

**Southwest Power Pool, Inc.
Model Development Working Group
Net Conference
July 5, 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 2:03 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	Jeremy Harris	YES	Westar Energy
Jason Bentz	YES			American Electric Power
Dustin Betz	NO	Jason Hofer	YES	Nebraska Public Power District
John Boshears	NO	Kevin Foflygen	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	NO	Aravind Chellappa	YES	Southwestern Public Service
Scott Schichtl	YES			Arkansas Electric Cooperative Company
Jason Shook	NO			GDS Associates
Liam Stringham	YES			Sunflower Electric Power Corporation
Anthony Cook	YES			Southwest Power Pool, Inc.

The following guests were also in attendance:

- Jason Hofer – Nebraska Public Power District
- Kevin Foflygen – City Utilities of Springfield
- Aravind Chellappa – Southwestern Public Service
- Ryan Baysinger – Kansas City Power & Light
- Alan Burbach – Lincoln Electric System
- Bruce Doll, Armin Sehic – Municipal Energy Agency of Nebraska
- Martin Green – American Electric Power
- Jeremy Harris – Westar Energy
- Jordan Lamb – East River Electric
- Edgardo Manansala – Midwest Energy
- Tom Mayhan – Omaha Public Power District
- Scott Mijin – Southwestern Power Administration
- Garrick Nelson – Western Area Power Administration

Gimod Olapurayil – ITC Great Plains
Dona Parks, Diego Toledo – Grand River Dam Authority
Joey Schrepel – Basin Electric Power Cooperative
John Weber – Missouri River Energy Services
Joe Williams – Western Farmers Electric Cooperative
Jarrod Wolford – Northeast Texas Electric Cooperative
John Varnel – Tanaska Power Services
Moses Rotich, and Michael Odom – Southwest Power Pool

Meeting Agenda

Nate asked the group if they had any issues or modifications to the agenda. No one had any issues with the material to be discussed.

**Motion: Derek Brown made the motion to approve the agenda as presented. Jerad Ethridge seconded the motion. The motion passed unanimously.
(Attachment 1 - MDWG Meeting Agenda 20170705.docx)**

Previous Meeting Minutes

Nate asked if anyone had changes to the June 12, 2017 minutes. Derek Brown stated that Nate's name needed to be changed to Derek in the Adjourn Meeting section. With no other updates to the June 12, 2017 minutes, Nate asked for a motion to approve the minutes.

**Motion: Jerad Ethridge motioned to approve the minutes as amended. Scott Schichtl seconded the motion. The motion passed unanimously.
(Attachment 2 - MDWG Minutes June 12, 2017.docx)**

Nate asked if anyone had changes to the June 15, 2017 minutes. Derek and Jerad asked to correct the spelling of Anthony and Jerad. With no other updates to the June 15, 2017 minutes, Nate asked for a motion to approve the minutes.

**Motion: Joe Fultz motioned to approve the minutes as amended. Scott Schichtl seconded the motion. The motion passed unanimously.
(Attachment 3 - MDWG Minutes June 15, 2017.docx)**

Agenda Item 2 – 2018 Series Model Schedule:

Anthony and Moses presented the schedule for the 2018 Series MDWG/ 2019 ITP model build. The group decided to discontinue the use of the company workbooks and asked to change the company workbook entries to data submittal workbook and add docucheck. The group also asked SPP to group transaction coordination on a geographical basis and setup conference calls for coordination purposes. The group decided to meet July 10, 2017 from 2-4 pm in order to finalize the schedule. All other agenda items were postponed.

AI: Schedule conference calls for transaction submissions based on geographic location.

Summary of Action Items:

- **Schedule conference calls for transaction submissions based on geographic location.**

Future Meetings

- The next conference call meeting will be on July 10, 2017 to approve the 2018 Series Schedule.

Adjourn Meeting

Nate solicited a motion to adjourn the meeting.

Motion: Scott Schichtl made the motion to adjourn the meeting. Jeremy Harris seconded it. The motion passed unanimously.

