Reliability Coordinator

Seasonal Operations Planning Coordination Process

Rev. 2.0

By

Peak Reliability

Month XX, 2018

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A. Applicability

Transmission Operators (TOP)

Peak Reliability Coordinator (RC)

WECC Reliability Entity (RE)

B. Effective Date

This revision of the RC Seasonal Operations Planning Coordination Process is effective OctoberMay 1, 2018 for the seasonal studies for the winter spring of 2018/2019.

C. Definitions and Terms

The capitalized terms used in this RC Seasonal Operations Planning Coordination Process shall have meanings set forth in the NERC Glossary of Terms and in Peak Reliability's *SOL Methodology for the Operations Horizon* (SOL Methodology) v8.1 or its successor. Any capitalized term used in this document that is not in the NERC Glossary of Terms or in the RC's SOL Methodology is captured in Appendix I.

D. Future Revisions

This document is a living document that will be revised as needed to be the most beneficial to Bulk Electric System (BES) reliability in the Peak RC Area. Revisions to this document will be available for review by TOP stakeholders prior to implementation.

E. RC Seasonal Operations Planning Coordination Process – Principles

The NERC Reliability Standards do not require reliability entities to perform seasonal operations planning assessments. However, the NERC Reliability Standards do require:

- Planning Coordinators (PC) and Transmission Planners (TP) to perform Planning Assessments for the Near-Term Transmission Planning Horizon (TPL-001-4)

- 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-001-3 and IRO-008-2 respectively)

The RC Seasonal Operations Planning Coordination Process fits between the TPL Planning Assessments and Peak's IRO-017-1 Outage Coordination Process. Reference Figure 1: Study Timeline below.

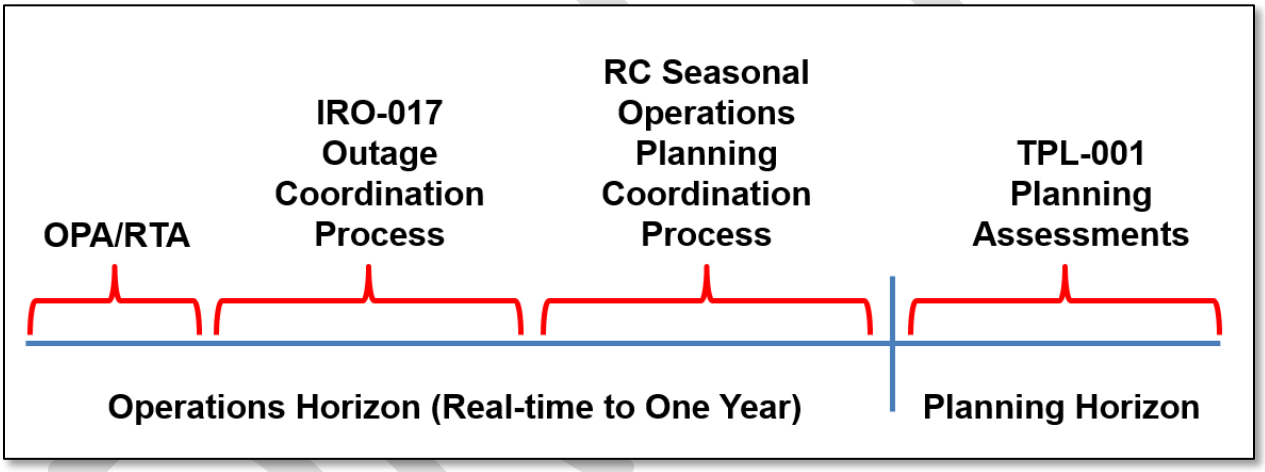

Figure 1: Study Timeline

The studies performed as part of the RC Seasonal Operations Planning Coordination 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 Operations Planning Coordination Process due to their long duration, the focus of the RC Seasonal Operations Planning Coordination Process is not centered on the assessment of specific planned outages.

The studies performed as part of the RC Seasonal Operations Planning Coordination 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. However, the subregional study groups retain discretion to perform studies on a routine basis. The RC Seasonal Operations Planning Coordination 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 studies performed as part of the RC Seasonal Operations Planning Coordination Process are subject to the RC's SOL Methodology. Accordingly, the concepts, principles, methods, technical criteria and requirements described in the RC's SOL Methodology apply to the studies performed as part of the RC Seasonal Operations Planning Coordination Process.

