpose of this document is to provide guidelines for the seasonal assessment and coordination process.

1. Applicability¹

Transmission Operators - TOPs
Reliability Coordinators - RCs.

2. Introduction

For the purposes of this document, Reliability Coordinator (RC) Guidelines for Seasonal Assessment and Coordination Process should be referred as the RC Seasonal Process. The RC Seasonal Process fits between the TPL Planning Assessments and RC’s IRO-017-1 Outage Coordination Process. Reference Figure 1: Study Timeline below.

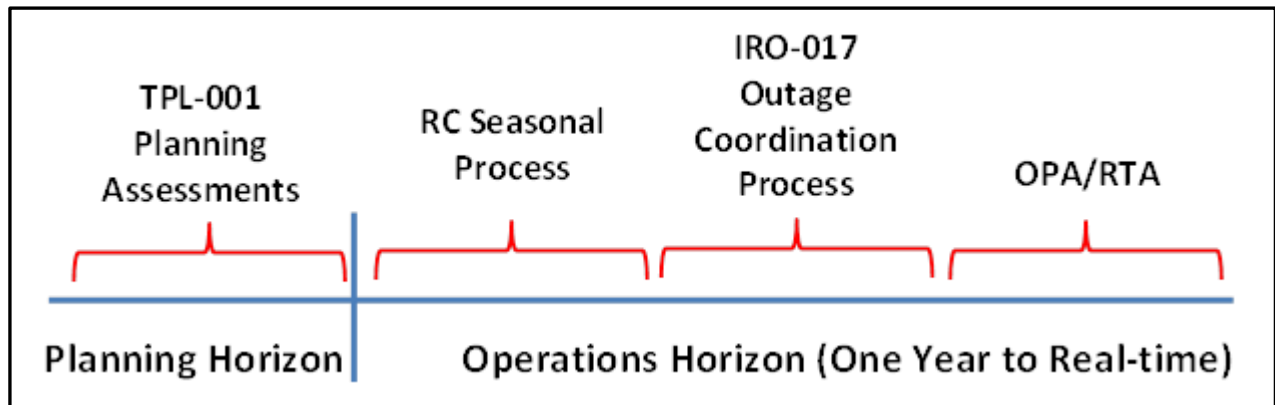


Figure 1: Study Timeline

¹ The WECC RE entity is mentioned throughout this document to indicate their internal process and not necessarily to establish their responsibilities or applicability of this process to the WECC RE.

The studies performed as part of the RC Seasonal Process are subject to the applicable RC's SOL Methodology. Accordingly, the concepts, principles, methods, technical criteria and requirements described in the applicable RC's SOL Methodology apply to the studies performed as part of the RC Seasonal Process.

For additional information regarding the principles for the RC Seasonal Process, see Attachment VI & VII.

3. Scope of the RC Seasonal Process

The scope of the RC Seasonal Process includes the following:

1. Determining the types of studies to be performed by the subregional study groups for a given season:
 - a. Studies to investigate reliability issues (including Stability, Facility Rating, System Voltage Limit issues) that require TOP-to-TOP coordination for the development of Operating Plans.
 - b. Studies to review known interactions or to identify new interactions between flows on major interfaces that impact more than one TOP (e.g., nomograms) for the establishment of Operating Plans to provide for reliable operations with respect to Stability, Facility Rating or System Voltage Limit constraints.
 - c. Studies to identify instability, Cascading or uncontrolled separation risks for single Contingencies, Always Credible MCs, or N-1-1 or N-1-2 Contingency scenarios per the applicable RC's SOL Methodology. These studies include stressing the system to reasonable maximum stressed conditions per the applicable RC's SOL Methodology and are aimed at identifying potential IROLs and non-IROL Stability Limits. Accordingly, the applicable RC's SOL Methodology has a major role in these studies.
2. Guidelines for base case coordination.
3. Performing coordinated seasonal studies within the subregional study groups.
4. Coordinating/reviewing study results within and among the subregional study groups.
5. Establishing/reviewing coordinated Operating Plans to address reliability issues identified in those studies. Operating Plans may be preliminary and may require further refinement as real-time approaches under the IRO-017 outage coordination process.

4. Studies Out of Scope of the RC Seasonal Process

The types of studies that may be out of scope of the RC Seasonal Process include those that are aimed at identifying Facility Rating and System Voltage Limit issues (including the development of Operating Plans for those identified issues) internal to the TOP Area that do not require coordinated operations with other TOPs. Facility Rating and System Voltage Limit issues internal to a TOP Area are identified and addressed as part of the IRO-017 Outage Coordination Process and subsequent OPAs.

5. RC Seasonal Process Overview

The RC Seasonal Process contains the following general six steps:

- A. Determine the studies to be performed.
- B. Develop the study plan.
- C. Develop the case(s) for use in the studies.
- D. Execute the study plan (perform the studies).
- E. Review, accept and publish study reports.
- F. Develop/review and publish associated Operating Plans and seasonal SOL limits summary table.

There may be a need to pursue necessary follow-ups outside the seasonal process, for example, the formal declaration and further development of IROLs, near-real-time calculations of Stability Limits or IROLs, etc.

At a minimum Step C is expected to be followed, as it is required by the applicable RC's SOL Methodology. Each of these steps is described further in the subsequent sections.

A. Determine the Studies to be Performed

The subregional study groups, and the TOPs that comprise the subregional study groups, in consultation with the RC, are responsible for determining the studies to be performed for a given season.