Respectfully submitted,
Anthony Cook
SPP Staff Secretary

Southwest Power Pool, Inc.
MODEL DEVELOPMENT WORKING GROUP
July 05, 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
 - e. Previous Meeting Minutes (Action Item)
 - i. June 12, 2017
 - ii. June 15, 2017
2. 2018 Series Model Schedule (**Action Item**) Anthony Cook/Moses Rotich
3. MDWG Procedure Manual Updates.....SPP Staff
 - a. Renewable Dispatch Language (**Action Item**)
4. Administrative Items Nate Morris
 - a. Summary of Action Items
 - b. Future Meeting
 - c. Adjourn

**Southwest Power Pool, Inc.
Model Development Working Group
Net Conference
June 12: 8:00 A.M. – 12:00 P.M.**

• M I N U T E S •

Agenda Item 1 – Administrative

The meeting was called to order at 8:02 a.m. The following MDWG members were in attendance:

MDWG Members present:

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

The following guests were also in attendance:

- Alan Burbach – Lincoln Electric System
- Aravind Chellappa – Southwestern Public Service
- Edgardo Manansala – Midwest Energy
- Ellis Lutz – Associated Electric Cooperative Inc.
- Gimod Olapurayil – ITC Great Plains
- Jeremy Severson – Basin Electric Power Cooperative
- John Weber – Missouri River Energy
- Mark Reinart – Golden Spread Electric Cooperative
- Ryan Baysinger – Kansas City Power & Light
- Jarrold Wolford – Northeast Texas Electric Cooperative
- Andrew Berg – Minnkota Power Cooperative
- Jason Hofer – Nebraska Public Power District

Jordan Lamb – East River Electric
Scott Rainbolt – American Electric Power
Michael Odom, Moses Rotich – Southwest Power Pool

Meeting Agenda

The group was asked if anyone had any issues or needed more time to review the posted materials. There were no concerns from anyone.

The agenda was also reviewed by the group.

(Attachment 1 - MDWG Meeting Agenda 20170612.docx)

Motion: Joe Fultz made the motion to approve the agenda. Scott Schichtl seconded it. The motion passed unanimously.

Previous Meeting Minutes

The group was asked if they had any comments to the May17-18, 2017 meeting minutes. There were no comments.

(Attachment 2 - MDWG Minutes May 17-18, 2017.docx)

Motion: Jason Shook made the motion to approve the May 17-18, 2017 meeting minutes. Scott Schichtl seconded it. The motion passed unanimously.

Agenda Item 2 – MDWG Procedure Manual Updates:

Michael Odom noted that he would be presenting on language changes in order to remove ambiguity in the existing MDWG manual language and also align the MDWG manual with the ITP Manual, which would reference the language for Phase Shifting Transformers and Load Forecasts in the MDWG manual. Michael presented the proposed load forecast language. He reminded the group that because the ITP manual references the MDWG manual, there is a need to update the MDWG manual. Load forecast language needed to be clarified in terms of what goes into the forecast (e.g., Distributed Energy Resources (DERs), controllable and non-controllable Demand Side Management (DSM), etc.) and also align the language with the requirements of the MMWG procedure manual. Joe Fultz requested that a 50/50 forecast curve graphic be included in the manual to help members visualize what an example forecast looks like. Aravind suggested that since 90/10 load forecasts are used in certain special studies, language needed to be added to acknowledge this scenario.

Action Item: SPP staff to add a 50/50 forecast curve graphic to the MDWG manual

During discussion of DERs, many in the group expressed concern about the complexity and granularity of DER modeling, since most modelers get their load forecast numbers from different groups within their own companies. Michael also noted that many Working Groups and companies in the industry are currently discussing DER modeling. He then mentioned that NERC has proposed some guidelines for DER modeling but this discussion will be had at a later date with the potential for a section dedicated to DER modeling being added to the MDWG manual.

Action Item: SPP Members to discuss DER modeling and inclusion in load forecasts internal to their companies

Action Item: SPP staff to add examples of controllable and non-controllable DERs

For the Phase Shifting Transformer (PST) language, Michael stated that it would be a good idea to have PST model guidelines in the MDWG manual so that the ITP manual can reference it similar to the load forecast language.

Michael then presented five options for renewable dispatch in the MDWG manual. He noted ideally there should be an alignment between the renewable dispatch methodologies in both the ITP and MDWG manuals but also recognized that assumptions in both model sets are different. Member opinions on the renewable dispatch varied, so the members were asked to review the language and provide feedback on the preferred option at a later date.

