



Southwest Power Pool, Inc.
OPERATING RELIABILITY WORKING GROUP
Little Rock, AR Face to Face
Wednesday May 30th 2018 8:00 AM – 5:00 PM (CDT)
Thursday May 31st 2018 8:00 AM – 12:00 PM (CDT)

• **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 document that explains how the outage coordination metrics are created.

ACTION ITEM: Develop a System Restoration Task Force (SRTF) charter for action by the ORWG.

Consent Agenda Items: Annual SPP RSG obligation review

Ron Gunderson (Nebraska Public Power District) moved to approve the consent agenda, and Todd Gosnell (Omaha Public Power District) seconded the motion. The motion carried without opposition or abstention.

May 03, 2018 ORWG meeting minutes

Jim Useldinger (South Central MCN) moved to approve the May 3, 2018 ORWG meeting minutes as modified, and Mark Eastwood (City Utilities of Springfield) seconded the motion. The motion carried without opposition or abstention.

RR291 Revision Request Process Language Updates

Chris Shaffer (American Electric Power) moved to approve RR291 Revision Request Process Language Updates, and Jeff Wells (Grand River Dam Authority) seconded the motion. The motion carried with two abstentions Allen Klassen (Westar Energy) and Jay Patel (Kansas City Power & Light).

Annual Flowgate Review

Jeff Wells (Grand River Dam Authority) moved to approve the MOD-030-3 Potential Flowgate Candidates, and Abu Elteriefi (ITC Holdings) seconded the motion. The motion carried without opposition or abstention.

CR Calculations

Jeff Wells (Grand River Dam Authority) moved to endorse the CR process changes, and Craig Speidel (Western Area Power Administration) seconded the motion. The motion carried without opposition or abstention.

OCRTF Retirement

Allan George (Sunflower Electric Power Corporation) moved to retire the OCRTF, and Jeff Wells (Grand River Dam Authority) seconded the motion. The motion carried without opposition or abstention.

RR309 Planning/OPS RC Area Criteria Separation

Ron Gunderson (Nebraska Public Power District) moved to approve RR309 as modified, and Jeff Wells (Grand River Dam Authority) seconded the motion. The motion carried without opposition or abstention.

PFRTF Charter

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

Update to the RDS project HAA

David Pham (Empire District Electric Company) moved to endorse staff recommendations to wait to add RDS site redundancy, and Ron Gunderson (Nebraska Public Power District) seconded the motion. The motion carried without opposition or abstention.

Southwest Power Pool, Inc.
OPERATING RELIABILITY WORKING GROUP
Little Rock, AR Face to Face
Wednesday May 30th 2018 8:00 AM – 5:00 PM (CDT)
Thursday May 31st 2018 8:00 AM – 12:00 PM (CDT)

• M I N U T E S •

Agenda Item 1 – Call to Order

Chairman Allen Klassen (Westar Energy, Inc.) opened the meeting at 8:04 AM on 5/30/2018.

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

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 3, 2018 ORWG meeting minutes, and the Annual SPP RSG obligation review. Bryn Wilson (Oklahoma Gas and Electric Co.) requested to pull the May 3, 2018 ORWG meeting minutes for discussion.

Ron Gunderson (Nebraska Public Power District) moved to approve the consent agenda, and Todd Gosnell (Omaha Public Power District) seconded the motion. The motion carried without opposition or abstention.

Pulled From the Consent Agenda

Bryn Wilson (Oklahoma Gas and Electric Co.) made modifications to agenda item 8 to state “Bryn Wilson (Oklahoma Gas and Electric Co.) stated that SPP may be taking on too much by managing who should or should not have data points. Bryn stated that SPP should develop a process to manage data point administration.” Allan George (Sunflower Electric Power Corporation) made a correction to the spelling of his name.

Jim Useldinger (South Central MCN) moved to approve the May 3, 2018 ORWG meeting minutes as modified, and Mark Eastwood (City Utilities of Springfield) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 6 – RR291 Revision Request Process Language Updates

Chris Cranford (Southwest Power Pool) discussed RR291 and explained that SPP’s goal with RR291 is to further add efficiency to the process by addressing two separate but key issues. One is to reduce the time it takes for a Revision Request to progress through the RR Process and to remove duplicate references causing additional unnecessary changes. Chris explained that the Current RR Process does not allow normal status RR to move forward for Secondary Working Group review until an Impact Assessment is completed and acted on by Primary WG. Chris stated that the proposed language change would allow an approved normal status RR to progress through the Stakeholder process while the Primary working group is waiting on the impact assessment. Chris reviewed the recommendation report and explained the changes.

