The following notes were the results of the "Seams Summit" meeting held by the RCs on March 11, 2019, at the WECC offices in Salt Lake City. It was attended by numerous BA and TOP entities either in person or over the webinar.

The column to describe where the issue is being addressed and / or the plans and descriptions to address are included in the last column. Any specific questions or comments can be directed to your new RC or to Brett Wangen / Eric Whitley. The RC-RC Coordination Group will periodically update this list through their own forums and to the WECC hosted RC forum site.

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RC Seams Issues

Interconnection wide tools, data, models and reports

Issue No.	Issue/Question	Where being addressed; Plan for addressing
1.	ECC – Who will "own" the ECC contract, and how will ECC be supported in the future?	ECC/WIT/UFMP small team is addressing this topic. • CISO will take the contract for WebIntegrity (ECC) with OATI and will be the data provider for all inputs post Peak wind down. • CISO and SPP will use ECC to implement UFMP step 4 for path 66 (CISO), and paths 30, 31, and 36 (SPP). • The funding RCs will form a joint WebIntegrity working group that will provide a technical advisory role to the RCs with regards to the WebIntegrity tool. This will serve a similar function as the sunset ECC Task Force. • The Governance small team is discussing funding arrangements, interface with industry stakeholders and decision making to support change orders. *Discussion with BAs/TOPs:* • *Communication – RC forums, RC customer meetings; make effort to include UFC and QOO groups in discussions and decisions made.* • *Phase shifter tool used by Peak – what is happening to that? Peak doesn't really use that anymore, they use study powerflow tools to assess impacts of phase shifter tap movements. SPP is building a tool to help their operators with managing phase shifter movements.*

2.	WIT – Who will "own" the WIT contract, and who will perform the WIT administrator functions?	The ECC/WIT/UFMP small team is addressing this topic. • CISO has offered to own the WIT contract, but no decision yet. • Both CISO and SPP would like to perform the WIT administrator functions for their RC area. • A new small team that includes WECC ISAS has been formed to discuss future WIT administration and schedule checkout processes. • CISO to provide required Delta Time Error (DTE) value and administer the DTE value when there are issues. • The Governance small team is discussing contract and funding arrangements, interface with industry stakeholders and decision making to support change orders.
3.	Western Interconnection Model maintenance and data exchange processes – how will the full interconnection model be managed going forward for the good of the interconnection?	CISO will maintain the full interconnection model and make it available to all RCs, BAs and TOPs. RC coordination taking place in network model sub-team. Details include: • Model data exchange between RCs will be in CIM15XML format. • Each BA/TOP will provide model information to their respective RC; each RC will provide their RC area model to CISO for inclusion in the Western Interconnection Model. • CISO will create new CIM model monthly for BA, TOP, RC use.
4.	How will the new IRO-005-2 WECC variance, which requires modeling and monitoring consistency across all RCs, be implemented to address the interconnection's situational awareness needs?	Network model RC sub-team is drafting a common methodology for use by all RCs. Team will look for opportunities to inform BAs and TOPs of progress in methodology development. Expected to have draft completed by Q4 2019. *Discussion with BAs/TOPs:* • *NERC stated modeling and monitoring requirements should be in place before SPP and large CAISO footprint RCs go live; however, variance has not yet been fully approved.* • *Concern voiced over CAISO model exports being available and in usable format for other RCs before Peak is gone.* • *ACTION ITEM - validate CAISO exports to ensure they work with BAs/TOPs using those models, and to provide a "mapping" document between what Peak posts on Peakrc.org versus the future of what will be posted by the CAISO; assign to network model sub-team.*
5.	Monitoring and alarming consistency – how will the RCs ensure that appropriate monitoring and alarming is implemented to properly address IRO-005-2 WECC variance, and to ensure that there is sufficient situational awareness, especially across RC seams?	Two RC coordination small teams are discussing this: • Network model RC sub-team is drafting a common methodology for use by all RCs. Team will look for opportunities to inform BAs and TOPs of progress in methodology development. Expected to have draft completed by Q4 2019. • The Shadow Operations sub-team is requesting each RC to document their monitoring and alarm methodology for review to identify any potential gaps.

		Coordination will be needed with team developing IRO-002-5 WECC variance modeling and monitoring methodology.
6.	Post-contingency monitoring and alarming consistency – how will RCs ensure an appropriate amount of post-contingency monitoring is in place to identify contingency impacts external to their respective RC footprint?	Two RC coordination small teams are discussing this: • Network model RC sub-team is drafting a common methodology for use by all RCs that will address post-contingency monitoring and contingency impact external to their RC footprint. Team will look for opportunities to inform BAs and TOPs of progress in methodology development. Expected to have draft completed by Q4 2019. • The Shadow Operations sub-team is requesting each RC to document their pre- and post-contingency monitoring methodology for review to identify any potential gaps. Coordination will be needed with team developing IRO-002-5 WECC variance modeling and monitoring methodology.
7.	Real-time Message Systems – how will RCs, BAs and TOPs exchange information that is currently shared via the common Reliability Messaging Tool (RMT)?	Real-time messaging sub-team is documenting the types of messages to be exchanged. Peak has provided RMT templates to support development of new RC messaging tools. AESO and BCH will use the CISO messaging system. A Messaging Guideline is under development to instruct RCs, BAs and TOPs on messaging system use. Key features of CISO and SPP messaging tools include: • RCs, BAs and TOPs will be able to send WECC wide messages. • BAs and TOPs in one RC area will be able to send messages via either tool to BAs and TOPs in external RC areas. RCs will communicate with all Reliability Coordinators in the Western and Eastern Interconnection via the NERC Reliability Coordinator Information System (RCIS).
8.	WECC wide inertia calculation – how will the Western Interconnection perform the WECC wide inertia calculation as required by NERC?	Each RC will calculate system inertial for their footprint; NERC/WECC will sum those for an interconnection wide system inertia value. Peak has provided documentation on how the calculation was implemented within Peak's EMS. CISO and SPP understand how they will calculate inertia for their system. BC Hydro and AESO are still discussing this internally.
9.	Will the UDSA be retired? When will the new WIDSA be created and be effective? Any significant changes as the UDSA signatories transition to the WIDSA?	Peak will withdraw and/or terminate its participation in the UDSA under the terms of the agreement when it no longer has a business need to provision data. Peak expects to no longer need to provision data beyond 12/3/2019 and is using that date for internal planning purposes. The UDSA and WIDSA are substantially similar, therefore it is ok for these two agreements to "co-exist" for a period of time. Accordingly, there shouldn't be any significant changes for UDSA signatories as they transition to the WIDSA. The WIDSA will support the