F. Scope of the RC Seasonal Operations Planning Coordination Process

The scope of the RC Seasonal Operations Planning Coordination Process includes the following:

1. Determining the studies to be performed by the subregional study groups for a given season.
2. Performing coordinated seasonal studies within the subregional study groups.
3. Coordinating/reviewing study results within and among the subregional study groups.
4. 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.

The types of studies that may be within scope of the RC Seasonal Operations Planning Coordination Process include the following:

1. Studies to investigate reliability issues (including stability, thermal or voltage issues) that require TOP-to-TOP coordination for the development of Operating Plans.

2. 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, thermal or voltage constraints.

3. Studies to identify instability, Cascading or uncontrolled separation risks for single Contingencies, Always Credible Multiple Contingencies, or N-1-1 or N-1-2 Contingency scenarios per the RC's SOL Methodology. These studies include stressing the system to reasonable maximum stressed conditions per the RC's SOL Methodology and are aimed at identifying potential IROLs and non-IROL stability limits. Accordingly, the RC's SOL Methodology has a major role in these studies.

Analyses that are out of scope may include those that are aimed at identifying thermal and voltage 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. Thermal and voltage issues internal to a TOP Area are expected to be identified and addressed as part of the IRO-017 Outage Coordination Process and subsequent OPAs.

The RC Seasonal Operations Planning Coordination Process facilitates reliable operation of the BES in the Peak 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 RC's SOL Methodology.

2. Providing a forum for TOPs to perform coordinated studies in an orderly and transparent manner.

3. 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.

4. Working seamlessly with – and providing continuity with – assessments required by the NERC Reliability Standards, including TPL Planning Assessments and IRO-017 Outage Coordination assessments.

5. Ensuring consistent study methodologies and criteria when performing seasonal assessments, identifying instability risks, identifying potential IROLs and verifying acceptable performance for the projected seasonal system conditions.

6. Providing consistency in communicating seasonal study results.

7. Allowing for peer review of seasonal studies via the subregional study group forums.

8. Defining the specific role of various entities (subregional study groups, TOPs, RC, etc.) in the RC Seasonal Operations Planning Coordination Process.

G. RC Seasonal Operations Planning Coordination Process Overview

The RC Seasonal Operations Planning Coordination Process contains the following general six steps:

1. Determine the studies to be performed.
2. Develop the study plan.
3. Develop the case(s) for use in the studies.
4. Execute the study plan (perform the studies).
5. Review, accept and publish study reports.
6. Develop/review and publish associated Operating Plans.

Once these six steps are completed, the Seasonal Operations Planning Coordination Process is deemed completed. 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.

Each of these steps is described further in the subsequent sections.

Determine the Studies to be Performed

Determining which studies to perform for any given season is a critical aspect of the RC Seasonal Operations Planning Coordination Process. The RC Seasonal Operations Planning Coordination Process affords ample flexibility in the studies that are performed for a given season. The studies performed as part of the RC Seasonal Operations Planning Coordination 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. However, if a subregional study group sees value in performing certain studies on a routine basis, the subregional study group may do so.

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 study selection process is encouraged to be collaborative and based on the greatest reliability need, given the resources available.

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

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, 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 described in the 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 long-term 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 limitations 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 will be determined based on engineering judgment, operating experience and prior assessments.

Develop the Study Plan

After the studies to be performed have been determined, the subregional study group should develop and document the study plan. The study plan should address the specifics for the study including:

1. Purpose of the study.
2. Timelines and milestones.
3. Base case coordination and assumptions.
4. Study criteria.
5. System stressing methods.

6. Types of studies to be performed.

7. Description of how any instability, Cascading or uncontrolled separation is identified[1].

8. Description of how any potential long-term IROLs for N-1-1 and N-1-2 conditions are identified[2].

The subregional study groups are expected to agree on their respective study plans prior to moving forward to the next step. Where there is a common transmission path between subregions that is being studied by either subregion, the assumptions and specifics of this path study should be agreed upon by the respective subregions prior to study commencement.

