



Southwest Power Pool, Inc.
OPERATING RELIABILITY WORKING GROUP

Face to Face

Xcel Energy - Denver, CO

Tuesday January 07, 2020 8:00 AM – 5:00 PM (MST)

Wednesday January 08, 2020 8:00 AM – 12:00 PM (MST)

• **A c t i o n I t e m s a n d V o t i n g R e c o r d** •

ACTION ITEM: Develop a winter preparedness survey report card for review at a future ORWG to show who is responding so we can encourage better participation.

ACTION ITEM: Return to ORWG with an updated version of the conservative operations notification with the suggested TOP/GOP bullet point location adjustments.

Agenda Item 5a – Consent Agenda (December 2019 ORWG Meeting Minutes)

Jeff Wells (Grand River Dam Authority) moved to approve the consent agenda and Chance Meyers (Western Farmers Electric Cooperative) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 6 – RR386 BAOC Consolidation

Ron Gunderson (Nebraska Public Power District) moved to approve RR386 BAOC Consolidation as presented and Allan George (Sunflower Electric Power Corporation) seconded the motion. The motion carried without opposition or abstention.



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• M I N U T E S •

Agenda Item 1 – Call to Order

Chairman Allen Klassen (Eversource) called the ORWG to order at 8:03 AM on 1/07/2020 and reconvened ORWG at 08:01 on 1/08/2020.

Agenda Item 2 – Attendance

Jason Tanner (Southwest Power Pool) called attendance and a meeting quorum was reached.

Agenda Item 3 – Antitrust Statement

Jason Tanner (Southwest Power Pool) read the SPP Antitrust Statement.

Agenda Item 4 – Agenda Review and Notification

Allen Klassen (Eversource) reviewed the agenda and noted the items that would require action.

Agenda Item 5a – Consent Agenda

Allen Klassen (Eversource) discussed the consent agenda, which included the December 2019 ORWG Meeting Minutes.

Jeff Wells (Grand River Dam Authority) moved to approve the consent agenda and Chance Meyers (Western Farmers Electric Cooperative) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 5b – Items Pulled from the Consent Agenda

None.

Agenda Item 6 – RR386 BAOC Consolidation

Kim Gorter (Southwest Power Pool) discussed the background of RR386 and stated that a recommendation was made for the responsibilities of the BAOC to be absorbed by the ORWG. Kim stated that the BA functional oversight was initially based on the members having a significant amount BA experience while SPP was limited in BA experience prior to 2014. Kim stated that the BAOC currently reports to the ORWG and much of the meeting materials are duplicated when presented to the ORWG, who has much of the same membership. Kim reviewed Attachment AN and stated that to align with the ORWG membership structure changes were made within section 2.31 to the definition of operating committee, and in section 18.4 the requirement for having an alternate member was removed.

Ron Gunderson (Nebraska Public Power District) moved to approve RR386 BAOC Consolidation as presented and Allan George (Sunflower Electric Power Corporation) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 7 – HITT Program Overview

Jason Tanner (Southwest Power Pool) discussed the Holistic Integrated Tariff Team (HITT) program and provided an overview of recommendations. Jason stated that SPP has already commenced working on the recommendations and is making progress towards the ORWG assignments. Jason introduced Chad Thompson from ERCOT and stated that Chad would be presenting the experiences ERCOT has with the SPP HITT recommendations. Jason stated that Chad would also be speaking at MWG and the goal is to understand why or why not ERCOT is doing what is recommended in the HITT.

Agenda Item 8 – ERCOT Experiences

Chad Thompson (ERCOT) discussed ERCOT's usage history of dynamic line ratings (DLR) in real-time and stated that ERCOT started using DLR's in 2005. Chad stated that when they initially started using DLR's they manually updated temperature adjusted ratings by hand, and in 2008 they implemented an automatic effort in EMS. Chad stated that the real-time effort utilizes telemetry from the field every 10 seconds where applicable or weather forecast temperature data every 10 minutes. Chad explained that ERCOT has implemented DLR's into the ERCOT day ahead market and reliability unit commitment systems, however those systems only utilize weather forecast to estimate temperatures upon which ratings are based. Chad stated that around 67% of ERCOT's transmission lines have DLR's but some of the lines have the same ratings for all temperatures. Chad explained that ERCOT discovered when telemetered ratings are incorrect but are showing good quality the system will use the incorrect values. Chad stated that they installed an indicator to RTCA that compares against its static ratings table to monitor the issue, however manual checks are required. Chad also explained that ERCOT is researching how to apply DLR's to autotransformers.

