Agenda Item 1 - Administrative

The meeting was called to order at 9:06 a.m. The following Model Development Working Group (MDWG) members were in attendance:

- Joe Fultz, Chair – Grand River Dam Authority
- Nate Morris, Vice Chair – Empire District Electric
- Nathan McNeil – Midwest Energy
- Reené Miranda – Southwestern Public Service
- Brian Wilson – Kansas City Power & Light
- Mike Clifton – Oklahoma Gas & Electric
- Derek Brown – Westar Energy
- Jason Shook – GDS Associates
- John Boshears - City Utilities of Springfield
- Dustin Betz – Nebraska Public Power District

SPP Staff in attendance included Anthony Cook (Secretary), John Mills, Mitch Jackson, and Scott Jordan.

The following guests were also in attendance:
- Jason Bentz – (Proxy for Scott Rainbolt) American Electric Power
- Dona Parks – Grand River Dam Authority
- Martin Green – Grand River Dam Authority
- Gimod Olapurayil – ITC Great Plains
- Liam Stringham – Sunflower Electric Power Corporation
- Peter Howard – Kansas City Power & Light
- William Hawkins – Western Farmers
- Kevin Foflygen - City Utilities of Springfield
- Jerry Bradshaw - City Utilities of Springfield
- Aravind Chellappa – (Proxy for Reené Miranda) Southwestern Public Service
Meeting Minutes
The May 21-22, 2014 minutes were open for review. Anthony Cook had a correction to the Agenda Item 8 section. Nate Morris motioned to approve the May 21-22, 2014 meeting minutes as amended; Derek Brown seconded the motion. The motion passed unopposed. (Attachment 1 - MDWG Minutes May 21-22, 2014.doc)

Meeting Agenda
The agenda was reviewed by the group. Nate Morris requested to adjust the agenda item order. Brian Wilson motioned to approve the agenda as amended; Nate Morris seconded the motion. The motion passed unopposed. (Attachment 2 - MDWG Meeting Agenda 20140701.docx)

Meeting Materials
Anthony Cook asked if anyone had any issues or needed more time to review the posted material. There were no concerns from anyone.

Agenda Item 2 – MDWG Model Building Activities:

2015 Series Schedule
Anthony Cook presented two schedules for the 2015 series MDWG model build. Option 1 is “schedule as usual” with five passes ending late February. Option 2 condenses to four passes ending early February. Anthony requested for the group to focus only on the powerflow schedule at this time. Several group members stressed the importance of completing the 2015 Series MDWG model build on time and in a timely manner. The concern with going with Option 1 doesn’t show that the group is serious about improving the build. The group reviewed Option 2 and adjusted dates for a few items. It was also requested to add language to the ACCC item of Pass 1 and Pass 2 so as not to delay the schedule if there are issues solving these passes. Derek Brown motioned to approve Option 2 with revisions. Mike Clifton seconded the motion. The motion passed unopposed. (Attachment 3 - MDWG 2015 Series Powerflow.pdf)

2015 Series Model Timeliness Improvements
Anthony Cook presented improvements submitted by Reené Miranda, Derek Brown, and Nate Morris. Anthony stated that some of the suggested improvements can easily be implemented while others will take some time. Further discussion will be had on these improvements as the 2015 Series build progresses.

Agenda Item 3 – Model Development Procedure Manual:

BES Definition and TPL-001-4
Anthony stated that the BES is not mentioned in the current Powerflow Procedure Manual. He asked the group to think about whether a paragraph needs to be added in future version. Anthony also asked the group to approve language to add to the posted manual for reporting known outages based on TPL-001-4 requirements. Reené Miranda motioned to approve “Known outage(s) of Generation or Transmission Facility(ies) with a duration of at least six months” and add it to the posted manual. Derek Brown seconded the motion. The motion passed unopposition.
Agenda Item 9 – Discussion of Future Meetings:
Next Meetings Place and Date:
- Conference call in July, 2014
- Face-to-Face in Little Rock on November 12, 2014
- Model Update Meeting on November 13-14, 2014

Adjourn Meeting
Reené Miranda motioned to adjourn the meeting, Derek Brown seconded the motion. The MDWG adjourned at 11:45 a.m.