The following considerations for determining the studies to be performed may include:

1. Planning Assessments or Transfer Capability assessments for the Near-Term Transmission Planning Horizon or other analyses performed by PCs and TPs have identified instability risks, negative system interactions or other reliability concerns that impact multiple TOP Areas. The results of these studies might point to the need to further analyze these issues as part of the seasonal study process.
2. Internal TOP studies have identified instability risks, negative system interactions or other reliability concerns that impact multiple TOP Areas. The results of these studies might point to the need to further analyze these issues as part of the seasonal study process.
3. Facilities may have been constructed or have been planned and could be in service within next coming season, retired or rendered temporarily unavailable, which might warrant a seasonal study.
4. Studies have not been conducted which stress the system in accordance with the system stressing methodology (as applicable) as described in the applicable RC's SOL Methodology.
5. It is determined that there is a need to assess N-1-1 and N-1-2 operating conditions to identify potential Conditional IROLs.
6. Prior studies have excluded key sensitivities, warranting an updated study.
7. Real-time operating experiences have identified vulnerabilities that warrant a follow-up seasonal study.
8. New RAS or other automatic mitigation schemes have been employed or retired that have an impact on Stability limits or have an impact on coordinated TOP-to-TOP operations.
9. Significant load or generation patterns have shifted due to economics or other factors.

10. Changes in load composition such as increased penetration of air conditioning.
11. New models (including dynamic models) have been approved for use by the WECC Modeling Subcommittee that may create the need to revise prior studies or perform new studies.
12. The addition of renewable generation and/or fossil-fueled generation retirements have significantly changed the TOP Area generation mix.

Ultimately, the studies to be performed for a given season are determined based on engineering judgment through collaboration, operating experience and prior assessments.

B. Develop the Study Plan

After the studies to be performed have been determined, the subregional study group is encouraged to develop and document the study plan (see Attachment II) per the recommended seasonal timeline (see Attachment I).

Where there is a common transmission path between subregions that is being studied by either subregion, the assumptions and specifics of this path study may be agreed upon by the respective subregions prior to study commencement.

C. Develop the Case(s) for Use in the Studies

Development and approval of initial operating base cases (in PSLF,² PSS/E³ or PowerWorld formats)⁴ coordinated by the WECC RE are the starting point for the RC Seasonal Process.

TOPs shall participate in the base case coordination to ensure their TOP Area is accurately modeled. Case development is expected for each TOP, even if there are no studies performed for that season per the seasonal timeline. (See Attachment I)

The TOPs participating as subregional study group members are responsible to:

- Review the WECC RE operating base case(s) used for the upcoming seasonal studies.
- Ensure accuracy (e.g. expected topology for the season, ratings, impedances, expected load and generation levels, etc.) and to set up the initial conditions for the cases involved.
- Coordinate with impacted entities and adjust the approved operating base case (s) to reflect the specific conditions being studied
- Case coordination occurs according to the seasonal timeline (Attachment I)
- If repetitive issues are observed in the WECC RE base cases, then provide feedback to the WECC RE through their respective Planning Coordinators.

If there is a delay in the publication of an approved operating base case, the RC and the subregional study group chairs can convene and determine an appropriate course of action and communicate any changes to the subregional study group members.

D. Execute the Study Plan (Perform the Studies)

The entities involved in performing the studies are encouraged to follow the study plan to meet the schedules and to keep the subregional study group chair updated on their progress.

² Positive Sequence Load Flow /GE PSLF Software.

³ Power System Simulator for Engineering.

⁴ Alternatively, other recognized formats as determined by the WECC RE.

E. Review, Accept and Publish Study Reports

The RC Seasonal Process requires peer review and acceptance of studies performed.

When documenting the study results, the subregional study groups are encouraged to adhere to the study plan outline (see Attachment II) and the seasonal timeline (see Attachment I). After the studies are completed, the subregional study group members are encouraged to:

- Review the RC Seasonal Process – Study Checklist (see Attachment III) to draft the final study report (see Attachment IV). For consistency, and to aid in the review of seasonal studies, TOPs are encouraged to follow the template provided in Attachment IV when developing the final study report.
- Coordinate a review with other Subregional Study Groups or RC's when any study results impact other subregional study groups or multiple RC areas (see [Section 7. B](#)).
- Submit study results for review and acceptance (see [Section 7. A](#)) By the subregional study group members.
- Post the study documentation on RC's website once the studies and associated study reports are accepted and finalized.

F. Develop/Review and Publish Associated Operating Plans

Each subregional study group is encouraged to review the RC Seasonal Process – Operating Plan Checklist (Attachment V) when developing or revising Operating Plans⁵ as part of the RC Seasonal Process.

Once the studies have been reviewed and accepted, the impacted TOPs are encouraged to collaborate to develop or revise Operating Plans⁴ as necessary. The coordinated operating plans should be posted to the RC secure SharePoint site according to the timeline in Attachment I.

6. Communicating Identified Instability, Cascading or Uncontrolled Separation

One of the primary objectives of the RC Seasonal Process is to identify any risks for instability, Cascading or uncontrolled separation applied consistent with the applicable RC's SOL Methodology. (See [Section 3](#), "Scope of the RC Seasonal Process.") The description of instability, Cascading or uncontrolled separation provided in the applicable RC's SOL Methodology should be applied.

As per the instructions in the applicable RC's SOL Methodology, Limit(s) identified to prevent instability, Cascading or uncontrolled separation shall be communicated to the RC. The subject line of the email shall clearly indicate that the communication contains an identified Stability limit.