Chris Shaffer (American Electric Power) moved to approve RR291 Revision Request Process Language Updates, and Jeff Wells (Grand River Dam Authority) seconded the motion. The motion carried with two abstentions Allen Klassen (Westar Energy) and Jay Patel (Kansas City Power & Light).

Agenda Item 7 – Annual Flowgate Review

Patrick DeLassus (Southwest Power Pool) discussed the current FG candidates selected for removal and the potential new flowgate candidates. Bryn Wilson (Oklahoma Gas and Electric Co.) stated that flowgate 5223 does not need to be removed, and after reviewing the status was set to keep the flowgate.

Jeff Wells (Grand River Dam Authority) moved to approve the MOD-030-3 Potential Flowgate Candidates, and Abu Elteriefi (ITC Holdings) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 8 – CR Calculations

Garrett Crowson (Southwest Power Pool) discussed the current design process for the possible changes to the contingency reserve requirement. Garrett explained that the current requirement is set based on most severe single contingency (MSSC) + (Next MSSC * 0.5) which means current requirement has always been expected max capacity of thermal based resources. Garrett stated that the requirement is currently set once daily, and with the possibility of a variable energy resource becoming the MSSC set at 2000 MWs the next largest unit would be 1200 MWs and this would cause SPP to begin carrying 2600 MWs for the entire day. Garrett suggested that we move from daily requirement to hourly requirement and to use a scaling factor. Pablo Ruiz (NewGrid, Inc.) asked if the CR requirement would be different between day ahead and real time. Casey Cathey (Southwest Power Pool) stated that the CR amount could only increase from day ahead and could not scale down. Neil Robertson (Southwest Power Pool) stated that our goal is to maintain appropriate amounts of CR and to minimize carrying extreme amounts of CR during certain scenarios. Derek Hawkins (Southwest Power Pool) asked if we considered different scenarios and reasons for a dynamic scaler. Garrett stated that he is working on a document to capture the different scenarios, and Garrett also provided an example of past CR performance.

Jeff Wells (Grand River Dam Authority) moved to endorse the CR process changes, and Craig Speidel (Western Area Power Administration) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 9 – OCRTF Retirement

Neil Robertson (Southwest Power Pool) provided an OCRTF appreciation statement and stated that he would add this to the org report and quarterly report.

“SPP would like to extend a special thank you to all the member staff who participated in the Operating Criteria Review Task Force effort. Members of the ORWG, RCWG, as well as other member staff all played a vital role in the success of the task force. The OCRTF serves as excellent example of SPP and its members working together for the betterment of the organization as a whole.”

Allan George (Sunflower Electric Power Corporation) moved to retire the OCRTF, and Jeff Wells (Grand River Dam Authority) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 10 – RR309 Planning/OPS RC Area Criteria Separation

Neil Robertson (Southwest Power Pool) discussed the separation of RC area SOL Methodology from planning criteria. Neil explained the motivation for submitting the RR, and Neil discussed the comments from NPPD. Mark Eastwood (City Utilities of Springfield) stated that his comments were covered by NPPD's. Neil explained that flowgate was capitalized in multiple locations, and discussed the other edits. The ORWG adjusted the generation MW minimum limit value from 300 to 150 in section 1.3 System Modeling and Contingency Definition.

Ron Gunderson (Nebraska Public Power District) moved to approve RR309 as modified, and Jeff Wells (Grand River Dam Authority) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 11 – PFRTF Charter

Daniel Baker (Southwest Power Pool) explained the need for a primary frequency response task force. Daniel stated that due to recent events SPP sees a need to evaluate our frequency response. Daniel explained that SPP needs to understand our frequency response when wind penetration is at 70% and 80%. Daniel stated that the goal of the task force would be to look at the frequency response 1 minute after a disturbance. Daniel explained that the task force will evaluate SPP dynamic model parameters against the measured Frequency Response of SPP Resources during periods with varying penetration of inverter-based resources. Daniel stated that the taskforce will develop an understanding of SPP’s Resource limitations and capabilities for providing frequency response. Additionally the taskforce will focus on SPP performance during events and recommend changes to the SPP Tariff and/or other SPP governing documents for frequency response capabilities via market incentives or tariff requirements. Ron Gunderson (Nebraska Public Power District) suggested adjusting the charter to limit the size of the group. Daniel adjusted the charter to comprise of 11 members Daniel also adjusted the qualifications. Allen Klassen (Westar Energy, Inc.) suggested the addition of a 6th bullet to provide a report for all activities listed.