When documenting the study plan for a given study, the subregional study groups should adhere to the Seasonal Study Plan Outline in Appendix II and the timeline in Appendix VI.

Develop the Case(s) for Use in the Studies

The study plan is expected to specify the WECC operating case(s) to be used in the study. Once that decision is made, the TOPs within the subregional study groups need to review the WECC operating case(s) to ensure accuracy and to set up the initial conditions for the cases involved. The subregional study group is responsible for coordinating TOP activities to ensure that case finalization occurs in a coordinated and timely manner. Case development is needed even if there are no studies performed for that season. For example, if the subregional study group determines that there is no need to perform a spring study, the subregional study group should still coordinate the case and make changes as necessary to provide an accurate case for TOP's subsequent use as a starting case for outage coordination and OPAs performed for the spring season.

Execute the Study Plan (Perform the Studies)

The study plan is expected to specify which entities are responsible for performing the various aspects of the study. The study plan should include a timeline and

[1] Reference section S of Peak's SOL Methodology

[2] Reference section T of Peak's SOL Methodology

milestone dates for completing the study. As part of this step, the entities involved in performing the studies are expected to meet the schedules and to keep the subregional study group chair updated on their progress.

Review, Accept and Publish Study Reports

After the studies are completed, the study results are reviewed and accepted by the subregional study group members. Any study results that impact other subregional study groups should include those groups in the review and acceptance. Studies and subsequent reviews might occur in an iterative fashion. Subregional study groups are encouraged to allow time for study iterations in the overall study timeline.

When documenting the study results, the subregional study groups should adhere to the study report outline in Appendix III and the timeline in Appendix VI of this document.

Once the studies and associated study reports are accepted and finalized, the study documentation needs to be posted on peakrc.org under Operations => Study Libraries => Seasonal SOL Coordination. The documentation is arranged by season, by subregional study group and by TOP.

Each subregional study group should review the Seasonal Operations Planning Study Checklist as part of conducting the studies and creating the final study report (see Appendix IV).

Develop/Review and Publish Associated Operating Plans

Often the seasonal studies may require the development of new Operating Plans or the revision of existing Operating Plans[3]. Once the studies have been reviewed and accepted, the impacted TOPs are expected to collaborate to develop or revise Operating Plans as necessary.

Each subregional study group should review the Seasonal Operating Plan Checklist when developing or revising Operating Plans as part of the RC Seasonal Operations Planning Coordination Process (see Appendix V).

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

H. Coordination Responsibilities

Since the scope of the RC Seasonal Operations Planning Coordination Process includes reliability issues that require TOP-to-TOP coordination, it is imperative that the TOPs involved collaborate and coordinate their tasks. The following list of actions describes some of the coordination responsibilities associated with the RC Seasonal Operations Planning Coordination Process:

1. Impacted TOPs have been identified by the TOP(s) performing the seasonal operating 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 Operations Planning Coordination 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.

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. 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 expected to address the roles, responsibilities and specific actions to be taken by entities involved.

7. 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 issue is not resolved to the satisfaction of the disagreeing parties, the TOPs are expected to work with Peak to assist in resolving the issue.

I. 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.

J. Peer Review and Acceptance of Seasonal Studies

The RC Seasonal Operations Planning Coordination Process requires peer review and acceptance of studies performed as part of the RC Seasonal Operations Planning Coordination Process.

Peer Review and Acceptance Criteria

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

1. The study processes and criteria used for identifying thermal and 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 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 TOP representative(s).

3. Reliability issues raised in the study review process have been satisfactorily resolved by the impacted TOPs.

Acceptance Process

Each subregional study group is expected to implement a study acceptance process that provides TOP 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.

Resolution of Outstanding Reliability Issues

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

If attempts to reach consensus remain unachievable, the subregion is expected to document each of the majority and minority positions and bring these to the attention of the Peak RC to facilitate resolution.

K. Role of Subregional Study Groups in the RC Seasonal Operations Planning Coordination Process

Four subregional study groups are recognized by Peak RC as having responsibility for performing, coordinating and accepting seasonal studies in accordance with the RC Seasonal Operations Planning Coordination 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 Operations Study Subcommittee (OSS) representing the California/Mexico subregion.