		continued sharing of data between BAs and TOPs in the West, but also by the multiple RCs that now exist in the region. There is ongoing discussion between CISO and SPP and their customers regarding what this agreement means for the SPP's Eastern Interconnection TOPs and BAs. The concern is with the single SPP Network Model which includes its east and west facilities. Making this model available to its members would allow east and west TOPs and BAs of SPP to be purview to all facilities in the model. All SPP east TOPs and BAs have signed the NERC ORD, however, there are some concerns and questions on if this is sufficient and if there are enough safe guards to protect west data. NERC is considering updating ORD to make it similar to the WIDSA, however NERC indicated that this effort is on different timeline. *Discussion with BAs/TOPs:* • *Timeframe – CAISO and SPP to work on remaining small section over the next couple of months.* • *NERC ORD revisions are based on UDSA. NERC is expediting ORD edits, but no schedule update received yet.*
10.	Have the RCs developed similar reporting data requirements? If reporting involves both RCs, will the data be shared between RCs or will a BA/TOP be expected to provide separate data to both?	Data requests from the RCs to TOPs, BAs and other RCs are expected to be very similar. The IRO-010 sub-team is reviewing each RC's data request and will identify significant differences that need to be resolved. WECC and NERC data requirements are being discussed by the WECC/NERC data needs RC coordination small team; data requirements to NERC and WECC include: • Real-time ICCP (NERC and WECC) • Daily report • Event analysis cases *Discussion with BAs/TOPs:* • *WECC is being flexible and working to collect data from each of the RCs.*
11.	Will each RC support a Dispatcher Training Simulator (DTS) to support simulation training for their BA/TOP members and for impacted RCs, or will a common DTS be utilized? (DEMSWG)	Each RC will provide simulation training using their own DTS or other simulation methods.
12.	Will each RC use the following advanced applications: State Estimation, Real-time Contingency Analysis, Real-time Voltage Stability, and Real-time Transient Stability? (DEMSWG)	Each RC will use State Estimation and Real-time Contingency Analysis. AESO, BC Hydro, CISO and SPP have all stated they have plans to use Real-time Voltage Stability and Real-time Transient Stability as part of their Real-time Assessments.

13.	Are the new RCs providing Hosted Advanced Application services? Will all the features provided by Peak today be provided by the new RCs in the future? (DEMSWG)	CISO and SPP are providing Hosted Advanced Applications: • CISO has held several working group meetings with interested customers. • SPP is working with their customers to provide Hosted Advanced Applications with the same features currently provided by Peak. No gap analysis has been provided to future CISO and SPP HANA/HAA users to validate similar functionality will exist between Peak's, CISO's, and SPP's Hosted Advanced Application solutions. *Discussion with BAs/TOPs:* • *SPP plans to have HAA service available to customers by June.* • *CAISO plans to have HANA service available to customers by October.* • *RC customers need to request details of tools to be received from their HAA/HANA provider.* *Communications on HAA and HANA will be managed by the RCs providing the service.*
14.	How will RCs and TOPs transition ICCP data? How will EHV be replaced for BAs and TOPs? Will RCs get external RC area data direct from BAs and TOPs, or will they get through other RCs? (DEMSWG)	This is being discussed in the ICCP small-group. Key discussions include: • All EHV ICCP point "readers" have been identified; each RC going to those BAs/TOPs to determine if they still need the data, and where they want to get it from in the future. • CISO is setting up an ICCP sharing system called the Western Data Sharing Pool that serves a similar function as Peak's EHV. AESO, BC Hydro, and SPP will all share their ICCP data directly from their respective production ICCP servers. • AESO, BC Hydro and CISO all plan to get external ICCP data directly from BAs and TOPs; SPP plans to get external ICCP data from the host RCs. *Discussion with BAs/TOPs:* • *CISO has sent connection requests to entities that they need a connection with.* • *CISO intends to limit points from their data sharing pool to clear BES elements > 100kV. Peak previously made all data available via EHV.* • *RC's have been given details by Peak on each EHV connection that include the company and data they receive.* • *CISO encourages companies to have a direct data link with neighbors rather than only with other RCs; potential to lose majority of external ICCP data. You can get data also from the RC if desired.*
15.	Will each RC implement the following synchrophasor applications: Linear State Estimation, Oscillation	Peak has been developing these applications for the west for many years, with the help of multiple vendors and research partners. Some baselining and PMU data validation has

