ESWG Minutes No. [37a]

**Southwest Power Pool**

**ECONOMIC STUDIES WORKING GROUP**

**AND**

**TRANSMISSION WORKING GROUP**

**October 4, 2010**

**Crowne Plaza Hotel Dallas Downtown**

**1015 Elm Street, Dallas, TX**

**10:00 am – 2:00 pm**

**• Summary of Action Items •**

1. Staff will maintain a "parking lot" for issues that need to be resolved by the group before the conclusion of the study and final presentation to the MOPC.
2. Staff will present a draft ITP 10 Scope to the group on October 21st.

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**Southwest Power Pool**

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**• Minutes •**

## Introductions

The following ESWG Members were present:

- Alan Myers, ITC Great Plains
- Kip Fox, AEP
- Leon Howell, OGE
- Bruce Merrill, LES
- Jason Atwood, Kelson Energy
- Greg Sweet, Empire
- Doug Kallesen, NPPD
- Bruce Walkup, AECC
- Al Tamimi, Sunflower Electric
- Paul Dietz, Westar Energy
- Bennie Weeks, Xcel Energy

- James Sanderson, KCC (liaison)

The following TWG Members were present:

- Travis Hyde, OGE
- Jason Shook, GDS/ETEC
- Sam McGarrah, EDE
- Matt McGee, AEP
- Nathan McNeil, Midwest Energy
- Mitch Williams, WFEC
- Jason Atwood, Kelson Energy
- Harold Wyble, KCPL
- Randy Lindstrom, NPPD
- Dan Lenihan, OPPD
- John Fulton, Xcel Energy / SPS
- Jason Fortik, LES
- Angela Easton, Calpine
- Al Tamimi for Noman Williams, Sunflower Electric

- Tony Gott, AECI (liaison)
- Paul Simoneaux, Entergy (liaison)

It was noted that Bennie Weeks held a proxy for David Hudson.

## Agenda Item 1 – Pre MOPC Interaction and Agenda Discussion

Charles Cates provided a summary of staff's plans for presentations at the MOPC meeting on the 12th and 13th of October and encouraged attendance at a pre-MOPC workshop at which staff will be describing the ITP process and the work conducted by the TWG and ESWG. Staff plans to take comments from this meeting and the MOPC meeting and create a plan for next steps to finalized the ITP20.

## Agenda Item 2 – Robust Transmission Portfolios & Testing

Tim Miller presented staff's work that used the robustness metrics to evaluated projects for inclusion in four "Robust Plans". The presentation focused upon the metrics that have been calculated, those that have been deferred till the next ITP cycle, additional projects that were studied with the robustness metrics and the presentation of four portfolios of projects that were evaluated with the metrics.

Both groups provided valuable feedback concerning the metrics, the projects and the portfolios.

**"Robustness"**
Paul Dietz stated that the overuse of "robust" may be misleading to those unfamiliar with our study process since the probabilistic tools needed for metrics involving stochastic analysis have not yet been developed. The plans are really only as robust as our assumptions and futures. He desired to make clear that we are long way off from where we envision these "robust" plans going and that until we have true probabilistic analysis we are missing the greater part of the "robustness" measure.

**Seams Projects**
Projects within these portfolios that crossed SPP seams received attention. In particular the groups asked if the benefit and cost of these projects was specific to SPP or if staff took into account that SPP's neighbors may bear some of the cost. Staff commented that they took the more conservative approach by assigning all of the costs to SPP while only capturing the benefit received by SPP. The benefit to neighboring utilities was not captured per the direction of the SPC to focus upon SPP generation and load rather than exports. The group wondered if an inclusion of neighboring utility benefits would still fit within the scope of the study, even though exports were not particularly considered.