These subregional study groups are not governed by Peak RC. They each have their own reporting and governance structure and their own responsibilities in accordance with their respective authorities. However, all four subregional study groups have the RC Seasonal Operations Planning Coordination Process in common, i.e., each of the four subregional study groups are to perform the functions specified in the RC Seasonal Operations Planning Coordination Process at a minimum, yet they are free to perform additional studies beyond the RC Seasonal Operations Planning Coordination Process as they are required or as they see fit.

Figure 2 depicts the nature of the commonality of the RC Seasonal Operations Planning Coordination Process among the four subregional study groups. As can be observed in Figure 2, each subregional study group may be required to perform studies or tasks that are outside the scope of the RC Seasonal Operations Planning Coordination Process per their governance or internal process obligations. If a subregional study group has such obligations, these studies or tasks would fall outside the scope of the RC Seasonal Operations Planning Coordination Process. It is important that this distinction be made when developing study plans for those studies that are performed under the RC Seasonal Operations Planning Coordination Process versus those that are not.

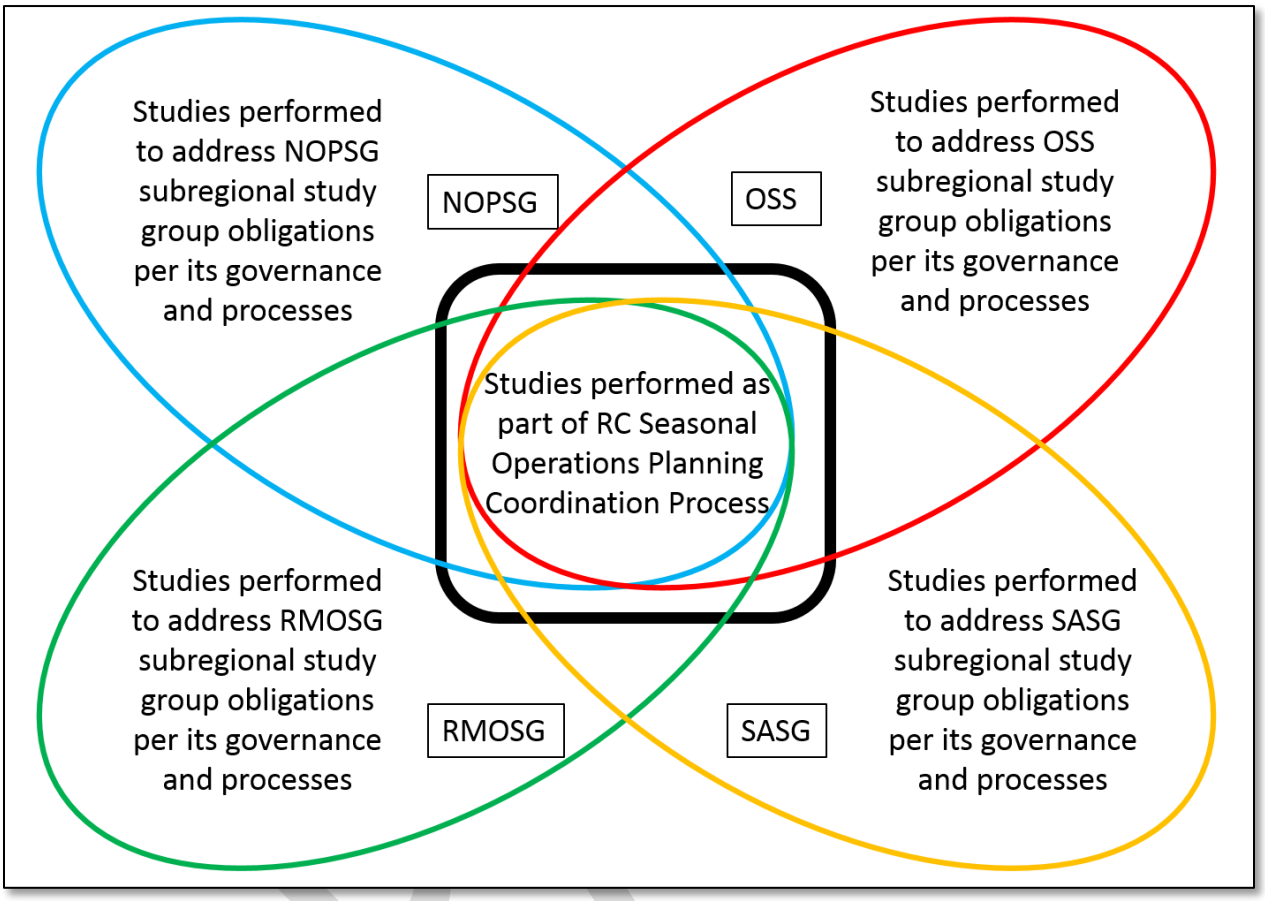

Figure 2: Commonality Diagram

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

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

1. Elect a Chair who is expected to:

    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 should 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.

5. Review and coordinate seasonal studies to verify that the RC Seasonal Operations Planning Coordination 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 Peak RC in support of the development of Operating Plans.

11. Ensure that resulting documentation is posted on the peakrc.org website. Examples of such documentation include study plans, study reports and Operating Plans.

L. Role of TOPs in the RC Seasonal Operations Planning Coordination Process

The RC Seasonal Operations Planning Coordination Process does not require TOPs to perform their own internal seasonal assessments. TOPs are at liberty to perform such assessments if they see value in doing so for their own purposes.

The expected roles and responsibilities of the TOPs 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 by attending meetings and conference calls.

3. Coordinate with subregional study group and Peak RC to determine the studies that are to be performed for a given season and the system conditions under which they should 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 ensure that the cases are accurate and ready for use for the studies being performed for the season. Additionally, TOPs should provide input to their respective Transmission Planners when the WECC operating base cases are being developed.