	Detection, Mode Meter, and Phase Angle Monitoring? (DEMSWG)	been done, but most of the tools will need further tuning and testing before they will be ready for operational decision making. The following capabilities and plans exist: • CISO has the following tool capabilities: LSE, Oscillation Detection, Mode Meter, and Phase Angle Monitoring. • CISO already monitors phase angle differences, both pre- and post-contingency, in both internal and external parts of the Western Interconnection. • SPP has the following tool capabilities: Oscillation Detection, Mode Meter, and Phase Angle Monitoring. • BC Hydro contributes PMU data but does not use synchrophasor applications in operations. • AESO utilizes Phasorpoint application and has developed custom displays to identify western regional islanding boundaries. • All RCs will need to work together and with TOPs/BAs to develop Operating Plans for future operator decisions based on synchrophasor data and applications. *Discussion with BAs/TOPs:* • *Harris network is being retired by end of June. Peak will not connect to the new AT&T network to be used for PMU data traffic and will no longer receive streaming synchrohphasor data post the end of June.* *Communications about RC implementation of these applications will be handled by each individual RC directly with their respective RC customers.*

SOL/IROL and UFMP coordination

Issue No.	Issue/Question	Where being addressed; Plan for addressing
16.	How will IROLs be coordinated and managed by multiple RCs? The NW Washington Load Area requires much mitigation from CISO RC, but BC Hydro and GridForce will have mitigation responsibilities. Similar coordination is required for Oregon Exports, San Diego Imports, and CENACE/San Diego Imports (Summer).	Operations Planning team has decided that the four voltage stability limited IROLs (OREX, NW Wash Load Area, SDGE Imports, and SDGE/CENACE imports) will be communicated via daily conference calls, outage records, study reports, and real-time ICCP. In addition to the four voltage stability limited IROLs, CISO will have the Path 61 IROL within their footprint. Operating procedures will be written based on the existing Peak IROL procedures which will document the required coordination and action required by all RCs and impacted BAs and TOPs. In real-time, conference calls will include all impacted RCs, BAs and TOPs.

17.	Identification of IROLs – will the process for identifying IROLs change? Will there be consistency across the Western Interconnection with how IROLs will be identified?	SOL methodology small team is addressing SOL methodology differences; this includes differences with Peak's existing methodology, as well as differences across all the new RC's methodologies. It is not expected that changes will be made to how IROLs are identified. Any new IROLs that cross RC boundaries will be coordinated with all impacted RCs, BAs and TOPs. SOL methodology status updates: • CISO has completed its SOL methodology and has coordinated with their RC Area BAs and TOPs as well as with adjacent RCs. • BC Hydro completed its draft SOL methodology and documented differences with Peak's methodology on February 8. • SPP plans to have a stakeholder approved SOL methodology by March 20.
18.	How will RCs address SOL and IROL exceedances across their seams when studies/tools have different results?	RC to RC agreements and Operating Plans will define how RCs manage differences in studies and tools. Most conservative operations are expected when real-time disagreements occur, ensuring reliable operations. Disagreements in real-time operations will be reviewed after the fact, including study and/or tool result reviews and updates to Operating Plans, if necessary.
19.	How will SOL or IROL mitigation across RC seams be coordinated? If there are disagreements in mitigation actions (including gen re-dispatch and load shedding), how will they be resolved? How will the RCs manage an issue where a contingency in one RC area creates a post-contingency SOL exceedance in another RC area?	The shadow operations small team is collecting operating procedures, including SOL ad IROL mitigation procedures, and will evaluate for key differences in SOL or IROL mitigation practices. Generally, coordination of SOLs and IROLs across RC seams will be coordinated way in advance, through seasonal coordination, outage coordination, or next-day study processes. If there isn't sufficient time to collaborate on the procedure or operating guide development in advance of real-time, then a temporary/interim operating guide can be published to address an urgent operational reliability concern. In all cases, impacted RCs, BAs, and TOPs will be notified and, time permitting, given opportunity to contribute to the development of the operating guide. Ultimately, it is the RC over the TOP where the SOL is located that is responsible for coordinating with impacted RCs, BAs, and TOPs to ensure that the SOL exceedance is mitigated. If there is any disagreement regarding proposed mitigation approaches, then the most conservative approach and action will be implemented until a final agreed upon mitigation approach is reached. *Discussion with BAs/TOPs:* • *In the history of WECC, there have been differences between RC's giving directions; how is it ensured the communication is the same* • *Writing operating guides – agreement upon actions to be taken and who gives the operating instructions; messaging system on a pre-determined list of participants.* • *RC will work with its BAs and TOPs; if a seams issue exists, the neighboring RC will be engaged prior to a RC calling a company outside of its RC Area.*