Chad Thompson (ERCOT) discussed ERCOT's economic outage coordination efforts and stated that ERCOT has no plans to pursue the economic outage coordination effort. Chad stated ERCOT realizes that an economic outage coordination process could potentially reduce real-time congestion cost and theoretically optimize the transmission and generation outages within its footprint. However, it could also delay new projects causing long-term losses for short-term gains and create preferential treatment issues.

Chad Thompson (ERCOT) discussed ERCOT's topology optimization efforts and how they investigate solutions to irresolvable constraints. Chad stated that ERCOT has no plans to do more than what is already being done on topology optimization. Chad explained that ERCOT participated in the Brattle Groups project NewGrid Router et al., and discussed the pro and cons of topology optimization. Chad stated that topology optimization could reduce real-time transmission congestion and save time developing mitigation plans. However, topology optimization could reduce life on transmission assets and could cause forward looking markets to consider unreasonable switching scenarios.

Agenda Item 9 – HITT M4 DLR

Jason Tanner (Southwest Power Pool) discussed the dynamic line rating efforts within SPP and stated that SPP has historically used static line ratings in operations. Jason explained that DLR's attempt to capture excess capacity when temperature and other conditions allow, and often require the deployment of field equipment to measure variables in real-time. Jason stated that temperature adjusted ratings (TAR) are frequently used as an initial deployment of DLR, and SPP currently uses TAR's in real-time for certain transmission elements. Jason stated that in March 2019 SPP implemented the DLR (TAR) functionality and as of December 3, 2019 SPP has 16 DLR (TAR) elements. Chris Shaffer (American Electric Power) stated he is seeing a benefit from the use of temperature adjusted ratings with no technical issues. Jeff Wells (Grand River Dam Authority) discussed discrepancies between Day Ahead and Real Time ratings and explained how unexpected generation allowed in

real time could create issues. Kyle McMenamain (Xcel Energy) explained that the additional capacity gained from DLR's could uncover underlying system issues, which require upgrades elsewhere to realize the supposed benefit. Ron Gunderson (Nebraska Public Power District) stated that using DLR's could create more forecast uncertainty and may require carrying extra reserves.

Agenda Item 10 – HITT M4 Econ Outage Coordination

Dustin Courtright (Southwest Power Pool) explained that economic outage coordination (EOC) is an analysis that returns an estimated cost associated with an individual outage based on forecasted system conditions, system topology, and available generation. Dustin stated that the EOC process would evaluate congestion costs of transmission and/or generation outages by using total production cost to identify high cost outages and outage combinations then assign cost to the individual outages and combinations of outages through case comparisons. Ron Gunderson (Nebraska Public Power District) expressed concerns that EOC could not just be denying outages that were deemed uneconomic. The process has to identify a better window within a reasonable amount of time to take the outage. He also stated that the cost associated with rescheduling outages could outweigh the benefits received through the reduction in system congestion. Ron stated that a detailed assessment would need to be performed to identify both the pros and the cons associated with implementing an economic outage coordination process.

Agenda Item 11 – HITT M4 Topology Opt

Temper Williams (Southwest Power Pool) explained that the industry has interest in having a more flexible grid and transmission elements are traditionally seen as static elements. Temper explained that reconfigurations are typically utilized on a limited basis, and usually implemented after generation dispatch options have been exhausted. Temper explained that topology optimization could be used to automatically identify reconfiguration options that reduce transmission congestion or voltage violations. Temper stated that it could increase grid flexibility and efficiency using existing assets and reduce the reliance on redispatch. However, topology optimization could increase breaker operations and maintenance expenses, create additional line losses, and cause funding issues in the TCR markets. Ron Gunderson (Nebraska Public Power District) stated that the topology optimization tool should not create reconfigurations that place loads on a radial and stated that angular stability should be considered when assessing reconfiguring options. Jeff Wells (Grand River Dam Authority) raised concerns that reconfigurations could cause a reduction to reliability and we would need to determine when the reconfiguration would need to return to normal. Mark Eastwood (City Utilities of Springfield) stated that voltage limits should be respected before implementing any reconfiguration options through topology optimization. Jason Tanner (Southwest Power Pool) stated that Operating Criteria Appendix OP1 should be considered with the deployment of any topology Optimization tools.

