



PEAKRELIABILITY
assuring the wide area view

Reliability Coordinator
Seasonal Operations Planning
Coordination Process
Rev. 2.0

By

Peak Reliability

Month XX, 2018

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 beginning with the seasonal studies for the winter of 2018/2019.

8 **C. Definitions and Terms**

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

14 **D. Future Revisions**

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

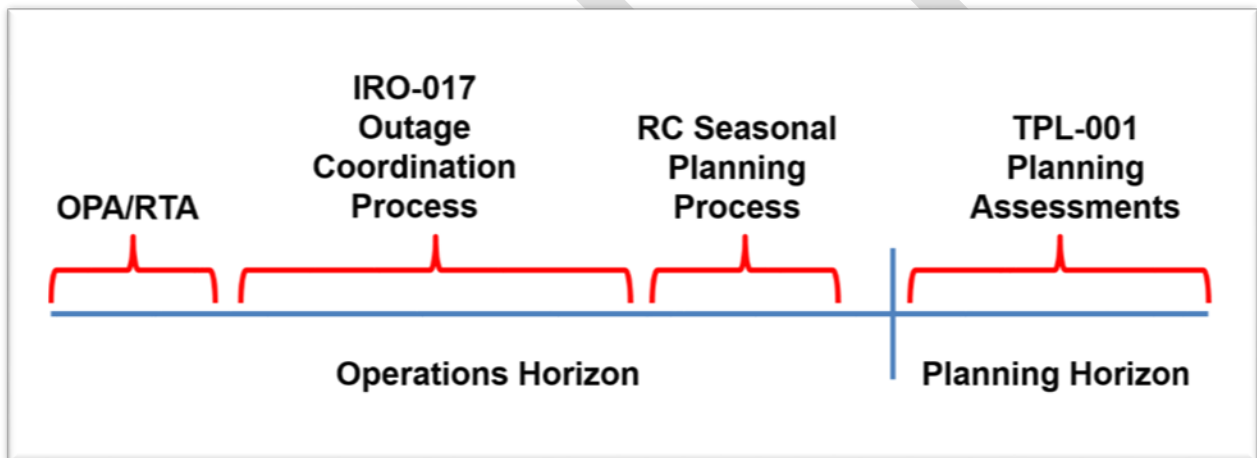
18 **E. RC Seasonal Operations Planning Coordination Process – Principles**

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

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

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

32 The RC Seasonal Operations Planning Coordination Process is intended to fit
33 between the TPL Planning Assessments and Peak's IRO-017-1 Outage Coordination
34 Process. Reference Figure 1: Study Timeline below.



35
36 **Figure 1: Study Timeline**
37

38 The studies performed as part of the RC Seasonal Operations Planning Coordination
39 Process are not intended to be an extension of the TPL Planning Assessments, nor
40 are they intended to serve the same purpose as the studies performed as part of the
41 IRO-017 Outage Coordination Process. Rather, these studies are intended to be
42 unique from these studies to the extent practicable. While certain planned outages
43 may be included in studies performed as part of the RC Seasonal Operations Planning
44 Coordination Process due to their long duration, the focus of the RC Seasonal
45 Operations Planning Coordination Process is not centered on the assessment of
46 specific planned outages.

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47 The studies performed as part of the RC Seasonal Operations Planning Coordination
48 Process are intended to add real, tangible value to operations reliability. This process
49 is intended to avoid performing routine studies each season that provide essentially
50 the same results season after season. That said, if a subregional study group sees
51 value in performing certain studies on a routine basis, the subregional study group
52 may do so. The RC Seasonal Operations Planning Coordination Process is intended
53 to be flexible to address the needs of the RC and the TOPs within the RC Area. For
54 example, the studies performed for one summer season might be very different from
55 the studies performed the next summer season.


56 The studies performed as part of the RC Seasonal Operations Planning Coordination
57 Process fall within the operations horizon (real-time through one year out), and
58 therefore fall under the jurisdiction of the RC’s SOL Methodology. Accordingly, the
59 concepts, principles, methods, technical criteria and requirements spelled out in the
60 RC’s SOL Methodology apply to the studies performed as part of the RC Seasonal
61 Operations Planning Coordination Process.

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

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

- 66 1. Determining the studies to be performed by the subregional study groups for a
67 given season
- 68 2. Performing coordinated seasonal studies within the subregional study groups
- 69 3. Coordinating/reviewing study results
- 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.

