



Southwest Power Pool, Inc.
OPERATING RELIABILITY WORKING GROUP
NextEra Offices
Wednesday May 29, 2019 8:00/7:00 AM – 5:00/4:00 PM (EDT/CDT)

• Action Items and Voting Record •

Agenda Item 5 – Consent Agenda: May 2, 2019 ORWG Meeting Minutes, and RR360 – Emergency Energy Assistance to Neighboring BA’s.

Ron Gunderson (Nebraska Public Power District) moved to approve the consent agenda, and Jeff Wells (Grand River Dam Authority) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 10 – Current Day Studies Update

Jeff Wells (Grand River Dam Authority) moved to endorse the removal of the current day study process, and Doug Peterchuck (Omaha Public Power District) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 16a – Permanent Flowgate Additions/Deletions

Jeff Wells (Grand River Dam Authority) moved to approve the potential flowgate additions and deletions as presented, and Mark Eastwood (City Utilities of Springfield) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 16b –TRM Results

Doug Peterchuck (Omaha Public Power District) moved to approve the TRM Results as presented, and Jeff Wells (Grand River Dam Authority) seconded the motion. The motion carried without opposition or abstention.

Southwest Power Pool, Inc.
OPERATING RELIABILITY WORKING GROUP
NextEra Offices
Wednesday May 29, 2019 8:00/7:00 AM – 5:00/4:00 PM (EDT/CDT)

• M I N U T E S •

Agenda Item 1 – Call to Order

Chairman Allen Klassen (Westar Energy, Inc.) opened the meeting at 8:14 AM (EDT) on 05/29/2019.
Chairman Allen Klassen (Westar Energy, Inc.) opened the Executive Session at 4:30 PM (EDT) on 05/29/2019.

Agenda Item 2 – Attendance

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

Agenda Item 3 – Antitrust Statement

Allen Klassen (Westar Energy, Inc.) read the SPP Antitrust Statement.

Agenda Item 4 – Agenda Review

Allen Klassen (Westar Energy, Inc.) reviewed the agenda and noted the items that would require action.

Agenda Item 5 – Consent Agenda

Allen Klassen (Westar Energy, Inc.) discussed the consent agenda, which included the May 2, 2019 ORWG Meeting Minutes, and RR360 – Emergency Energy Assistance to Neighboring BA's.

Ron Gunderson (Nebraska Public Power District) moved to approve the consent agenda, and Jeff Wells (Grand River Dam Authority) seconded the motion. The motion carried without opposition or abstention.

Liaison Reports

Agenda Item 6a OCMTF Activities Update

Doug Peterchuck (Omaha Public Power District) stated that during the last OCMTF meeting the group discussed topics pertaining to operations performance, power swings, general rating submission tool discussions, and solution methodology. Doug stated that the OCMTF also took an action item to research MW vs MVA impacts.

Agenda Item 6b PFRTF Activities Update

Allan George (Sunflower Electric Power Corporation) discussed the July 10, 2018 low frequency event and stated that the PFRTF evaluated SPP's balancing-area performance by measuring the actual response versus expectations to support the Eastern Interconnect. Allan stated that the PFRTF also reviewed the droop and deadband responses of individual generating resources utilizing North American Electric Reliability Corporation (NERC) guidelines. The ORWG recommended sending the PFRTF report to a wider audience.

Agenda Item 6c SRTF Activities Update

Neil Robertson (Southwest Power Pool) stated that the SRTF met on 5/8/2019 and 5/9/2019 where they decided that SPP would investigate frequency monitoring and make enhancements to capabilities to ensure SPP can handle multiple islands. Neil stated that future SRTF meetings would include invitations to industry restoration experts. Jeff Wells (Grand River Dam Authority) stated that the group also held discussions over who controls

the BA until ties are made. Jeff stated that TOP's do not have the capability however SPP does, it's just a matter of how SPP acquires the necessary data and dispatches units.

Agenda Item 7 – Battery Capabilities and Ancillary Services

Jeff Plew (NextEra) discussed battery storage design and provided a market overview. Jeff stated that while ancillary services markets drove initial growth in storage in 2013-2015, long duration applications are expected to grow rapidly through 2023 and beyond. Jeff explained that Energy storage is poised to become an integral part of the electric sector, due in a large part to continued battery cost declines and pairing with solar. If construction begins prior to 2020, solar (and coupled storage) projects would receive 30% solar investment tax credit (ITC). After this date a stepdown in the amount of the ITC occurs reaching 10% by 2024. Jeff stated that battery storage systems have two key parameters; rate of energy released (power measured in kW) and the amount of energy stored (energy measured in kWh) and reviewed considerations regarding battery degradation, safety and how to preform use case "stacking". Jeff explained that energy storage projects connected at substations and through the distribution grid can provide localized reliability services and aggregated benefits at a grid level that reduces customer outages and provides localized voltage support. Jeff explained that most bi-directional inverters on the market today are essentially PV solar inverters with upgraded software and very minor hardware changes, and custom PSS/E models exist including a generic storage module used in WECC. Kyle McMenamin (Xcel Energy) asked if an entity depends on batteries would temperature impact the battery life, and Jeff stated that it shouldn't be an issue if the batteries are monitored appropriately. Jeff stated that batteries are typically operated around 25 degrees C, and when idle there is more flexibility in ambient temperature ranges.

