Southwest Power Pool, Inc.
Model Development Working Group
Conference Call
March 1: 10:30 A.M. – 12:00 P.M. (CST)

• M I N U T E S •

Agenda Item 1 – Administrative Items:

– Agenda Item 1a – Call to Order:
The meeting was called to order at approximately 10:32 a.m.

– Agenda Item 1b,c – Attendance and Proxies:
The following MDWG members and guests were in attendance.

MDWG Members present:

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<tr>
<th>MDWG Member</th>
<th>Present</th>
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<td>Nate Morris</td>
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<td>Empire District Electric Company</td>
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<td>Derek Brown</td>
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<td>Dustin Betz</td>
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Antitrust: SPP strictly prohibits use of participation in SPP activities as a forum for engaging in practices or communications that violate the antitrust laws. Please avoid discussion of topics or behavior that would result in anti-competitive behavior, including but not limited to, agreements between or among competitors regarding prices, bid and offer practices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that might unreasonably restrain competition.
Additional Guests present:

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<td>Tri-State Generation and Transmission</td>
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Agenda Item 1d – Agenda Review:
Nate Morris asked the group if they had any modifications to the agenda or issues with the posted material. No one stated any issues with agenda.
Motion: Jerad Ethridge made the motion to approve the agenda as posted (Attachment 1 - MDWG Meeting Agenda 20180301.docx). Gimod Olapurayil seconded the motion. During the discussion of the motion, Anthony Cook presented a recommended edited agenda for adoption for the meeting. Following the motion discussion, the vote to approve the posted agenda failed unanimously.

Motion: Jason Shook made the motion to adopted the edited agenda as presented (Attachment 2 - MDWG Meeting Agenda 20180301_redlined.docx). Dustin Betz seconded the motion. The motion passed unanimously.

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**Agenda Item 1e – Previous Meeting Minutes:**

The group was asked if there were any proposed edits to the January 23-24, 2017 meeting minutes. Several members voiced acceptance with the minutes. No one stated any issues with the minutes.

**Motion:** Jason Shook motioned to approve the January 23-24, 2017 meeting minutes as presented. Dustin Betz seconded the motion. The motion passed unanimously. (Attachment 3 - 1e. MDWG Minutes January 23-24, 2018.docx)

**Agenda Item 2 – 2018 Series Status:**

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**Agenda Item 2a (i) – MDWG Power Flow (Approval Item):**

Staff was asked to start the discussion for the Power Flow models. Moses Rotich started the Power Flow discussion by thanking the group for participation. Moses then proceeded to review the pre-final and post final DocuCheck errors.

- The review included wind machine voltage errors, branch overloads, and branch rating errors.
- Moses briefly explained the acceptance process for exceptions.
- Moses explained that additional follow with each associated entity is still required for action and correction plans for the DocuCheck errors presented.

Following the DocuCheck error discussion, Moses presented discussion for constraints resulted from last minute data submission.

- **Nate Morris** asked would like to share the data submitters’ perspective for submission concerns, issues and struggles related to late minute submissions.
  - The group discussed concerns pertaining to the struggle for resources submitting transactions data and expected results differing from local environments to outputs from MOD. Moses explained the complexities of collected data from various entities meshing it to the expected results.
  - Concerns for BLG profile data issues were was express. It was noted that Moses was able to help resolve the issue.
  - Nate proposed discussion around MOD training or additional user guide information for help with next year’s model build. Participates acknowledged MOD training would be helpful. It was mentioned that data submitters that went from being a none PSSE data submitter to a PSSE data submitter would benefit from additional training.
  - Participates expressed concerns for shorter timeframes for later stage passes, review of accurate pass to merge data with MMWG, and code change resulting in increased voltage errors between late stage passes.
Nate requested an additional offline conversation to better understand the situation and concerns in more detail. Eddie Watson volunteered to participate on the call for SPP representation.

SPP Staff suggested developing a survey to better understand roadblocks for late submission concerns.

Following the late submission discussion, the group discussed the utilization of the power flow MDWG models.