⁵ Per the NERC Glossary of Terms, the definition of Operating Plan includes Operating Procedures. This document uses the more general term Operating Plan.

7. Roles and Responsibilities of the Subregional Groups, RC and members

Four subregional study groups are recognized by the RCs as having responsibility for performing, coordinating and accepting seasonal studies in accordance with the RC Seasonal Process. These study groups are:

1. The Northwest Operational Planning Study Group (NOPSG) representing the Northwest/Canada subregion;
2. The Rocky Mountain Operating Study Group (RMOSG) representing the Rocky Mountain subregion;
3. The Southwest Area Subregional Group (SASG) representing the Arizona/New Mexico/Nevada subregion; and
4. The Operating Studies Subcommittee (OSS) representing the California/Mexico subregion.

These subregional study groups are not governed by the RCs. They each have their own reporting and governance structure and their own responsibilities in accordance with their respective authorities. All four subregional study groups have the RC Seasonal Process in common, i.e., each of the four subregional study groups perform the functions specified in the RC Seasonal Process, yet they are free to perform additional studies other than the RC Seasonal Process.

Figure 2 depicts the nature of the commonality of the RC Seasonal Process among the four subregional study groups.

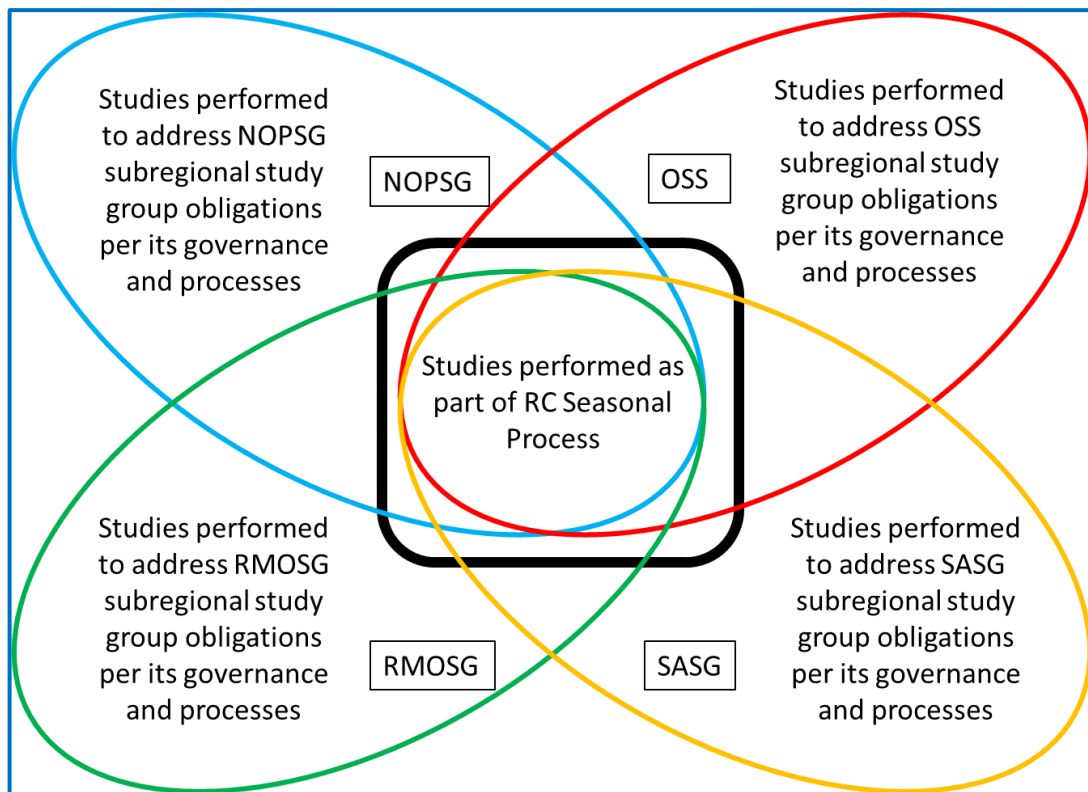


Figure 2: RC Seasonal Process

While membership of the subregional study groups is not specified in the RC Seasonal Process, each TOP is encouraged to actively participate in its respective subregional study group to facilitate effective coordination. RC participates in each subregional study group.

The roles and responsibilities of subregional study groups may include the following:

1. Elect a Chair, who may:
 - a. Coordinate and facilitate study review meetings and the development of study plans, reports and resulting Operating Plans.
 - b. Serve as the liaison for the subregion when interacting with the RC and other subregions.
2. Coordinate with the TOP representatives in the subregional study group and with the RC to determine the studies that are to be performed for a given season and the system conditions under which they will be studied.
3. Review and coordinate development of seasonal study plans and schedules for the subregion to ensure timely completion of seasonal operating studies.
4. Coordinate base cases to be reviewed and prepared for the studies. Coordination should be led by the Chair or its designee.
5. Review and coordinate seasonal studies to verify that the RC Seasonal Process has been followed.
6. Where system interactions outside the subregion are known to exist or are identified, coordinate and communicate study results with impacted subregions.
7. Address reliability concerns and issues raised by TOPs internal and external to the subregional study group.
8. Absent a consensus regarding study results, document the majority and minority positions.
9. Complete the studies in time for developing coordinated Operating Plans.
10. Coordinate technical study support as requested by the TOPs and RC in support of the development of Operating Plans.
11. Participate in the implemented study acceptance process and peer review described in Section (7.A) below.
12. Post the resulting documentation on the RC website. Examples of such documentation include study plans, study reports and Operating Plans.