20.	How will the RCs calculate IROLs and non-IROL stability limits? How will those limits be shared so that each RC has appropriate levels of situational awareness?	SOL methodology and Operations Planning small teams are addressing SOL methodology differences; this includes differences with Peak's existing methodology, as well as differences across all the new RC's methodologies. It is not expected that changes will be made to how IROLs are identified. Key points to IROLs and non-IROL stability limits: • Any new IROLs or stability limits that cross RC boundaries will be coordinated with all impacted RCs, BAs and TOPs. • IROLs and non-IROL stability limits will be communicated in day ahead study reports, Outage Coordination outage records, and via ICCP (for real-time calculated values) to impacted RCs, BAs and TOPs.
21.	How will SOL exceedances along the Southwest Power Link (SWPL) be monitored and mitigated? Will phase angle separation continue to be monitored as is done today?	CISO has existing procedures for monitoring and mitigating SOL exceedances on the SWPL, which includes monitoring phase angle separation. SPP will develop Operating Plans, including the need to monitor phase angle separation, to address their required actions to monitor and mitigate SWPL SOL exceedances.
22.	How will SOL exceedance coordination and mitigation occur for Path 14 and Path 75 due to heavy flows W>E (heavily impacted by unscheduled flows - important due to numerous impacted TOPs)?	Operating Plans for specific areas will be developed in coordination with all impacted RCs, BAs and TOPs. *Discussion with BAs/TOPs:* • *SPP will work with TOPs to determine where Proxy SOLs will be appropriate. Otherwise consistent with other RCs that they will monitor and mitigate pre- and post-contingency SOL exceedances in a manner similar to Peak Reliability does today.* • *Have several procedures which Peak developed – plan on transferring and re-using as much as possible;* *Communications about how each RC will handle SOL exceedance coordination and mitigation will take place in specific RC customer meetings.*
23.	How will each RC model, study, and monitor IROLs or other cascading risks if they are 1) within their RC area, or 2) outside their RC area but may have an impact on their RC area, or RC has resources within the RC area that are needed for mitigation?	RC to RC agreements and Operating Plans address how RCs monitor and manage IROLs or other cascading risks. The RC coordination team has created a sub-group (network modeling sub-group) that is tasked to create and document a common methodology for implementation of IRO-002-5 WECC regional standard variance. This common RC modeling and monitoring methodology will address the modeling and monitoring of IROLs and cascading risks. In addition, the shadow operations small team is looking at each RCs pre- and post-contingency monitoring strategies.
24.	How will the RCs coordinate actions related to the Western Interconnection Unscheduled Flow Mitigation Plan (WIUFMP) • Step progression	WIUFMP tool (ECC) changes being managed by ECC/WIT/UFMP small-group. Operations coordination expectations and training being managed by Shadow Operations small-group. Table top and simulation training drills are being developed to address coordination of WIUFMP actions. The main WIUFMP coordination issues for RCs include:

	• COPS • Curtailment process	• Step 3 COPS RC coordination is to determine the most effective phase shifter tap changes. The RCs (CISO and SPP for WIUFMP) will agree on desired tap settings, and then each RC will perform an assessment to verify the new tap settings do not result in a reliability problem within their RC Area. • Step 4 curtailments will continue to be identified and enacted via the Enhanced Curtailment Calculator. *Discussion with BAs/TOPs:* • *What to do with competing paths when there are two RCs? Will show up in ECC as two separate events. Each RC will need to work with the ECC results (no different than today); each RC will need to approve for their respective path(s).* • *Communications on this topic requested to include UFC and QOO groups.* • *Concern voiced over the EIR registration process; need to communicate the process and coordinate with BAs. This is being discussed in the EIR/WIT/ECC small team, where an EIR transition document is being written.* • *Both CISO and SPP to provide ECC USF event messages via their respective messaging tools.*

Operations Planning

Issue No.	Issue/Question	Where being addressed; Plan for addressing
25.	Outage Coordination questions: • Need coordinated scheduling and mitigation steps. • How are Cancelled or Urgent outages handled across boundaries? • How will outage information be shared among the RCs? • Do multiple impacted RCs need to all approve an outage? • Will there be regularly scheduled calls to discuss outage information?	The Operations Planning RC sub-team is addressing all Outage Coordination issues. Open issue to resolve related to the submission of clearance points with all scheduled outages. Generally, each RC's Outage Coordination Plan as required by NERC IRO-017-1 will address these questions. • Coordinated scheduling and mitigation – Outages will be submitted to the RCs, who in turn will share those outages with other RCs. • Cancelled or Urgent outages – these outages will be coordinated among the RCs. Urgent outages will continue to be studied and coordinated as time allows. • Outage information sharing - Peak's COS will continue to be the repository for Western Interconnection outages until December 3. CISO's OMS will be the repository for all outages starting December 3. • Outage approval – when multiple RCs are impacted by an outage, only the RC where the outage is occurring will need to approve the outage. For tie lines, both RCs will

		need to approve the tie line outage. RCs will be required to coordinate outages with other impacted RCs, BAs and TOPs. • Outage calls – Each RC will establish call frequency, which may include nightly calls, shift change calls, or weekly calls. *Discussion with BAs/TOPs:* • *How are submittal timing differences going to be addressed across RCs? Response - if you are meeting your RC requirements you should be good to go.* • *SPP RC customers will not have access to CAISO OMS, rather SPP customers will get it from SPP. SPP will sync their outage system with CAISO so they have all the necessary outages.* • *Outages will automatically be sent to all RCs once an outage is submitted by a BA or TOP (doesn't have to be approved by RC before being sent to other RCs)* • *Outage conflicts will be addressed by "first in wins".* • *Both RCs will have to study and approve outages on tie lines.*
26.	Seasonal Coordination • Will there be consistency of seasonal study and coordination processes between the RCs? • If a seasonal study involves both RCs, how will discrepancies be addressed/mitigated?	The Operations Planning RC sub-team is addressing seasonal coordination issues. A Seasonal Coordination process has been created for use by all RCs through winter 2019/2020 based on the existing Peak Seasonal Coordination process. The RCs will coordinate the development of a common Seasonal Coordination process for seasons beginning Spring 2020. It is envisioned that the regional study groups will continue to perform studies under the coordination processes managed by the RCs.
27.	How will the RCs ensure consistency across SOL Methodology, mitigation philosophy, and credible contingency methodology (including multiple contingency credibility)?	SOL methodology small-group is addressing this. Each RC is completing their SOL methodology and documenting differences from Peak's SOL methodology. The small group will review all those differences and address problems identified.
28.	How will RCs share and coordinate Operating Plans, including those created in outage coordination, next-day, or same-day study processes?	The Operations Planning small-group is addressing this. Methods for sharing Operating Plans include: • Each RC will host a file sharing system; each RC will automatically collect other RC study reports (including the external BA/TOP studies) and make them available to their respective BAs and TOPs. • Outage cards in the CISO OMS will be updated to include Operating Plans and notes. • RCs will also coordinate as necessary by phone and email to ensure Operating Plans are in place. *Discussion with BAs/TOPs:*

