



**PEAKRELIABILITY**  
assuring the wide area view

**Reliability Coordinator**  
**Seasonal Operations Planning**  
**Coordination Process**  
**Rev. 2.0**

**By**

**Peak Reliability**

**JuneMonth XX7, 2018**

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**PEAK RELIABILITY — RELIABILITY COORDINATION**

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1 **A. Applicability**

- 2 Transmission Operators (TOP)
- 3 Peak Reliability Coordinator (RC)
- 4 WECC Reliability Entity (RE)

5 **B. Effective Date**

6 This revision of the RC Seasonal Operations Planning Coordination Process is  
7 effective ~~October~~May 1, 2018 for the seasonal studies for the ~~winter-spring~~ of  
8 ~~2018/~~2019.

9 **C. Definitions and Terms**

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

15 **D. Future Revisions**

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

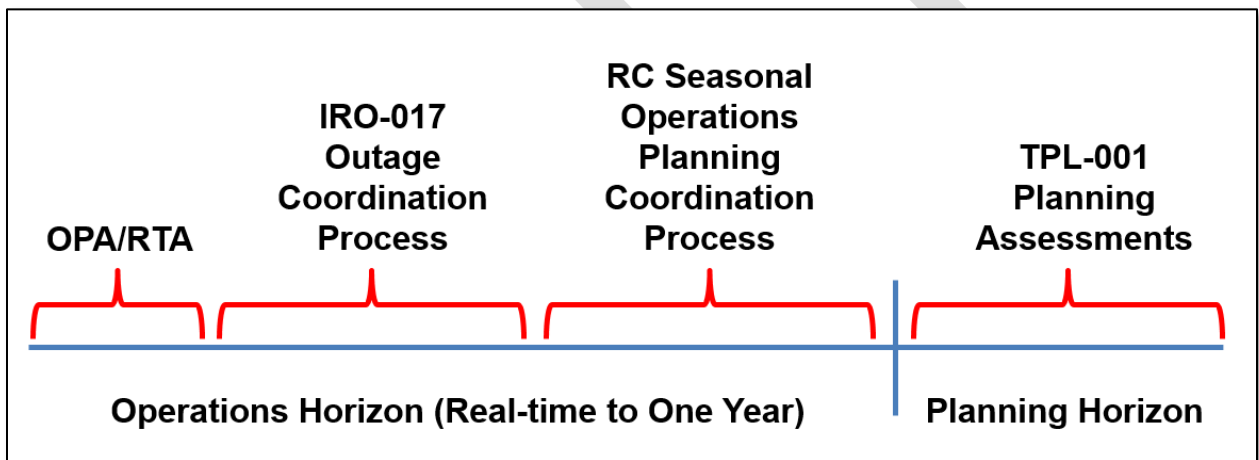
20 **E. RC Seasonal Operations Planning Coordination Process – Principles**

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

- 24 • Planning Coordinators (PC) and Transmission Planners (TP) to perform  
25 Planning Assessments for the Near-Term Transmission Planning Horizon (TPL-  
26 001-4)


- 27       • The TOP and Balancing Authority (BA) to perform functions specified in its  
28       RC’s outage coordination process, which includes studies for planned outage  
29       conditions (IRO-017-1)
- 30       • TOPs and RCs to perform Operational Planning Analyses (OPA) (TOP-002-4  
31       and IRO-008-2 respectively)
- 32       • TOPs and RCs to perform Real-time Assessments (RTA) at least once every  
33       30 minutes (TOP-001-3 and IRO-008-2 respectively)

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



37  
38       **Figure 1: Study Timeline**  
39

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

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


56 The studies performed as part of the RC Seasonal Operations Planning Coordination  
57 Process are subject to the RC's SOL Methodology. Accordingly, the concepts,  
58 principles, methods, technical criteria and requirements described in the RC's SOL  
59 Methodology apply to the studies performed as part of the RC Seasonal Operations  
60 Planning Coordination Process.