**Robust Plan 4, 765 kV and the ITP Scope**
Kip Fox led a discussion concerning their concerns with the way SPP Staff approached the use of 765 kV elements in their analysis. The use of an "all or nothing" approach that included extensive amounts of 765 kV lines replacing nearly all of the 345 kV circuits shown in the cost-effective plan was excessive and has the negative side effect of linking any plan with 765 kV with a very high investment cost. He proposed that staff take another look at "right-sizing" the use of 765 kV elements so that the benefits from those lines can be seen without the high cost of the "Robust Plan 4". Specific note of the large northern loop shown in the study was made. SPP Staff was asked if such a loop was really needed. SPP Staff responded that the methodology they used was based upon their experience that 765 kV elements (or any other new extra high voltage level in SPP) suffer from impedance penalties at the step-up transformers that necessitate a collective 765 kV approach rather than a piece-meal collection of 345 and 765 kV elements.

Adam McKinnie presented his concerns that the way this plan was developed was outside of the methodology used in the rest of the study and does not match the scope of the ITP20. By creating a new plan from scratch instead of addressing individual projects as was done in the cost-effective and other robust plans, he believes staff took too large a step in morphing the cost-effective plan into a 765 kV revision and presenting it as a "robust plan"

**Parking Lot**
A "parking lot" was created to capture items that were discussed but not yet resolved. The following items were included:

- Amarillo – Clovis sensitivity since the project fell out of the 10-year reliability study needs.
- A report showing units that were forced offline due to competition from cheaper wind.
- Other approaches to the 765 kV portfolio that avoided the "all-in" approach taken by staff.
- Specific approval of the calculated metrics by the SPC, MOPC or BOD.
- Should there be a metric for wind connection ability? Can generation step up to 765 kV (specifically in regards to Woodward – Tuco)?

**Agenda Item 3 – ITP20 Report Update**

SPP Staff updated the group on the progress of the draft ITP20 report that was to be presented to the MOPC on the 12th. Charles Cates stated that the report was to be posted on the 5th of October and will need review and updates before the next MOPC meeting in January.

**Agenda Item 4 – Plans for TWG and ESWG Interaction**

Rachel Hulett initiated discussion about the next joint meeting between the ESWG and TWG. The groups decided that an October 21st conference call with web conferencing would be ideal for an initial review of a draft ITP10 scope and a touch-base for parking/lot issues identified in this meeting.

Respectfully Submitted,
Tim Miller

## Proxy Notifications

ESWG

David Hudson notified the group that Bennie Weeks held his voting rights for Xcel Energy/SPS.

> From: Hudson, David T [David.Hudson@XCELENERGY.COM]
> Sent: Monday, October 04, 2010 9:29 AM
> To: Myers, Alan; Charles Cates
> Cc: Weeks, Bennie; Cude, Bruce
> Subject: Please give Bennie Weeks my proxy for today's ESWG meeting. Thank you.
>
> David Hudson
> Director, SPS Strategic Planning
> Xcel Energy/SPS

TWG

Al Tamimi for Noman Williams, Sunflower Electric

**From:** Williams, Noman [mailto:NWilliams@sunflower.net]
**Sent:** Wednesday, September 29, 2010 9:26 AM
**To:** Rachel Hulett; Tamimi, Al
**Subject:** FW: ESWG/TWG 9/29/10 net conference Agenda & Background posted

Rachel - I will not be able to attend the TWG meeting today or on Monday October 4,2010. I will provide my proxy to Al Tamimi for both of these meetings

Thanks

*Noman Williams*
Vice President, Transmission Policy
Sunflower Electric Power Corporation
nlwilliams@sunflower.net
Telephone: 785/623-3332
Fax: 785-623-3395
Cell 785-259-5110

**Other Attendees**

Southwest Power Pool, Inc.

TWG/ESWG JOINT MEETING

October 4, 2010

Crowne Plaza Downtown Dallas/Dallas, TX

• ATTENDANCE LIST •

| Name | Company |
|---|---|
| Mike Collins | OGE |
| Leon Howell | OGE |
| Bruce Merrill | L.E.S |
| Charles Cates | SPP |
| [illegible] | KCC |
| Jason Shook | GDS/ETEC |
| Adam McKinnie | Mo PSC |
| Watt Cecil | Mo PSC staff |
| Jason Atwood | Kelson Energy |
| Sam McGarrah | EDE |
| Greg Sweet | EDE |
| Terri Gallup | AEP |
| Doug Kallesen | NPPD |
| Bruce Walkup | AECC |
| Alan Myers | ITC Great Plains |
| Rachel Hulett | SPP Staff |

