

Southwest Power Pool, Inc.
Model Development Working Group
Net Conference
July 10, 2017:
2:00 P.M. – 4:00 P.M.

• M I N U T E S •

Agenda Item 1 – Administrative

The MDWG Chair, Nate Morris, called the meeting to order at approximately 2:02 p.m. The following MDWG members were in attendance:

MDWG Members present:

| MDWG Member | Present | Proxy | Present | Company |
|----------------|---------|--------------|---------|---------------------------------------|
| Nate Morris | YES | | | Empire District Electric Company |
| Derek Brown | YES | | | Westar Energy |
| Jason Bentz | YES | Martin Green | YES | American Electric Power |
| Dustin Betz | YES | | | Nebraska Public Power District |
| John Boshears | YES | | | City Utilities of Springfield |
| Jerad Ethridge | YES | | | Oklahoma Gas & Electric |
| Joe Fultz | YES | | | Grand River Dam Authority |
| Wayne Haidle | YES | | | Basin Electric Power Cooperative |
| Holli Krizek | YES | | | Western Area Power Administration |
| Reené Miranda | YES | | | Southwestern Public Service |
| Scott Schichtl | NO | | | Arkansas Electric Cooperative Company |
| Jason Shook | YES | | | GDS Associates |
| Liam Stringham | YES | | | Sunflower Electric Power Corporation |
| Anthony Cook | YES | | | Southwest Power Pool, Inc. |

The following guests were also in attendance:

Ryan Baysinger – Kansas City Power & Light
 Jerry Bradshaw – City Utilities of Springfield
 Bruce Doll, Armin Sehic – Municipal Energy Agency of Nebraska
 Martin Green – American Electric Power
 Jeremy Harris – Westar Energy
 Jordan Lamb – East River Electric
 Ellis Lutz – Associated Electric Cooperative
 Edgardo Manansala – Midwest Energy
 John Mayhan – Omaha Public Power District
 Dave Sargent, Scott Mijin – Southwestern Power Administration
 Gimod Olapurayil – ITC Great Plains
 Dona Parks, Diego Toledo – Grand River Dam Authority
 Mark Reinart – Golden Spread Electric Cooperative
 John Weber – Missouri River Energy Services
 Joe Williams – Western Farmers Electric Cooperative

Jarrold Wolford – Northeast Texas Electric Cooperative
Alan Burbach – Lincoln Electric System
Aravind Chellappa, Frank Favela – Southwestern Public Service
Eddie Watson, Theva Chanthaseny, Moses Rotich, Michael Odom, and Mitch Jackson – Southwest Power Pool

Meeting Agenda

Following the roll call audit, Nate asked the group if they had any issues with meeting material and how it was provided to the group. There were no comments.

**Motion: Jerad Ethridge made the motion to approve the agenda. Reené Miranda seconded it. The motion passed unanimously.
(Attachment 1 - MDWG Meeting Agenda 20170710.docx)**

Agenda Item 2 – 2018 Series Model Build Schedule (Action Item):

Nate commenced discussion by asking SPP staff to discuss the changes made to the schedule based on the previous meeting discussion. Anthony mentioned to the group that the proposals to include the data submittal workbook and approval date to the schedule had been implemented. He then asked the group to allow him discuss an alternate schedule that staff had drafted to benefit both members and SPP. He then mentioned that the only difference between the schedule in the background material and the one staff had modified is that the transaction and topology passes were flipped i.e., pass 0 would concentrate on topology updates whereas pass 1 would concentrate on transaction updates. In ensuing discussion, Derek asked whether SPP was going to provide a mapping of the profiles so that members can apply MOD profiles correctly. Anthony replied that SPP staff will provide a mapping of the profiles.

Action Item: SPP staff to provide Data Submitters a mapping of MOD base profiles so that they know the starting point.