61 **F. Scope of the RC Seasonal Operations Planning Coordination**  
62 **Process**

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

- 65 1. Determining the studies to be performed by the subregional study groups for a  
66 given season.
- 67 2. Performing coordinated seasonal studies within the subregional study groups.
- 68 3. Coordinating/reviewing study results within and among the subregional study  
69 groups.
- 70 4. Establishing/reviewing coordinated Operating Plans to address reliability issues  
71 identified in those studies. Operating Plans may be preliminary and may require  
72 further refinement as real-time approaches under the IRO-017 outage  
73 coordination process.

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

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

79 2. Studies to review known interactions or to identify new interactions between  
80 flows on major interfaces that impact more than one TOP (e.g., nomograms) for  
81 the establishment of Operating Plans to provide for reliable operations with  
82 respect to stability, thermal or voltage constraints.

83 3. Studies to identify instability, Cascading or uncontrolled separation risks for  
84 single Contingencies, Always Credible Multiple Contingencies, or N-1-1 or N-1-  
85 2 Contingency scenarios per the RC's SOL Methodology. These studies  
86 include stressing the system to reasonable maximum stressed conditions per  
87 the RC's SOL Methodology and are aimed at identifying potential IROLs and  
88 non-IROL stability limits. Accordingly, the RC's SOL Methodology has a major  
89 role in these studies.


90 Analyses that are out of scope may include those that are aimed at identifying thermal  
91 and voltage issues (including the development of Operating Plans for those identified  
92 issues) internal to the TOP Area that do not require coordinated operations with other  
93 TOPs. Thermal and voltage issues internal to a TOP Area are expected to be  
94 identified and addressed as part of the IRO-017 Outage Coordination Process and  
95 subsequent OPAs.

96 The RC Seasonal Operations Planning Coordination Process facilitates reliable  
97 operation of the BES in the Peak RC Area by:

98 1. Providing a mechanism by which the RC and TOPs ensure that non-IROL  
99 stability SOLs are established and potential IROLs are identified consistent with  
100 the RC's SOL Methodology.

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

103 3. Coordinating Operating Plans prior to the beginning of each operating season  
104 to provide sufficient lead time to develop and coordinate relevant operating  
105 tools and provide training for System Operators and other operating personnel.

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- 106 4. Working seamlessly with – and providing continuity with – assessments  
107 required by the NERC Reliability Standards, including TPL Planning  
108 Assessments and IRO-017 Outage Coordination assessments.
- 109 5. Ensuring consistent study methodologies and criteria when performing  
110 seasonal assessments, identifying instability risks, identifying potential IROs  
111 and verifying acceptable performance for the projected seasonal system  
112 conditions.
- 113 6. Providing consistency in communicating seasonal study results.
- 114 7. Allowing for peer review of seasonal studies via the subregional study group  
115 forums.
- 116 8. Defining the specific role of various entities (subregional study groups, TOPs,  
117 RC, etc.) in the RC Seasonal Operations Planning Coordination Process.

118 **G. RC Seasonal Operations Planning Coordination Process Overview**


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

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

127 Once these six steps are completed, the Seasonal Operations Planning Coordination  
128 Process is deemed completed. There may be a need to pursue necessary follow-ups  
129 outside the seasonal process, for example, the formal declaration and further  
130 development of IROs, near-real-time calculations of stability limits or IROs, etc.

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



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132 **Determine the Studies to be Performed**

133 Determining which studies to perform for any given season is a critical aspect of the  
 134 RC Seasonal Operations Planning Coordination Process. The RC Seasonal  
 135 Operations Planning Coordination Process affords ample flexibility in the studies that  
 136 are performed for a given season. The studies performed as part of the RC  
 137 Seasonal Operations Planning Coordination Process are intended to add real,  
 138 tangible value to operations reliability and to avoid performing routine studies that  
 139 provide essentially the same results season after season. However, if a subregional  
 140 study group sees value in performing certain studies on a routine basis, the  
 141 subregional study group may do so.