6. Perform seasonal studies as part of the RC Seasonal Operations Planning Coordination Process, and in accordance with the RC's SOL Methodology.

7. Prepare Operating Plans developed as part of the RC Seasonal Operations Planning Coordination Process to support operational reliability consistent with the RC's SOL Methodology.

8. Consistent with the timelines in Appendix VI, update and publish the list of Always Credible Multiple Contingencies for its TOP Area for use in seasonal planning studies.

9. Review and provide comments on seasonal studies as appropriate.

While the level of involvement in the RC Seasonal Operations Planning Coordination 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 Operations Planning Coordination Process.

M. Role of Peak Reliability in the RC Seasonal Operations Planning Coordination Process

The expected roles and responsibilities of Peak RC 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 should be studied.
3. Participate in the development of study plans to ensure that the studies will achieve the objectives of the RC Seasonal Operations Planning Coordination Process.
4. 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 RC's SOL Methodology.
5. Provide guidance on the consistency of Operating Plans developed as part of the RC Seasonal Operations Planning Coordination Process to support operational reliability consistent with the RC's SOL Methodology.
6. Develop and maintain the RC Seasonal Operations Planning Coordination Process document.
7. Participate as necessary with the subregional study groups to discuss approaches to resolve outstanding reliability issues prior to each operating season.
8. Facilitate dispute resolution of seasonal studies for reliability issues related to stability limits and identification of potential IROLs. It is not the responsibility of the RC to resolve contractual or commercial issues that may exist between TOPs.

N. Role of the WECC RE in Seasonal Study Coordination

The expected roles and responsibilities of the WECC Regional Entity (RE) include the following:

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 Appendix VI.

2. Address base case issues raised by TOPs and the RC; e.g., any delays in base development.

O. Operating Base Case Development

Development and approval of operating base cases (in both PSLF[4], PSS/E[5] and PowerWorld formats)[6] used for seasonal studies is coordinated by the WECC RE. Since TOPs must use the approved operating base cases as starting power system conditions, it is important that these base cases (power flow and dynamics) are published by the WECC RE in time to implement seasonal studies per the Seasonal Coordination Timelines in Appendix VI.

Depending on the studies being undertaken, TOPs are expected to coordinate with impacted entities to adjust the approved operating base cases to reflect the specific conditions being studied. Coordinated base cases must be completed in a timely manner.