Reené then asked if SPP will accept data submissions over the weekend. Anthony answered that weekend submissions will be accepted only when the scheduled deadline falls on a Friday, and will not be marked late. Moses then told the group that in order to maintain schedule, late submissions will be applied to the next model posting. At that juncture, Reené asked that if some entities provide late submissions that impact other systems, how that will this situation be handled. Anthony responded that some language will be drafted in the MDWG manual to mitigate this issue. Eddie Watson also took this opportunity to tell the group that SPP management had discussed the model build and the need to adhere to the schedule deadlines.

For the face-to-face meeting in the schedule, Anthony and Nate both asked for the group's thoughts on the timing or need for the meeting. Wayne commented that coordination with his entities was so wide and would be difficult but hoped that a lot of things would be ironed out by the time the face-face meeting came. He also loved the schedule as amended to coordinate transactions later instead of July/August timeframe. He also added that it would be good to merge with MISO MTEP to clean up some seams issues. Anthony answered that SPP had reached out to MISO and would do it's best to explore the possibility of merging with the latest MTEP (no promises though). Derek commented that the face-to-face meeting is a good idea to alleviate any last minute issues. He said that the meeting needs to take place next year, before its need is re-evaluated.

In other discussion, Reené asked that a footnote be added to the schedule to reflect data submission over the weekend as acceptable. The MDWG agreed to add the footnote to the schedule. Jerad then asked whether the 2019 ITP/ 2018 MDWG model set will also be added to the schedule just like the previous model build schedule. Anthony replied that the model set will be added to the approved schedule and posted to the MDWG web page. John Boshears suggested that the MDWG chair and staff secretary determine a need for the face-to-face meeting in case some serious model issues arise that require most in the group to attend. Additionally, he also suggested that entities be notified at least two weeks in advance if a face-to-face meeting is determined.

Seeing no further discussion, Anthony proposed that the Transmission Planners (TP) in attendance provide feedback on the schedule before the MDWG approves it. Moses did a roll call of all TPs in attendance and asked them to provide feedback. SPP also reached out to the TPs who were not attendance for feedback on the schedule. Below is a summary of the TPs who approved of the schedule:

| Transmission Planner | Representative | Feedback on the model build schedule |
|--|-----------------------|---|
| Basin Electric Power Cooperative | Wayne Haidle | Approved - in attendance |
| Corn Belt Power Cooperative | Tyler Baxter | Approved - not in attendance |
| Lincoln Electric System | Alan Burbach | Approved - not in attendance |
| Nebraska Public Power District | Dustin Betz | Approved - in attendance |
| Omaha Public Power District | John Mayhan | Approved - in attendance |
| Western Area Power Administration - Rocky Mountain Region | No Response | No Response |
| Western Area Power Administration - Upper Great Plains East | Holli Krizek | Approved - in attendance |
| American Electric Power Corp. as Agent for AEP Oklahoma Transmission Company, Inc., Public Service Company of Oklahoma, and Southwestern Electric Power Company | Jason Bentz | Approved - in attendance |
| Board Of Public Utilities (Kansas City KS) | John Turner | Approved - not in attendance |
| City Utilities Of Springfield, MO | John Boshears | Approved - in attendance |
| East Texas Electric Cooperative Inc. | Jason Shook | Approved - in attendance |
| Grand River Dam Authority | Joe Fultz | Approved - in attendance |
| Independence Power & Light (Independence, Missouri) | Daniel Benedict | Approved - not in attendance |
| ITC Great Plains, LLC | Gimod Olapurayil | Approved - in attendance |
| Kansas City Power & Light Company | Ryan Baysinger | Approved - in attendance |
| Midwest Energy, Inc. | Edgardo Manansala | Approved - in attendance |
| Oklahoma Gas And Electric Co. | Jerad Ethridge | Approved - in attendance |
| Southwestern Power Administration | Dave Sargent | Approved - in attendance |

| | | |
|--|----------------|--------------------------|
| Southwestern Public Service Co. (Xcel Energy) | Reené Miranda | Approved - in attendance |
| Sunflower Electric Power Corporation | Liam Stringham | Approved - in attendance |
| Tex-La Electric Cooperative of Texas, Inc. | Jason Shook | Approved - in attendance |
| The Empire District Electric Company | Nate Morris | Approved - in attendance |
| Westar Energy, Inc. | Derek Brown | Approved - in attendance |
| Western Farmers Electric Cooperative | Joe Williams | Approved - in attendance |