142 The subregional study groups, and the TOPs that comprise the subregional study  
 143 groups, in consultation with the RC, are responsible for determining the studies to be  
 144 performed for a given season. The study selection process is encouraged to be  
 145 collaborative and based on the greatest reliability need, given the resources  
 146 available.

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

- 149 1. Planning Assessments or Transfer Capability assessments for the Near-Term  
 150 Transmission Planning Horizon or other analyses performed by PCs and TPs  
 151 have identified instability risks, negative system interactions or other reliability  
 152 concerns that impact multiple TOP Areas. The results of these studies might  
 153 point to the need to further analyze these issues as part of the seasonal study  
 154 process.
- 155 2. Internal TOP studies have identified instability risks, negative system  
 156 interactions or other reliability concerns that impact multiple TOP Areas. The  
 157 results of these studies might point to the need to further analyze these  
 158 issues as part of the seasonal study process.
- 159 3. Facilities may have been constructed, retired or rendered temporarily  
 160 unavailable, which might warrant a seasonal study.
- 161 4. Studies have not been conducted which stress the system in accordance with  
 162 the system stressing methodology as described in the RC's SOL  
 163 Methodology.

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- 164 5. It is determined that there is a need to assess N-1-1 and N-1-2 operating  
165 conditions to identify potential long-term IROLs.
- 166 6. Prior studies have excluded key sensitivities, warranting an updated study.
- 167 7. Real-time operating experiences have identified vulnerabilities that warrant a  
168 follow-up seasonal study.
- 169 8. New RAS or other automatic mitigation schemes have been employed or  
170 retired that have an impact on stability limitations or have an impact on  
171 coordinated TOP-to-TOP operations.
- 172 9. Significant load or generation patterns have shifted due to economics or other  
173 factors.
- 174 10. Changes in load composition such as increased penetration of air  
175 conditioning.
- 176 11. New models (including dynamic models) have been approved for use by the  
177 WECC Modeling Subcommittee that may create the need to revise prior  
178 studies or perform new studies.
- 179 12. The addition of renewable generation and/or fossil-fueled generation  
180 retirements have significantly changed the TOP Area generation mix.

181 Ultimately, the studies to be performed for a given season will be determined based  
182 on engineering judgment, operating experience and prior assessments.

### 183 **Develop the Study Plan**

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

- 187 1. Purpose of the study.
- 188 2. Timelines and milestones.
- 189 3. Base case coordination and assumptions.
- 190 4. Study criteria.
- 191 5. System stressing methods.

- 192           6. Types of studies to be performed.
- 193           7. Description of how any instability, Cascading or uncontrolled separation is  
194           identified<sup>1</sup>.
- 195           8. Description of how any potential long-term IROLs for N-1-1 and N-1-2  
196           conditions are identified<sup>2</sup>.

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

202           When documenting the study plan for a given study, the subregional study groups  
203           should adhere to the Seasonal Study Plan Outline in [Appendix II](#) and the timeline in  
204           [Appendix VI](#).

205           **Develop the Case(s) for Use in the Studies**

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

217           **Execute the Study Plan (Perform the Studies)**

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

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<sup>1</sup> Reference section S of Peak's SOL Methodology

<sup>2</sup> Reference section T of Peak's SOL Methodology

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

223 **Review, Accept and Publish Study Reports**

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

230 When documenting the study results, the subregional study groups should adhere to  
 231 the study report outline in [Appendix III](#) and the timeline in [Appendix VI](#) of this  
 232 document.

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

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

241 **Develop/Review and Publish Associated Operating Plans**

242 Often the seasonal studies may require the development of new Operating Plans or  
 243 the revision of existing Operating Plans<sup>3</sup>. Once the studies have been reviewed and  
 244 accepted, the impacted TOPs are expected to collaborate to develop or revise  
 245 Operating Plans as necessary.

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<sup>3</sup> Per the NERC Glossary of Terms, the definition of Operating Plan includes Operating Procedures. This document uses the more general term Operating Plan.