Agenda Item 8 – Batteries Studies and Potential Policy Requirements

Micha Bailey (Southwest Power Pool) discussed studying batteries and potential policy requirements. Micha stated that batteries were submitted in the DPP window, and when comparing batteries as an alternative, we notice a need for a more robust criteria and policy. Micha stated that if an alternative proposal is selected in the ITP process then it will only be on the transmission side for phase 1 which only allows Energy Storage Resources (ESR) to be utilized to solve the transmission issue and not participate in the SPP Integrated Marketplace. However, Micha stated that phase 2 allows an ESR to participate in the marketplace and be a transmission solution. The ORWG discussed skipping directly to phase 2 since phase 1 would be difficult to implement and not extract the total value from the ESR. There was discussion about how to treat revenue from the market and credit that to the transmission investment. Micha explained how batteries could be used as transmission solutions and asked ORWG if they have concerns about that direction. Jeff Wells (Grand River Dam Authority) stated that using batteries for transmission issues is the same as placing band aids on the system, and transmission issues should be fixed with actual solutions. There was concern from several ORWG members about how long the ESR would be able to provide assistance with respect to how long the constraint is expected to last. There was also concern about the impacts of charging the ESR as that would make the transmission issue worse. It was suggested that a peak day off-peak period may need to be studied to evaluate the impacts of recharging the ESR.

Agenda Item 9 – Batteries and Compliance Requirements

Jeff Rooker (Southwest Power Pool) discussed NERC standard implications to batteries and compliance requirements. Jeff stated that early on we had Project 2014-01 Standards Applicability for Dispersed Generation Resources that focused on GO/GOP implications of wind and solar. Mr. Rooker explained FERC Order 841 and stated that it focused on energy storage resources (ERS) in the market which would remove barriers to participate in capacity, energy, and ancillary service markets. Mr. Rooker discussed the impacts on contingency reserves in BAL-002 and stated that SPP filed OATT revisions on 12/3/18. Jeff stated that FERC Order 842

Relationship-Based • Member-Driven • Independence Through Diversity

Evolutionary vs. Revolutionary • Reliability & Economics Inseparable

required LGIA and SGIA for synchronous or non-synchronous gen to provide primary frequency response equipment in order to interconnect, and in April 2018 FERC Order 845 changed the definition of generating facility to include ESR for any resources larger than 20MW's.

Agenda Item 10 – Current Day Studies Update

Will Tootle (Southwest Power Pool) provided a follow up to the question regarding the removal of the current day study process, and Will stated that the feedback he received indicated the members didn't have any issue removing the process.

Jeff Wells (Grand River Dam Authority) moved to endorse the removal of the current day study process, and Doug Peterchuck (Omaha Public Power District) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 11 – Event Comparisons

Garrett Crowson (Southwest Power Pool) discussed different events that were experienced on the SPP system and compared the differences. Garrett stated that on 2/16/2019 after 08:00 wind began an un-forecasted decline, which caused a short-term wind forecast error of nearly 1,500 MW through peak, depleting the projected headroom with no clear indications to operators of the approaching wind error. Garrett stated that during this timeframe SPP operators called on close to 1,800 MW of additional capacity to manage wind forecast error across peak load. However, not all this capacity was online and available in a timely fashion. These system conditions led to a few intervals of shortages which caused the significantly high prices and additional unit commitments. Garrett stated that on 3/4/2019 SPP experienced persistent icing, high load forecast, cold temperatures, and many units that failed to start due to extreme cold and gas restrictions. Garrett stated that on 4/17/2019 SPP ran out of ramp around the 21:00 hour while wind was dropping off when it was expected to level out around that time, and no indicators were given of the continual drop in forecast. Garrett stated that SPP is working with operators to help identify real-time ramp excursions prior to the implementation of a Ramp Product. Garrett stated that SPP is also looking to automatically procure offline/online product for uncertainty, and further improving its assessment process for large amounts of generation outages, more specifically around capacity. Ron Gunderson (NPPD) expressed concern these events demonstrate that because of the uncertainty and the inability to predict this uncertainty, SPP is not procuring enough Operating Reserve to cover these unexpected events. He stated that industry needs to reevaluate how we determine Operating Reserves. In the past the largest risk was losing a large generating unit. With the change in resource mix, the uncertainty in many smaller intermittent resources seems to be a more probable and impactful event. He urged SPP to procure additional resource to cover these uncertainties.