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

Agenda Item 12 – IBIS FFS Analysis and Results

Doug Bowman (Southwest Power Pool) discussed fast fault screening (FFS) and explained how it works. Doug stated that FFS determines the most severe fault locations then ranks the faults using a ranking index (RI). Doug stated that RI uses characteristics of the power system that have the largest impact on dynamic stability. Doug explained that a larger value of kinetic energy of a generator rotor during a fault corresponds to a bigger chance of loss of synchronism, and the ratio of the electrical torque at the moment the fault is cleared and before the fault is applied depends on the potential energy of the post fault conditions. Doug explained critical clearing time and stated that the smaller the critical clearing time the more severe the applied fault. Doug also explained the preliminary FFS analysis for the Inverter Based Generation Integration Study models.

Agenda Item 13 – Topology Control study and results

Casey Cathey (Southwest Power Pool) introduced Pablo Ruiz (NewGrid, Inc.) and Pablo provided a presentation for Topology Control. Pablo explained that the topology optimization software finds reconfigurations to divert flow around congested or breached elements while meeting reliability standards. Pablo stated that they evaluated the effectiveness of topology optimization to mitigate congested or breached constraints in 20 real-time SPP snapshots. Pablo presented the findings and stated that 70% of constraints analyzed had a single-action solution that led to 26% flow relief on average. Pablo stated that 95% of the constraints analyzed had feasible solutions that led to 31% relief with no new constraints. Pablo stated that SPP has already developed an operating guide based on the analysis and Pablo estimated that topology optimization would enable reduced frequency of breached intervals from 29% to 7%. Pablo stated that the annual RT market savings would be between \$3-8 million if deployed in Outage Coordination, and \$18-44 million if used in RT Market Optimization. Pablo stated that the software significantly reduced wind curtailments, and provides full relief under some conditions. Pablo stated that he also evaluated the effectiveness of topology optimization in long-term planning to develop Corrective Action Plans for multiple outage events.

Agenda Item 14 – 4/30 Voltage Oscillations

Kathryn Dial (Southwest Power Pool) discussed the system power swing event that occurred on 4/30/18. Kathryn reviewed some of the statistics and stated that the largest change in MISO wind occurred between 01:11 and 01:44 with a 2200 MW change. Kathryn stated that SPP observed voltage swings of 2-3 kV on multiple 345kV buses. Kathryn provided and explained a number of charts that showed items such as the unit MVAR swings, MISO wind, 345 kV bus voltage swings, regional transfer flow, and flowgate loading. Abu Elteriefi (ITC Holdings) asked if PJM saw the MVAR swings at Quad City, and Kathryn stated they did. Ron Gunderson (Nebraska Public Power District) asked if the PJM operators expressed concerns regarding the observed swings, Kathryn stated they have and Pablo Ruiz (NewGrid, Inc.) asked if the MVAR swings originated in MISO, and Kathryn stated they have. Will Ragsdale (Southwest Power Pool) discussed the market logic and explained some flowgate comparisons. Will stated that SPP only had visibility on flowgate 5375 swings in real time, but showed a comparison against PJM's flowgate 575. Will stated that the baseline market to market logic doesn't have a controlled release for the NMRTO. Will stated that when NMRTO has a lot of fast-ramping dispatchable relief to provide, they provide a lot of relief very quickly. Will also stated that NMRTO will conversely reload very quickly when the MRTO releases them. Will stated that SPP has an alarm set up to send the shift engineers and other operations staff an email when loading on the Cooper South flowgate #6009 changes by more than 150 MW over 10 minutes, and the Shift engineers will investigate and reply to Operations staff as to the suspected cause and continue to monitor. Will stated that PJM is looking at enhanced wind logic, and that MISO and PJM are looking at exchanging ownership on select flowgates.