Agenda Item 12 – HITT R5 Additional Operational Tools

Charles Cates (Southwest Power Pool) reviewed the new tools and improvements installed within SPP during 2019. Charles explained that SPP recoded the real time contingency analysis to improve speed and added breaker to breaker modeling. Charles stated that SPP added a transient stability analysis tool and implemented DLR's into the ratings submission tool for day ahead and real-time operations. Charles also explained other tool installations such as the ratings submission tool, the reliability communications tool, the generation assessment process tool, and generation maintenance margin forecasting tool. Charles stated that for 2020 SPP would be looking into Meteologica and using it on a trial basis through October to determine accuracy of wind and solar forecasts. Charles explained that SPP would also be looking into other tools such as a cascading outage analysis tool, parallel flow visualization tool, community data analysis tool, et al. Charles stated that the next steps for HITT R5 will be for SPP Staff to work with ORWG & MWG to discuss potential tool deployments and work with other TOP's, ISO's, and RTO's to determine the which tools should be adopted that would provide the most

benefit. The ORWG expressed interested in PMU data driven tools for voltage frequency and oscillation detection. The ORWG also expressed interested in PROBE for improving dispatch solutions and utilizing tool for economic outage coordination.

Agenda Item 13 – RR340 PMU for New Generator Interconnection

Cody Parker (Southwest Power Pool) provided an update on the status of RR340 and discussed the deficiency notice from FERC. Cody stated that FERC has asked SPP to “Explain how SPP’s proposal ensures transmission owners will not include PMU installation costs in transmission rates in cases where the transmission owner installs PMUs on behalf of its own generation.” Cody stated that SPP responded that “PMU costs will be “directly assigned” to that customer under its Generator Interconnection Agreement as defined in Section 1 of Part I of the SPP Tariffs.” Cody review each of the deficiency items and shared SPP’s response and stated that a FERC action is expected in February.

Agenda Item 14 – Breaker Outages and Impacts to Rating Changes

Will Tootle (Southwest Power Pool) stated that various TOP’s request SPP to model breakers in CROW and then submit outages on the new equipment and on occasion a single breaker outage will be submitted resulting in a change to a facility rating because of an open breaker limit. Will stated that only select TOP’s notify SPP of open breaker limits causing rating changes and wanted to better understand how common the practice is.

A survey will be developed regarding the modeling of breakers, switches, and disconnects in member’s outage coordination processes to understand the member readiness for including clearance points in the outage submission process to SPP.

Agenda Item 15 – Follow up to ICCP for Tie Line Data

Jeff Wells (Grand River Dam Authority) provided an update to the status of the ICCP data exchange discussion and stated that they had dealt with some push back from non-SPP entities. However, Jeff explained that the current format is not cost effective without redundant communication paths, and Jeff stated that the SPP ICCP and GRDA ICCP are highly reliable with multiple built in redundancies which are far more cost effective. Jeff explained that progress is being made and that GRDA is using 5 sites at a time to test and address any issues before moving forward with full scale implementation.

Agenda Item 16 – Notification of SOL exceedances

Terry Oxandale (Southwest Power Pool) discussed communications for SOL exceedances and stated that RTCA through R-COMM is the most efficient method for communications with TOPs. Terry stated that SPP posts in 10-minute increments the RTCA results on GlobalScape, which displays branch data that loaded 95% or greater. Terry stated that file also shows voltage results that are outside the .93 to 1.05 limits. Terry also discussed communications of actions to mitigate the SOL exceedances and how they are communicated through the R-COMM tool.

Agenda Item 17 – Winter Prep Survey Update

Scott Aclin (Southwest Power Pool) discussed the winter preparedness survey and stated that SPP had a response from around 125 entities. Scott stated that with over 800 units in the fleet he would like to increase the response rate. ORWG suggested putting together a report card for review at a future ORWG to show who is responding so we can encourage better participation.