A. Peer Review and Acceptance Criteria

Each subregional study group is encouraged to implement a study acceptance process that provides TOP and RC representatives the opportunity to voice outstanding reliability issues. This acceptance process acknowledges that reliability issues impacting more than one TOP have been adequately addressed and that coordination has taken place prior to the beginning of the operating season.

Acceptance is granted when peer review is deemed successful according to the following:

1. The study processes and criteria used for identifying Facility Rating and System Voltage Limit exceedance issues, risks for instability, Cascading or uncontrolled separation and for the establishment of preliminary Stability Limits and potential IROLs are consistent with the applicable RC's SOL Methodology.
2. Peer review has taken place, the established study plan has been followed and the technical study report is judged satisfactory by the reviewing subregional study group members.

3. Reliability issues raised in the study review process have been resolved.

B. Coordination Responsibilities with Impacted Entities/TOPs

Since the scope of the RC Seasonal Process includes reliability issues that require TOP-to-TOP coordination, it is imperative that the TOPs involved collaborate and coordinate their tasks :

1. Impacted TOPs have been identified by the TOP(s) performing the seasonal studies. This applies to TOPs internal and external to the subregional study group.
2. A study plan has been developed in accordance with the RC Seasonal Process and any concerns from impacted TOPs and/or the subregional study group have been addressed in a collaborative manner.
3. Study results have been shared among impacted TOPs and impacted subregional study groups, and the technical study results agreed upon through the established peer review and acceptance criteria.
4. Transmission path/interface interactions have been recognized by the impacted TOPs.
5. Coordinated Operating Plans have been developed and agreed upon by impacted TOPs and the RC. Where applicable, TOP options for providing relief obligations (e.g., scheduling methods, curtailment plans, etc.) are to be addressed as part of the Operating Plan.
6. If Operating Plans involve operating within a nomogram due to simultaneous interactions, or within proxy values such as Transfer Capability values, the Operating Plans are encouraged to address the roles, responsibilities and specific actions to be taken by entities involved.

C. Resolution of Outstanding Reliability Issues

Where reliability concerns/issues are raised, the subregion(s) are encouraged to initiate a process to satisfactorily address each reliability issue. Satisfactory resolution of outstanding reliability issues is in the interest of BES reliability in the RC(s) Area.

If attempts to reach consensus remain unachievable, the subregion(s) are encouraged to document each of the majority and minority positions and bring these to the attention of the RC(s) to facilitate resolution.

Where disagreements arise and are not reconciled by the beginning of the season, the impacted TOPs' Operating Plans default to interim conservative limits – or other agreed upon limits – while awaiting dispute resolution. If the reliability issue is not resolved to the satisfaction of the disagreeing parties, the TOPs are encouraged to collaborate with RC to assist in resolving the reliability issue.

D. Role of the RCs in the RC Seasonal Process

The RC plays an important role in the RC Seasonal Process, especially when it comes to identifying potential SOL exceedances or identifying instances of potential IROL -like conditions. It is not the responsibility of the RC to resolve contractual or commercial issues that may exist between TOPs. Moreover, the RC will acknowledge that any potential operational plans between TOPs and the RC do not explicitly violate existing contractual agreements or tariffs.

The roles and responsibilities of the RCs can include the following:

1. Participate in the subregional study group process by attending meetings and conference calls.
2. Coordinate with the subregional study groups to determine the studies that are to be performed for a given season and the system conditions under which they will be studied.

3. Participate in the development and review of study plans to ensure that the studies will achieve the objectives of the RC Seasonal Process.
4. Identify the need to reassess existing IROLs and co-develop the study plans and timelines as necessary.
5. Provide guidance on the consistency of study plans and studies for identifying risks for instability, Cascading or uncontrolled separation and for establishing Stability Limits and potential IROLs in accordance with the applicable RC's SOL Methodology.
6. Provide guidance on the consistency of Operating Plans developed as part of the RC Seasonal Process to support operational reliability consistent with the applicable RC's SOL Methodology.
7. Develop and maintain the RC Seasonal Process document.
8. Participate as necessary with the subregional study groups to discuss approaches to resolve outstanding reliability issues prior to each operating season.
9. Facilitate dispute resolution of seasonal studies for reliability issues related to :
 - a. Stability Limits and identification of potential IROLs.
 - b. Conflicts in study results or conclusions due to differences in the applicable RC's SOL Methodology.

E. Role of TOPs in the RC Seasonal Process

While the level of involvement in the RC Seasonal Process of smaller TOPs may be significantly less than that of larger TOPs, it is incumbent on smaller TOPs to participate in their corresponding subregional study group to maintain an awareness of any impacts the seasonal studies might have on their TOP Area. Depending on the specifics of a given study plan, smaller TOPs could have a more significant role in performing the studies in accordance with the RC Seasonal Process.

The roles and responsibilities of the TOPs may include the following:

1. Appoint a TOP representative to the subregional study group(s) for the subregion(s) in which the TOP Area resides.
2. Participate in the subregional study group process; e.g. by attending meetings and conference calls.
3. Coordinate with subregional study group and RC to determine the studies that are to be performed for a given season and the system conditions under which they will be studied.
4. Participate in the development of study plans and in performing the studies in accordance with the study plan.
5. Review WECC operating cases and make necessary adjustments to their TOP area to ensure that the cases are accurate and ready for use for the studies being performed for the season. Additionally, TOPs are encouraged to provide input to their respective Planning Coordinators when the WECC RE operating base cases are being developed.
6. Perform seasonal studies as part of the RC Seasonal Process, and in accordance with the applicable RC's SOL Methodology.
7. Prepare Operating Plans developed as part of the RC Seasonal Process to support operational reliability consistent with the applicable RC's SOL Methodology.