Agenda Item 15 – Wind Drop Post Analysis

Gunnar Shaffer (Southwest Power Pool) explained the wind error on 3/26/2018 and stated that the core of the low-pressure system was very close to the SPP region. Gunnar stated that very often that leads to high uncertainties in the wind predictions. Usually at least one weather model shows a very different forecast to the others and indicates the uncertainty. Bryn Wilson (Oklahoma Gas and Electric Co.) asked what was the difference between the 26th and 27th and Gunnar stated it was an issue between weather models where they were all agreeing, but incorrect. Gunnar stated that the models were relatively close together, so it was not obvious that the forecast might be wrong. Garrett Crowson (Southwest Power Pool) the short-term capacity forecasting and discussed the studies performed in real time operations. Garrett stated that moving forward we would work towards creating enhanced high-risk scenarios to automatically detect large potential continuous wind loss. The scenarios would be compared to our short-term capacity.

Agenda Item 16 – Update on 1/17

Casey Cathey (Southwest Power Pool) provided an update to the 1/17 operations event where the central and southern US experienced abnormally cold weather that caused record winter loading for SPP and MISO South. Casey reminded ORWG that during this event MISO exceeded the 3000MW limit over 6 hours without explicit permission. Casey stated that the issue has been elevated to FERC and that SPP wants FERC to understand what happened. Casey stated that we also want MISO to make improvements. Kathryn Dial (Southwest Power Pool) explained how MISO worked to prepare for the latest heat wave and Casey stated that MISO also filed tariff changes to carry more reserves in the southern region of MISO.

Agenda Item 17 – Summer Assessment

Jon Langford (Southwest Power Pool) provided ORWG with the 2018 Summer Assessment. Jon explained that the assessment was performed by creating seven different snapshot cases spaced three weeks apart covering the study period. Jon stated that the study period ranges from May 2018 through the end of September 2018. Wednesday cases are used to represent high load and high outage concentration. Jon stated that the study includes all known SPP RC area footprint facility outages submitted to SPP's outage management system, CROW, as of April 9th, 2018, with each case containing the appropriate outages for its time frame. Jon stated that the SPP's RC Area footprint and BA footprint is expected to perform reliably during the 2018 summer operating season. No capacity limitations are expected to impact reliability. Ron Gunderson (Nebraska Public Power District) asked if we have looked at capacity shortfalls in the spring and fall with higher than normal temperatures and a number of larger units out for maintenance. Jon stated that we have not assessed that scenario. Casey Cathey (Southwest Power Pool) stated that he would like to see more scenarios like this that provide value to SPP members.

Agenda Item 18 – Update to the RDS project HAA

Katie Mauldin (Southwest Power Pool) discussed the RDS project and explained that the replicated data server is currently used by TOs/TOPs for model data validation and to view real and contingent flows. Katie stated that the IT process copies real time data from Production EMS applications to replicated data server every two minutes. Katie stated that SPP staff provides minimal support and the RDS is hosted at the primary site with no redundancy. Katie explained that SPP members have requested additional features and currently the RDS can have 17 concurrent users. Katie explained for the upgrade project the concurrent users would increase to 40, and the RDS would have site redundancy. The upgrades would allow for area-specific filtering on displays, and it would secure SPP's network with appropriate member access. Katie stated that the project has been officially approved to move forward, and is currently in requirements and design stage. Internal and external testing will begin October 2018, and the production installation date is set for December 2018. Ron Gunderson (Nebraska Public Power District) noted that NPPD security policies do not permit using VPN to tie the NPPD network with the SPP network, so only standalone PC's can be utilized to access the RDA. Jeff Wells (Grand River Dam Authority) indicated they had the same restrictions.

David Pham (Empire District Electric Company) moved to endorse staff recommendations to wait to add RDS site redundancy, and Ron Gunderson (Nebraska Public Power District) seconded the motion. The motion carried without opposition or abstention.

Agenda Item 19 – Outage Metrics

Zachary Sharp (Southwest Power Pool) discussed the outage metrics and showed the number of outages by kV level since 5/01/17. Zachary discussed the percentage of planning outages and the associated lead times. Zachary also discussed the number of unplanned outage and with the associated lead times. Zachary explained the transmission outage scorecard which showed the percentage of outages submitted greater than 14 days less than 14 day and how many were forced. Allen Klassen (Westar Energy, Inc.) asked how much more generation do we have going into retirement, and Casey Cathey (Southwest Power Pool) stated that we currently have gaps in this area due to the 6-month notification requirement. Casey stated that beyond the 6-month notification we

don't know what is slated for retirement. The ORWG requested SPP staff to develop a document that explains how the metrics are created.

ACTION ITEM: Develop a document that explains how the outage coordination metrics are created.