- Moses explained the NERC standards are evaluated on these models. Flowgate assessment uses these models. TPL studies will start using the ITP in 2019. This year TPL will continue to use the MDWG. Jeremy Severson presented concerns about neighboring generation. Jeremy said there is usually another step after the off the shelf models to accurately model the neighboring generation.
- Moses noted that post-processing idevs could be submitted for those steps.
- Anthony Cook explained the external areas would be scaled if there were no additional corrections/idevs provided.
- Wayne Hilde mentioned merger with the current MISO model build would be beneficial and provide more accurate updated MISO modeling information. Moses stated that MISO is building their models at the same time as SPP. Moses mentioned this would require additional discussion.

Nate Morris asked for straw poll of how the MDWG models look for finalization. The group generally expressed acceptance the models with post processing idevs. Nate opened the floor to entertain a motion.

**Motion:** Jason Shook motioned to finalize the 2018 MDWG power flow pass 5 models. John Broshears seconded the motion. The motion passed unanimously.

**Agenda Item 2a(ii) – ITP Power Flow:**
Zack Bearden provided a status update for the ITP power flow models. Zack noted that late submissions were not included in the posted models. Zack suggested resubmitting the late submissions through RMS for SPP review and determination of inclusion in the ITP models. Zack noted one, an inadvertent duplicate 345kV line, late submission was included due to its significant impact. Zack mentioned spring and fall wind levels dispatch assumptions concerns.

**Agenda Item 2b – MDWG Short Circuit:**
Zack Bearden provided a status update for the MDWG short circuit models. Zack mentioned the models would be posted soon after the meeting.

**Agenda Item 2c – MDWG Dynamics:**
Moe Shahriari provided a status update for the MDWG dynamic models. Moe reiterated the requirement for accurately modeling wind farm topology. Moe asked the group to continue reviewing Mbase values below Pmax. Additionally voltage criteria violations are still a concern for Moe. Moe reviewed the initial data due date and status call following the initial data due date for.

**Agenda Item 3 – Misc Discussions:**
The meeting was pressed for time. The group elected to defer the Misc. Discussion for a future meeting.
**Agenda Item 11 – Administrative Items:**

Future Meetings

- Anthony Cook mentioned SPP Staff request to schedule a special meeting for the group. The special meeting would be scheduled to provide a Short Circuit Model approval discussion item and introduction to the potential Mountain West Integration.

  **AL:** SPP Staff to send out Doodle poll for availabilities on March 9th, 15th, or 16th.

- April 5th conference call
- May Face to Face to be determine.

Summary of Action Items:

- SPP Staff to send out Doodle poll for availabilities on March 9th, 15th, and 16th.

Adjourn Meeting

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

  **Motion:** Jerad Ethridge motioned to adjourn the meeting. Holli Krizek seconded it. The motion passed unanimously.

  The meeting was adjourned at 12:12pm.

Respectfully submitted,
Sunny Raheem
SPP Staff Secretary
Southwest Power Pool, Inc.
MODEL DEVELOPMENT WORKING GROUP
March 1, 2018
Net Conference

• A G E N D A •

1. Administrative Items .............................................................................................................. Nate Morris
   a. Call to Order
   b. Attendance
   c. Proxies
   d. Agenda Review (Action Item)
      i. Acknowledgement of preparedness to discuss meeting materials
   e. Previous Meeting Minutes (Action Item)
      i. January 23-24, 2018

2. 2018 Series Status ................................................................................................................... SPP Staff
   a. Power Flow
      i. Approve MDWG (Action Item)
      ii. ITP
   b. Short Circuit
   c. Dynamics

3. Misc. Discussions ............................................................................................................. Anthony Cook
   a. Siemens Aha Ideas
      i. https://pss.ideas.aha.io/portal_session/new
   b. 2018 Series ITP to MMWG Conversion
   c. 2019 MDWG Models dispatched by SPP

4. Administrative Items ............................................................................................................. Nate Morris
   a. Meeting Survey: QR Code
   b. Summary of Action Items
   c. Future Meetings
   d. Adjourn
Southwest Power Pool, Inc.
MODEL DEVELOPMENT WORKING GROUP
March 1, 2018
Net Conference: 10:30am - 12:00pm CST