Before the MDWG voted, more discussion ensued. Holli asked whether transactions are needed for some of the models that don't require generation profiles. Anthony answered that that because of the ITP, transactions are still required for every model. She then asked how transactions tied to dispatch will be modeled if generation profiles are not required for the ITP models. Derek also added that Westar has similar situations and wanted to know how they will be handled. Holli then asked if SPP was expecting transactions to be coordinated with external entities, for all the non-MMWG models that will built. Anthony replied that SPP expects entities to submit expected transactions and coordinate with external entities if possible, but noted that there is no requirement to coordinate those transactions.

There was a lot more discussion on the ITP dispatch than anticipated so Nate reminded the group that the schedule needed to be approved. He then entertained further comments pertaining to the schedule. Seeing no further discussion, he solicited a motion from the MDWG members.

Motion: Jason Bentz made the motion to approve the schedule as amended. Derek Brown seconded it. The motion passed unanimously. (Attachment 2 - 2019 ITP and 2018 Series MDWG Powerflow and Short Circuit Model Build_20170710.xlsx)

Summary of Action Items

- SPP staff to provide Data Submitters a mapping of MOD base profiles so that they know the starting point.

Future Meetings

- The next conference call meeting is scheduled for Wednesday, August 02, 2017.

Adjourn Meeting

Seeing no further discussion, Nate solicited a motion to adjourn the meeting.

Motion: Reené Miranda made the motion to adjourn the meeting. Jerad Ethridge seconded it. The motion passed unanimously.

Respectfully submitted,
Anthony Cook
SPP Staff Secretary

**Southwest Power Pool, Inc.
MODEL DEVELOPMENT WORKING GROUP
July 10, 2017**

• A G E N D A •

2:00 p.m. – 4:00 p.m.

1. Administrative Items Nate Morris
 - a. Call to Order
 - b. Introductions
 - c. Proxies
 - d. Agenda Review (**Action Item**)
 - i. Meeting Materials
2. 2018 Series Model Schedule (**Action Item**) Anthony Cook/Moses Rotich
3. Administrative Items Nate Morris
 - a. Summary of Action Items
 - b. Future Meeting
 - c. Adjourn