Agenda Item 20 – EOP-005-3 R8.5

John Gunter (Southwest Power Pool) discussed the EOP-005 standard and explained that each TOP shall develop a plan to return control from the TOP to the BA and train their operators on that plan. SPP training was asked by some members if the SPP training could be used by members to satisfy this requirement. John would like the TOP plans to have the same language so that the training could cover all members. Neil Robertson (Southwest Power Pool) proposed TOP plan language for R1.9 and stated that we need to address the transfer between the TOP and BA. Ron Gunderson (Nebraska Public Power District) expressed a concern about the current language in the plan. The current language could imply that all of SPP is connected prior to turning control over to the SPP BA. With the current size of the SPP BA, Ron was not confident the individual TOPs would be able to adequately control frequency once more than two or three TOPs were connected. This is an issue that really has not been addressed by the restoration plans. Neil stated that he sees two scenarios that need to be addressed. Neil stated that the training issue is separate from the issue of how or when control should be turned over to the BA. The ORWG suggested creating a task force to address the issues associated with frequency control once multiple TOPs are connected and in multiple islands. Neil stated that he would draft a task force charter and bring it to a future ORWG meeting for discussion and approval. It was the consensus of the ORWG that SPP training simply develop their training based upon the SPP restoration plan. If members desire to utilize SPP training to satisfy the requirements of EOP-005 R8.5, it is incumbent upon the member to be in alignment with the language in the SPP plan.

ACTION ITEM: Develop a System Restoration Task Force (SRTF) charter for action by the ORWG.

Agenda Item 21 - 22 – Online VSAT Status and Results and Online TSAT introduction and project timeline

Kevin Sanson (Southwest Power Pool) provided an update to the VSAT project and stated that currently SPP is running 14 scenarios, and in May SPP successfully uploaded VSAT to PROD. Kevin stated that currently SPP is monitoring real-time results and the results are being posted in Global Scape. Kevin stated that the Shift engineers are providing feedback on results verification and staff is continuing work on look ahead and study modes. Kevin stated that for TSAT SPP staff will begin work in early July by evaluating 20 different scenarios. Kevin stated that the hardware has already been delivered and statement of work has been executed with GE for model export enhancements. Kevin stated that the PowerTech Labs statement of work will be executed in June 2018.

Agenda Item 23 – MWTG Update

Casey Cathey (Southwest Power Pool) stated that the non PSCO entities are doing a cost benefit study for joining SPP. Casey stated that SPP is currently focusing on RC services in the west and that SPP is trying to be competitive in the west against CAISO and Peak RC. Ron Gunderson (Nebraska Public Power District) asked if SPP would have a different set of RC operators, and Casey stated that SPP would. Jason Tanner (Southwest Power Pool) stated that the RC services would likely look like the Entergy ICT RC services SPP provided.

Other Items:

Agenda Item 24 – ORWG Member Topic List

*Relationship-Based • Member-Driven • Independence Through Diversity
Evolutionary vs. Revolutionary • Reliability & Economics Inseparable*



Jason Tanner (Southwest Power Pool) reviewed the ORWG Member topic list

Action Item Review:

Agenda Item 25 – Review of Open and Closure Pending Actions

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

Agenda Item 26 – New Action Items

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

Agenda Item 27 – General Q&A/Open Forum

Agenda Item 28 – Meeting Schedule

- a. 6/27/2018 WebEx (Wed) 0830-1200
- b. 8/1 - 8/2/2018 Face-to-Face (Denver, CO) (Tri State) - CONFIRMED
- c. 9/6/2018 WebEx (Thurs) 0830-1200
- d. 10/3 – 10/4/2018 Face-to-Face (Little Rock, AR) (SPP) – CONFIRMED
- e. 11/1/2018 WebEx (Thurs) 0830-1200
- f. 12/6/2018 WebEx (Thurs) 0830-1200

Agenda Item 29 – Adjournment

Chairman Allen Klassen (Westar Energy, Inc.) adjourned the ORWG at 4:25 PM (EDT) on 5/30/2018.

Chairman Allen Klassen (Westar Energy, Inc.) adjourned the ORWG at 10:47 PM (EDT) on 5/31/2018.