• A G E N D A •

1. Administrative Items ........................................................................................................... Nate Morris
   a. Call to Order
   b. Attendance
   c. Proxies
   d. Agenda Review (Action Item)
      i. Acknowledgement of preparedness to discuss meeting materials
   e. Previous Meeting Minutes (Action Item)
      i. January 23-24, 2018

2. 2018 Series Status
   a. Power Flow
      i. Approve MDWG (Action Item) .............................................. Moses Rotich/Members
      ii. ITP ............................................................................ David Duhart/Zack Bearden
   b. Short Circuit ............................................................... Zack Bearden/Theva Chanthaseny
   c. Dynamics ............................................................................. Moe Shahriar/Michael Odom

3. Misc. Discussions
   a. Siemens Aha Ideas ............................ Moses Rotich
      i. https://pss.ideas.aha.io/portal_session/new
   b. 2018 Series ITP to MMWG Conversion .................................. Moses Rotich/Anthony Cook
   c. 2019 MDWG Models dispatched by SPP ......................................... All

4. Administrative Items ......................................................................................................... Nate Morris
   a. Meeting Survey: QR Code
   b. Summary of Action Items
   c. Future Meetings
      i. Special meeting to discuss Mountain West
   d. Adjourn
Agenda Item 1 – Administrative Items:

– Agenda Item 1a – Call to Order:
The meeting was called to order at approximately 8:05 a.m.

– Agenda Item 1b,c – Attendance and Proxies:
The following MDWG members and guests were in attendance.

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**Agenda Item 1d – Agenda Review:**
Nate Morris asked the group if they had any modifications to the agenda or issues with the posted material. No one voiced any dissention.

**Motion:** Jason Shook made the motion to approve the agenda as presented. Alex Mucha seconded the motion. The motion passed unanimously.

*Attachment 1 - MDWG Meeting Agenda 20180123-24.docx*
Agenda Item 1e – Previous Meeting Minutes:
The group was asked if there were any proposed edits to the December 7, 2017 meeting minutes. No one stated any issues with the minutes.

Motion: Joe Fultz motioned to approve the December 7, 2017 meeting minutes as presented. Gimod Olapurayil seconded the motion. The motion passed unanimously. (Attachment 2 - MDWG Minutes_12-07-2017.docx)

Agenda Item 2 – 2018 Series Status:

Agenda Item 2a – Power Flow:
Nate Morris asked everyone what their thoughts are on the model build so far.

- Derek Brown stated that dealing with two model builds simultaneously has been a challenge and added work load.
- Jason Shook said that the GlobalScape transition has been challenging.
- Alex Mucha thinks the build has gone smoother with improved communication to coordinate with others.
- Reené Miranda asked why there were so many models being posted; referencing the Solved Area Interchange Enabled/Disabled models and the Unsolved models.
  - Moses Rotich stated that individuals have asked for both Area Interchange Enabled and Disabled sets to be able to look at the models in different views. The Unsolved models are posted so that individuals can see the issues that SPP had to correct in order to get the models to solve.
- Martin Green asked why there is a need for the windfarms to be modeled to the turbine voltage.
  - Anthony Cook stated that windfarm topology is needed for the dynamic models and Generation Interconnection studies. For efficiency and process improvement, it was requested that the data submitters submit the topology during the power flow model build. He added that recently the MMWG added it as a modeling guideline and MDWG adopted it as a requirement.
- Moses Rotich stated that participation has been a lot better this year; however, docucode issues propagating through the passes is still an issue. He added that there are several issues remaining in the Pass 4 models. He stated that many individuals are asking questions to which the answers are in the posting emails, which infers that the emails are not being read. He reminded everyone that for the rest of the build, SPP will now have to be notified of load and interchange changes and generation addition/retirements or submissions won’t be accepted. This is so that SPP can determine the impact on the model build and decide whether the updates need to be presented to the MDWG/TWG for approval before being included in the models.
  - Wayne Haidle voiced concern that there is still a lot of work to be done for Basin and doesn’t think the practice of having to go through an approval process to submit data is helpful to the model building process.
- Anthony Cook reminded everyone that profile files should only have the data that the data submitter is responsible for or has agreed to submit on behalf of another data owner. He stated that there was an instance where someone else’s data was included in a data submitters profile and a seasonal profile file was accidentally attached to the wrong base seasonal profile.
- Wayne Haidle asked why SPP changes the schedules set on the DC ties by the data submitters.
Moses Rotich answered that the DC schedules come from the transactions worksheet in the Data Submittal Workbook. SPP’s scripts set the inverter and rectifier per the DC tie totals and direction of flow based on the data submitted. An action item was requested that SPP Staff and the DC Tie Entities meet to improve DC tie coordination.