| Task Name | Duration | Start | Finish | Predecessors | Comment |
|--|-----------------|---------------------|---------------------|--------------|-------------------------------|
| 2019 ITP Powerflow & 2018 MDWG Model Series (Powerflow & Short Circuit) - PSS/E 33.10 - MOD 8.1.0.1 | 342 days | Mon 7/17/17 | Tue 11/6/18 | | Last Edited: 7/10/2017 |
| 2019 ITP & 2018 MDWG Powerflow/Short Circuit Models | 170 days | Mon 7/17/17 | Fri 3/9/18 | | |
| Pass 0: SPP Internal Powerflow & Short Circuit Data/Topology Update | 170 days | Mon 7/17/17 | Fri 9/1/17 | | |
| Pass 0 - SPP Staff send out kick-off email | 0 days | Mon 7/17/17 | Mon 7/17/17 | | |
| Pass 0 - Lock Down MOD | 5 days | Mon 7/17/17 | Fri 7/21/17 | | |
| Pass 0 - SPP Staff Reviews/Builds Trial 1 Unsolved models | 5 days | Mon 7/17/17 | Fri 7/21/17 | | |
| Pass 0 - SPP Staff Posts Trial 1 models for Member Review | 0 days | Fri 7/21/17 | Fri 7/21/17 | | |
| Pass 0 - SPP Staff Posts Trial 1 DocuCode | 0 days | Fri 7/21/17 | Fri 7/21/17 | | |
| Pass 0 - Trial 1: Stakeholders review models/data submission through MOD | 10 days | Mon 7/24/17 | Fri 8/4/17 | | |
| Pass 0 - Trial 1: Stakeholder Data/Topology Updates Due | 0 days | Fri 8/4/17 | Fri 8/4/17 | | |
| Pass 0 - Lock Down MOD | 5 days | Mon 8/7/17 | Fri 8/11/17 | | |
| Pass 0 - SPP Staff Reviews/Builds Trial 2 Unsolved models | 5 days | Mon 8/7/17 | Fri 8/11/17 | 8 | |
| Pass 0 - SPP Staff Posts Trial 2 models for Member Review | 0 days | Fri 8/11/17 | Fri 8/11/17 | 11 | |
| Pass 0 - SPP Staff Posts Trial 2 DocuCode | 0 days | Fri 8/11/17 | Fri 8/11/17 | 11 | |
| Pass 0 - Trial 2: Stakeholders review models/data submission through MOD | 10 days | Mon 8/14/17 | Fri 8/25/17 | 12 | |
| Pass 0 - Trial 2: Stakeholder Data/Topology Updates Due | 0 days | Fri 8/25/17 | Fri 8/25/17 | 14 | |
| Pass 0 - Lock Down MOD | 5 days | Mon 8/28/17 | Fri 9/1/17 | 14 | |
| Pass 0 - SPP Staff Reviews/Builds Trial 3 Unsolved models | 5 days | Mon 8/28/17 | Fri 9/1/17 | 14 | |
| Pass 0 - SPP Staff Posts Trial 3 models for Member Review | 0 days | Fri 9/1/17 | Fri 9/1/17 | 17 | |
| Pass 0 - SPP Staff Posts Trial 3 DocuCode | 0 days | Fri 9/1/17 | Fri 9/1/17 | 17 | |
| Pass 0 - Complete | 0 days | Fri 9/1/17 | Fri 9/1/17 | 17 | |
| Pass 1 - Load and Generation Profiles/Transactions | 30 days | Mon 9/4/17 | Fri 10/13/17 | | |
| Pass 1 - Trial 1: Stakeholders coordinate load, generation and transactions | 10 days | Mon 9/4/17 | Fri 9/15/17 | 20 | |
| Pass 1 - Trial 1: Stakeholder Submissions Due | 0 days | Fri 9/15/17 | Fri 9/15/17 | | |
| Pass 1 - Trial 1: SPP Staff compiles transactions | 5 days | Mon 9/18/17 | Fri 9/22/17 | 23 | |
| Pass 1 - Trial 1: SPP Staff posts transactions | 0 days | Fri 9/22/17 | Fri 9/22/17 | 24 | |
| Pass 1 - Trial 2: Stakeholders update load and generation reports/reconcile transaction discrepancies | 10 days | Mon 9/25/17 | Fri 10/6/17 | 25 | |
| Pass 1 - Trial 2: Stakeholder Submissions Due | 0 days | Fri 10/6/17 | Fri 10/6/17 | 26 | |
| Pass 1 - Trial 2: SPP Staff compile and conduct interchange conference calls | 5 days | Mon 10/9/17 | Fri 10/13/17 | 26 | |
| Pass 1 - Trial 2: SPP Staff posts transactions | 0 days | Fri 10/13/17 | Fri 10/13/17 | 28 | |
| Pass 1 - Complete | 0 days | Fri 10/13/17 | Fri 10/13/17 | 28 | |
| Pass 2: Incorporate Load and Generation Profiles/Transactions | 25 days | Mon 10/16/17 | Fri 11/17/17 | | |
| Pass 2 - Stakeholders incorporate Profiles into MOD | 5 days | Mon 10/16/17 | Fri 10/20/17 | 28 | |
| Pass 2 - Stakeholder Profiles into MOD Due | 0 days | Fri 10/20/17 | Fri 10/20/17 | 32 | |
| Pass 2 - Lock Down MOD | 10 days | Mon 10/23/17 | Fri 11/3/17 | 33 | |
| Pass 2 - SPP Staff Reviews/Builds Pass 2 Solved models | 10 days | Mon 10/23/17 | Fri 11/3/17 | 33 | |
| Pass 2 - Model Data Submittal Workbook: SPP Staff Compile | 10 days | Mon 10/23/17 | Fri 11/3/17 | 33 | |
| Pass 2 - SPP Staff Posts Pass 2 Models for Stakeholder Review | 0 days | Fri 11/3/17 | Fri 11/3/17 | 35 | |
| Pass 2 - SPP Staff Posts Model Data Submittal Workbook and DocuCode | 0 days | Fri 11/3/17 | Fri 11/3/17 | 35 | |