If there is a delay in the publication of an approved operating base case, Peak RC and the subregional study group chairs will convene and determine an appropriate course of action.

[4] Positive Sequence Load Flow/GE PSLF Software.

[5] Power System Simulator for Engineering.

[6] Or other recognized formats as determined by the WECC RE.

P. Contingencies

Reference the RC's SOL Methodology for instructions on the selection of Always Credible Multiple Contingencies (MC) and Conditionally Credible MCs. It is expected that single Contingencies, Always Credible MCs, and applicable Conditionally Credible MCs comprise the Contingencies to be included in the seasonal studies.

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 should be listed in the study plan.

Q. Facility Outages

Planned transmission or generation Facility outages that span the entire season must be removed from service in the operating base case(s) for accuracy. While the RC Seasonal Operations Planning Coordination 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 should be listed in the study plan and in the final study report.

R. Study Seasons

The seasons eligible for study as part of the RC Seasonal Operations Planning Coordination 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 planning studies, subregional study groups might see a need to perform fall studies. If this is the case, the subregional study group should determine the appropriate WECC case(s) to be used and should establish their own timeline since fall studies are not addressed in the Study Timeline in Appendix VI. The subregional study groups are not obligated to create or provide a fall case.

S. Communicating Identified Instability, Cascading or Uncontrolled Separation

One of the primary objectives of the RC Seasonal Operations Planning Coordination Process is to identify any risks for instability, Cascading or uncontrolled separation applied consistent with the RC's SOL Methodology. See section F, "Scope of the RC Seasonal Operations Planning Coordination Process." The description of instability, Cascading or uncontrolled separation provided in the RC's SOL Methodology should be applied.

It is imperative that the study reports specifically call out any instability, Cascading or uncontrolled separation identified in the seasonal planning studies. The study reports, as outlined in Appendix III, should specifically address the following:

1. The type of phenomenon identified – for example, Cascading (per the Cascading test described in the RC's SOL Methodology), uncontrolled separation, voltage collapse, angular instability, transient system performance 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 may potentially be lost due to instability, Cascading or uncontrolled separation, if it is possible to make this determination.
5. Any automatic scheme, including Remedial Action Scheme 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[7].

[7] If any of these measures were taken to address instability, Cascading or uncontrolled separation, the report needs to clearly indicate that these automatic schemes were responsible for the avoidance of the instability, Cascading or uncontrolled separation. It is critical that there is an awareness that without these schemes, instability, Cascading or uncontrolled separation could result.

T. Study Plan and Report Outlines

For consistency, and to aid in the review of seasonal studies, TOPs should follow the outline provided in Appendix II when developing the study plan and the outline provided in Appendix III when developing study reports.

U. Timelines for the RC Seasonal Operations Planning Coordination Process

To ensure that the RC Seasonal Operations Planning Coordination Process is executed in an orderly and timely manner, the timelines stipulated in Appendix VI apply. TOPs and subregional study groups are expected to take these timelines into consideration when coordinating subregional study group activities such as developing base case(s), any study iterations and report acceptance processes.

V. Controlled Copy

The online electronic copy of the RC Seasonal Operations Planning Coordination Process is the only controlled copy and is posted on the PeakRC.com site. Printed copies may be out of date.

W. Contact Information

For information about this RC Seasonal Operations Planning Coordination Process, or if you have any questions, please contact sol.help@peakrc.com. Alternatively, contact the following Peak Reliability Operations Engineering Support staff:

Don McInnis (primary contact) at (970) 590-1172 or dmcinnis@peakrc.com

Jason Ausmus (alternate contact) at (970) 613-3563 or jausmus@peakrc.com

Version History

Version	Date	Action	By	Change Tracking
1.0	11/26/2013	Issued for Implementation	Jaison Tsikirai	**Original process document** Document 'Peaked' following the 2/12/14 FERC approval of bifurcation. No version change. No issue date change. Effective date remains the same.
1.1	4/25/2017	Revised	Don McInnis	Revised to coordinate with Peak SOL Methodology 8.1 and retirement of TOP-007-WECC-1a.
2.0	X/X/2018	Major Revision	Vic Howell	Revised per the Seasonal Operations Planning Coordination Process Revision Project.

