

WECC RC Seams Issues and Related Topics

March 11th SEAMS Summit

Active RC Coordination Sub-Groups

RC Coordination sub-groups:
ICCP / Data Sharing Transitions
ECC/WIT/USFM
Messaging Tool
Network Modeling
Operations Planning
Shadow Operations
SOL Methodology
Synchrophasors – WECC / NERC data
RC-RC Coordination EOP Restoration Drills
IRO-010 Data Request Coordination

Interconnection wide tools, data, models and reports

1. ECC – Who will “own” the ECC contract, and how will ECC be supported in the future?

The RCs are working on governance of the interconnection wide tools (ECC & WIT). The objective is to reach an agreement on the management of the tools, the contract structure between the vendor and the RCs and establishing a process for software maintenance and enhancements. The Governance document will include details of the administration of the tools and the allocation of the costs associated with the applications, enhancement and maintenance costs and fees. The RCs will fund these tools through their RC Services fees. Various teams and sub-groups of ECC/UFMP and WIT were formed are working on the details of the governance and address several related topics. CAISO will hold the ECC contract with OATI. CAISO will also provide a consolidated model to OATI to use as the power flow based case needed by ECC. CAISO and SPP will use ECC to implement UFMP step 4 for path 66 (CAISO), and paths 30, 31, and 36 (SPP). The congestion management tool is undergoing enhancements that would allow supporting multiple RCs use of ECC, each RC will be responsible for maintaining various registration and modeling information for its area. CAISO and SPP have both stated the desire to perform the WIT administrator functions for each of their RC area. CAISO will administer the required Delta Time Error (DTE) process.

2. WIT – Who will “own” the WIT contract, and who will perform the WIT administrator functions?

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objective is to reach an agreement on the management of the tools, the contract structure between the vendor and the RCs and establishing a process for software maintenance and enhancements. The Governance document will include details of the administration of the tools and the allocation of the costs associated with the applications, enhancement and maintenance costs and fees. The RCs will fund these tools through their RC Services fees. Various teams and sub-groups of ECC/UFMP and WIT were formed and are working on the details of the governance and are addressing several related topics. CAISO will hold the ECC contract with OATI. CAISO will also provide a consolidated model to OATI to use as the power flow base case needed by ECC. CAISO and SPP will use ECC to implement UFMP step 4 for path 66 (CAISO), and paths 30, 31, and 36 (SPP). The congestion management tool is undergoing enhancement that would allow supporting multiple RCs use of ECC, each RC will be responsible for maintaining various registration and modeling information for its area. CAISO and SPP have both stated the desire to perform the WIT administrator function for each of their RC area. CAISO will administer the required Delta Time Error (DTE) process.

3. West-wide Interconnection Model maintenance and data exchange processes – how will the full interconnection model be managed going forward for the good of the interconnection?

SPP is using the Peak WSM as the starting point for the west model including its SPP West RC footprint. This model will be made available to SPP RC customer for validation. Each SPP RC TOP and BA can request updates to the model, to which SPP will comply with on a monthly basis starting in June 2019. SPP's model will also have a sizeable representation of the rest of the interconnection and detailed modeling for the first tier areas to SPP RC footprint. SPP is assessing what RAS is impactful and should be modeled by SPP. Peak made its RAS-model available to SPP and the evaluation is on-going.

4. How is the new IRO-005-2 WECC variance, which requires modeling and monitoring consistency across all RCs, be implemented to address the interconnections situational awareness needs?

RCs in Western Interconnect will draft a methodology that is in accordance and compliance with In accordance with WECC-0135 and IRO-002-5 Variance. The Network Model RC sub-team is discussing the data exchange process. Model data exchange between RCs will be in CIM15XML format. The RCs have agreed that CAISO will maintain the full interconnection model and make it available to all RCs, BAs and TOPs to consume.

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?

RCs in Western Interconnect will draft a methodology that is in accordance and compliance with In accordance with WECC-0135 and IRO-002-5 Variance. The Network Model RC sub-team is discussing the data exchange process. Model data exchange between RCs will be in CIM15XML format. The RCs have agreed that CAISO will maintain the full interconnection

model and make it available to all RCs, BAs and TOPs to consume.

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?