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

## 249 H. Coordination Responsibilities

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

- 255 1. Impacted TOPs have been identified by the TOP(s) performing the seasonal  
 256 operating studies. This applies to TOPs internal and external to the subregional  
 257 study group.
- 258 2. A study plan has been developed in accordance with the RC Seasonal  
 259 Operations Planning Coordination Process and any concerns from impacted  
 260 TOPs and/or the subregional study group have been addressed in a  
 261 collaborative manner.
- 262 3. Study results have been shared among impacted TOPs and impacted  
 263 subregional study groups, and the technical study results agreed upon.
- 264 4. Transmission path/interface interactions have been recognized by the impacted  
 265 TOPs.
- 266 5. Coordinated Operating Plans have been developed and agreed upon by  
 267 impacted TOPs. Where applicable, TOP options for providing relief obligations  
 268 (e.g., scheduling methods, curtailment plans, etc.) are to be addressed as part  
 269 of the Operating Plan.
- 270 6. If Operating Plans involve operating within a nomogram due to simultaneous  
 271 interactions, or within proxy values such as Transfer Capability values, the  
 272 Operating Plans are expected to address the roles, responsibilities and specific  
 273 actions to be taken by entities involved.
- 274 7. Where disagreements arise and are not reconciled by the beginning of the  
 275 season, the impacted TOPs' Operating Plans default to interim conservative  
 276 limits – or other agreed upon limits – while awaiting dispute resolution. If the

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

## 279 **I. Impacted Entity/TOP**

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

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

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

## 296 **J. Peer Review and Acceptance of Seasonal Studies**

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

### 300 **Peer Review and Acceptance Criteria**

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

- 303 1. The study processes and criteria used for identifying thermal and voltage limit  
304 exceedance issues, risks for instability, Cascading or uncontrolled separation

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305 and for the establishment of preliminary stability limits and potential IROLs are  
306 consistent with the RC’s SOL Methodology.

307 2. Peer review has taken place, the established study plan has been followed and  
308 the technical study report is judged satisfactory by the reviewing TOP  
309 representative(s).

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

312 **Acceptance Process**

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

318 **Resolution of Outstanding Reliability Issues**

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


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

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

328 Four subregional study groups are recognized by Peak RC as having responsibility for  
329 performing, coordinating and accepting seasonal studies in accordance with the RC  
330 Seasonal Operations Planning Coordination Process. These study groups are:

331 1. The Northwest Operational Planning Study Group (NOPSG) representing the  
332 Northwest/Canada subregion;

333 2. The Rocky Mountain Operating Study Group (RMOSG) representing the Rocky  
334 Mountain subregion;