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**Southwest Power Pool, Inc.**

**TWG/ESWG JOINT MEETING**

**October 4, 2010**

**Crowne Plaza Downtown Dallas/Dallas, TX**

**• ATTENDANCE LIST •**

| Name | Company |
|---|---|
| Nathan McNeil | Midwest Energy |
| AL Tamimi | Sunflower Electric |
| Thomas Teafatiller | SPP RE |
| Tim Miller | SPP |
| Dennis Harris | OXY |
| Steve Gaw | Wind Coalition |
| Paul Dietz | Westar Energy |
| Roy Boyer | Xcel Energy |
| Bruce Cude | Xcel Energy / SPS |
| Bennie Weeks | Xcel Energy / SPS |
| Kip Fox | AEP |
| Mitch Williams | WFEC |

Southwest Power Pool, Inc.

TWG/ESWG JOINT MEETING

October 4, 2010

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• ATTENDANCE LIST •

Teleconference

| Name | Company |
|---|---|
| Jason Fortik | LES |
| Paul Simoneaux | Entergy |
| John Fulton | SPS |
| Randy Lindstrom | NPPD |
| Tony Gott | AECI |
| Angela Easton | Calpine |
| Matt M'Gee | AEP |
| Travis Hyde | OGE |
| Dan Lenihan | OPPD |
| Harold Wyble | KCPL |
| Mark Loveless | OMPA |
| Chris Jones | |
| Lloyd Kolb | GSEC |
| Cary Frizzell | SPP |

Southwest Power Pool

# SPP Model Improvement White Paper



TWG Approved: October 4, 2010
MDWG Approved: September 8, 2010

Formatted: Centered

**Prepared by: Model Improvement Task Force** **October 18, 2010**

# Table of Contents

**History and Background**

The Model Improvement Task Force (MITF) was formed by the Transmission Working Group (TWG) to address increasing concern regarding the modeling process and the models produced by SPP. The MITF began work in February of 2010, comprised of members from the TWG and the Model Development Working Group (MDWG).

**Purpose and Objective**

The MITF was instructed to identify areas for process improvement within modeling. This group aimed efforts at adjusting and expanding the current set of practices associated with the MDWG in order to allow that group to develop a common base data set that will expand stakeholder input and instill efficiency and accuracy into each of the model sets it supports.

This document addresses issues put forth by SPP staff and members of the MITF.

## 1. Modeling Data Requirements

The following topics are addressed to highlight, adjust and expand the current MDWG data requirements in order to increase granularity and consistency of the modeling data being used for the different SPP model sets.

### *A. Uniform Generation Modeling*

**Issue:** No uniform requirements exist to model generation.

- ✓ Seasonal maximum and minimum capabilities and forecasted capabilities are often not accounted for.
- ✓ Some members model station service or auxiliary load and others do not.
- ✓ Municipal Generation listed in EIA reports is often netted with load.

**Solution:**

- ✓ Any distributive or otherwise generation registered with the SPP market shall be represented appropriately in the base model set such that generation is not netted with customer load.
- ✓ Net capability of units as listed in data reporting vehicles, such as EIA reports or SPP NITS applications, should be reflected in the base model set.
- ✓ Generator auxiliary load should be included in net capability of units. If an individual member company prefers to model gross generator capability, reports shall be provided detailing the bus number and ID for auxiliary load associated with each generator or plant.
- ✓ Ownership assignments shall be modeled with each machine.

**Deleted:** per Load Serving Entity (LSE)

**Benefit:** More effort spent to accurately model generator data will help to improve efficiency and accuracy of study processes and results.