**AI: SPP Staff and DC Tie Entities meet to improve DC Tie coordination**

Anthony Cook explained that the Data Coordination Workbook contains the information for who is submitting modeling data on behalf of whom for the 2018 Series model build. He also explained that the power flow model report card only contains entities that have submitted data directly to SPP throughout the power flow model build. He stated that the Data Coordination Workbook and the Report Card should be used together to determine if an entities data is being submitted. For example: if an entities’ data is being submitted by another entity, their company name would not appear on the report card, but the submitting entities’ company name does if data is being submitted.

- Jerad Ethridge asked which standard the Report Card covers.
  - Moses Rotich answered that it covers those entities that are applicable to MOD-032 or the SPP Tariff.
- Gimod Olapurayil asked if a column can be added to the Report Card to show the number of docucode issues that are being addressed.
  - Anthony Cook stated that it could be difficult to track that, but SPP Staff will look into it. He also stated that it is helpful if data submitters send an email that details what their submissions are expected to update/correct.

**AI: SPP Staff to look into tracking docucode issues being corrected each pass and added to the Report Card.**

Zack Bearden provided a history of the block dispatch, what the ECDI dispatch is, and the current status of the ECDI dispatch. He stated that there wasn’t a lot of participation with updating the block dispatch on a yearly basis and therefore the data could be stagnate. Also, generation additions and retirements were possibly not getting applied correctly to the block dispatch order. The ECDI dispatch is an economic dispatch function within PSSE and can be updated yearly based on data submitted through SPP Operational processes. It will also allow for inputs from the individual GO is desired. Zack asked that everyone review the Gen Overview worksheet of the docucode report in the ITP model posting and tell him about base load units as well as any other changes that need to be made. He also requested that station service loads are reviewed for accuracy.

**– Agenda Item 2b – Short Circuit:**
Zack Bearden stated that Pass 2 will be posted on Thursday. He reminded everyone that the 2022 Summer model will be studied in the ITP assessment this year.

- Alex Mucha stated that software versions can cause issues in data submissions so data submitters need to be careful to review the data.

**– Agenda Item 2c – Dynamics:**
Moe Shahriar stated that there are windfarms still being modeled on the 34.5 kV level as well as some are being modeled as non-windfarms.

- Derek Brown stated that some of those windfarms are not modeled in detail due to the lack of data provided by the GO.
• Mark Reinart asked if there is a template for data submission.
  o Moe stated that he prefers to receive the data in text format.
  o Michael Odom stated to comment out old data so that they can distinguish the difference between the old and new data and so that if the new data doesn’t work properly, the old data can be used and not delay the build.

– Agenda Item 2d – GlobalScape Implementation:
Moses Rotich reminded everyone that GlobalScape is replacing TrueShare as the file sharing site for the model data. An RMS ticket will have to be submitted in order to request access. TrueShare will no longer be used by SPP as of February 1, 2018.
  • There were concerns about multiple file download capability. It was stated that only two files at a time can be downloaded.
  • There were also concerns about the time-out duration. It was stated that the amount of in-active time is too short.
  • Nate Morris said it seems GlobalScape works best with Internet Explorer.

Agenda Item 3 – Charter:
The proposed Charter updates were presented to the group. The group discussed the need for individual taskforces to focus on power flow, dynamics, and short circuit. After a lengthy discussion, Anthony Cook stated that it seemed the topic for task forces needed more discussion and should be pushed to another meeting for consideration. After additional edits of the proposed updates, Nate Morris solicited a motion.