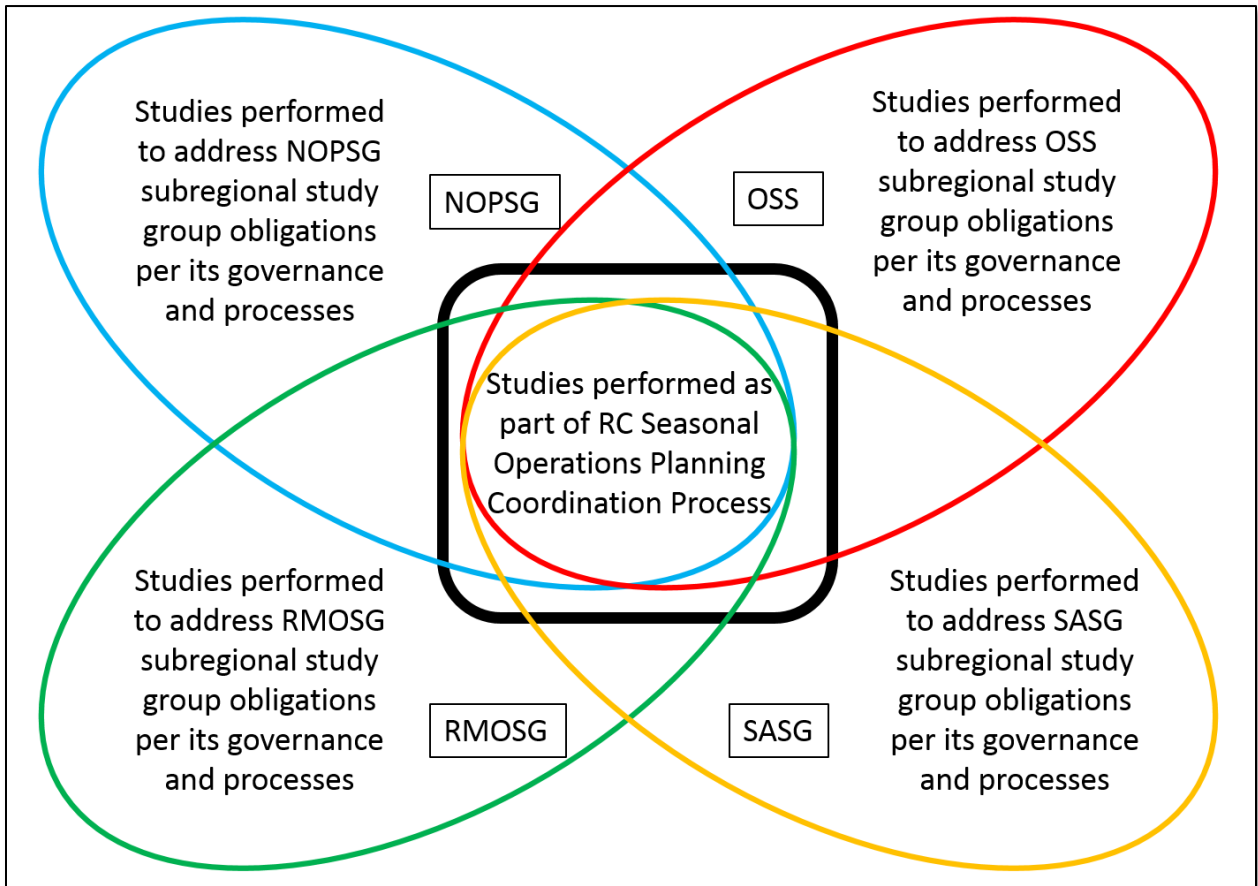
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- 335           3. The Southwest Area Subregional Group (SASG) representing the Arizona/New  
336           Mexico/Nevada subregion; and
- 337           4. The Operations Study Subcommittee (OSS) representing the California/Mexico  
338           subregion.

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

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





357

358

**Figure 2: Commonality Diagram**

359

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

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

- 366 1. Elect a Chair who is expected to:
- 367 a. Coordinate and facilitate study review meetings and the development of  
 368 study plans, reports and resulting Operating Plans.

- 369            b. Serve as the liaison for the subregion when interacting with the RC and  
370            other subregions.
- 371            2. Coordinate with the TOP representatives in the subregional study group and  
372            with the RC to determine the studies that are to be performed for a given  
373            season and the system conditions under which they should be studied.
- 374            3. Review and coordinate development of seasonal study plans and schedules for  
375            the subregion to ensure timely completion of seasonal operating studies.
- 376            4. Coordinate base cases to be reviewed and prepared for the studies.
- 377            5. Review and coordinate seasonal studies to verify that the RC Seasonal  
378            Operations Planning Coordination Process has been followed.
- 379            6. Where system interactions outside the subregion are known to exist or are  
380            identified, coordinate and communicate study results with impacted subregions.
- 381            7. Address reliability concerns and issues raised by TOPs internal and external to  
382            the subregional study group.
- 383            8. Absent a consensus regarding study results, document the majority and  
384            minority positions.
- 385            9. Complete the studies in time for developing coordinated Operating Plans.
- 386            10. Coordinate technical study support as requested by the TOPs and Peak RC in  
387            support of the development of Operating Plans.
- 388            11. Ensure that resulting documentation is posted on the peakrc.org website.  
389            Examples of such documentation include study plans, study reports and  
390            Operating Plans.