Network model RC sub-team is drafting a common methodology for use by all RCs. The Shadow Operations sub-team has requested that each RC document its monitoring and alarming methodology for review to identify any potential gaps.

7. Real-time Message Systems – how will RCs, BAs and TOPs exchange information that is currently shared via the common Reliability Messaging Tool (RMT)?

SPP's messaging tool (R-Comm) will communicate with CAISO's GMS via an API. The API will be used to pass messages from one tool to the next, some of these messages would be broadcasted once retrieved via the interface. APIs are being developed to allow messages to flow from/to both SPP and CAISO messaging systems. A TOP/BA residing in one RC footprint can send messages to a single or multiple TOPs/BAs in a neighboring RC. The SPP/CAISO messaging integration will support west wide communications and TOP/BA to TOP/BA for system issues. Criterion are being drafted by RC-RC Coordination teams to determine the type of messages that warrant being broadcasted across the RC communication systems.

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 inertia contribution for its footprint. Peak has provided documentation on how the calculation was implemented within its EMS. The RCs have not yet determined how this information will be calculated and passed to WECC/NERC. There are multiple ways this information can be shared and reported to appropriate parties. Each RC may calculate the inertia provided by each of its BA in real-time and communicate this information to the BAs via ICCP, who then may report this information via ICCP to WECC/NERC. SPP RC is also capable of reporting the data on behalf of the BAs if this is the preferred approach.

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?

CAISO drafted a new agreement (WIDSA) that was reviewed by all Entities in the west. Some entities provided comments and recommended changes that are still under review. There has yet to be a date established for WIDSA will be final and entities can start signing. The WIDSA will replace UDSA starting on December 31st, 2019 or earlier if an agreement is reached. There are various ongoing discussion between CAISO 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 NERC ORD, however, there are some concerns and questions on if this is sufficient and 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.

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?

RCs will use the Peak data format with minor modifications to minimize impact on BAs and TOPs. The host RC of the entity experiencing the reportable event will submit the report. If the event involves multiple entities in more than one RC, then RCs will coordinate the reporting and each will submit a separate report.

11. Will each RC support a Dispatcher Training Simulator to support simulation training for their BA/TOP members and for impacted RCs, or will a common DTS be utilized?

Each RC will support its own Dispatch Training Simulator. Training will be coordinated and hosted by each RC for their customers.

12. Will each RC use the following advanced applications: State Estimation, Real-time Contingency Analysis, Real-time Voltage Stability, and Real-time Transient Stability?

Yes.

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?

Yes. SPP continues to work with its RC customers to ensure that SPP provides and hosts, at minimum, the same applications and features currently provided by Peak.

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?

Each RC plans to communicate various data utilizing different platforms and methods with their respective BAs and TOPs in the west. SPP, CAISO, and BCH plan to communicate directly with BAs and TOPs, while AESO will be receiving the data it needs through CAISO. BAs and TOPs may also establish a direct connection with each other, or receive data from their RC where their RC has direct connections or the neighboring RC has made that data available. SPP BAs and TOPs have the option to maintain their WON connection in the long term or utilize network layer bridging to allow them to only maintain their SPPNet connection and reach both SPPNet and WON customers directly. These options were outlined in detail to the ICCP resources and Project Managers of each entity directly. This will need to be coordinated with both SPP RC and CAISO RC. SPP RC will attempt to make all requested data available to its

customers, both data from neighboring BAs and TOPs that are under same RC those that are in a different RC footprint. Any SPP RC customer may maintain its WON connection with CAISO RC. This will need to be coordinated between that entity and CAISO RC

The RC to RC ICCP Data Sharing Subgroup has agreed on the following approach to ICCP data exchange and migration planning:

- All entities will continue to send ICCP data to PEAK and PEAK EHV as they do today until after final RC transition in December 2019.
- RCs were provided a full list of the data items being read from the Peak EHV at this time by Peak
- Each RC is responsible for developing a migration plan with their customers
 - SPP will report on the list provided for all of the data that our customers read (see action item below)
- RCs will provide pass through data, as needed for any customers that do not have direct connections
- RCs and other customers are welcome to reach out and request direct ICCP connections with other customers
- For data sharing, the customers have the following options:
 - SPP Pass Through – customer will provide which points they would like to be read directly from their ICCP link with SPP
 - These can be sourced from SPP, other SPP customers or other customers outside of SPP
 - Data requested of SPP customers will be verified as being received by SPP and then read access will be provided to requesting customer.
 - Data requested of outside customers will be provided to CAISO to obtain from its source and provide read access to SPP. SPP will then provide read access to requesting customer.
 - Data requested by outside customers will be provided to SPP to obtain from its source and provide read access to CAISO. CAISO will then provide read access to the requesting customer.
 - Direct ICCP Connections – customer will establish or continue to maintain direct ICCP application connections to other customers