73 The types of studies that are within scope of the RC Seasonal Operations Planning
74 Coordination Process include the following:

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

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

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

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

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

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

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

102 3. Ensuring that coordinated Operating Plans are in place prior to the beginning of
103 each operating season, and that relevant operating tools are developed and
104 adequate training for System Operators and other operating personnel has
105 been provided.

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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 The RC Seasonal Operations Planning Coordination Process affords ample flexibility
 134 in the studies that are performed for a given season. As was stated earlier in this
 135 document, the studies performed as part of the RC Seasonal Operations Planning
 136 Coordination Process are intended to add real, tangible value to operations
 137 reliability. It is intended that this process avoid performing routine studies each
 138 season that provide essentially the same results season after season. That said, if a
 139 subregional study group sees value in performing certain studies on a routine basis,
 140 the subregional study group may do so. Therefore, determining which studies to
 141 perform for any given season is a critical aspect to the RC Seasonal Operations
 142 Planning Coordination Process.

143 The subregional study groups, the TOPs that comprise the subregional study groups
 144 and the RC are responsible for determining the studies to be performed for a given
 145 season. This decision should be collaborative and should be based on the greatest
 146 reliability need, given the resources available.

147 Some considerations for determining the studies to be performed 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.
- 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 to stability limitations or have an impact to
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 needs to develop and document the study plan. The study plan addresses
186 many of 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

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- 192 6. Types of studies to be performed
- 193 7. Description of how any instability, Cascading or uncontrolled separation is
194 identified¹
- 195 8. Description of how any potential long-term IROLs for N-1-1 and N-1-2
196 conditions are identified²

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](#).

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

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

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

217 The study plan is expected to specify which entities are responsible for performing
218 the various aspects of the study. The study plan should include a timeline and
219 milestone dates for completing the study. As part of this step, the entities involved in

¹ Reference section S of Peak's SOL Methodology

² Reference section T of Peak's SOL Methodology

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220 performing the studies are expected to meet the schedules and to keep the
221 subregional study group chair updated on their progress.

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

223 After the studies are completed, the study results should be reviewed and accepted
224 by the subregional study group members. Any study results that impact other
225 subregional study groups should include those groups in the review and acceptance.
226 It is expected that the studies and subsequent reviews might occur in an iterative
227 fashion. Care should be taken to allow time for study iterations in the overall study
228 timeline.

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

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

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

237 Often the seasonal studies require the development of new Operating Plans or the
238 revision of existing Operating Plans³. Once the studies have been reviewed and
239 accepted, the impacted TOPs are expected to collaborate to develop or revise
240 Operating Plans as necessary.

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

244 **H. Coordination Responsibilities**

245 Since the scope of the RC Seasonal Operations Planning Coordination Process
246 includes reliability issues that require TOP-to-TOP coordination, it is imperative that

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

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247 the TOPs involved perform their tasks with coordination at the forefront. The following
248 list of actions describes some of the coordination responsibilities associated with the
249 RC Seasonal Operations Planning Coordination Process:

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

274 I. Impacted Entity/TOP

275 In several locations in this document, the term “impacted entity” or “impacted TOP” is
276 used to indicate the need to follow-up, coordinate and resolve any reliability issues

277 uncovered by a study or analysis. Impacted TOPs are also to be consulted in the
278 development of Operating Plans for ensuring acceptable system performance.

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

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

291 **J. Peer Review and Acceptance of Seasonal Studies**

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

295 **Peer Review and Acceptance Criteria**

296 Acceptance can be granted when peer review is deemed successful according to
297 the following:

- 298 1. The study processes and criteria used for identifying thermal and voltage limit
299 exceedance issues, risks for instability, Cascading or uncontrolled separation
300 and for the establishment of preliminary stability limits and potential IROLs are
301 consistent with the RC's SOL Methodology.
- 302 2. Peer review has taken place, the established study plan has been followed and
303 the technical study report is judged satisfactory by the reviewing TOP
304 representative(s).

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

307 **Acceptance Process**

308 Each subregional study group is expected to implement a study acceptance
309 process that provides TOP representatives the opportunity to voice outstanding
310 reliability issues. This acceptance process is intended to ensure that reliability
311 issues impacting more than one TOP have been adequately addressed and that
312 proper coordination has taken place prior to the beginning of the operating season.

313 **Resolution of Outstanding Reliability Issues**


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

318 If attempts to reach unanimity remain unachievable, the subregion is expected to
319 document each of the minority positions and bring these to the attention of the
320 Peak RC to help facilitate resolution. Each dissenting TOP is expected to be
321 prepared to make their case to Peak RC as part of these discussions.