Respectfully submitted,
Anthony Cook
SPP Staff Secretary
Southwest Power Pool
MODEL DEVELOPMENT WORKING GROUP
May 21-22, 2014
Crowne Plaza Kansas City Downtown
Kansas City, Missouri

• M I N U T E S •

Agenda Item 1 - Administrative

The meeting was called to order at 1:02 p.m. The following Model Development Working Group (MDWG) members were in attendance:

Joe Fultz, Chair – Grand River Dam Authority
Nate Morris, Vice Chair – Empire District Electric
Scott Rainbolt – American Electric Power
Nathan McNeil – Midwest Energy
Reené Miranda – Southwestern Public Service
Brian Wilson – Kansas City Power & Light
Mike Clifton – Oklahoma Gas & Electric
Derek Brown – Westar Energy
Scott Schichtl – Arkansas Electric Cooperative
Jason Shook – GDS Associates
John Boshears - City Utilities of Springfield

SPP Staff in attendance included Anthony Cook (Secretary), John Mills, Chris Haley, Mitch Jackson, Scott Jordan, and Shannon Mickens.

The following guests were also in attendance:
Jason Hofer – (Proxy for Dustin Betz) Public Power District
Jason Bentz – American Electric Power
Dona Parks – Grand River Dam Authority
Martin Green – Grand River Dam Authority
Mark Reinart – Golden Spread Electric Cooperative
Gimod Olapurayil – ITC Great Plains
Liam Stringham – Sunflower Electric Power Corporation
Peter Howard – Kansas City Power & Light
Alex Mucha – Oklahoma Municipal Power Authority
Alan Burbach – Lincoln Electric System
Jerry Bradshaw - City Utilities of Springfield
Aravind Chellappa – Southwestern Public Service
Steve Hardebeck– Oklahoma Gas & Electric
Kyle Drees – Westar Energy
James Remley – Westar Energy
Mo Awad – Westar Energy
Daniel Benedict – Independence Power & Light
Holli Krizek – Western Area Power Administration
Meeting Minutes
The November 11, 2013 minutes were open for review. Nate Morris had a correction to
the Meeting Minutes section. John Boshears motioned to approve the November 11,
2013 meeting minutes as amended; Brian Wilson seconded the motion. The motion
passed unopposed. (Attachment 1 - MDWG Minutes 20131111.doc)

The April 16, 2014 minutes were open for review. The company name was added to an
attending guess, Reené Miranda had submitted corrections to remove that Aravind was
his proxy and wording for his question in the TPL-001-04-R1 section. Reené Miranda
motioned to approve the April 16, 2014 meeting minutes as amended; Jason Shook
seconded the motion. The motion passed unopposed. (Attachment 2 - MDWG Minutes 20140416.doc)

Meeting Agenda
The agenda was reviewed by the group. Jason Shook motioned to approve the agenda
as presented; Nathan McNeil seconded the motion. The motion passed unopposed.
(Attachment 3 - MDWG Meeting Agenda 20140521-22.docx)

Meeting Materials
Anthony Cook asked if anyone had any issues or needed more time to review the posted
material. There were no concerns from anyone.