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

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

396            The expected roles and responsibilities of the TOPs include the following:

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- 397 1. Appoint a TOP representative to the subregional study group(s) for the  
398 subregion(s) in which the TOP Area resides.
- 399 2. Participate in the subregional study group process by attending meetings and  
400 conference calls.
- 401 3. Coordinate with subregional study group and Peak RC to determine the studies  
402 that are to be performed for a given season and the system conditions under  
403 which they should be studied.
- 404 4. Participate in the development of study plans and in performing the studies in  
405 accordance with the study plan.
- 406 5. Review WECC operating cases and make necessary adjustments to ensure  
407 that the cases are accurate and ready for use for the studies being performed  
408 for the season. Additionally, TOPs should provide input to their respective  
409 Transmission Planners when the WECC operating base cases are being  
410 developed.
- 411 6. Perform seasonal studies as part of the RC Seasonal Operations Planning  
412 Coordination Process, and in accordance with the RC's SOL Methodology.
- 413 7. Prepare Operating Plans developed as part of the RC Seasonal Operations  
414 Planning Coordination Process to support operational reliability consistent with  
415 the RC's SOL Methodology.
- 416 8. Consistent with the timelines in Appendix VI, update and publish the list of  
417 Always Credible Multiple Contingencies for its TOP Area for use in seasonal  
418 planning studies.
- 419 9. Review and provide comments on seasonal studies as appropriate.

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

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

429 The expected roles and responsibilities of Peak RC include the following:

- 430 1. Participate in the subregional study group process by attending meetings and  
431 conference calls.
- 432 2. Coordinate with the subregional study groups to determine the studies that are  
433 to be performed for a given season and the system conditions under which they  
434 should be studied.
- 435 3. Participate in the development of study plans to ensure that the studies will  
436 achieve the objectives of the RC Seasonal Operations Planning Coordination  
437 Process.
- 438 4. Provide guidance on the consistency of study plans and studies for identifying  
439 risks for instability, Cascading or uncontrolled separation and for establishing  
440 stability limits and potential IROLs in accordance with the RC's SOL  
441 Methodology.
- 442 5. Provide guidance on the consistency of Operating Plans developed as part of  
443 the RC Seasonal Operations Planning Coordination Process to support  
444 operational reliability consistent with the RC's SOL Methodology.
- 445 6. Develop and maintain the RC Seasonal Operations Planning Coordination  
446 Process document.
- 447 7. Participate as necessary with the subregional study groups to discuss  
448 approaches to resolve outstanding reliability issues prior to each operating  
449 season.
- 450 8. Facilitate dispute resolution of seasonal studies for reliability issues related to  
451 stability limits and identification of potential IROLs. It is not the responsibility of  
452 the RC to resolve contractual or commercial issues that may exist between  
453 TOPs.

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454 **N. Role of the WECC RE in Seasonal Study Coordination**

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

- 457 1. Coordinate and ensure that approved seasonal operating base cases are  
458 prepared, approved and made available to TOPs in a timely manner in the  
459 PSLF, PSS/E and PowerWorld formats. See timelines in [Appendix VI](#).
- 460 2. Address base case issues raised by TOPs and the RC; e.g., any delays in base  
461 case development.

462 **O. Operating Base Case Development**

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

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

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

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<sup>4</sup> Positive Sequence Load Flow/GE PSLF Software.

<sup>5</sup> Power System Simulator for Engineering.

<sup>6</sup> Or other recognized formats as determined by the WECC RE.

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476 **P. Contingencies**

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

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

486 **Q. Facility Outages**

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

496 **R. Study Seasons**

497 The seasons eligible for study as part of the RC Seasonal Operations Planning  
498 Coordination Process include summer, winter and spring. If prior studies are deemed  
499 by the subregional study group to be sufficient for a given season, the subregion may  
500 determine that performing a new study is not warranted. While fall studies have not  
501 historically been performed as part of coordinated seasonal planning studies,  
502 subregional study groups might see a need to perform fall studies. If this is the case,  
503 the subregional study group should determine the appropriate WECC case(s) to be  
504 used and should establish their own timeline since fall studies are not addressed in  
505 the Study Timeline in [Appendix VI](#). The subregional study groups are not obligated to  
506 create or provide a fall case.