8. Consistent with the timelines in Attachment I, update and publish the list of Always Credible MCs for its TOP Area for use in seasonal studies.
9. Review and provide comments on seasonal studies as appropriate.
10. Identify the need to reassess existing IROLs and co-develop the study plans and timelines as necessary with the RC and/or impacted entities.

F. Role of the WECC RE in development of Base Cases

The WECC Regional Entity (RE):

1. Coordinate and ensure that approved seasonal operating base cases are prepared, approved and made available to TOPs in a timely manner in the PSLF, PSS/E and PowerWorld formats. See timelines in Attachment I.
2. Address base case issues raised by TOPs through their respective Planning Coordinators and the RC; e.g., any delays in base case development.

8. Supporting Information

Operationally Affected Parties

Publicly posted and shared with BAs and TOPs, and Neighboring RCs.

References

NERC Requirements	
Other References	

Definitions

The following terms capitalized in this Operating Procedure are in accordance with the NERC Glossary, and/or otherwise when used are as defined below:

Term	Description
None.	

Version History

Version	Change	Date
1.0	Procedure created by the RCs of the Western Interconnection.	06/04/19
1.1	Section 8: Replaced CAISO RC with RC West. Updated Operationally Affected Parties to include “Publicly posted” and updated procedure footer format. Updated NERC references. Attachment I: Minor grammar update in first paragraph.	1/29/21
1.2	Periodic Review: no content edits, formatting only.	8/24/22

9. Periodic Review Procedure

Review Criteria & Incorporation of Changes

There are no specific review criteria identified for this document.

Frequency

Review at least once every three years.

Attachment I: RC Seasonal Process – Study Timelines

TOPs and subregional study groups are encouraged to consider these timelines when coordinating subregional study group activities such as developing base case(s), any study iterations and report acceptance processes.

The following recommended timelines apply for each WECC operating season:⁶

Summer Season:

- November 1 WECC RE publishes approved WECC Summer Operating Base Case(s) (heavy load, light load cases, and powerflow and dynamic files) in PSLF, PSS/E and PowerWorld formats for use in the seasonal studies. Cases might be published prior to this date.
- December 1 Summer study plans are finalized and posted to the secure portion of the RC's website. TOPs ensure that Always Credible MCs posted in the secure portion of the RC's website are updated.
- December 15 Subregions complete coordinated subregional base cases. This is a suggested target date. TOPs in the subregion(s) may agree on a different target date, as appropriate.
- April 1 Accepted seasonal operating study reports and detailed results are posted to the secure RC's website.
- May 1 Final versions of the coordinated Operating Plans are posted to the secure RC's website.
- June 1 Summer operating season begins.

Winter Season:

- April 1 WECC RE publishes approved WECC Winter Operating Base Case(s) (heavy load, light load cases, and powerflow and dynamic files) in both PSLF, PSS/E and PowerWorld formats for use in the seasonal studies. Cases might be published prior to this date.
- May 1 Winter study plans are finalized and posted to the secure RC's website. TOPs ensure that Always Credible MCs posted in the secure portion of RC's site are updated.
- May 15 Subregions complete coordinated subregional base cases. This is a suggested target date. TOPs in the subregion(s) may agree on a different target date, as appropriate.
- September 1 Accepted seasonal operating study reports and detailed results are posted to the secure portion of the RC's site.
- October 1 Final versions of the coordinated Operating Plans are posted to the secure portion of RC's site.
- November 1 Winter operating season begins.

⁶ If date falls on a weekend or a holiday, the applicable deadline is the following business day.

Spring Season:

- August 1 WECC RE publishes approved WECC Spring Operating Base Case(s) (heavy load, light load cases, and powerflow and dynamic files) in both PSLF, PSS/E and PowerWorld formats for use in the seasonal studies. Cases might be published prior to this date.
- October 1 Spring study plans are finalized and posted to the secure RC’s website. TOPs ensure that Always Credible MCs posted in the secure RC’s website are updated.
- October 15 Subregions complete coordinated subregional base cases. This is a suggested target date. TOPs in the subregion(s) may agree on a different target date, as appropriate.
- February 1 Accepted seasonal operating study reports and detailed results are posted to the secure RC’s website.
- March 1 Final versions of the coordinated Operating Plans are posted to the secure RC’s website.
- April 1 Spring operating season begins.

Attachment II: RC Seasonal Process – Study Plan Outline

For consistency, and to aid in the review of seasonal studies, TOPs are encouraged to follow the outline provided below when developing the study plan:

Introduction^{*7}

1. Season being studied and period of time for which study is considered valid
2. Purpose of the study
 - a. Path SOL review
 - b. Investigate topology changes
 - c. Revised system conditions, e.g., load level different from prior studies
 - d. Other
3. Entities with whom the study will be coordinated
4. Timeline and milestones
5. The TOPs (and contact information) that will perform the specific study duties

Base Case Coordination and Assumptions*

1. Starting approved WECC or subregional base case(s) used
2. System adjustments made to base case
3. Seasonal specific Facility Ratings changes
4. System additions or retirements to be considered
5. WECC dynamics file to be used and any adjustments or changes
6. Identification of new or modified RAS to be included
7. Planned maintenance outages, either internal or external facilities to be included or for which sensitivity studies will be performed, if applicable
8. Unit or line sensitivities to be included, if any

Study Criteria (consistent with the applicable RC's SOL Methodology)*

1. Power flow performance criteria (state explicitly if external facilities are checked for violations – table format preferred)
 - a. Pre-Contingency Facility Rating and System Voltage Limit criteria
 - b. Post-contingency Facility Rating and System Voltage Limit criteria for Single contingencies
 - c. Post-Contingency Facility Rating and System Voltage Limit criteria for Credible MCs

⁷ Sections with an asterisk (*) are considered to be minimum recommendation if a study plan is created. In addition, the numbered bullets within each section are recommended when they are applicable to the study plan.