### *B. Uniform Load Modeling*

**Issue:** The modeling world can vary from the real world in some respects. Often, methods used by members to model special loads (location or owner issues) skew the area interchange numbers. Some of the examples are:

- ✓ Pseudo-Tie Modeling
- ✓ Varying methods of assigning one's Load in another Area

**Solution:**

- ✓ Zero-impedance tie lines shall not be used to connect a load bus.
  - o Load shall be represented as it physically exists on the transmission system as accurately as the base model set will allow.
- ✓ Load shall be modeled on the metering bus (as allowed by the base model set) and shall be identified by the assignment of ownership, load area, or both.
  - o See Appendix A: Methods 1 and 2 will be used to model load for those members who have a modeling area and serve load which physically exists in another modeling area.

**Benefit:** This improvement will enhance model granularity and allow SPP Staff to accurately validate the area interchange when constructing the models.

### *C. Stability Load Modeling*

**Issue:** More representative load modeling needs to be utilized for dynamic studies. 100% constant current data, which may be worst case, is unrealistic.

**Solution:** Each data reporting member may provide more detailed dynamic load data for each dynamic model supported by the MDWG. If this data is not provided, staff should assume data based on recognized national/IEEE standards.

**Benefit:** This will provide consistency and help prevent unrealistic dynamic studies.

### *D. Explicit Modeling of Reactive Control Devices*

**Issue:** Net var modeling is sometimes used in power flow cases instead of showing the discrete capacitor or reactor banks that are available for switching.

**Solution:**

- ✓ All capacitor banks shall be modeled as switched shunts as specified in section 5.10 of the MDWG Power Flow Manual.
- ✓ Reactive devices shall be modeled to show individual blocks and steps available for switching.
- ✓ The MDWG should provide modeling assistance to SPP members and the Multi-Regional Modeling Working Group on voltage bandwidth for switched shunts.

**Benefit:** This improvement will provide additional guidance of what can be done in contingencies to remedy voltage problems.

### *E. Identification of Generation Types*

**Issue:** Proper identification of generation types, especially with respect to wind, does not currently exist in the base model set. Some study processes currently mix in non-firm generation that should not be dispatched.

**Solution:**

- ✓ The MDWG should discuss the implementation of uniform generator identification as done with load.

**Deleted:** per LSE

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**Deleted:** shall

**Deleted:** should

**Comment [KJA1]:** It is a lot of work to obtain day/night load data per bus per season. Why not utilize IEEE or EPRI research papers and use some combination like 60% constant current and 20% constant admittance and 20% constant power or some combination based on research?

**Comment [KJA2]:** This could be accomplished using scalers summer loading data - staff could do.

**Comment [KJA3]:** This statement is a bit confusing. Do you mean each dynamic model of load or each dynamic seasonal case that MDWG supports?

**Deleted:** (day/night, summer/winter/spring/fall)

**Deleted:** guidance

**Comment [KJA4]:** Make it clear in the document that SPP is not trying to tell utilities how to set cap banks.

- ✓ Develop a set of generator IDs for the purpose of identifying different generation types such as:
  - o Long-term firm
  - o EIS market (non-firm)
  - o Wind QF
  - o Customer owned (behind the meter)

**Benefit:** Better rules for identifying generation "buckets" will aid those using models developed by SPP and the MDWG in discerning what generation is dispatchable.

**Deleted:** including but not limited to

**Comment [KJA5]:** What if the generator participates in both long-term firm and EIS market?

**Comment [KJA6]:** We do identify generation type in the Generator Workbook. We can come up with an ID strictly for wind and everything else stays as is but not break it down into long-term firm and EIS market.

**Comment [KJA7R6]:** Kelsey Allen: We are proposing to imbed this detail in the load flow model so that when SPP data is handed off to other departments and companies both within and outside of SPP, there is less confusion about dispatchable generation. This becomes even more important when users of the MDWG models have no knowledge of the generator workbook. I think this topic is one of the few that are intended to spark discussion rather than simply laying out a specific solution. We can discuss at the next MDWG meeting.

## 2. Detailed Reporting and Data Synching

The following topics are addressed to expand the current practices of the MDWG and SPP staff in order to reconcile data sources within SPP and help bridge the gaps between models developed by the MDWG and those developed by SPP staff for the current STEP processes.

### *A. Joint-Owned Unit Coordination and Reports*

**Issue:** The information staff receives for the dispatching of jointly owned units is simply a generation output value as modeled which makes it very difficult to determine which owners are using what amount of power.