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507 **S. Communicating Identified Instability, Cascading or Uncontrolled**  
508 **Separation**

509 One of the primary objectives of the RC Seasonal Operations Planning Coordination  
510 Process is to identify any risks for instability, Cascading or uncontrolled separation  
511 applied consistent with the RC’s SOL Methodology. See section F, “Scope of the RC  
512 Seasonal Operations Planning Coordination Process.” The description of instability,  
513 Cascading or uncontrolled separation provided in the RC’s SOL Methodology should  
514 be applied.

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

- 518 1. The type of phenomenon identified – for example, Cascading (per the Cascading  
519 test described in the RC’s SOL Methodology), uncontrolled separation, voltage  
520 collapse, angular instability, transient system performance criteria violation.
- 521 2. The associated stability criteria used as part of determining the instability.
- 522 3. The impacted TOPs, and the associated Contingency(ies) and critical system  
523 conditions which result(s) in the instability, Cascading or uncontrolled  
524 separation.
- 525 4. The amount of load that may potentially be lost due to instability, Cascading or  
526 uncontrolled separation, if it is possible to make this determination.
- 527 5. Any automatic scheme, including Remedial Action Scheme action, under voltage  
528 load shedding (UVLS) action, under frequency load shedding (UFLS) action, or  
529 any other automatic scheme or manual action that results in load loss required to  
530 address the instability, Cascading or uncontrolled separation<sup>7</sup>.

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<sup>7</sup> 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.

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531 **T. Study Plan and Report Outlines**

532 For consistency, and to aid in the review of seasonal studies, TOPs should follow the  
533 outline provided in [Appendix II](#) when developing the study plan and the outline  
534 provided in [Appendix III](#) when developing study reports.

535 **U. Timelines for the RC Seasonal Operations Planning Coordination  
536 Process**

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

542 **V. Controlled Copy**

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

546 **W. Contact Information**

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


550 Don McInnis (primary contact) at (970) 590-1172 or [dmcinnis@peakrc.com](mailto:dmcinnis@peakrc.com)

551 Jason Ausmus (alternate contact) at (970) 613-3563 or [jausmus@peakrc.com](mailto:jausmus@peakrc.com)

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## Version History

Version	Date	Action	By	Change Tracking
1.0	11/26/2013	Issued for Implementation	Jaison Tsikirai	<b>Original process document</b> 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	<del>6/7/2018</del>	Major Revision	Vic Howell	Revised per the Seasonal Operations Planning Coordination Process Revision Project.

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## Appendix I: Definitions and Terms

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

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## 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

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- 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, 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

**Description of How Any Instability, Cascading or Uncontrolled Separation are Identified<sup>8</sup>**

**Description of How Any Potential Long-Term IROLs for N-1-1 and N-1-2 Conditions are Identified<sup>9</sup>**


**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~~

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<sup>8</sup> Reference section S of Peak’s SOL Methodology for the Operating Horizon

<sup>9</sup> Reference section T of Peak’s SOL Methodology for the Operating Horizon

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## 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]**

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## 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, - or system area one lines, 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)

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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.

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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. Identification of any Operating Plans that need to be developed for the upcoming season~~Identify any coordinated Operating Plan that has been developed~~



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### 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: <ol style="list-style-type: none"> <li>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</li> <li>2. The associated stability criteria used as part of determining the instability</li> <li>3. The associated Contingency(ies) which result(s) in the instability, Cascading or uncontrolled separation</li> <li>4. The amount of load that is lost due to instability, Cascading or uncontrolled separation, if it is possible to make this determination</li> <li>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</li> </ol>
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?

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<b>Seasonal Operations Planning Coordination Study Checklist</b>	
<b>ITEM</b>	<b>Description</b>
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.

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## 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?

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## Appendix VI: Seasonal Operations Planning Coordination Study Timelines


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

### 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 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.

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- 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.