Agenda Item 2 – Review of Past Action Items:
Anthony Cook reviewed the action items. There was discussion to make #42 more
specific to individual standards. He stated that many of the items are on the agenda for
discussion. (Attachment 4 - SPP MDWG Action Items 20140521.xls)

Agenda Item 3 – NERC Reliability Standards Updates:
Shannon Mickens introduced the SPP Reliability Standards department. He discussed
what they do and how they can assistance the Working Groups with information dealing
with the many NERC standards under development. Their objective is to make sure all
SPP members are knowledgeable of changes to standards being proposed or
implemented. He gave an overview of the standards that are currently under review.
The yellow highlighted areas indicate the changes since the previous discussion of the
standard. (Attachment 5 - NERC Activities Update - 052114.docx),
(Attachment 6 - First Posting-Unofficial Comment Form_0421_SPP
comments_file.docx)

Agenda Item 4 – Modeling Contacts Updates:
Anthony Cook presented an updated list of Modeling Contacts. The members made
additional changes. Nate Morris asked to add a column for company names. Joe Fultz
asked to add whether the person is the powerflow, short circuit, and/or dynamic contact.
(Attachment 7 - SPP_Modeling_Contacts_20140521.xls)

AI: Add columns for company name and type of contact.
**Agenda Item 5 – MDWG Member Survey Results**

Anthony reviewed the MDWG Member Survey results with the group. He asked for clarification on the comments that were made.

- Member feedback was given that the MDWG should be more involved in the development of the different models that are being built by SPP. To encourage this, the MDWG should hold frequent conference calls and be readily available to give input during the model building process.
- Members requested that SPP Staff with stability understanding are available during the MDWG meetings to answer questions. Scott Jordan affirmed the upcoming dynamic workshop hosted by SPP and extended an invitation for all to attend.
- Members requested either assigning sections of the MDWG manual to members to update or form a task force in order to get the manual updated.
- Members requested truing up the wind farm topology between the powerflow and dynamic models which is a current action item.

(Attachment 8 - 2013 org survey_analysis_MDWG.xlsx)

**Agenda Item 6 – MDWG Charter Updates:**

Anthony Cook presented the MDWG Charter with edits provided by member feedback. The group was not prepared to discuss the updates made to the Charter. A few additional edits were added; however, the discussion was tabled. Anthony stated that he would resend the charter with updates to the group for members to provide additional comments.

(Attachment 9 - MDWG_Charter_5-21-2014_DRAFT.docx)

AI: Anthony to check on needing to name specific models being built in scope section.

AI: MDWG Members to provide comments on updating the Charter.

**Agenda Item 7 – MDWG Model Building Updates:**

### 2014 Series Dynamics

Scott Jordan reviewed changes made to the dynamic model building schedule due to the delay of the powerflow models. He also gave an update of the status of the model build.

### 2014 Powerflow and Short Circuit

Anthony recapped the delay of finalizing the models. He reviewed the reoccurring issues that were reported by the docucheck program.

Alan Burbach discussed the MRO model building process. He stated that for the first few passes, unsolved models are provided for members to check that topology is correct and that load, generation, and interchange are balanced. This reduced the scheduled time needed to build the models since solving models can take a considerable amount of effort if these are incorrect. Many of the members agreed that the first couple of passes could be issued without being solved.
The group discussed how many projects were added/modified each pass and how there are some entities that wait until the later passes and update their system all at once. Anthony expressed that this causes a considerable amount of time to be spent reviewing so many projects at one time. More attention needs to be made to the models at the beginning of the build and use the last few passes to make minor adjustments. Mo asked what the main reasons are for the unscheduled passes each year. Anthony stated that it goes back to the reoccurring issues presented in the docucheck output.

Anthony presented improvements that the SPP Modeling Staff created based on requests from members. These improvements would apply to all modeling data reporting entities. Nathan McNeil asked for an improvement to the report card because it doesn’t capture the amount of work someone does at the beginning of the process and then makes minor changes at the end. It only shows that they made changes at the end of the process and maybe not throughout. He asked for some sort of scale that shows the amount of updates being submitted each pass. Dona Parks suggested having frequent conference calls during the build to check on the member’s progress of submitting data. Nathan added to hold a call each pass and let Anthony discuss the issues that he is seeing. There was consensus to hold a call during each pass to help Anthony and the members discuss the building process.