Agenda Item 12 – Ramp Capability Product

Ricky Finkbeiner (Southwest Power Pool) provided an updated to the current status of the ramp product. Ricky stated that the ramp product has two associated products ramp capability up and ramp capability down. Ricky explained that the product treatment would be similar to other reserves. Ricky discussed the key variables associated with the ramp product. Ricky explained the Day Ahead Market RTBM full simulation methodology and provided a simulation example. Ricky also discussed shortages during high MEC and showed the percent changes in shortages with and without high MEC. Ron Gunderson (Nebraska Public Power District) asked if the market considers the 90 minutes to recover reserves after they are deployed, and Ricky stated that the reserves are deployed in the AGC. Ricky also discussed resource clearing and provided requirement calculations.

Agenda Item 13 – Reliability and Grid Switching

Garrett Crowson (Southwest Power Pool) discussed resource designations and stated that a capacity resource is designated to meet supply adequacy obligations in a Balancing Authority. Garrett stated that an energy resource is not designated to meet supply adequacy obligations in any Balancing Authority, and the same MW of a resource cannot be designated to meet supply adequacy obligations in multiple Balancing Authorities. Garrett stated that a Balancing Authority claiming a resource as a capacity resource has authority over the resource, and the RC has authority over resources which are currently switched into RC footprint which are not claimed as capacity resources. Garrett stated that in the market system there are no differentiating market registration or offer submission requirements, and the URT process analyzes capacity based on availability to market.

Agenda Item 14 – Reliability In Your Shop “Real-time Quality Assessment”

Doug Peterchuck (Omaha Public Power District) discussed Real-time Assessment (RTA) Compliance Implementation Guidance. Doug explained that a RTA is an evaluation of system conditions using Real-time data to assess existing (pre-Contingency) and potential (post-Contingency) operating conditions. The assessment shall reflect applicable inputs including, but not limited to: load, generation output levels, known Protection Systems and Special Protection System status or degradation, Transmission outages, generator outages, Interchange, Facility Ratings, and identified phase angle and equipment limitations. Doug stated that RTA may be provided through internal systems or through third-party services, however they must be completed in 30 minutes. Doug also explained which standards had the most questions from audits such as TOP-001-4 R21.

Agenda Item 15 – R-COMM Q/A

Jason Tanner (Southwest Power Pool) provided ORWG with an update to the status of the R-COMM tool. Jason stated that SPP had a new release that fixed some of the known bugs and all members are connected. Jason stated that SPP had an additional load shed test on 5/29/2019 that went extremely well with 100% participation. Jason asked ORWG if they had additional changes that they would like pursued, and the group recommended that the alarming settings default to off. The group also recommended correcting lock up issues after midnight.

Agenda Item 16 – Event Analysis Process

This item was postponed to a future meeting.

Agenda Item 17 – Charter Review

This item was postponed to a future meeting.

Agenda Item 18 – Permanent Flowgate Additions/Deletions and TRM Results

The ORWG went into Executive Session to discuss two market sensitive items “permanent flowgate additions and deletions” and “TRM Results”. The Executive Session began at 4:30 (EDT) and ended at 5:13 (EDT).

Jeff Wells (Grand River Dam Authority) moved to approve the potential flowgate additions and deletions as presented, and Mark Eastwood (City Utilities of Springfield) seconded the motion. The motion carried without opposition or abstention.

Doug Peterchuck (Omaha Public Power District) moved to approve the TRM Results as presented, and Jeff Wells (Grand River Dam Authority) seconded the motion. The motion carried without opposition or abstention.

Other Items:

Agenda Item 17 – ORWG Member Topic List

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

Action Item Review:

Agenda Item 18 – Review of Open and Closure Pending Actions

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

Agenda Item 19 – New Action Items

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

Agenda Item 20 – General Q&A/Open Forum

Agenda Item 21 – Meeting Schedule

- a. 6/27/2019 WebEx (Wed) 0830-1200
- b. 7/30/2019 WebEx (Tues) 0830-1200
- c. 9/5/2019 WebEx (Thurs) 0830-1200
- d. 10/2 - 10/3/2019 Face-to-Face (Dallas, TX)(AEP Office) – CONFIRMED
- e. 11/7/2019 WebEx (Thurs) 0830-1200
- f. 12/5/2019 WebEx (Thurs) 0830-1200
- g. 1/07 - 1/08/2020 Face-to-Face (Denver, CO)(Xcel) – CONFIRMED
- h. 2/6/2020 WebEx (Thurs) 0830-1200
- i. 3/5/2020 WebEx (Thurs) 0830-1200
- j. 4/01 - 4/02/2020 Face-to-Face (Amarillo, TX)(Xcel) – CONFIRMED
- k. 5/7/2020 WebEx (Thurs) 0830-1200
- l. 6/4/2020 WebEx (Thurs) 0830-1200
- m. 6/30 - 7/01/2020 Face-to-Face (Tulsa, OK)(GRDA) – CONFIRMED
- n. 8/6/2020 WebEx (Thurs) 0830-1200
- o. 9/3/2020 WebEx (Thurs) 0830-1200
- p. 9/30 - 10/01/2020 Face-to-Face (Little Rock, AR)(SPP) – CONFIRMED
- q. 11/5/2020 WebEx (Thurs) 0830-1200
- r. 12/3/2020 WebEx (Thurs) 0830-1200