		• *Is there a plan to use a common format for a study template? - (ACTION ITEM) This has not been discussed formally but will be added to the Ops Planning Team Action Item list.*
29.	Will forecast data (load forecast, interchange forecast, and unit schedules) be shared by the RCs, or does a BA need to provide to multiple RCs? Will BAs need to change how they are currently submitting this data?	Forecast data submissions is being discussed in the Operations Planning sub-team. CISO will send LF data to Peak for BAs in its July 1 and November 1 RC Area. All other LF and generator forecast data will continue to flow to Peak directly from BAs until Peak no longer needs the data. Long term plan is for each BA to send LF and generator forecast data to their RC, who will then send the forecast data on to the other RCs. CISO has offered to be a data warehouse for all the forecast data that could be accessed by entities in the West. Interchange forecast information will be pulled from WIT by each RC. *Discussion with BAs/TOPs:* • *SPP customers will submit to SPP; non-SPP will be in the CISO repository and SPP will obtain and make it available to SPP customers.*

RAS Coordination – Modeling and Monitoring

All RAS within WECC are required to be reviewed by the WECC RAS Reliability Subcommittee (RAS RS), per the PRC-012-WECC-CRT-1, Remedial Action Schemes (RAS Criterion). In the future the subcommittee will change to the RAS Review Subcommittee to align with the requirements associated with PRC-012-2, which will require the RCs to review and approve RAS. WECC will continue to facilitate the review of RAS in the Western Interconnection through the new RAS RS process. RCs, along with BAs and TOPs, will be members of the WECC RAS RS and will participate in the RAS review and approval process.

Issue No.	Issue/Question	Where being addressed; Plan for addressing
30.	What is each RC doing to ensure it has the "right" RAS modeled and appropriate levels of situational awareness as it relates to actual and potential RAS impacts?	The network model sub-team is developing a common monitoring and modeling methodology as required by the new IRO-002-5 WECC variance. Requirement 1.4 requires the methodology to address which RAS are needed for analyses and assessments. The CISO is referencing the WECC RAS PRC-013 list along with Peak's RAS list and is developing an index to match those to the RAS modeled for Contingency Analysis for the CISO RC area. SPP is reviewing Peak's RAS models and collecting information from their customers to ensure the correct RAS are modeled.

		Discussion with BAs/TOPs: • *WECC and RCs are implementing a new RAS RS process to meet needs of PRC-012. Implementation due in 2021, but schedule will be moved forward to 2020 to be sure process is working as expected.*
31.	RCs must have appropriate levels of ICCP data informing of real-time RAS arming status so that analyses properly reflect the actual status of RAS.	The network model sub-team is developing a common monitoring and modeling methodology as required by the new IRO-002-5 WECC variance. Requirement 1.4 requires the methodology to address which RAS are needed for analyses and assessments. The ICCP sub-team is discussing ICCP data sharing, and it has been agreed that BAs, TOPs and RCs are able to share RAS information that is needed for RC situational awareness. The CISO is referencing the WECC RAS PRC-013 along with Peak's RAS list and is developing an index to match those to the RAS modeled for Contingency Analysis for the CISO RC area. SPP is reviewing Peak's RAS models and collecting information from their customers to ensure the correct RAS are modeled.
32.	How will RAS awareness and coordination be handled for major RAS, including WECC-1-RAS (When Captain Jack – Olinda is out of service, simultaneous loss of Malin – Round Mountain #1 & #2 lines will cause NE/SE separation scheme to trigger if COI flows are above set-point) and Path 1/MATL RAS (when Path 1 trips, MATL also trips, islanding Alberta; restoration is currently coordinated by Peak with AESO, BCH, NWE, Naturener and MATL).	RAS coordination and training is being discussed in the Shadow Operations small-group; Identifying RAS that need to be included in OPAs and RTAs is being discussed in the IRO-005-2 WECC variance small team. WECC is working with RCs to determine the future for a WECC RAS RS "like" group to facilitate RAS changes in the West, recognizing that reviewing new or modified RAS become a compliance obligation for RCs per PRC-012-2. Today RAS are approved and coordinated through the WECC RASRS group. RCs will have Operating Plans in place to address major RAS. The RC of the TOP that maintains and owns RAS will be the lead on any coordination of actions required after a RAS operation or coordination and actions required if a RAS is temporary disabled. *Discussion with BAs/TOPs:* • *SPP evaluating which RAS to model and provide situational awareness; will incorporate into operating guides as appropriate. SPP is expanding capabilities of EMS to support additional RAS modeling.* • *CISO is considering implementing additional operating guides to give RCs clarity of how to coordinate RC to RC on these types of RAS.* • *Bob Cummings pointed out the need to identify all inter-area RAS and to have each RC have situational awareness of those RAS. Discussion of the need for a common RAS (and non-RAS automatic devices) list for use by all RCs, but consensus not reached.*