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

324 Four subregional study groups are recognized by Peak RC as being responsible for
325 performing, coordinating and accepting seasonal studies in accordance with the RC
326 Seasonal Operations Planning Coordination Process. These study groups are:

- 327 1. The Northwest Operational Planning Study Group (NOPSG) representing the
328 Northwest/Canada subregion;
- 329 2. The Rocky Mountain Operating Study Group (RMOSG) representing the Rocky
330 Mountain subregion;
- 331 3. The Southwest Area Subregional Group (SASG) representing the Arizona/New
332 Mexico/Nevada subregion; and
- 333 4. The Operations Study Subcommittee (OSS) representing the California/Mexico
334 subregion.

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

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

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

- 349 1. Elect a Chair who is expected to:
 - 350 a. Coordinate and facilitate study review meetings and the development of
351 study plans, reports and resulting Operating Plans.
 - 352 b. Serve as the liaison for the subregion when interacting with the RC and
353 other subregions.
- 354 2. Coordinate with the TOP representatives in the subregional study group and
355 with the RC to determine the studies that are to be performed for a given
356 season and the system conditions under which they should be studied.
- 357 3. Review and coordinate development of seasonal study plans and schedules for
358 the subregion to ensure timely completion of seasonal operating studies.
- 359 4. Ensure that base cases are reviewed and prepared for the studies.
- 360 5. Review and coordinate seasonal studies to verify that the RC Seasonal
361 Operations Planning Coordination Process has been followed.
- 362 6. Where system interactions outside the subregion are known to exist or are
363 identified, coordinate and communicate study results with impacted subregions.

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- 364 7. Address reliability concerns and issues raised by TOPs internal and external to
365 the subregional study group.
- 366 8. Absent a consensus regarding study results, document the majority and
367 minority positions.
- 368 9. Ensure studies are completed in time for developing coordinated Operating
369 Plans.
- 370 10. Provide technical study support and coordination as requested by the TOPs
371 and Peak RC in support of the development of Operating Plans.
- 372 11. Ensure that resulting documentation is posted on the peakrc.org website.
373 Examples of this documentation include study plans, study reports and
374 Operating Plans.

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

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

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

- 381 1. Appoint a TOP representative to the subregional study group(s) for the
382 subregion(s) in which the TOP Area resides.
- 383 2. Participate in the subregional study group process by attending meetings and
384 conference calls.
- 385 3. Coordinate with Peak RC to determine the studies that are to be performed for
386 a given season and the system conditions under which they should be studied.
- 387 4. Participate in the development of study plans and in performing the studies in
388 accordance with the study plan.
- 389 5. Review WECC operating cases and make necessary adjustments to ensure
390 that the cases are accurate and ready for use for the studies being performed
391 for the season. Additionally, TOPs should provide input to their respective

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392 Transmission Planners when the WECC operating base cases are being
393 developed.

394 6. Ensure that the studies performed as part of the RC Seasonal Operations
395 Planning Coordination Process are in accordance with the RC’s SOL
396 Methodology.

397 7. Ensure that Operating Plans developed as part of the RC Seasonal Operations
398 Planning Coordination Process support the level of reliability described in the
399 RC’s SOL Methodology.

400 8. Update and publish, in a timely manner, the list of Always Credible Multiple
401 Contingencies for its TOP Area for use in seasonal planning studies.

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

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

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

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

413 1. Participate in the subregional study group process by attending meetings and
414 conference calls.

415 2. Coordinate with the subregional study groups to determine the studies that are
416 to be performed for a given season and the system conditions under which they
417 should be studied.

418 3. Participate in the development of study plans to ensure that the studies will
419 achieve the objectives of the RC Seasonal Operations Planning Coordination
420 Process.

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- 421 4. Ensure that the studies performed for identifying risks for instability, Cascading
422 or uncontrolled separation and for establishing stability limits and potential
423 IROLs are executed in accordance with the RC’s SOL Methodology.
- 424 5. Ensure that Operating Plans developed as part of the RC Seasonal Operations
425 Planning Coordination Process support the level of reliability described in the
426 RC’s SOL Methodology.
- 427 6. Develop and maintain the RC Seasonal Operations Planning Coordination
428 Process document.
- 429 7. Participate as necessary with the subregional study group chairs to discuss and
430 resolve any outstanding reliability issues prior to each operating season.
- 431 8. Facilitate dispute resolution for reliability issues related to stability limits and
432 potential IROLs. It is not the responsibility of the RC to resolve contractual or
433 commercial issues that may exist between TOPs.