Agenda Item 23 – Adjournment

Chairman Allen Klassen (Westar Energy, Inc.) adjourned the ORWG at 4:24 PM (EDT) on 05/29/2019.
Chairman Allen Klassen (Westar Energy, Inc.) adjourned the Executive Session 5:13 (EDT) 05/29/2019.

Respectfully Submitted,
Jason Tanner, Secretary



Operating Reliability Working Group
Meeting Attendance: 5/29/2019
M=Member, G=Guest, S=SPP Staff, P= Proxy

Day 1		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
a	14	Matthew Stoltz	M	Basin Electric Power Cooperative
x	15	Chance Myers	M	Western Farmers Electric Cooperative
x	16	Craig Speidel	M	Western Area Power Administration
x	17	Abu Elteriefi	M	ITC Holdings
x	18	Keith Carman	M	Tri-State G&T
x	19	Brittany Gray	G	Xcel Energy
x	20	Kevin Ma	G	Oklahoma Gas and Electric Co.
x	21	Ron Thompson	G	Nebraska Public Power District
x	22	Steve Gaw	G	The Wind Coalition
x	23	Carrie Dixon	G	Xcel Energy
x	24	Casey Moye	G	NextEra Energy, Inc.
x	25	Jeff Plew	G	NextEra Energy, Inc.
x	26	Nico Ciccone	G	NextEra Energy, Inc.
x	27	Syed Ahmad	G	Federal Energy Regulatory Commission
x	28	Keeth Works	G	Southwestern Power Administration
x	29	Jim Fletcher	G	American Electric Power
x	30	Ryan Kirk	G	American Electric Power
x	31	Garrick Nelson	G	Western Area Power Administration
x	32	Cindy Sabin	G	Grand River Dam Authority
x	33	Chris Bultsma	G	Western Area Power Administration
x	34	Tyler Springer	G	American Electric Power
x	35	Tanner New	G	Sunflower Electric Power Corporation
x	36	Jason Mazigian	G	Basin Electric Power Cooperative
x	37	Gary Burget	G	Golden Spread Electric Cooperative, Inc
x	38	Ben Hammer	G	Western Area Power Administration
x	39	Neal Faltys	G	Omaha Public Power District
x	40	Baryaley Sharwani	G	Western Area Power Administration
x	41	Robert Safuto	G	Customized Energy Solutions
x	42	Jim Krajecki	G	Customized Energy Solutions
x	43	John Fernandes	G	Customized Energy Solutions
x	44	Tom Mayhan	G	Omaha Public Power District
x	45	Jason Tanner	S	Southwest Power Pool
x	46	Clint Savoy	S	Southwest Power Pool
x	47	Daniel Baker	S	Southwest Power Pool
x	48	Doug Clark	S	Southwest Power Pool
x	49	Kevin Bates	S	Southwest Power Pool
x	50	Kristen Darden	S	Southwest Power Pool
x	51	Scott Aclin	S	Southwest Power Pool
x	52	Will Ragsdale	S	Southwest Power Pool

x	53	Jerry Stone	S	Southwest Power Pool
x	54	Chris Davis	S	Southwest Power Pool
x	55	Ricky Finkbeiner	S	Southwest Power Pool
x	56	Kim Gorter	S	Southwest Power Pool
x	57	Kim Vanbrimer	S	Southwest Power Pool
x	58	Margaret B. Quispe	S	Southwest Power Pool
x	59	Melanie Hill	S	Southwest Power Pool
x	60	Eric Samson	S	Southwest Power Pool
x	61	Micha Bailey	S	Southwest Power Pool
x	62	Alan Wahlstrom	S	Southwest Power Pool
x	63	Brad Johnson	S	Southwest Power Pool
x	64	Raleigh Mohr	S	Southwest Power Pool
x	65	Hagen Boehmer	S	Southwest Power Pool
x	66	Terry Oxandale	S	Southwest Power Pool
x	67	Joshua Pilgrim	S	Southwest Power Pool
x	68	Garrett Crowson	S	Southwest Power Pool
x	69	Neil Robertson	S	Southwest Power Pool
x	70	Will Tootle	S	Southwest Power Pool
x	71	Jim Williams	S	Southwest Power Pool