ACTION ITEM: Develop a winter preparedness survey report card for review at a future ORWG to show who is responding so we can encourage better participation.

Agenda Item 18 – State of the Model East and West

Tim Miller (Southwest Power Pool) discussed the representation of the bulk electric system and other high voltage equipment used in SPP's real-time operations. Tim stated that the network model is part of other models, which are used for reliability markets and planning. Tim explained that the model synchronizes with SCADA, ICCP, AGC, the commercial model, and the historian model. Tim stated that the network model defines connections and equipment characteristics. Tim discussed many of the modeling concepts and configurations used throughout the system. Tim also discussed the model maintenance, timelines, processes and associated staff.

Agenda Item 19 – Outage Metrics

Dustin Courtright (Southwest Power Pool) provided ORWG with the outage metrics for transmission outages by voltage level, and explained the planned outage percentages against the planned lead times. Dustin also explained the unplanned transmission outage metrics. Dustin reviewed the transmission outage score card showing the number of forced outages vs outages submitted greater than or less than 14 days in advance. Dustin also reviewed the generation outage score card showing the number of forced outages vs outages scheduled greater than or less than 14 days in advance.

Agenda Item 20 – Black Start Resources

Terri Pyle (Oklahoma Gas and Electric) discussed feedback received from MRO and stated that the ERO does consider and aux diesel generator a valid blackstart unit. Terri explained that since the diesel generator is not considered a valid blackstart resource the cranking path defined in the procedure is invalid. Allan George (Sunflower Electric Power Corporation) stated that they have a similar configuration. Terri provided a review of EOP-005-2 and explained how OKGE believes it meets the standard requirements and provided FERC testimony language that supports the OKGE position. Terri stated that the NATF risk controls compliance practices group meets in January and this topic will be discussed with others in different regions.

Agenda Item 21 – Conservative Operations Notification

Margaret Quispe (Southwest Power Pool) explained that during the November ORWG an action item was taken to return to ORWG with a conservative operations notification and generation alert that explains what actions SPP needs from members when a notification is issued. Jeff Wells (Grand River Dam Authority) stated he was looking for SPP to be specific with its expectations from TOP's and GOP's regarding its generation alerts and requested that SPP bring back an example operations notification that specifically identifies what actions SPP is requesting of the entities. Margaret discussed the conservative operations notification and provided an updated template of the SPP BA resource alert and conservative operations notification. Bryn Wilson (Oklahoma Gas and Electric) suggested a location adjustment to the TOP/GOP bullet, Margaret stated that she would return with another draft.

ACTION ITEM: Return to ORWG with an updated version of the conservative operations notification with the suggested TOP/GOP bullet point location adjustments.

Agenda Item 22 – TOP's Customer Outage (Load) Reporting Draft RR

Margaret Quispe (Southwest Power Pool) provided a draft revision request and stated that the SPP RC and SPP BA must submit NERC and DOE reports for reporting thresholds for each respective footprint. Margaret stated

that only certain SPP notifications request the TOP's in the SPP BA and RC footprints to report on these events. Margaret stated that this information should be added to a governing document to help SPP ensure consistent reporting regardless of the operating conditions. Margaret reviewed the proposed data specification language and Jeff Wells (Grand River Dam Authority) stated that SPP needs to come up with a way to identify when the BA has a loss of 300 MW's or greater which it is required to report. Jeff stated that SPP should add the language to the operating criteria opposed to the data specification. Jeff stated that a field is also needed in CROW to report the loss of load for forced outages.

Agenda Item 23 – RST Timing Requirement Enhancement

William Ragsdale (Southwest Power Pool) discussed the ratings submission tool (RST) enhancement and stated that the OCMTF took action items during May and June 2019 to track the progress of previous RST enhancements and to track the current enhancement. William stated that the previous enhancement was completed and installed into the production environment in September 2019. William explained that the OCMTF and SPP Staff decided to add an additional RST enhancement for the emergency rating timing requirement and set the default value to 30 minutes. William stated that the enhancement is in the early development stages and is going through the approval process within the appropriate working groups. William provided the projected benefits and stated that the enhancement would improve situational awareness and help assess urgency and allow for more time to develop mitigation plans.