Respectfully Submitted,
Jason Tanner, Secretary



Operating Reliability Working Group
Meeting Attendance: 5/30/2018 - 5/31/2018
M=Member, G=Guest, S=SPP Staff, P= Proxy

Day 1	Day 2		Name	Status	Company
x	x	1	Allen Klassen, Chairman	M	Westar Energy
x	x	2	Ron Gunderson, Vice Chairman	M	Nebraska Public Power District
x	x	3	Jim Useldinger	M	South Central MCN
x	x	4	Gary Plummer	M	City of Independence, MO
x	x	5	Kyle McMenamin	M	Xcel Energy
x	x	6	Laurie Gregg	M	Lincoln Electric System
x	x	7	Allan George	M	Sunflower Electric Power Corporation
x	x	8	Jeff Wells	M	Grand River Dam Authority
x	x	9	Todd Gosnell	M	Omaha Public Power District
x	x	10	Bryn Wilson	M	Oklahoma Gas and Electric Co.
x	x	11	Chris Shaffer	M	American Electric Power
x	x	12	David Pham	M	Empire District Electric Company
P	P	13	Matthew Stoltz	M	Basin Electric Power Cooperative
x	x	14	Chance Myers	M	Western Farmers Electric Cooperative
x	x	15	Craig Speidel	M	Western Area Power Administration
x	x	16	Abu Elteriefi	M	ITC Holdings
x	x	17	Jay Patel	M	Kansas City Power & Light
x	x	18	Mark Eastwood	M	City Utilities of Springfield
a	a	19	Keith Carman	M	Tri-State G&T
x	x	20	Jeremy Severson Proxy for Matthew Stoltz	P	Basin Electric Power Cooperative
x	x	21	Ryan Kirk	G	American Electric Power
x	x	22	Jason Mazigian	G	Basin Electric Power Cooperative
x	x	23	Steve Gaw	G	The Wind Coalition
x		24	Robert Safuto	G	Customized Energy Solutions
x		25	Jim Krajecki	G	Customized Energy Solutions
x	x	26	Seth Cochran	G	DC Energy
x	x	27	Kevin Foflygen	G	City Utilities of Springfield
x		28	Scott Williams	G	City Utilities of Springfield
x		29	Terry Volkmann	G	Volkmann Consulting
x	x	30	Keeth Works	G	Southwestern Power Administration
x		31	Gayle Nansel	G	Western Area Power Administration
		32	Garrick Nelson	G	Western Area Power Administration
x	x	33	Ben Hammer	G	Western Area Power Administration
	x	34	Frank Li	G	Western Area Power Administration
x		35	Neil Faltys	G	Omaha Public Power District
x		36	Don Hargrove	G	Oklahoma Gas and Electric Co.
x		37	Hermes Arevalo	G	Oklahoma Gas and Electric Co.
x	x	38	Carrie Dixon	G	Xcel Energy
x	x	39	Jason Tanner	S	Southwest Power Pool
x	x	40	Casey Cathey	S	Southwest Power Pool
x		41	Abram Harder	S	Southwest Power Pool
x		42	Ashley Gray	S	Southwest Power Pool
x	x	43	Brad Johnston	S	Southwest Power Pool
x		44	Chris Cranford	S	Southwest Power Pool
x		45	Douglas Bowman	S	Southwest Power Pool
x		46	Hagen Boehmer	S	Southwest Power Pool
x	x	47	John Gunter	S	Southwest Power Pool
x		48	Jordan Boehmer	S	Southwest Power Pool
x	x	49	Katie Mauldin	S	Southwest Power Pool
x	x	50	Tim Miller	S	Southwest Power Pool
x	x	51	Kevin Sanson	S	Southwest Power Pool

x		52	Kim Farris	S	Southwest Power Pool
x		53	Kim Gorter	S	Southwest Power Pool
x	x	54	Margaret Q. Adams	S	Southwest Power Pool
x		55	Melanie Hill	S	Southwest Power Pool
x		56	mrinehart	S	Southwest Power Pool
x	x	57	Neil Robertson	S	Southwest Power Pool
x		58	Raleigh Mohr	S	Southwest Power Pool
x	x	59	Danial Baker	S	Southwest Power Pool
x	x	60	Shannon Mickens	S	Southwest Power Pool
x	x	61	Kevin Bates	S	Southwest Power Pool
x	x	62	Kathryn Dial	S	Southwest Power Pool
x		63	Garrett Crowson	S	Southwest Power Pool
x	x	64	Patrick Delassus	S	Southwest Power Pool
x	x	65	Jon Langford	S	Southwest Power Pool
x	x	66	Scott Brown	S	Southwest Power Pool
x	x	67	Zachary Sharp	S	Southwest Power Pool