- **Direct connections between SPP customers can be created/migrated to SPPNet IP addresses as confirmation is received by both companies that their SPPNet connectivity has been established and is ready for use**
- **Direct connections between SPP customers and outside (WON) customers can be created/maintained on the WON at this time.**
 - **SPP customers may choose to maintain their WON connectivity and no changes are required to these direct connections**
 - **SPP customers may choose to disconnect their WON connectivity after the RC transition is complete and confirmation that all needed data exchanges have been migrated to new paths. All direct connections will need to be updated by the WON customer to begin using SPP customer's SPPNet IP addresses before disconnecting from the WON.**
 - **SPP will notify all SPP customers once our connection to the WON is complete and routing is in place to facilitate bridging the WON and SPPNet. This bridging allows SPPNet and WON customers to have direct ICCP application connections like they were on the same network. Once notified, work can then begin to migrate to using SPPNet IPs with WON customers for direct connections.**
- **Action Items for SPP Customers**
- **SPP has segregated the Peak EHV file into points being read by each of our customers. SPP customers are being provided customer specific files during their individual calls this week.**
 - **SPP requests that for each data item the following is provided in the last column:**
 - **Direct – this indicates that this data will be communicated between the customer and the source via a direct ICCP connection between the customers**
 - **SPP – this indicates that this data will be passed through the customer's ICCP connection with SPP**
 - **N/A – this indicates that this data is no longer necessary**

15. Will each RC implement the following synchrophasor applications: Linear State Estimation, Oscillation Detection, Mode Meter, and Phase Angle Monitoring?

SPP currently monitors PMU data in the Eastern Interconnection and will collect PMU data from our West RC customers and more from CAISO to provide enhanced situational awareness. SPP also has the following tool capabilities: oscillation detection, mode meter, and phase angle monitoring

16. How will IROLs be coordinated and managed by multiple RCs? The NW Washington Load Area requires much mitigation from CAISO 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, study reports, and real-time ICCP. Operating procedures will be written following and consistent with the existing Peak IROL procedures which will document the required coordination and action required by all RCs and impacted 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?

SPP plans to have SOL methodology complete for review by March 20. SPP's SOL methodology will include SOL and IROL methodologies. The methodology is being coordinated with TOPs, BAs and other RCs. The differences between each RC methodology and existing Peak's methodology are being reconciled. IROL methodology and identification of an IROL is expected to be the same as Peak's existing methodology.

18. How will RCs address SOL and IROL exceedances across their seams when studies/tools have different results?

The RC of the TOP that owns the most limiting equipment on the constrained facility will be responsible for coordinating and mitigating congestion on the facility. This host RC will coordinate with neighboring RCs and TOPs/BAs as necessary. RCs will coordinate and develop Operating Plans for those Seams situations that require coordination and assistance from neighboring RC(s) to mitigate the loading. If there is any disagreement regarding any mitigation approach, then the most conservative approach and action will be implemented until a final agreed upon mitigation approach is reached. Disagreements are to be handled after the fact which should be documented through Operating Plans for those Seams situations that require coordination and assistance from neighboring RC to mitigate the loading.

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 RC of the TOP that owns the most limiting equipment on the constrained facility will be responsible for mitigating congestion on the facility. This host RC will coordinate with

neighboring RCs and TOPs/BAs as necessary. RCs will coordinate and develop Operating Plans for those Seams situations that require coordination and assistance from neighboring RC(s) to mitigate the loading.

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?

The capability to exchange various data and information exists between the RCs. Interface limits may be shared between the RCs by posting the limits on each of the RC's secure site. The information would be available to all TOPs and BAs on these secure sites.

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?

SPP will monitor phase angle separation as needed to ensure the reliability of the interconnection and transmission system is maintained. If exceeding certain thresholds require actions from RC, SPP will document those in Operating plan.