  Motion: Jerad Ethridge motioned to endorse the charter updates to be approved by applicable SPP Org Groups. Derek Brown seconded the motion. The motion passed unanimously. (Attachment 3 - MDWG_Charter_1-23-2018.docx)

Agenda Item 4 – MOD Matrix:
– Agenda Item 4a, b – ITP Only Projects, Brainstorming Type/Status:
Anthony Cook stated that an effort by both SPP Staff and Data Submitters is needed to update the MOD Matrix. He asked individuals to provide types and statuses that make sense to them in order to make the matrix more useful.
  • Reené Miranda asked about a category for projects that SPP could use in a study if they are useful to correct issues.
  • Derek Brown discussed the NERC Standard Compliance projects and how they are intended to be used; however, he believes that fictitious facilities shouldn’t be in the base cases.
  • Derek also discussed the need for ITP specific projects. He state that the Westar slack machine needed to be changed for the ITP Light Load models due to the new requirement to model firm wind at 100%.

AI: Data Submitters to provide ideas on MOD Matrix update for possible new types and statuses for the March meeting.

Agenda Item 5 – MDWG Manual Updates:
Anthony presented the proposed manual changes to the group. Additional updates were presented for the Shortfall Guidance Process that were submitted after the posted material. It
was also requested to change references of TrueShare to GlobalScape. After discussion of the Shortfall Process, the group decided to make the updates necessary for the 2018 Series model build and allow the Manual Taskforce to re-examine this section. Nate Morris asked the group how to proceed with approving the updates, as a whole or individually. The group decided to approve the updates as a whole. Nate entertained a motion to approve the manual updates.

Motion: Jerad Ethridge motioned to approve the updates as discussed in the meeting. Derek Brown seconded the motion. The motion passed unanimously. (Attachment 4 - SPP MDWG Model Development Procedure Manual (Public)_V16.docx)


Agenda Item 6 – Modeling Practices:

– Agenda Item 6a – Generation without Firm Transmission Service:
Dustin Betz asked how to handle generation without firm transmission service in the MDWG models. He explained that his practice is to model the units but not dispatch them. He was looking for how others handle this situation.
  • Reené stated that SPS models them a zero.
  • Dustin asked if entities would be able to call upon resources without firm service to cover shortfall in the future.
  • Anthony Cook stated that if anyone has such issues, they are invited to the Manual TF calls to help craft language and steer discussion that can be incorporated in the manual.

It was requested that the Manual Taskforce discuss this situation and draft language for the 2019 Series.

AI: Manual Taskforce to discuss the modeling practice of generation without firm transmission service and draft language for the 2019 Series.

– Agenda Item 6b – Grid Switching Generation:
Mark Reinart explained that Golden Spread has natural gas based units that have the ability to serve the SPP and ERCOT systems. Upon review, he noticed that in some situations some of these units are being dispatched in the planning models for the same seasons, mainly summers. He was looking for guidance and possibly manual language to be drafted in the future.
  • Anthony Cook stated that if anyone has such issues, they are invited to the Manual TF calls to help craft language and steer discussion that can be incorporated in the manual.

AI: Manual Taskforce to discuss the modeling practice of grid switching generation and draft language for the 2019 Series.
AI: SPP Modeling Staff to work with SPP Operations and SPP Planning and possibly ERCOT to see what is/can be done procedurally.

Agenda Item 7 – Model On Demand:

– Agenda Item 7a – Project vs. Profile Data:
Anthony Cook briefly gave an overview of MOD and how projects and profiles work. Wayne then discussed the inconvenience on Basin and its members having to update stagnant data
like transformer taps through dc profiles rather than projects. He asked where the base profile data came from.

- Anthony answered that he believed the data was from the 2016 Series when SPP uploaded the IS data into MOD for the IS entities.
- Anthony Cook suggested that SPP work with Basin to upload the Basin device control profiles to correct the issue for the 2018 Series and will remove all data from the base profiles for those entities that want their data removed before the 2019 Series.