Other thoughts are to require MOD training for new hires, start next series build immediately after finalizing previous series, SPP Staff to keep MOD updated, Staff not to accept corrections after deadline, build dynamic models in parallel with powerflow models.

(Assignment 11 - DocuCode_2014Series_P1-FINAL_Compare-8MAY2014.xlsx)
(Assignment 12 - Member Accountability Process Improvement.docx)

AI: Members to provide additional improvement suggestions to Anthony.

2015 Series Model Selection
Anthony presented the 2015 series model selection if it were to stay as usual. Nathan McNeil discussed Requirement 2.1 of TPL-001-04. Anthony stated that the current model selection does comply with the NERC definition if year 1 is 2017. Nathan stated that the TPL Task Force (TPLTF) decided for the 2015 series, year 1 will be 2016. In doing this, there isn’t a 5 year or 10 year model in the current selection. Anthony presented how the MDWG models align with the MMWG models. Nathan discussed the document that the TPLTF created specifically the options tables. The group discussed whether to add 2020 summer and 2025 summer to the presented model selection or shift the set and rebuild the 2020 and 2025 models and not build 2021 and 2026 models. Nathan McNeil motioned to shift the model selection and rebuild the 2020 and 2025 models for the 2015 series. Mike Clifton seconded the motion. The motion passed unopposed.

(Assignment 13 - 2015 Series Model Selection.xlsx)
(Assignment 14 - Model Matchup Presentation.pptx)
(Assignment 15 - NERC_TPL-001-04.pdf)
(Assignment 16 - Powerflow_and_Dynamics_Model_Options_TPL-001-4.docx)

2015 Series Schedule
Anthony Cook presented a proposed schedule for the 2015 series MDWG model build. The group discussed that the chair of the TWG wants to see the model build end by December 31. The group discussed that this date wouldn’t allow for the inclusion of the Board approved NTC projects to be added to the model set. There were several suggestions on how to improve the schedule. The group asked SPP Staff to prepare a couple of schedules and send them to the group to decide which one to adopt. (Attachment 17 - MDWG 2015 Series Schedule_Draft.pdf)

**Agenda Item 8 – MDWG Modeling Practice Improvements:**

**Gross vs. Net Pmax, Aux Load**

Anthony discussed the SPP Staff recommendations for modeling generator parameters document that had been sent out to the members before. He discussed that there is an action planned for the MDWG to decide in favor or against and then it will be presented to the TWG. Chris Haley stated that the process documentation has to be established by July 2015, and then everything is enforceable by July 2016 according to the new NERC MOD standards recently approved. The MDWG and SPP Staff made additional updates to the document. Derek Brown motioned to approve the document as revised with SPP Staff checking on the specificity of referencing MOD 25. Nate Morris seconded the motion. There was one vote against by Scott Rainbolt.

**AI:** SPP Staff and Members to look into the PSS\e issue of decimal places being added to generator values.

**Agenda Item 10 – TPL-001-4:**

Nathan McNeil discussed R1 and how outages of six months or longer are going to be reported. Emails have circulated to report those outages in the data submittal workbook that accompanies the model set being built. Scott Jordan stated that there have been some concerns of the market sensitivity of the information being in the workbook. Scott stated that whether it is in the workbook or not, the outages have to be represented in the models as of January 1, 2015. The 2014 series powerflow models might have to be altered to add these outages if not already modeled.

Nathan stated that we may have to change the process of building the short circuit models to comply with R2.3 of the standard. The MDWG and SPCWG will need to hold a joint meeting and the Short Circuit Task Force (SCTF) will possibly need to be revived for model improvements.

**Agenda Item 13 – Modeling Entity Expansion:**

Chris Haley asked the group for their opinion to move toward modeling based on Transmission Customer or Load Serving Entities. He asked for the members to send him an email with their suggestions on the subject. He stated that it was brought up to the MOPC and are currently collecting responses. The group asked for Chris to send an email request.