(Attachment 3 - SPP MDWG Model Development Procedure Manual (Public)_V10_RedLine.docx)

Motion: Joh Boshears made the motion to approve the load forecast and PST language updates. Brian Wilson seconded it. The motion passed unanimously.

Agenda Item 3 – Administrative Items:

Summary of Action Items

- **SPP staff to add a 50/50 forecast curve graphic to the manual**
- **SPP Members to discuss DER modeling and inclusion in load forecasts internal to their companies**
- **SPP staff to add examples of controllable and non-controllable DERs**

Future Meetings

- TBD

Adjourn Meeting

With no further business to discuss, Derek asked for a motion to adjourn.

Motion: Scott Schichtl made the motion to adjourn the meeting. Aravind Chellappa seconded it. The motion passed unanimously.

Respectfully submitted,
Anthony Cook
SPP Staff Secretary

**Southwest Power Pool, Inc.
Model Development Working Group
Net Conference
June 15: 1:00 P.M. – 5:00 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 1:06 p.m. The following MDWG members were in attendance:

MDWG Members present:

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

The following guests were also in attendance:

- Alan Burbach – Lincoln Electric System
- Aravind Chellappa – Southwestern Public Service
- Dona Parks – Grand River Dam Authority
- Edgardo Manansala – Midwest Energy
- Gimod Olapurayil – ITC Great Plains
- Jarrold Wolford – Northeast Texas Electric Cooperative
- John Turner – Board of Public Utilities
- Kenneth Hale – City Utilities of Springfield
- Mark Reinart – Golden Spread Electric Cooperative
- Ryan Baysinger – Kansas City Power & Light
- Shaun Golden – Western Farmers Electric Cooperative
- Moses Rotich, and Mitch Jackson – Southwest Power Pool

Meeting Agenda

Following the roll call audit, Nate asked the group if they had any issues or modifications to the agenda. Holli Krizek asked whether agenda item 6 included member feedback on the 2018 series model schedule. Anthony replied that the 2018 series model schedule would be presented at a later meeting.

(Attachment 1 - MDWG Meeting Agenda 20170615.docx)

Motion: Jason Shook made the motion to approve the agenda. Jason Bentz seconded it. The motion passed unopposed.

Agenda Item 2 – MOD-033-1:

Anthony presented and mentioned that since this item had been in the previous two meeting agendas but never discussed, there was need to discuss it. During the presentation, a lot of discussion ensued. Holli asked which planning models will be utilized for the analysis. Anthony answered by saying that the model selected will depend on when the event happens. He also said that the closest summer model will probably be utilized for powerflow but for a dynamics, a model from the previous model set might be selected in case there isn't a more current one. During discussion, many stakeholders agreed that MOD-033-1 analysis will be a time consuming effort.

Nate then asked the group if they had comments on the acceptable differences that Anthony had pointed out in his presentation. John Boshears cautioned that somethings may not show up in the panning models that would otherwise show up in the operational models based on experience that City Utilities of Springfield undertook to convert a planning model to an operational one. Many members also voiced concern over the acceptable differences being defined in the MOD-033 document. Anthony alleviated their concerns by mentioning that the MOD-033 document was developed by the North American Transmission Forum (NATF) through collaboration with different industry experts, but that the document was tailored to fit SPP's needs. He also stated that the acceptable differences could be changed at any point based on experience through learning and current data.

Action Item: Anthony to send members a link to the NATF document on MOD-033

Furthermore, Derek also asked if Anthony had considered which Working Group (s) the MOD-033 analysis will fall under. Anthony responded that even though the analysis is mainly a PC function, SPP will present the results of the analysis to a few Working Groups, such as ORWG and RCWG. Reené then asked if SPP had developed a data request template to send out to different entities. Anthony answered that no template has been developed yet but SPP will draft one based on the type of event and other factors.

Agenda Item 3 – MMWG Update:

Anthony provided a recap of the discussion that took place at the 2017 March face-to-face MMWG meeting regarding the creation of an online database to house both interchange and tie line data between the different PCs in the Eastern Interconnect. There was a lot of deliberation on tie lines being submitted as double entry rather than single entry since many PCs did it differently. Anthony commented that during discussion, SPP took the stance that it would help

with coordination between its members on the tie lines and submit the data to the MMWG data base since the PC is responsible for providing data to the MMWG. Additionally, Anthony also pointed out that with the money already spent on creating the Engineering hub, it made more sense to go with the single entry. In conclusion, he mentioned that that the MMWG ended up including options to either upload ties as single or double entry without any additional cost.