2. Transient performance criteria (state explicitly if external facilities are checked for violations)
 - a. Voltage dip for single Contingencies and Credible MCs
 - b. Voltage recovery for single Contingencies and Credible MCs
 - c. Damping
 - d. Frequency dip for single Contingencies and Credible MCs
 - e. Type of faults (e.g., three phase or single phase)
 - f. Duration of fault in cycles
 - g. Generic statement of how faults are applied (e.g., at the bus, % of the line, etc.)

System Stressing Methodology (if applicable)

1. Briefly describe which of the stressing options as provided in the applicable RC's SOL Methodology for the Operating Horizon will be applied

Types of Studies to be Performed*

1. Transfer analysis on path/interface
2. N-1, N-2, or IROL-related N-1-1 or N-1-2 analyses
3. Sensitivity analysis (units, line flows, path transfers, etc.)
4. Transient analysis
 - a. Types, duration and location of faults to be applied
5. Voltage Stability methodology
 - a. e.g. Q/V or P/V or both and how margin is applied to be compatible with RC SOL Methodology stressing options
6. Other

Description of How Any Instability, Cascading or Uncontrolled Separation are Identified⁸

Description of How Any Potential Conditional IROLs for N-1-1 and N-1-2 Conditions are Identified⁹

Appendix

1. List or description of single Contingencies to be studied*¹⁰
2. List of Always Credible MCs to be studied (internal and external)*
3. List of any Conditionally Credible MCs to be studied

⁸ Reference the RC's SOL Methodology for the Operating Horizon

⁹ Reference the RC's SOL Methodology for the Operating Horizon

¹⁰ These numbered bullets with an asterisk (*) are considered to be minimum recommendation if a study plan is created.

Attachment III: RC Seasonal Process – Study Checklist

This checklist is intended to aid in performing the studies and developing the study reports

Seasonal Operations Planning Coordination Study Checklist		
ITEM	Description	Yes/No
1	Has the purpose of the study been clearly described and documented?	
2	Have the appropriate subregions reviewed the study?	
3	Is it clear which TOP(s) are performing the studies?	
4	Is an existing Stability Limit or IROL being changed?	
4b	If answer to 4 is yes, is reason for revision clearly stated in the report?	
5	Has a new Stability Limit been identified?	
5b	If the answer to 5 is yes, is the reason for – and seasonal study value of – the new Stability Limit clearly identified in the report?	
6	Were there any Contingencies or operating conditions that impacted other TOPs?	
6a	If answer to 6 is yes, were technical studies coordinated with the impacted TOPs?	
6b	If answer to 6 is yes, has a coordinated Operating Plan been developed?	
7	Are base case adjustments adequately documented in the study report?	
8	Does the study report include all sections in the Seasonal Planning Study Report outline? If not, briefly explain why the standard outline was not followed in this instance.	
9	Were any instabilities, Cascading or uncontrolled separation identified?	
9a	If answer to 9 is yes, are the following included in the report: <ol style="list-style-type: none"> 1. The type of phenomenon identified – for example, Cascading (per the Cascading test described in the SOL Methodology), uncontrolled separation, voltage collapse, angular instability, transient voltage dip criteria violation 2. The associated Stability criteria used as part of determining the instability 3. The associated Contingency(ies) which result(s) in the instability, Cascading or uncontrolled separation 4. The amount of load that is lost due to instability, Cascading or uncontrolled separation, if it is possible to make this determination 5. Any RAS action, under voltage load shedding (UVLS) action, under frequency load shedding (UFLS) action, or any other automatic scheme or manual action that results in load loss required to address the instability, Cascading or uncontrolled separation 	
9b	If the answer to 9 is yes, has an Operating Plan to mitigate the instability risks been developed and coordinated?	
9c	If the answer to 9 is yes, is an operating nomogram needed?	
9d	If the answer to 9 is yes, has the instability risk been communicated to the RC?	
10	Was stressing performed using the guidelines in the applicable RC's SOL Methodology or was a different approach adopted?	

Seasonal Operations Planning Coordination Study Checklist		
ITEM	Description	Yes/No
11	Were all studies performed per the applicable RC's SOL Methodology?	
12	Are the power flow plots, Stability plots and other supporting documents included in the appendices? If answer is no, briefly explain in the report where they are available.	

Attachment IV: RC Seasonal Process – Study Report Outline

For consistency, and to aid in the review of seasonal studies, TOPs are encouraged to follow the template provided when developing the final study results report:

[Name of Study]

Seasonal Operations Planning Coordination Study Report

For

[Identified Season]

Performed By:

[Name of Entity Providing Report]

[Subgroup / Region]

[Date]

Table of Contents

Table of contents - needed for large studies to facilitate review

Executive Summary*¹¹

1. Summary of any BES issues identified or required operating restrictions
2. A summary of the type of phenomenon identified – for example, steady-state issues, Cascading (per the Cascading test described in the applicable RC’s SOL Methodology), uncontrolled separation, voltage collapse, angular instability, transient voltage dip criteria violation, etc.
3. Identification of the limiting or critical conditions, elements and Contingencies, etc.
4. Load/Generation Impacts identified
5. Nomograms to be used, if any
6. Affected TOPs and/or path/system interactions
7. Additional study highlights, etc.