**AI:** Chris Haley to send members an email request for opinions.

The rest of the agenda items were tabled until the next meeting.
Agenda Item 16 – Summary of Action Item:
- Add columns for company name and type of contact to the modeling contact sheet.
- Anthony to check on needing to name specific models being built in scope section of the charter.
- MDWG Members to provide comments on updating the Charter.
- Members to provide additional improvement suggestions to Anthony for staying on schedule.
- SPP Staff and Members to look into the PSS\e issue of decimal places being added to generator values.
- Chris Haley to send members an email request for opinions.

Agenda Item 17 – Discussion of Future Meetings:
Next Meetings Place and Date:
- Conference call in late June, 2014
- Face-to-Face in Little Rock on November 12, 2014
- Model Update Meeting on November 13-14, 2014

Adjourn Meeting
Reené Miranda motioned to adjourn the meeting, Nathan McNeil seconded the motion. With no further business to discuss, the MDWG adjourned at 12:26 p.m.

Respectfully submitted,
Anthony Cook
SPP Staff Secretary
Southwest Power Pool, Inc.
MODEL DEVELOPMENT WORKING GROUP
July 1, 2014
Conference Call
9:00 A.M. – 11:30 A.M.

• A G E N D A •

1. Administrative Items ........................................................................................................... Joe Fultz (10 min)
   a. Call to Order
   b. Introductions
   c. Proxies
   d. Previous Meeting Minutes (Action Item)
      i. May 22, 2014 Face-Face
   e. Agenda Review (Action Item)
   f. Meeting Materials

2. MDWG Model Building Activities ....................................................................................... Staff (1 hr)
   a. 2015 Series
      i. Schedule (Action Item)
         1. Powerflow
         2. Short Circuit
         3. Dynamics
      ii. Model Timeliness Improvements

3. Model Development Procedure Manual .................................................................................. All ()
   a. BES Definition
   b. TPL-001-4

4. New BES Definition .............................................................................................................. Scott Jordan (10 min)

5. MDWG Modeling Practice Improvements ............................................................................. Staff (30 min)
   a. Generator Ids
      i. Leading Zeroes
   b. Parallel Three Winding Transformer Ids
      i. ASPEN Error
   c. Modeling Transactions
   d. Modeling of Mothballed/Retire/Decommissioned Units (Action Item)
      i. MOD Profiles Pmax/Qmax/Qmin = 0
      ii. Removal
   e. Gross vs. Net Pmax, Aux Load (Reminder)

6. Modeling Entity Expansion .................................................................................................. Chris Haley and Anthony Cook (15 min)

7. Other ..................................................................................................................................... All (10 min)

8. Summary of Action Items ...................................................................................................... Anthony Cook (10 min)
9. Little Rock Meeting ........................................................................................................ Joe Fultz (5 min)
   a. MDWG: November 12
   b. Model Update Meeting 13 and 14
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<td>Fri 11/14/14</td>
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<tr>
<td>32</td>
<td>Pass 3 - Request Review of 2014 ITP IDEVS</td>
<td>6 days</td>
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<td>Mon 11/17/14</td>
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<td>37</td>
<td>Pass 4 - Request Review of 2014 ITP IDEVS</td>
<td>45 days</td>
<td>632 hrs</td>
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<td>38</td>
<td>Pass 4 - Members Review/Submit Changes to Pass 4 Powerflow Models</td>
<td>22 days</td>
<td>176 hrs</td>
<td>Wed 12/11/14</td>
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<td>39</td>
<td>Pass 4 - Status Conference Call</td>
<td>1 day</td>
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<td>Mon 12/11/14</td>
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<td>41</td>
<td>Pass 4 - Request Review of 2014 ITP IDEVS</td>
<td>33 days</td>
<td>264 hrs</td>
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<td>42</td>
<td>Pass 4 - Review MOD Projects</td>
<td>33 days</td>
<td>264 hrs</td>
<td>Wed 12/16/14</td>
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<td>22 days</td>
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