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)?

SPP will review each situation with its RC customers to get a clear understanding of the situation and if deemed useful or necessary, SPP RC will document required actions in an Operating Plan. In general, the RC of the TOP that owns the most limiting equipment on the constrained facility will be responsible for coordinating and mitigating congestion on the facility. This host RC will coordinate with neighboring RCs and TOPs and BAs as necessary. RCs will coordinate and develop Operating Plans for those Seams situations that require coordination and assistance from neighboring RC(s) to mitigate the loading.

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?

Each RC will maintain an IROL methodology and perform assessments to identify new potential IROLs, either thermal, voltage stability or transient stability. New potential IROLs will be communicated with neighboring RCs, BAs and TOPs. The RC-RC Coordination agreements describe how exceedance of current IROLs will be coordinated and how operating plans for new IROLs will be coordinated.

24. How will the RCs coordinate actions related to the Western Interconnection Unscheduled Flow Mitigation Plan (WIUFMP):
- a. Step progression
 - b. COPS

c. Curtailment process

- **RCs will develop USFM Procedure to determine responsibilities of RCs, TOPs, BAs during UFMP events. Below some actions discussed by RCs a few months ago and documented by Saad Malik (Peak).**
- **RC requesting Phase Shifter movement will propose new tap position(s) and both RCs will study new tap position(s) to make sure it doesn't result in reliability issues in their respective footprints. If new tap position(s) result in a reliability issue in either RC footprints, Phase Shifters will not be moved and new tap position(s) will be coordinated between both RCs or other mitigation options will be considered as appropriate"**
- **Example #1: Path 66 Needs Relief (Step 3)**
- **Action 1: CAISO TOP issues Step 3 request in ECC.**
- **Action 2: CAISO RC runs a study and proposes new tap positions for qualified devices.**
- **Action 3: CAISO RC contacts Peak RC for Step 3 and also provides proposed new tap positions.**
- **Action 4: Peak RC performs study and coordinates tap positions with CAISO RC.**
- **Action 5: When both RCs are satisfied with the new tap positions, CAISO RC approves Step 3 request in ECC. If either RC sees problems with new tap positions, or any other feasible tap positions cannot be coordinated then proceed to Step 4 of UFM.**
- **Action 6: Peak RC issues instructions to TOP(s) to move the device to new tap position.**
- **Example #2: Path 36 Needs Relief (Step 3)**
- **Action 1: WAPA TOP issues Step 3 request in ECC.**
- **Action 2: Peak RC runs a study and proposes new tap positions for qualified devices.**
- **Action 3: Peak RC contacts CAISO RC for Step 3 and also provides proposed new tap positions.**
- **Action 4: CAISO RC performs study and coordinates tap positions with Peak RC.**
- **Action 5: When both RCs are satisfied with the new tap positions, Peak RC approves Step 3 request in ECC. If either RC sees problems with new tap positions, or any other feasible tap positions cannot be coordinated then proceed to Step 4 of UFM.**
- **Example #3: Both Path 36 and Path 66 Need Relief (Step 3)**
- **Action 1: WAPA TOP issues Step 3 request in ECC.**
- **Action 2: CAISO TOP issues Step 3 request in ECC.**
- **Action 4: CAISO RC and Peak RC discuss and study new phase shifter tap settings.**

- **Action 5: When both RCs are satisfied with the new tap positions, Peak RC and CAISO RC approve Step 3 request in ECC. If either RC sees problems with new tap positions, or any other feasible tap positions cannot be coordinated then proceed to Step 4 of UFM.**

Operations Planning

25. Outage Coordination questions:

- a. Need coordinated scheduling and mitigation steps.

Outages will be coordinated between RCs on a continuous basis. Regularly scheduled conference calls for outage coordination will take place on RC-TOP and RC-RC levels. Outage conflict and mitigation approach are being documented in RC – RC agreement. In general, the most conservative approach is taken when there is conflict or disagreement. An outage may take precedence over another in a different RC footprint or within a single RC footprint depending on urgency and time of submission of each outage request.

- b. How are Cancelled or Urgent outages handled across boundaries?