		Communications regarding specific RAS will be addressed by each respective RC.
33.	Cross RC boundary RAS actions - who manages (takes the lead) and who has authority? RC for the BA/TOP that manages the RAS regardless of what other BA/TOPs are impacted? Those approved by the RASRS should be re reviewed.	RAS coordination and training is being discussed in the Shadow Operations small-group. The specific details of how each cross RC boundary RAS approved by RASRS will be coordinated has not yet been addressed; generally, those RAS will need to be identified and Operating Plans put in place. The Operating Plans will identify roles and responsibilities of impacted parties, including identifying leadership roles for decision making and issuances of Operating Instructions. WECC will continue to facilitate the review of RAS in the western interconnection through the new WECC RAS Review Subcommittee (RAS RS) process. RCs, along with BAs and TOPs, will be members of the WECC RAS RS and will participate in the RAS review process. *Discussion with BAs/TOPs:* • *have the new RCs reviewed Peak's operating procedures to determine what Peak does today and who will do what in the future?* • *Is there a need for all RCs to have a common RAS list, which contains all identified RAS in the West, in addition to non-RAS automatic action that impact the BES?* *Communications on these items will be provided through each RCs work groups and communication channels.*

Real-time Operations Coordination

Issue No.	Issue/Question	Where being addressed; Plan for addressing
34.	Phase shifter operation is often coordinated between NWE and WAPA, where a tap change in the WAPA BA is operated by NWE. This is beyond COPS in the UFMP. How will this be handled in the future?	Regarding the specific issue in the question, CISO, NWE, SPP and WAPA are developing a seams coordination process for items such as Phase Shifters. A TOP that operates a phase shifter will coordinate this with its RC and impacted neighboring RCs and TOPs as needed. The TOP and the notified RCs will perform assessments if needed to determine the impact of new tap setting on the transmission system.
35.	Restoration and Emergency Operations • Getting offsite power to Nuke plants. • Restoration across RC Seams (Training/Line energization/Paralleling/Island Frequency Control/AGC Operation/Hoover Use/etc.) Separation is covered in the SOL	There is an EOP and Restoration topics small-team leading coordination of restoration and emergency operations. Each RC is required to develop an RC area restoration plan (EOP-006) that will address these topics. Also, RC to RC agreements will address the high-level issues related to restoration and emergency operations. Peak and CISO have already reviewed each other's RC area restoration plans for July 1. Other plans are under development and due for exchange/review early summer.

	documentation. Black Start for Palo Verde, in RC areas will have to be coordinated.	*Discussion with BAs/TOPs:* • *Will each RC have its own restoration plan? Answer - Yes, but those will be coordinated with other RC's.* • *WALC talked about restoration/island coordination when each step on the restoration process might require a different RC to give its approval. For example, one step they might tie to APS (CISO RC), next step TEP (SPP RC).* *Communication on this topic will come from each RC because of the specific nature of the operating plans needed.*
36.	How will the RCs address issues across seams when RCs have different understanding of the problem (tools/data say different things) or different solutions?	For areas where conflicts arise, the RC will participate in discussion to find resolution between the parties. In accordance with RC Operator procedures, for instances where resolution is not achieved, the RC, by use of Operating Instructions when necessary, will take a conservative approach and operate to the most limiting results, ensuring reliability. *Discussion with BAs/TOPs:* • *RC to RC agreements cover a piece of this. The RCs will work with TOPs to determine if it is / is not an issue.*
37.	EEA events and Reserve Sharing Group (RSG) coordination (RSGs span multiple RCs) • How to manage RSG deficiency situations? • MATL cannot be used for contingency reserves • SRSG (RSG ACE Calculation/Entity Reserve Deficiency actions) • How will RSG information be shared during communication/data transfer issues? • How will emergency energy assistance be coordinated between RCs? How will requests for assistance under EEA's be communicated in both RCs?	A RC Coordination small team is meeting to discuss the impacts of RSGs spanning multiple RCs. Each RC will participate in those meetings and bring back details to be included in Operating Plans. Each topic listed in this question has an Operating Plan that has been (or will be) created to coordinate all necessary activities by impacted BAs, TOPs and RCs. *Discussion with BAs/TOPs:* • *Initially working with Peak to have consistent approach.* • *Not much change from today - will need to work with the deficient BA; may need to request assistance from neighboring RCs.* • *MATL can be used for contingency reserves in the NW bubble, however it can NOT be used between NW and AESO. (Paul Olsen, NaturEner)* • *CISO and SPP have created responses to these questions and may be requested to provide the responses.* *Communications on these specific operating seams will be handled by the RCs where the issues reside.*

38.	Load, Generation or Transmission in multiple RCs – There needs to be clarity on authority and responsibility for mitigation of system conditions that cross RC borders, especially where the BA boundaries do not align with TOP boundaries, and a BA in one RC has transmission, load or generation in another BA, or where resources in a BA can mitigate system conditions in a different BA in a different RC. These areas need to be specifically identified for SOL mitigation coordination, outage coordination, and/or emergency coordination. Examples include: • NWE/WAPA-UGP both have load, generation and Transmission in each other's BAA, largely in the Northern part of Montana (Fort Peck to Great Falls). Miles City DC tie is part of the nomogram for Path 80. WAPA-UGP also has the unique ability to shift some load to the Eastern Interconnection. • PACE/WAPA have dozens of interchange points. This is an issue especially in Wyoming, but also into Colorado, where PACE has a large portion of the 230 kV system and WAPA has a large portion of the parallel 115 kV system. There are many nomogram-driven (several non-linear nomograms) paths with variable generation that require somewhat regular RC coordination today. Some also include NWE, TSGT and BHP. • BPA/BCH Path 3 Operation – Expectation is that BPA TOP to BCH TOP coordination will continue as today but need clarity on role of RCs. • BPA/GRID – The GRID generation is interconnected to BPA transmission, and thus impacts BPA transmission flows.	Each RC is required to document high level operating and coordination plans in their respective RC agreements, required by IRO-014-3. Each RC, together with the impacted BAs and TOPs will need to address the specific nature of these items through detailed operating plans. NWE/WAPA-UGP - RCs are working with the impacted BAs/TOPs to create an Operating Guide for the area. PACE/WAPA – RCs will work with impacted BAs and TOPs to develop Operating Plans to address these issues. BPA/BC Hydro Path 3 Operation - CISO RC and BC Hydro RC will have a joint operating agreement for Path 3. Additionally, an Operating Guide will be developed to instruct the RCs and TOPs on operation of the interface, which includes Path 3. BPA/GRID - GridForce as filed with WECC to become an RC. CISO RC and GridForce RC will have a joint operating agreement and additionally an Operating Guide will be developed to instruct the RC's and TOPs on operation of the interface. Communications on these specific issues will be handled by the RCs involved in the activity.