– **Agenda Item 7b – Future Training Needs:**
Nate Morris stated that MOD training can be offered if there is enough interest from data submitters. Anthony Cook stated that training would be held closer to June/July if scheduled.

AI: SPP Staff to send an email to gauge interest in MOD training and possibly determine dates around June/July.
AI: Post the MOD training material to GlobalScape.

**Agenda Item 8 – Engineering Data Submission Tool (EDST) Status:**
Eddie Watson stated that development of the Engineering Data Submission Tool is complete and small group testing was performed. Additional enhancements are being considered based on feedback from testing. SPP Staff is currently reviewing the developed User’s Manual. Large group training will in April.

**Agenda Item 9 – 2017 Working Group Survey:**
Nate went over the results of the Working Group Survey for the MDWG. Anthony Cook asked that comments be made specific to the MDWG and not blanket statements that cover other working groups as well.

**Agenda Item 10 – Misc.:**

– **Agenda Item 10a – Meeting Registration:**
Anthony Cook stated that everyone needs to make sure to keep their registration current because it helps ensure room capacity is adequate and makes sure there is enough food or food is not wasted.

– **Agenda Item 10b – Siemens Aha Ideas:**
Anthony Cook reminded everyone that Siemens has an idea submission mechanism that allows individuals to vote on ideas which will move them up on the implementation plan. He stated that SPP Staff will send out a list of ideas that individuals can vote on if desired.

AI: SPP Staff to send out list of Siemens Aha ideas.

– **Agenda Item 10c – Demonstration of Power Flow Checker Program:**
SPP Staff will perform another net conference if desired.

– **Agenda Item 10d – Future F2F Meetings:**
Nate Morris asked everyone how many face to face meetings are desired and when in the year to hold them.

- The consensus is to have one or two a year and scheduled around the TWG meetings.
- Ideally to be in May, July, or Fall and not during the model data submission period.
- Top locations are Oklahoma City, Denver, and Little Rock.
- Requested to look into including consultants that might be able to get CEUs for PEs.

-- **Agenda Item 10e – Standard Efficiency Review Email:**
Anthony Cook mentioned that some of the standards are being retired and if anyone is interested to be sure to look over the email sent by Shannon Mickens on January 15, 2018.

-- **Agenda Item 10h – Meeting Survey: QR Code:**
Anthony Cook stated that surveys can be set up for each meeting so that individuals can fill out that would allow the group to get instant feedback and hopefully improve meeting efficiency going forward.

Agenda items 10f and 10g were tabled for a later meeting.

**Agenda Item 11 – Administrative Items:**

-- **Agenda Item 11a – Summary of Action Items:**
  - SPP Staff and DC Tie Entities meet to improve DC Tie coordination
  - SPP Staff to look into tracking docucode issues being corrected each pass and added to the Report Card.
  - Data Submitters to provide ideas on MOD Matrix update for possible new types and statuses for the March meeting.
  - Modeling Taskforce to discuss the modeling practice of generation without firm transmission service and draft language for the 2019 Series.
  - Manual Taskforce to discuss the modeling practice of grid switching generation and draft language for the 2019 Series.
  - SPP Modeling Staff to work with SPP Operations and SPP Planning and possibly ERCOT to see what can be done procedurally.
  - SPP Staff to send an email to gauge interest in MOD training and possibly determine dates around June/July.
  - Post the MOD training material to GlobalScape.
  - SPP Staff to send out list of Siemens Aha ideas.

Future Meetings

- Net Conference: 1st Thursday of each month from 10:30-12:00am
- Face to Face to be determine.

Adjourn Meeting

Anthony stated that this was his last face to face meeting with the group and that Sunny Raheem would be replacing him as Staff Secretary. Nate Morris thanked Anthony for his time on the MDWG and for being flexible when helping data submitters.

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

**Motion:** Reené Miranda motioned to adjourn the meeting. Alex Mucha seconded it. The motion passed unanimously.
The meeting was adjourned at 12:02pm.

Respectfully submitted,
Anthony Cook
SPP Staff Secretary