Urgent outages will be studied by the RC if times allows for it. The RC will coordinate with neighboring RCs and TOPs/BAs as necessary. Modifications to outages (cancelled or new) will be reflected in the Outage Management Systems and automatically exchanged between RCs. Any system impacts that may result from a change to an outage will be communicated and coordinated by the RC.

- c. How will outage information be shared among the RCs?

CAISO ODMS (Outage Coordination System) will have all transmission and generation outages of WI. SPP RC will upload its RC customer outages to CAISO ODMS and download the CAISO RC customer outages programmatically via an interface. SPP RC will make all the outage information available to their customers on a secure site.

- d. Do multiple impacted RCs need to all approve an outage?

No, unless the outage is a tie-line between RCs.

- e. Will there be regularly scheduled calls to discuss outage information?

Yes, there will be TOP - RC and RC - RC weekly conference calls.

26. Seasonal Coordination

- a. Will there be consistency of seasonal study and coordination processes between the RCs?

RCs came to agreement in the RC-RC Coordination efforts to use the revised seasonal study process that became effective on October 1, 2018. An RC – RC Coordination taskforce (“Operational Planning”) will work out the details and coordination.

- b. If a seasonal study involves both RCs, how will discrepancies be addressed/mitigated?

An RC – RC Coordination taskforce (“Operational Planning”) will work out the details and coordination. RCs will coordinate and share findings with each other. If discrepancies arise, TOPs and BAs inputs will be taken into consideration. The most conservative approach will be implemented as the resolution if there is disagreement or discrepancy in results between RCs or TOPs and BAs.

27. How will the RCs ensure consistency across SOL Methodology, mitigation philosophy, and credible contingency methodology (including multiple contingency credibility)?

If there is any disagreement regarding any mitigation approach, then the most conservative approach and action will be implemented until a final agreed upon mitigation approach is reached. Conservative approach includes use of highest estimated post-contingent flows and/or mitigation approach that provides the highest amount of relief. RCs will work to reconcile the differences between the RCs and TOPs and coordinate to achieve a consistent and agreed upon approach to resolving congestion on the Seams.

28. How will RCs share and coordinate Operating Plans, including those created in outage coordination, next-day, or same-day study processes?

SPP will maintain a secure site where all Operating Plans will be posted and to which CAISO RC will have access to. CAISO RC will also maintain a different secure site for posting of Operating Plans and SPP RC will have access to it. There will be TOP - RC and RC - RC weekly conference calls to discuss study results and new Operating Plans. Any Operating Plan that will be used to address a Seams event and that requires action or impacts neighboring RC(s) will require approval by both RCs and impacted TOPs and BAs.

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?

RCs will gather load and generation forecast data from each of their TOPs and BAs. This information will be shared with the other RCs in the interconnection. Each TOP and BA are responsible for submitting various parameters including load and generation forecast to SPP’s secure site (GlobalScape). SPP will download similar information from CAISO’s secure site for each of CAISO’s TOPs and BAs and will make this information available on GlobalScape. SPP TOPs and BAs may download all load and generation forecast data (that includes data of neighboring TOPs and BAs across RC boundaries) from the secure site. The data format of the information is EIDE (XML) based. Both RCs intend to share each of the information received

from the BAs and TOPs on their respective secure site.

RAS Coordination – Modeling and Monitoring

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. SPP obtained and is performing analysis of the PEAK and WECC RAS models to assist in the development of that variance. SPP has obtained RAS details from SPP customers in order to validate the obtained models against the information from SPP customers to ensure the details of the RAS are modeled correctly. We are waiting on the other RCs, as part of the variance, to perform similar validations and provide data defining the RAS. In the mean time we will leverage PEAK and WECC models.

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 ICCP sub-team is discussing ICCP data sharing, and it has been agreed on that BAs, TOPs and RCs are able to share sufficient RAS information needed for RC situational awareness.

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).

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. Each RC will have visibility of any RAS that may impact its transmission system. The RC will receive information, via ICCP, of RAS status and alarms.

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.

Each RC will monitor conditions that trigger RAS arming and status. RCs will share each of their evaluation, reconcile discrepancies and coordinate remedial actions.

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?

A TOP that operates a phase shifter shall coordinate this with its RC and impacted neighboring RCs and TOPs as needed. The TOP and the notified RCs will perform assessment 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 documentation. Black Start for Palo Verde, in RC areas will have to be coordinated.