Agenda Item 4 – Frequency of MDWG Meetings:

Anthony commenced discussion by asking the group whether they thought the current MDWG meetings are sufficient or need to be changed. Nate said that given the amount of work that needs to be accomplished, the number of meetings could increase. Anthony then stressed the need to plan out meetings in order to create efficiency, rather than sending out doodle polls every time before scheduling the meetings. Jerad then suggested that recurring meetings (for example, every 1st Wednesday of the month) be planned to be consistent. Anthony proceeded to ask to if anyone was opposed to the monthly meetings. Holli suggested that for the face-to-face meeting, whole day instead of half day meetings be considered with respect to those who have to travel a great distance. Many members liked the idea of planned meetings since it will help them block their calendars rather than the unexpected meetings. Derek also remarked that the face-to-face meeting be held towards the end of the model build in order to coordinate and finalize any outstanding issues, rather than scheduling it earlier in the model build. After much deliberation, the group came to a consensus on the frequency of meetings. They agreed on the first Wednesday of every month.

Action Item: Anthony to schedule recurring MDWG meetings on the first Wednesday of every month.

Agenda Item 5 – 2018 Series Software:

Anthony mentioned that the 2017 series models were build using PSS/E v33.7 and wanted to discuss using a newer version of the software in the 2018 series model build. Many members voiced concern about using different PSSE versions. For example, some stated that upgrading to a newer version required vetting and approval by their IT department which in itself was a long process, whereas others noted some bugs and issues in v33.9. Jason Shook asked Anthony if migrating to a different version of PSS/E impacted the MMWG models in any way. Anthony answered that the MMWG normally uses the latest point revision; therefore, it would not be a problem to use a newer point revision for the 2018 series model build. Jason then asked that members who have PSS/E leases be considered in the decision to move to a different version since it can become a problem. After some discussion, the members agreed to use a different PSS/E version for the 2018 series model build. It came down to either using v33.9 or v33.10.

Action Item: Moses to send members PSS/E release notes of the versions after v33.7 in order to find out which bugs have been fixed.

Motion: Reené made the motion to move to PSS/E v33.10 for the 2018 series powerflow, short circuit and dynamics model builds. Liam seconded it. The motion passed with one abstention.

Moses then gave an update on using a different version of the Models On Demand (MOD) tool for the 2018 series model build. He stated that the SPP IT department will not be able to install the necessary servers and testing environments in time for the upcoming model build. Some members asked whether moving to PSS/E v33.10 will affect MOD in any way. Moses

responded that it would not. Because of these reasons, Moses stated that MOD v8.1.0.1 will continue to be used in the 2018 series model build. He also encouraged members to start submitting MOD projects and correcting any errors before the new model build commences.

Continuing dialogue, Wayne asked if it was possible for SPP to provide members an updated MOD base case monthly and a list of committed projects that were applied in order allow members better review. Anthony answered that the base case had not been updated because of some bugs encountered in MOD in the previous model build. Anthony also said that it is a good idea to update the base case annually but the members would have to vote to get it approved and changed in the manual. Furthermore, he also said that SPP has to get member feedback before committing projects to the MOD base case in order to avoid committing wrong projects and then having members redo extra work.

Agenda Item 6 – Draft Modeling Timeline:

Moses presented the draft modeling timeline for the next three model builds. He stated that this was to satisfy an action item for staff to present a modeling time line to the MDWG.

Action Item: SPP staff to draft a timeline for the ITP and TPL study process so that members can see how it aligns with the modeling timeline.

Agenda Item 7 – Administrative Items:

Summary of Action Items

- Anthony to send members a link to the NATF document on MOD-033
- Anthony to schedule recurring MDWG meetings on the first Wednesday of every month.
- Moses to send members PSS/E release notes of the versions after v33.7 in order to find out which bugs have been fixed.
- SPP staff to draft a timeline for the ITP and TPL study process so that members can see how it aligns with the modeling timeline.

Future Meetings

- The group decided to have the next conference call meeting on July 5, 2017

Adjourn Meeting

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

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

Respectfully submitted,
Anthony Cook
SPP Staff Secretary