39.	Frequency issues • RCs should see ACEs across the Interconnection and have protocols for communications about the deviations and expected actions to take. • Under-frequency Load Shed and island coordination is currently largely coordinated through NWPP today for the NW	RCs will have situational awareness and operating procedures for dealing with ACE, capacity, reserves, and frequency. RCs will work with other RCs in the Western Interconnection to coordinate resolutions when FTL triggers are hit. UFLS and island coordination follows the processes described in PRC-006-2-WECC-CRT-3, Under frequency Load Shedding. This process will continue to be applicable to BAs, UFLS Entities, Generation Owner and TOP as it is today.
40.	Canada – US separation: Heavy N->S transfers have impacts across multiple RCs, TOPs and BAs; risk of Canadian island has resulted in problems with transfer levels, schedule cuts and system frequency.	CISO RC, BC Hydro and AESO are developing Seams Interface Operating Guides for each interface that will be effective November 1.
41.	Will each RC simulate and monitor for the PDCI bi-pole and Intermountain DC contingencies and associated system response? Potential for RAS impacts and low FTL exceedance.	The network model sub-team is working on the IRO-002-5 WECC variance which requires a common methodology for all RCs. Requirement 1.3 requires the methodology to address "A method to determine Contingencies included in analyses and assessments", while requirement 1.4 requires "A method to determine Remedial Action Schemes included in analyses and assessments". CISO simulates and monitors for the PDCI bi-pole and Intermountain DC contingencies and associated system response.
42.	How will the RCs address wind pushes in Wyoming and Colorado and manage resulting transmission constraints?	RCs will develop Operating Plans and Guides in conjunction with impacted BAs, TOPs, and RCs to address these transmission constraints.
43.	Path 30 has impacts to several TOPs, BAs and future RCs. How will actions be coordinated by SPP and CISO?	Path 30 is a Qualified Path, so unscheduled flow issues will continue to be addressed through implementation of the WIUFMP. For other issues, RCs (CISO and SPP in this question) will coordinate and develop Operating Plans for those seams situations that require coordination and assistance from neighboring RC(s) to mitigate the loading. *Discussion with BAs/TOPs:* • *When will each RC have a list of operating plans they want to develop? When will that list be available to RC customers? Answer - Peak/CISO have list for July 1 transition, Peak and BCH for Sept. 2nd list; CISO also working on Nov. 1 list; SPP still working out details with CISO for coordination.*

44.	Mead issues, including reserves carried there for multiple RC footprints.	Each RC is required to monitor reserves for BA's under their jurisdiction. There is an RSG Team that will address RSG seams coordination.
45.	How will gas coordination issues be managed across RC footprints? For example, the Feb 2011 cold weather event. El Paso Natural Gas pipelines will cross multiple RCs.	Each BA / TOP that is impacted by gas constraint due to cold weather or other event will manage their own impact within their footprint. A BA may communicate the need for declaring an EEA to its RC in the case that fuel supply issues (i.e. gas supply issues) cause a shortage in generation supply. RC will issue a notice declaring the EEA on various interconnection wide communication platforms. If the entity experiencing the EEA is a member of an RSG, the normal process for requesting assistance from the RSG should be implemented. The RC(s) will monitor System Operating Limits to ensure a reliable transmission system. When an outage impacts multiple RC areas, the RCs will coordinate with all impacted entities. *Discussion with BAs/TOPs:* • *Today, CAISO coordinating with Peak regarding gas shortages. Impacted RCs may need to sign an NDA to get access to these gas coordination calls (ACTION ITEM). RC's should also discuss with the gas companies within their footprints to see if there is a need to create NDAs.*
46.	Operator communications will be important – especially in the future world where each RC and its members have different messaging tools. How are neighboring TOPs/BAs going to communicate with each other and both RCs in an efficient manner?	CISO RC has developed a messaging tool called Grid Messaging System (GMS). BCH and AESO will use CISO's GMS. SPP is implementing their communications tool called R-Comm for use with their Western Interconnection RC customers. GMS and R-Comm will broadcast messages via an API to each tool. Any RC, BA or TOP can issue a WECC wide message which will be received by all WECC entities with a messaging tool. BAs and TOPs can also communicate directly with other BAs and TOPs using GMS and R-Comm, both within their RC footprint as well as outside their RC footprint. RMT will be retired on 12/3/2019, until that time CISO will duplicate appropriate messages on to RMT. There is an RC Messaging Tools small team that is supporting this transition.
47.	Since TOP boundaries are not necessarily the same as BA boundaries, how will load shedding be coordinated between RCs?	Load shed Operating Instructions will be issued to BAs for capacity emergencies and to TOPs for Transmission Emergencies by their jurisdictional RC. This jurisdictional RC will coordinate with neighboring RCs and TOPs/BAs as necessary. RCs will coordinate and develop Operating Plans for those seams issues that require coordination and assistance from neighboring RC(s) to mitigate the issue. If no Operating Plan exists yet a load shed need arises, the RC will assess and determine, in coordination with impacted BAs, TOPs and