Each RC is required to develop an RC area restoration plan in accordance with NERC EOP-006 standards. RC to RC agreements will also address the high level coordination needed and to address restoration and emergency operations planning between the RCs.

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?

The RC of the TOP that owns the most limiting equipment on the constrained facility will be responsible for coordinating and mitigating congestion on the facility. This host RC will coordinate with neighboring RCs and TOPs/BAs as necessary. RCs will coordinate and develop Operating Plans for those Seams situations that require coordination and assistance from neighboring RC(s) to mitigate the loading. If there is any disagreement regarding any mitigation approach, then the most conservative approach and action will be implemented until a final agreed upon mitigation approach is reached. Disagreements are to be handled after the fact which should be documented through Operating Plans for those Seams situations that require coordination and assistance from neighboring RC to mitigate the loading.

37. EEA events and Reserve Sharing Group (RSG) coordination (RSGs span multiple RCs)
- How to manage RSG deficiency situations?

RCs will take action in accordance and as described in EOP-011-1.

- MATL cannot be used for contingency reserves

SPP will review each situation with its RC customers to get a clear understanding of the situation and if deemed useful or necessary; SPP RC will document required actions in an Operating Plan. In general, the RC of the TOP that owns the most limiting equipment on the constrained facility will be responsible for coordinating and

mitigating congestion on the facility. This host RC will coordinate with neighboring RCs and TOPs and BAs as necessary. RCs will coordinate and develop Operating Plans for those Seams situations that require coordination and assistance from neighboring RC(s) to mitigate the loading.

- c. SRSG (RSG ACE Calculation/Entity Reserve Deficiency actions)

SPP had discussions with SRSG and understands the data need and the requirement. SPP plans to facilitate the data and calculation for its BAs.

- d. How will RSG information be shared during communication/data transfer issues?

If not already in existence, SPP RC will work with Reserve Sharing Entities (NWPP, SRSG, and CAISO) to develop procedures for loss of critical systems or loss of critical data transfers. This will include communication and initiation of procedures that SPP will implement and have in place to address this condition.

- e. How will emergency energy assistance be coordinated between RCs? How will requests for assistance under EEA's be communicated in both RCs?

A BA may communicate the need for declaring an EEA to its RC. 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 will monitor transfer limits and path loading to ensure a reliable transmission system.

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:

- a. 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.

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 determine contingencies included in analyses and assessments, while requirement 1.4 requires a method to determine Remedial Action Schemes included in analyses and assessments.

- b. 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.

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 determine contingencies included in analyses and assessments, while requirement 1.4 requires a method to determine Remedial Action Schemes included in analyses and assessments.

- c. 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.

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 determine contingencies included in analyses and assessments, while requirement 1.4 requires a method to determine Remedial Action Schemes included in analyses and assessments.

- d. BPA/GRID – The GRID generation is interconnected to BPA transmission, and thus impacts BPA transmission flows.

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Summary: TOPs that reside in multiple RC footprints are considered split into multiple areas, each one in an RC footprint, this is the same for BA boundaries. The host TOP and RC of the limiting equipment on a monitored transmission element dictates the primary RC responsible for coordinating a mitigation plan for any congestion on the element. If different BAs that are under different RCs need to provide relief, an Operating Plan will be drafted by the primary responsible RC and approved by other RCs, affected TOPs and affected BAs. Each RC is required to document high level operating and coordination plans in their respective RC agreements required by IRO-014-3.

39. Frequency issues

- a. RCs should see ACEs across the Interconnection and have protocols for communications about the deviations and expected actions to take.

RCs will monitor BA ACEs, frequency and interchange. RC will address any BA that may

not comply with NERC BAL Standards, with particular focus on BA performance which may be contributing to interconnection frequency.

- b. Under-frequency Load Shed and island coordination is currently largely coordinated through NWPP today for the NW.

We need to get a better understanding of the role of NWPP in UFLS and island coordination. Each RC is required to develop an RC area restoration plan (EOP-006) that addresses the coordination of UFLS and Islanding. RC-to-RC agreements will also address the high-level issues related to restoration and emergency operations.

- 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.

SPP will review this situation with its RC customers to get a clear understanding of this condition, and if deemed useful or necessary, SPP RC will document required actions in an Operating Plan.

- 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.