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

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

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

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442 **O. Base Case Development**

443 Development and approval of operating base cases (in both PSLF⁴, PSS/E⁵ and
444 PowerWorld formats)⁶ used for seasonal studies is coordinated by the WECC RE.
445 Since TOPs must use the approved operating base cases as starting power system
446 conditions, it is important that these base cases (power flow and dynamics) are
447 published by the WECC RE in time to implement seasonal studies per the Seasonal
448 Coordination Timelines in [Appendix VI](#).

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

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

456 **P. Contingencies**


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

461 The selection of Contingencies (single and multiple) to be included in a given study
462 depends on the type of study being performed and the specifics of that study. The
463 subregional study groups select applicable Contingencies based on system
464 knowledge, prior experience and engineering judgement. The Contingencies included
465 in a given study should be listed in the study plan.

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.

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466 **Q. Facility Outages**

467 Planned transmission or generation Facility outages that span the entire season must
 468 be removed from service in the base case(s). While the RC Seasonal Operations
 469 Planning Coordination Process is not intended to be an extension of the RC Outage
 470 Coordination Process, subregions have discretion to include certain prior outages in a
 471 given study. Any outages included in the studies must be listed in the study plan and
 472 in the final study report.


473 **R. Study Seasons**

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

484 **S. Communicating Identified Instability, Cascading or Uncontrolled
 485 Separation**

486 One of the primary objectives of the RC Seasonal Operations Planning Coordination
 487 Process is to identify any risks for instability, Cascading or uncontrolled separation.
 488 Section F, entitled “Scope of the RC Seasonal Operations Planning Coordination
 489 Process,” provides a description of this aspect of the RC Seasonal Operations
 490 Planning Coordination Process. The description of instability, Cascading or
 491 uncontrolled separation provided in the RC’s SOL Methodology should be applied.

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

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- 495 1. The type of phenomenon identified – for example, Cascading (per the Cascading
496 test described in the RC’s SOL Methodology), uncontrolled separation, voltage
497 collapse, angular instability, transient voltage dip criteria violation.
- 498 2. The associated stability criteria used as part of determining the instability.
- 499 3. The associated Contingency(ies) which result(s) in the instability, Cascading or
500 uncontrolled separation.
- 501 4. The amount of load that is lost due to instability, Cascading or uncontrolled
502 separation, if it is possible to make this determination.
- 503 5. Any Remedial Action Scheme action, under voltage load shedding (UVLS)
504 action, under frequency load shedding (UFLS) action, interruption of Firm
505 Transmission Service or Non-Consequential Load Loss required to address the
506 instability, Cascading or uncontrolled separation⁷.


507 **T. Study Report Outline**

508 For consistency, and to aid in the review of seasonal studies, TOPs should follow the
509 seasonal planning study report outline provided in [Appendix III](#) when implementing
510 study reports.

511 **U. Timelines for the RC Seasonal Operations Planning Coordination 512 Process**

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

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.

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518 **V. Controlled Copy**

519 Only the online electronic copy of the RC Seasonal Operations Planning Coordination
520 Process posted on the PeakRC.com site is controlled. Printed copies may be out of
521 date.

522 **W. Contact Information**


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

526 Vic Howell (primary contact) at (970) 613-3537 or vhowell@peakrc.com

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


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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		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, 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 Identified⁸


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

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

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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, 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

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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, interruption of Firm Transmission Service or Non-Consequential Load Loss was 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

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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

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4. Number each Appendix for ease of review

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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	<p>If answer to 9 is yes, are the following included in the report:</p> <ol style="list-style-type: none"> 1. The type of phenomenon identified – for example, Cascading (per the Cascading test described in the SOL Methodology), uncontrolled separation, voltage collapse, angular instability, transient voltage dip criteria violation 2. The associated stability criteria used as part of determining the instability 3. The associated Contingency(ies) which result(s) in the instability, Cascading or uncontrolled separation 4. The amount of load that is lost due to instability, Cascading or uncontrolled separation, if it is possible to make this determination 5. Any RAS action, under voltage load shedding (UVLS) action, under frequency load shedding (UFLS) action, interruption of Firm Transmission Service, or Non-Consequential 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?

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Seasonal Operations Planning Coordination Study Checklist	
ITEM	Description
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?
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.