		RCs, the amount of required load shed needed for mitigating an issue. Accordingly, all RCs will issue Operating Instructions to their BAs and TOPs. *Discussion with BAs/TOPs:* • *When it is a BA issue, it will be the RC of that BA that manages that load shedding.* • *When it is a transmission emergency, multiple RCs may be involved.* *Related question - when mitigation is taken by gen redispatch, how long will the generator need to hold that gen output? What will be the process to look at addressing that to a more equitable solution?* • *Dede pointed out that the "final phase" of ECC project could address some of this if the BAs want the RCs to tackle that. Final phase documentation has been created by the ECC TF and has been available to BAs, TOPs and RCs.*
48.	NERC (Carter Edge) identified three areas of concern for RC coordination: IPPDC, Hassayampa switchyard, and Metropolitan Water District transmission system (which interconnects IID with WALC via AEPCO TOP). How do the RCs plan to manage operating issues across this seam?	RCs will coordinate with impacted BAs, TOPs and neighboring RCs to develop Operating Plans to address these, and other, seams issues. As these areas reside within the CISO RC Area, CISO provided this response: • IPPDC, CISO RC has coordinated the development of an IPPDC Operating Guide with the impacted parties. • Hassayampa Switchyard and MWD, the main change is the move of jurisdiction over certain facilities to CISO RC. CISO RC will have overviews which show demarcation. CISO RC will monitor facilities across the seam and in the RTA. CISO RC foresees holding joint blast/conference calls with the adjacent RC and impacted TOP/BAs for any issues that develop in real-time. CISO RC outage coordination will inform and vet any planned work with the adjacent RC. Coordination of these facilities have always been, will continue to be coordinated by impacted TOP/BAs. Planned outages may require a Temporary Operating Guide(s). RC's retain approval rights over all planned and emergency outages.

Training

Issue No.	Issue/Question	Where being addressed; Plan for addressing
49.	How will training/RC education be handled, especially for issues across seams?	Each RC is developing training plans for their respective RCs. Those training plans that require other RC support (table tops or simulation drills) are being coordinated and scheduled to be sure resources are available to support the training. Training for several

		unique seams topics, including IROL coordination, WECC-1 RAS, UFMP, and various RC interface are being discussed and planned in the Shadow Operations small team. Tabletops and simulation drills will include impacted BAs and TOPs. All necessary training will be provided prior to the start of shadow operations for each new RC. *Discussion with BAs/TOPs:* • *RCs are creating a training coordination matrix that shows which trainings will need external RC participation.* • *CISO: Identified training, coordination procedures, drills needed; have had some joint training with BAS and TOPS and with BPA* • *SPP's trainers are training and attending various available trainings in the west; internally have several sessions a week on each operating guide, RAS, etc. Starting their visits in April with their customers in the west.* • *Getting training from their TOPS on phase shifter operation.* • *AESO – working with shadow ops team to determine training and development of training guides; table TOPs; simulations; coordination.*
50.	How will restoration (black start) drills/training be coordinated? Will they be combined or separate?	Peak will be providing a restoration simulation exercise for all RCs in April of this year. The RCs support continuing to provide WECC wide restoration drills to practice Western Interconnection wide restoration, including practicing restoration across RC seams. *Discussion with BAs/TOPs:* • *Consider having entities that are impacted by common resources (Glen Canyon, Hoover for example) together in a restoration drill.* • *Restoration drills that AESO is planning – do every year with their TOPs; BC invited, Peak invited, CISO invited; invitations for this year have been sent out; coordinate plans with Peak and CISO.* • *Peak – third week out of 5; area A, B and C; sixth week will be for the RCs on the restoration plan or individual plan; scenario is ready to go for a 2020 year* • *CISO participating in Peak restoration drill; will host a drill second half of the year for their area and will develop a plan for later this year.* • *SPP attending restoration drills in the west and support the efforts taking place.* • *BCH attending the Peak sessions and will attend the one in April; like CISO – have BAs and TOPs in their footprint and coordinating with them.* • *GridForce will be attending the drills in April; focus will be RC to RC coordination.* • *WAPA got into specifics as to restoration training needing to have the various entities involved in nuke plant restoration and other.*

51.	Will all RCs be participating in GridEx? Will there be coordination prior to GridEx? (DEMSWG)	All RCs are active GridEx participants. Coordination among the RCs, BAs and TOPs will also continue, as appropriate. *Discussion with BAs/TOPs:* • *Peak will not participate in November's GridEx.*

Other

Issue No.	Issue/Question	Where being addressed; Plan for addressing
52.	Will the new RCs provide CIP-014 physical security risk assessment review services? (DEMSWG)	CISO will provide this service to interested customers. SPP will not provide this service at this time.
53.	Will the new RCs provide TOP-003 library for their BAs and TOPs? (DEMSWG)	CISO will provide TOP-003 library for their BAs and TOPs. SPP is also planning to provide a TOP-003 library for their BAs and TOPs.
54.	Will RCs coordinate on IRO-010 data requests? Will there be common requests with consistent data definitions? (DEMSWG)	The IRO-010 small-group is addressing IRO-010 issues and the need for consistency across all RCs. For the July 1 transition with Peak RC, CISO is working with Peak to ensure a smooth transition and minimize changes for Peak systems and integration points. CISO has created new attachments to its data specification for RC-RC specific exchanges and is maintaining consistent numbering for traceability to Peak's requirement numbers.