Agenda Item 24 – Potential RR - Formal Proposal for Market Buffers

William Ragsdale (Southwest Power Pool) provided an update to the proposal for market buffers. William explained that flowgate loadings above the highest rating are a condition where, if the contingency occurs, it is not known how the system will respond. William stated that the OCMTF is working on a proposal for the ORWG to review that reduces the exceedances to a satisfactory level. William stated that once the OCMTF agrees then it's possible that the market protocols, operating criteria, or other governing documents will need to be updated to meet the recommendations set within the whitepaper.

Agenda Item 25 – Operational Transmission Planning Assessment

Ryan Schoppe (Southwest Power Pool) discussed the operational transmission planning assessments and discussed the options provided that were provided to ESWG and TWG. Ryan stated that SPP is looking to remove language in the ITP manual section 2.4 that specifies re-running DA-RUC cases with an energy management system snapshot model. Ryan stated that ORWG would be primary on a revision request if it's brought forward and ESWG and TWG would be secondary. Ryan also provided the annual time and cost breakdown for each of the three options and the ORWG stated that they would like for ESWG to weigh in first on determining which option to pursue.

Agenda Item 26 - Liaison Reports

26a – PFRTF Activities Update

Allan George (Sunflower Electric Power Corporation) stated that the next PFRTF meeting will occur on January 15, 2020 and that ERCOT would be in attendance.

26b - SRTF Activities Update

Jeff Wells (Grand River Dam Authority) stated that the SRTF would be meeting following the completion of the ORWG.

26c - OCMTF Activities Update

Doug Peterchuck (Omaha Public Power District) stated that the OCMTF will meeting again on January 16, 2020 and the group will continue discussions regarding buffers.

Other Items:

Agenda Item 27 – ORWG Member Topic List

The ORWG member topic list was provided in the meeting material packet.

Action Item Review:

Agenda Item 28 – Review of Open and Closure Pending Actions

The action item list was provided in the meeting material packet.

Agenda Item 29 – New Action Items

Jason Tanner (Southwest Power Pool) reviewed the new action items with the ORWG.

Agenda Item 30 – General Q&A/Open Forum

Agenda Item 31 – Meeting Schedule

- a. 2/6/2020 WebEx (Thurs) 0830-1200
- b. 3/5/2020 WebEx (Thurs) 0830-1200
- c. 4/08 - 4/09/2020 Face-to-Face (Amarillo, TX)(Xcel) – CONFIRMED
- d. 5/7/2020 WebEx (Thurs) 0830-1200
- e. 6/4/2020 WebEx (Thurs) 0830-1200
- f. 6/30 - 7/01/2020 Face-to-Face (Tulsa, OK)(GRDA) – CONFIRMED
- g. 8/6/2020 WebEx (Thurs) 0830-1200
- h. 9/3/2020 WebEx (Thurs) 0830-1200
- i. 9/30 - 10/01/2020 Face-to-Face (Little Rock, AR)(SPP) – CONFIRMED
- j. 11/5/2020 WebEx (Thurs) 0830-1200
- k. 12/3/2020 WebEx (Thurs) 0830-1200

Agenda Item 32 – Adjournment

Chairman Allen Klassen (Evergy) recessed the ORWG at 4:41 PM (MST) on 1/07/2020, and stated that ORWG would reconvene at 8:00 AM (MST) on 1/08/2020.

Chairman Allen Klassen (Evergy) adjourned the ORWG at 12:06 PM (MST) on 1/08/2020.

Respectfully Submitted,
Jason Tanner, Secretary



Operating Reliability Working Group
Meeting Attendance: 01/07/2020 - 01/08/2020
M=Member, G=Guest, S=SPP Staff, P= Proxy