Study Scope/Description*

1. Why was the study performed? What were the objectives of performing the study?
2. What is being studied?
3. Geographical overview diagrams, system area one lines, etc.

¹¹ Sections with an asterisk (*) are considered to be minimum recommendation if a report is created. In addition, the numbered bullets within each section are recommended when they are applicable to the study performed.

4. Path/interface or system description (if applicable). Indicate location of metering points for paths/interfaces
5. Include study scope; when the last similar study was performed, if at all
6. Indicate what the critical season is for the path/System being studied

Study Case Description and Adjustments*

1. Starting approved WECC or subregional base case(s) used
2. Identified changes to base cases (include a summary discussion of adjustments made to the starting base case, e.g., Load, Generation and Topology)
3. How system was stressed (include a brief description of major actions taken to stress the starting case to arrive at the studied system conditions)
4. Any sensitivities included in the study
5. Identification of planned facilities out of service that were studied
6. Table of pertinent data (Generation, Load, path Flows, etc.) for each base case (This allows for quick assessment of conditions that were studied)
7. Other pertinent study assumptions used beyond those required in the applicable RC's SOL Methodology
8. New facilities that are going into service that are included in the study along with estimated in service dates

RAS and Other Automatic Schemes Studied*

1. Identification of RAS and other automatic schemes employed in the study (include brief description of the scheme and key actions studied)
2. Mention whether the RAS is expected to be unavailable
3. Clearly indicate if any RAS action, under voltage load shedding (UVLS) action, under frequency load shedding (UFLS) action, or any other automatic scheme or manual action that results in load loss required to address any instability, Cascading or uncontrolled separation

Study Criteria*

1. Include a description of study criteria used in this particular study (e.g., voltage limits, steady-state (post-transient) voltage Stability Limits, transient Stability Limits, Facility Ratings, Cascading test or uncontrolled separation) if it deviates from the applicable RC's SOL Methodology.
2. If the study criteria does not deviate from the RC SOL Methodology, a statement indicating the study followed the RC SOL Methodology should be included.

Steady-State Study Assessment

1. List of Contingencies simulated (e.g., single Contingencies and Credible MCs applied, N-1-1, N-1-2, etc.) The list of Contingencies can reside in an appendix. Single Contingencies (SC) may be listed by type rather than a complete listing of every single Contingency. For example, if a study examines all single Contingencies in a TOP Area, there is no need to list every Contingency examined. A description of the types of Contingencies analyzed will suffice.

2. Include any summary tables that are appropriate

Reactive Margin Assessment

1. List of Contingencies applied in the assessment (SCs, Credible MCs, etc.)
2. Any identified insufficient reactive margins
3. Include any summary tables that are appropriate

Transient Stability Assessment

1. List of Contingencies applied in the assessment (SCs, Credible MCs, etc.)
2. Switching Sequences and case data is encouraged to be available upon request
3. Any other study assumptions made beyond those required by the RC SOL Methodology
4. Include any summary tables that are appropriate
5. The associated Contingency(ies) which result(s) in the instability, Cascading or uncontrolled separation
6. The amount of load and generation that is lost due to instability, Cascading or uncontrolled separation, if it is possible to make this determination

Interactions with Other Paths/Systems

1. Describe identified path/interface interactions, if any, and describe the nature of impact
2. Include other systems significantly impacted, if any, and describe the nature of impact
3. Information in this section will later serve to identify the TOPs that need to collaborate when coordinating development of plans, processes and procedures that support operation within established limits

Conclusions*

1. Summary of significant study findings, Stability limits or potential IROLs
2. Include identification of the limiting and critical conditions, elements and Contingencies, etc.
3. Identification of any Operating Plans that need to be developed for the upcoming season

Contact Information

1. Name, email address and phone number of primary and alternate contacts

Appendices

1. Power Flow Plot Diagrams
2. Stability Plots (Bus Voltages, Rotor Angles, Frequency, etc.)
3. Other supporting documentation
4. Number each Appendix for ease of review
5. Operations Planning Coordination Study Checklist

Attachment V: RC Seasonal Process – Operating Plan Checklist

Operating Plans may include:

- Both pre- and post-Contingency mitigation plans/strategies.
 - Pre- Contingency mitigation plans/strategies are actions that are implemented before the Contingency occurs to prevent the potential negative impacts on reliability associated with the Contingency.
 - Post-Contingency mitigation plans/strategies are actions that are implemented after the Contingency occurs to bring the system back within limits.
- Details to include appropriate timelines to escalate the level of mitigating plans/strategies to ensure BES performance is maintained as per the RC SOL Methodology.
- The appropriate time element to address potential SOL exceedances.

This checklist is intended to aid in the development of Operating Plans that are issued as part of the RC Seasonal Process.

Seasonal Operating Plan List	
ITEM	Description
1	Is purpose of the Operating Plan clearly stated?
2	Are any limits and monitored interfaces, if applicable, clearly defined?
3	Are limiting facilities and Contingencies clearly identified?
4	Are applicable RAS and their actions identified?
5	Are the impacted entities clearly identified?
6	Are the mitigation measures and timeframes for implementation clearly stated?
7	Were the technical studies that identified the need for the Operating Plan coordinated with impacted TOPs?
8	Have the mitigation measures been fully studied to resolve the issue?
9	Is the procedure necessary to prevent instability, Cascading or uncontrolled separation?