| Task Name | Duration | Start | Finish | Predecessors | Comment |
|--|----------------|---------------------|---------------------|--------------|---------|
| Pass 2 - Stakeholders review Pass 2 models/data submission through MOD | 10 days | Mon 11/6/17 | Fri 11/17/17 | 37 | |
| Pass 2 - Stakeholders update load and generation reports/reconcile transaction discrepancies | 10 days | Mon 11/6/17 | Fri 11/17/17 | 37 | |
| Pass 2 - Stakeholder Model Data Submittal Workbook Submission Due | 0 days | Fri 11/17/17 | Fri 11/17/17 | 39 | |
| Pass 2 - Stakeholder Data/Topology Updates Due | 0 days | Fri 11/17/17 | Fri 11/17/17 | 40 | |
| Pass 2 - Complete | 0 days | Fri 11/17/17 | Fri 11/17/17 | 39 | |
| Pass 3 (Generation Topology, Loads & Interchange Locked Down) | 25 days | Mon 11/20/17 | Fri 12/22/17 | | |
| Pass 3 - Lock Down MOD | 10 days | Mon 11/20/17 | Fri 12/1/17 | 43 | |
| Pass 3 - SPP Staff Reviews/Builds Pass 3 Solved models (Merge with MMWG Current or Prior year) | 10 days | Mon 11/20/17 | Fri 12/1/17 | 43 | |
| Pass 3 - Model Data Submittal Workbook: SPP Staff Compile | 10 days | Mon 11/20/17 | Fri 12/1/17 | 43 | |
| Pass 3 - SPP Staff Posts Pass 3 Models for Stakeholder Review | 0 days | Fri 12/1/17 | Fri 12/1/17 | 46 | |
| Pass 3 - SPP Staff Posts Model Data Submittal Workbook and DocuCode | 0 days | Fri 12/1/17 | Fri 12/1/17 | 46 | |
| Pass 3 - Stakeholders review Pass 3 models/data submission through MOD | 15 days | Mon 12/4/17 | Fri 12/22/17 | 48 | |
| Pass 3 - Stakeholders update load and generation reports/reconcile transaction discrepancies | 15 days | Mon 12/4/17 | Fri 12/22/17 | 48 | |
| Pass 3 - Final Stakeholder Model Data Submittal Workbook Submission Due | 0 days | Fri 12/22/17 | Fri 12/22/17 | 50 | |
| Pass 3 - Stakeholder Data/Topology Updates Due | 0 days | Fri 12/22/17 | Fri 12/22/17 | 51 | |
| Pass 3 - Complete | 0 days | Fri 12/22/17 | Fri 12/22/17 | 53 | |
| Pass 4 (Final Generation Dispatch, Docucheck Issues and Data/Topology Updates) | 29 days | Mon 12/25/17 | Thu 2/1/18 | | |
| Pass 4 - Lock Down MOD | 19 days | Mon 12/25/17 | Thu 1/18/18 | 54 | |
| Pass 4 - SPP Staff Reviews/Builds Pass 4 Solved models | 19 days | Mon 12/25/17 | Thu 1/18/18 | 54 | |
| Pass 4 - Model Data Submittal Workbook: SPP Staff Compile | 19 days | Mon 12/25/17 | Thu 1/18/18 | 54 | |
| Pass 4 - SPP Staff Posts Pass 4 Models for Stakeholder Review | 0 days | Thu 1/18/18 | Thu 1/18/18 | 57 | |
| Pass 4 - SPP Staff Posts Model Data Submittal Workbook and DocuCode | 0 days | Thu 1/18/18 | Thu 1/18/18 | 57 | |
| Pass 4 - Stakeholders review Pass 4 models/data submission through MOD | 10 days | Fri 1/19/18 | Thu 2/1/18 | 60 | |
| Pass 4 - Stakeholder Data/Topology Updates Due | 0 days | Thu 2/1/18 | Thu 2/1/18 | 61 | |
| Pass 4 - Complete | 0 days | Thu 2/1/18 | Thu 2/1/18 | 63 | |
| Pass 5 (Finalization of Powerflow) | 15 days | Fri 2/2/18 | Thu 2/22/18 | | |
| Pass 5 - Lock Down MOD | 15 days | Fri 2/2/18 | Thu 2/22/18 | 64 | |
| Pass 5 - SPP Staff Reviews/Builds Pass 5 Powerflow Models | 15 days | Fri 2/2/18 | Thu 2/22/18 | 64 | |
| Pass 4 - SPP Staff/Member Face to Face | 2 days | Tue 2/6/18 | Wed 2/7/18 | | |
| Pass 5 - SPP Staff Posts Pass Final Models for Stakeholder Review | 0 days | Thu 2/22/18 | Thu 2/22/18 | 67 | |
| Pass 5 - Final Models Posted for MDWG approval | 0 days | Thu 2/22/18 | Thu 2/22/18 | 68 | |
| Pass 5 - Initial Final Models Posted for TWG approval | 0 days | Thu 2/22/18 | Thu 2/22/18 | 68 | |
| 2019 ITP (Load & Generation) & 2018 MDWG Powerflow Finalization | 5 days | Fri 2/23/18 | Thu 3/1/18 | | |
| Final | 5 days | Fri 2/23/18 | Thu 3/1/18 | | |
| Stakeholders Review for Finalization of the 2018 Series MDWG Powerflow Models | 5 days | Fri 2/23/18 | Thu 3/1/18 | 68 | |
| Stakeholders Review for Finalization of the 2019 ITP Load & Generation | 5 days | Fri 2/23/18 | Thu 3/1/18 | 68 | |
| Finalization - Conference Call Vote | 0 days | Thu 3/1/18 | Thu 3/1/18 | 73,74 | |
| 2018 MDWG Short Circuit Models | 74 days | Mon 11/20/17 | Thu 3/1/18 | | |
| Merge with SERC Short Circuit Models | 15 days | Mon 11/20/17 | Fri 12/8/17 | | |
| Pass 0 - SPP Staff Posts Pass 0 for Stakeholder review | 0 days | Fri 12/8/17 | Fri 12/8/17 | 77 | |