Appendix I: Definitions and Terms

- **Defined Term.** Defined terms and definitions, if any, to be added here.

Appendix II: Seasonal Study Plan Outline

Introduction

1. Season being studied and period of time for which study is considered valid
2. Purpose of the study
    a. Path 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. WECC or subregional case to be 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 RC's SOL Methodology)

1. Power flow performance criteria (state explicitly if external facilities are checked for violations – table format preferred)
    a. Pre contingency thermal and voltage criteria
    b. Post contingency thermal and voltage criteria for N-1
    c. Post contingency thermal and voltage criteria for N-2
2. Transient performance criteria (state explicitly if external facilities are checked for violations)
    a. Voltage dip for N-1 and N-2
    b. Voltage recovery for N-1 and N-2
    c. Damping
    d. Frequency dip for N-1 and N-2

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 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, 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

Description of How Any Instability, Cascading or Uncontrolled Separation are Identified[8]

Description of How Any Potential Long-Term IROLs for N-1-1 and N-1-2 Conditions are Identified[9]

Appendix

1. List or description of N-1 contingencies to be studied
2. List of Always Credible Multiple Contingencies to be studied (internal and external)
3. List of any Conditionally Credible Multiple Contingencies to be studied
4. List of N-1-1 that have created issues in past year or been flagged by Planning TPL assessments

[8] Reference section S of Peak's SOL Methodology for the Operating Horizon

[9] Reference section T of Peak's SOL Methodology for the Operating Horizon

Appendix III: Seasonal Operations Planning Coordination Study Report Outline

[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

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 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, etc.
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 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 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); include criteria for determining instability
2. Identify any exceptions used in the study

Post-Disturbance Steady State Study Assessment

1. List of Contingencies simulated (e.g., single Contingencies and credible multiple Contingencies applied, N-1-1, N-1-2, etc.) The list of Contingencies can reside in an appendix. Single Contingencies 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. Any identified insufficient reactive margins
2. Include any summary tables that are appropriate

Transient Stability Assessment

1. List of Contingencies applied in the study (SCs, Credible MCs, etc.)
2. Switching Sequences and case data should 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 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 work together when coordinating development of plans, processes and procedures that support operation within established limits

Conclusions

1. Summary of significant study findings, stability limitations or potential IROLs
2. Include identification of the limiting and critical conditions, elements and Contingencies, etc.
3. Identify any coordinated Operating Plan that has been developed

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

Appendix IV: Seasonal Operations Planning Coordination 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**
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: 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 Peak RC?
10	Was stressing performed per the RC's SOL Methodology?
11	Were transient studies performed per the RC's SOL Methodology?

Seasonal Operations Planning Coordination Study Checklist	
ITEM	**Description**
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.

Appendix V: Seasonal Operating Plan Checklist

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

Seasonal Operating Plan Checklist	
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?
10	Has the Operating Plan been coordinated with impacted entities?

Appendix VI: Seasonal Operations Planning Coordination Study Timelines

The following specific timelines shall apply for each WECC operating season:

Summer Season:

November1 ..... 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 peakrc.org website. TOPs ensure that Always Credible Multiple Contingencies posted in the secure portion of peakrc.org website are updated.

December 15 ..... Subregions complete coordinated subregional base cases, *if needed*. 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 peakrc.org website.

May 1 ..... Final versions of the coordinated Operating Plans are posted to the secure peakrc.org 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 peakrc.org website. TOPs ensure that Always Credible Multiple Contingencies posted in the secure portion of PeakRC.ORG site are updated.

May 15 ..... Subregions complete coordinated subregional base cases, *if needed*. 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 PeakRC.ORG site.

October 1 ..... Final versions of the coordinated Operating Plans are posted to the secure portion of PeakRC.ORG site.

November 1 ..... Winter operating season begins.

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 peakrc.org website. TOPs ensure that Always Credible Multiple Contingencies posted in the secure peakrc.org website are updated.

October 15 ..... Subregions complete coordinated subregional base cases, *if needed*. 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 peakrc.org website.

March 1..... Final versions of the coordinated Operating Plans are posted to the secure peakrc.org website.

April 1..... Spring operating season begins.