**Solution:** Data reporting members shall provide reports detailing Inter-area and intra-area transactions that represent the modeling of the dispatched power from each jointly owned unit or plant.

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**Benefit:** This improvement will remove any guesswork done by staff and improve efficiency in verifying usage rights.

**Comment [KJA8]:** We already do this in the Transaction Workbook. Are we eliminating the workbook or adding duplicate work?

**Comment [KJA9R8]:** While I agree that some of these transfers are in the transaction workbook, there is still always a question about intra-area usage, especially for those companies that may have multiple LSE's within their footprint, all with rights to a portion of a JOU.

### *B. Delivery Point Changes and Load Owner Reports*

**Issue:** Additions, modifications, and abandonment of delivery points are not clearly documented.

- ✓ Each year staff has to correct intra-area transfers between Host TO and Load Serving Entities (Load Owners, Municipals, Coops, etc.).
- ✓ With the new tariff addition of Attachment AQ, "new" loads cannot be added to the model without first being studied.
- ✓ With the new tariff addition of Attachment AR the transfer of an existing load is studied.

**Solution:** In conjunction with implementation of the new SPP modeling assignments, which will create more granularity in defining load ownership, load reports should be provided on a per LSE basis. These reports would include, as necessary:

- ✓ Load values
- ✓ Generation required to serve load
- ✓ Transactions and any resulting changes to area interchange
- ✓ Losses incurred in serving load

SPP must work with each data reporting member to ensure that all LSE reports are provided.

**Benefit:** These detailed reports will help facilitate and instill accuracy into SPP processes.

- ✓ Transmission Service Studies
- ✓ Studies pursuant to Attachment AR
- ✓ Studies pursuant to Attachment AQ

**Comment [KJA10]:** Should not apply to all members. Example: AECC provides load to SPP, but AEP provides generation information that covers the amount of load needed. Transactions are also provided by AEP, SWPA and Entergy.

**Comment [KJA11R10]:** We develop these sheets internally to determine loadflow changes for scenario models so providing SPP with the reports an LSE may provide to their BA would reduce staff man hours and improve accuracy.

### *C. MDWG Transaction Improvement*

**Issue:** Currently, connectivity to both MDWG Models and OASIS Data is limited. This leads to a significant amount of time spent to validate, correct and expand the transactions in the MDWG Transaction Workbook by hand in order to create the STEP base scenario models. Non-firm transactions or exploratory and proposed transactions above reserved amounts are currently included in the MDWG models. In order to build the STEP base scenario models these transactions are removed; staff also adds transmission service that is not included in the MDWG models:

- ✓ DNR and PTP DC tie adjustments
- ✓ Inter-area DNR at reserved amount
- ✓ Intra-area DNR not in TO or TDU dispatch order
- ✓ Intermittent wind generation at reserved amount
- ✓ PTP (inter-regional, intra-regional, intra-area, designated resource) at reserved amount.

Netting and combining transactions practices:

- ✓ Transactions are netted from A to B with B to A transactions making it difficult to correlate with OASIS reservation amounts
- ✓ Transactions summed together making it difficult to correlate with OASIS reservation amounts

**Solution:** Staff would like to work with members to bridge the gap in the development of models suitable for NERC Compliance versus studies governed by SPP Tariff requirements in relation to transaction schedules and OASIS reservations.

- ✓ The MDWG transaction workbook should be expanded to include data from SPP OASIS.
- ✓ Transactions should be more comprehensive with all inter-area and intra-area reservations accounted for thereby allowing the members to make their own forecasts about usage of these capacity and roll-over rights.
- ✓ Eliminate the practice of netting and summing transactions.
  - o Transactions should only be summed if they are from the same resource/source and load owner/sink.

**Benefit:** The amount of hours spent by engineers to develop transactions correlation can be reduced and thereby reducing STEP base model development time, making the process more efficient.

## 3. Modeling Methods

The following topics are addressed to highlight and better define modeling methods that will help create more uniformity across the SPP footprint.