- 42. How will the RCs address wind pushes in Wyoming and Colorado and manage resulting transmission constraints?

SPP will review this situation with its RC customers to get a clear understanding of this condition, and if deemed useful or necessary, SPP RC will document required actions in an Operating Plan.

- 43. Path 30 has impacts to several TOPs, BAs and future RCs. How will actions be coordinated by SPP and CAISO?

SPP will review each situation with its RC customers to get a clear understanding of the situation and if deemed useful or necessary, SPP RC will document required actions in an Operating Plan. In general, the RC of the TOP that owns the most limiting equipment on the constrained facility will be responsible for coordinating and mitigating congestion on the facility. This host RC will coordinate with neighboring RCs and TOPs and BAs as necessary. RCs will coordinate and develop Operating Plans for those Seams situations that require

coordination and assistance from neighboring RC(s) to mitigate the loading.

44. Mead issues, including reserves carried there for multiple RC footprints.

SPP RC will be working with its customers and their Reserve Share Groups to develop any needed Operating Plans that describes criteria and conditions that require action from RC or require monitoring by RC.

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.

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 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 will monitor transfer limits and path loading to ensure a reliable transmission system.

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?

SPP's messaging tool (R-Comm) will communicate with CAISO's GMS via an API. The API will be used to pass messages from one tool to the next, some of these messages would be broadcasted once retrieved via the interface. APIs are being developed to allow messages to flow from/to both SPP and CAISO messaging systems. A TOP/BA residing in one RC footprint can send messages to a single or multiple TOPs/BAs in a neighboring RC.

47. Since TOP boundaries are not necessarily the same as BA boundaries, how will load shedding be coordinated between RCs?

The RC of the TOP that owns the most limiting equipment on the constrained facility will be responsible for coordinating and mitigating congestion on the facility. This host RC will coordinate with neighboring RCs and TOPs/BAs as necessary. RCs will coordinate and develop Operating Plans for those Seams events that require coordination and assistance from neighboring RC(s) to mitigate the loading. This could include load shed. The RC will assess and determine, in coordination with neighboring RCs, the amount of required load shed needed for mitigating the loading. Accordingly, all RCs will issue instructions to their BAs.

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?

SPP will review each situation with its RC customers to get a clear understanding of the

situation and if deemed useful or necessary, SPP RC will document required actions in an Operating Plan. In general, the RC of the TOP that owns the most limiting equipment on the constrained facility will be responsible for coordinating and mitigating congestion on the facility. This host RC will coordinate with neighboring RCs and TOPs and BAs as necessary. RCs will coordinate and develop Operating Plans for those Seams situations that require coordination and assistance from neighboring RC(s) to mitigate the loading.

Training

49. How will training/RC education be handled, especially for issues across seams?

SPP is currently identifying all training initiatives for SPP RCs and the West operator/operations to maintain reliability of the Western and seams interconnection at this time. SPP Customer Training will provide training to West operators and support staff on all identified initiatives prior to parallel operations.

50. How will restoration (black start) drills/training be coordinated? Will they be combined or separate?

SPP supports hosting or co-hosting interconnection-wide restoration drills and trainings as is done by Peak today. The RC-RC Coordination sub-group will address this topic.

51. Will all RCs be participating in GridEx? Will there be coordination prior to GridEx?

SPP participates and is active in GridEx trainings.

Other

52. Will the new RCs provide CIP-014 physical security risk assessment review services?

Not at this time.

53. Will the new RCs provide TOP-003 library for their BAs and TOPs?

SPP will use a secure site for information sharing between its TOPs and other RCs. The data that will be housed in this location includes

- a. **Current Day / Next Day Assessment Results**
- b. **Approved Operating Guides, and various Operation Plans.**
- c. **Load and Generation forecast by BA**
- d. **RTCA Results**

Access to this secure site will be extended to other RCs outside of SPP RC footprint for the purpose of information and procedure sharing between TOPs across RC footprints and with

other RCs. SPP will have access to CISO's similar site/location. SPP plans to retrieve its neighboring RCs' relevant information from CISO's TOP-003 library, this information will be made available to SPP TOPs on SPP's secure site.

54. Will RCs coordinate on IRO-010 data requests? Will there be common requests with consistent data definitions?

Yes. There is an RC – RC IRO-010 Task force.