Attachment VI: Principles of the RC Seasonal Process

The NERC Reliability Standards do not require reliability entities to perform seasonal studies. NERC Reliability Standards do require:

- Planning Coordinators (PC) and Transmission Planners (TP) to perform Planning Assessments for the Near-Term Transmission Planning Horizon (TPL-001-5.1)
- The TOP and Balancing Authority (BA) to perform functions specified in its RC's outage coordination process, which includes studies for planned outage conditions (IRO-017-1)
- TOPs and RCs to perform Operational Planning Analyses (OPA) (TOP-002-4 and IRO-008-2 respectively)
- TOPs and RCs to perform Real-time Assessments (RTA) at least once every 30 minutes (TOP-001-5 and IRO-008-2 respectively)

The studies performed as part of the RC Seasonal Process are neither an extension of the TPL Planning Assessments, nor do they serve the same purpose as the studies performed as part of the IRO-017 Outage Coordination Process. Rather, these studies are intended to be unique from these studies to the extent practicable. While certain planned outages may be included in studies performed as part of the RC Seasonal Process due to their long duration, the focus of the RC Seasonal Process is not centered on the assessment of specific planned outages.

The studies performed as part of the RC Seasonal Process are intended to add real, tangible value to operations reliability and to avoid performing routine studies that provide essentially the same results season after season. The subregional study groups retain discretion to perform studies on a routine basis. The RC Seasonal Process is flexible to address the needs of the RC and the TOPs within the subregional study group area. For example, the studies performed for one summer season might be very different from the studies performed the next summer season.

The RC Seasonal Process facilitates reliable operation of the BES in the RC Area by:

1. Providing a mechanism by which the RC and TOPs ensure that non-IROL Stability SOLs are established and potential IROLs are identified consistent with the applicable RC's SOL Methodology.
2. Providing a forum for TOPs to perform coordinated studies in an orderly and transparent manner.
3. Supporting base case coordination and development.
4. Coordinating Operating Plans prior to the beginning of each operating season to provide sufficient lead-time to develop and coordinate relevant operating tools and provide training for System Operators and other operating personnel.
5. Working seamlessly with – and providing continuity with – assessments required by the NERC Reliability Standards, including TPL Planning Assessments and IRO-017 Outage Coordination assessments.
6. Ensuring consistent study methodologies and criteria when performing seasonal studies, identifying instability risks, identifying potential IROLs and verifying acceptable performance for the projected seasonal system conditions.
7. Providing consistency in communicating seasonal study results.
8. Allowing for peer review of seasonal studies via the subregional study group forums.
9. Defining the specific role of various entities (subregional study groups, TOPs, RC, etc.) in the RC Seasonal Process.

Attachment VII – RC Seasonal Process – Definitions

1. Impacted Entity/TOP

In several locations in this document, the term “impacted entity” or “impacted TOP” is used to identify the parties for follow-up, coordination, and resolution of any reliability issues uncovered by a study or analysis. Impacted TOPs are also consulted in the development of Operating Plans for reliable system performance.

The following are some of the guidelines TOPs may use to identify impacted entities:

1. Studies in one TOP Area identify potential SOL exceedance in that TOP Area or in another TOP Area requiring TOP-to-TOP coordination to address the SOL exceedance.
2. Study results reveal simultaneous interaction that may result in a nomogram relationship of conditions in one TOP Area with those in another TOP Area.
3. In the course of base case adjustments in preparation for a study, potential SOL exceedances are observed in another TOP Area.
4. Studies involve transmission paths or BES Facilities that are jointly operated by multiple TOPs.
5. Operational experience determines that TOP-to-TOP coordination is necessary to address potential SOL exceedances.

2. Study Seasons

The seasons eligible for study as part of the RC Seasonal Process include summer, winter and spring. If prior studies are deemed by the subregional study group to be sufficient for a given season, the subregion may determine that performing a new study is not warranted.

While fall studies have not historically been performed as part of coordinated seasonal studies, subregional study groups might see a need to perform fall studies. If this is the case, the subregional study group may determine the appropriate WECC case(s) to be used and are encouraged to establish their own timeline since fall studies are not addressed in the Study Timeline in Attachment I.

3. Contingencies

Reference the applicable RC’s SOL Methodology for instructions on the selection of Always Credible MCs and Conditionally Credible MCs. Single Contingencies, Always Credible MCs, and applicable Conditionally Credible MCs comprise the Contingencies to be included in the seasonal studies per the SOL Methodology.

The selection of Contingencies (single and multiple) to be included in a given study depends on the type of study being performed and the specifics of that study. The subregional study groups may select applicable Contingencies based on system knowledge, prior experience and engineering judgment. The Contingencies included in a given study are encouraged to be listed in the study plan and in the final study report.

4. Facility Outages

Planned transmission or generation Facility outages that span the entire season can be removed from service in the operating base case(s) for accuracy. While the RC Seasonal Process is not intended to be an extension of the RC Outage Coordination Process, subregions have discretion to include certain prior outages in a given study. Any outages included in the studies are encouraged to be listed in the study plan and in the final study report. The determination of outages to be included in any given study is the responsibility of the subregional study group. Subregional study group chairs may coordinate with other subregions to determine any external outages to include.