| Task Name | Duration | Start | Finish | Predecessors | Comment |
|---|---------------|---------------------|--------------------|--------------|---------|
| Pass 2 - SPP Staff Posts Pass 2 for Stakeholder review | 0 days | Thu 1/25/18 | Thu 1/25/18 | 59FS+5 days | |
| Pass 3 - SPP Staff Posts Pass 3 for Stakeholder review | 0 days | Thu 3/1/18 | Thu 3/1/18 | 68FS+5 days | |
| 2018 MDWG Short Circuit Model Finalization | 6 days | Fri 3/2/18 | Fri 3/9/18 | | |
| Stakeholders Review for Finalization of the 2018 Series MDWG Short Circuit Models | 6 days | Fri 3/2/18 | Fri 3/9/18 | 80 | |
| Finalization - Conference Call Vote | 0 days | Fri 3/9/18 | Fri 3/9/18 | 82 | |
| 2019 ITP Powerflow Models Finalization | 5 days | Wed 10/31/18 | Tue 11/6/18 | | |
| Stakeholders Review for Finalization of the 2019 ITP Powerflow Models | 5 days | Wed 10/31/18 | Tue 11/6/18 | | |
| Finalization - Conference Call Vote | 0 days | Tue 11/6/18 | Tue 11/6/18 | 85 | |