		Name	Status	Company
x	1	Allen Klassen, Chairman	M	Westar Energy
x	2	Ron Gunderson, Vice Chairman	M	Nebraska Public Power District
x	3	Jim Useldinger	M	South Central MCN
x	4	Gary Plummer	M	City of Independence, MO
x	5	Kyle McMenamin	M	Xcel Energy
x	6	Laurie Gregg	M	Lincoln Electric System
x	7	Allan George	M	Sunflower Electric Power Corporation
x	8	Jeff Wells	M	Grand River Dam Authority
x	9	Mark Eastwood	M	City Utilities of Springfield
x	10	Doug Peterchuck	M	Omaha Public Power District
x	11	Bryn Wilson	M	Oklahoma Gas and Electric Co.
x	12	Chris Shaffer	M	American Electric Power
x	13	David Pham	M	Empire District Electric Company
x	14	Chance Myers	M	Western Farmers Electric Cooperative
x	15	Craig Speidel	M	Western Area Power Administration
x	16	Abu Elteriefi	M	ITC Holdings
x	17	Keith Carman	M	Tri-State G&T
x	18	Tyler Springer	G	American Electric Power
x	19	Casey Heier	G	Smart Wires Inc.
x	20	Jessica Hanway	G	Appian Way Energy Partners
x	21	John Stephens	G	City Utilities of Springfield
x	22	Jeremy Severson	G	Basin Electric Power Cooperative
x	23	Preston Blinsky	G	Basin Electric Power Cooperative
x	24	Pablo Ruiz	G	Brattle Group
x	25	Chris Lyons	G	Customized Energy Solutions
x	26	J. Scott Williams	G	City Utilities of Springfield
x	22	Tom Mayhan	G	Omaha Public Power District
x	23	Seth Cochran	G	DC Energy
x	24	Ryan Kirk	G	American Electric Power
x	25	Don Hargrove	G	Oklahoma Gas and Electric Co.
x	26	John Hare	G	Oklahoma Gas and Electric Co.
x	27	Kevin Ma	G	Oklahoma Gas and Electric Co.
x	28	Sing Tay	G	Oklahoma Gas and Electric Co.
x	29	Neal Faltys	G	Omaha Public Power District
x	30	Ted Bloch-Rubin	G	Smart Wires Inc.
x	31	Jason Kemper	G	EDF Renewable Energy
x	32	John Shultzabarger	G	EDF Renewable Energy
x	33	Gary Burget	G	Golden Spread Electric Cooperative
x	34	Ann Beasley	G	American Electric Power
x	35	Heather Starnes	G	Healy Law Offices
x	36	John Allen	G	City Utilities of Springfield
x	37	Bruce Grabow	G	Locke Lord
x	38	Matt Welch	G	Golden Spread Electric Cooperative
x	39	Jason Mazigian	G	Basin Electric Power Cooperative
x	40	Marc Zolnierz	G	Midwest Energy, Inc.
x	41	Simon Mahan	G	Southern Renewable Energy Association
x	42	Chris Bultsma	G	Western Area Power Administration
x	43	Carrie Dixon	G	Xcel Energy
x	44	Baryaley Sharwani	G	Western Area Power Administration
x	45	Ben Hammer	G	Western Area Power Administration
x	46	Ellen Watkins	G	Sunflower Electric Power Corporation
x	47	Paul Mehlhaff	G	Sunflower Electric Power Corporation
x	48	Jason Tanner	S	Southwest Power Pool
x	49	Terry Oxandale	S	Southwest Power Pool

x	50	Jef Rooker	S	Southwest Power Pool
x	51	Garrett Crowson	S	Southwest Power Pool
x	52	Kathryn Dial	S	Southwest Power Pool
x	53	Anthony Cook	S	Southwest Power Pool
x	54	Cody Parker	S	Southwest Power Pool
x	55	John Gunter	S	Southwest Power Pool
x	56	Charles Cates	S	Southwest Power Pool
x	57	Jim Williams	S	Southwest Power Pool
x	58	Raleigh Mohr	S	Southwest Power Pool
x	59	Margaret B. Quispe	S	Southwest Power Pool
x	60	Melissa Rinehart	S	Southwest Power Pool
x	61	Kim Gorter	S	Southwest Power Pool
x	62	Patrick deLassus	S	Southwest Power Pool
x	63	Scott Aclin	S	Southwest Power Pool
x	64	Will Tootle	S	Southwest Power Pool
x	65	Temper Williams	S	Southwest Power Pool
x	66	Zachary Sharp	S	Southwest Power Pool
x	67	Tim Miller	S	Southwest Power Pool
x	68	Dustin Courtright	S	Southwest Power Pool
x	69	William Ragsdale	S	Southwest Power Pool