### *A. Forecasting of Rollover Rights*

**Issue:** Currently, the MDWG manual encourages planners to model roll-over rights for transmission service. However, this assumption can result in the identification of reliability issues where none would have been identified otherwise.

**Solution:**

- ✓ In developing transaction schedules, each data reporting member should continue to project the use of long-term firm transmission roll-over rights in the base model set.

**Deleted:** E

**Deleted:** LSE

**Comment [KJA12]:** This will presume knowing future business decisions. We can't forecast what transactions will be scheduled in the long-term or forecast future business decisions.

**Comment [KJA13]:** This should be more clearly explained in the document.

**Deleted:** ir

- ✓ SPP will continue to address boundary conditions associated with modeling any unused roll-over rights in the scenario models, as required by Section III.1.d. of Attachment O to the SPP Tariff.

**Benefit:** This improvement will lead to more accurate and realistic modeling.

### *B. Modeling New Generation and Transmission Projects*

**Issue:** No common practice currently exists for including new generation and transmission projects in the MDWG model set. Transmission Owners are allowed to add any new transmission and generation projects to meet load requirements and NERC reliability standards.

**Solution:**

- ✓ STEP Base Models (Used by SPP as the base for ITP Reliability, Transmission Service, and Generation Interconnection studies):
  - o New Generation
    - ▪ New generation will only be modeled if it has a signed Interconnection Agreement and not on suspension.
    - ▪ New generation modeled will only be dispatched if it has an executed transmission service agreement.
    - ▪ Exceptions to the above requirements will be based on the TWG approved "Rules and Exceptions for Generation Deficiencies".
      - This rule set will aid in reducing the reliance on heavily weighted transmission solutions until the SPP ITP can give more guidance on resource planning.
  - o New Transmission will only be modeled if:
    - ▪ There is an existing Notification to Construct issued by SPP which has been accepted by the Transmission Owner.
    - ▪ It has been budgeted and approved by the Transmission Owner with firm commitment to build.
- ✓ MDWG Base Models (Used by SPP for NERC Compliance studies)
  - o In addition to generation and transmission meeting the STEP base model requirements, projects may be modeled as necessary to meet load requirements and/or NERC reliability standards.
- ✓ The MDWG manual should be updated to reflect the following for generation deficiencies:
  - o Inclusion of proposed generation to meet load requirements within the LSE
  - o Inclusion of existing generation and proposed transactions based on the method described in Appendix B.

**Benefit:** This set of rules will provide guidance in modeling new projects in order to create more consistent modeling practices across the SPP footprint.

### *C. Review, Expansion, and Implications of MOD Project Types*

**Issue:** The current MOD project type/status matrix contains errors and is incomplete.

**Solution:** The MDWG should review and adjust the current MOD project matrix to account for issues addressed in this white paper and Tariff changes made to implement the ITP.

**Benefit:** This will aid members and staff alike in classifying projects correctly to feed into study processes and project tracking.

**Comment [KJA14]:** What exactly are the problems that this paper refers to?

**Comment [KJA15]:** What adjustments to the matrix are suggested?

### *D. Modeling Projects in MOD before the RTO Need Date*

**Issue:** It has been noted that often a member will submit a project in MOD with an effective date before the RTO Determined Need Date which can result in masking inherent reliability issues or allowing SPP to oversell the transmission system.

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**Solution:** Any transmission project that has been issued an NTC by SPP shall not be modeled earlier than the later of the RTO Determined Need Date or the Transmission Owner Projected In-Service Date unless energized.

**Benefit:** This improvement would eliminate inherent ATC provided by projects modeled with no commitment to build. It would also allow the ITP reliability and transmission service analyses to accurately complete the following:

- ✓ Determine the need for Reliability Projects.
- ✓ Reassess the need for Reliability Projects without a NTC or with a NTC under review.
- ✓ Rescind the need for Reliability Projects with a NTC.
- ✓ Minimize the number of reliability analysis studies needed to determine whether a modeled TO Planned Project has reliability need.
- ✓ Protect SPP and its members against selling transmission service on ATC that may not exist due the delay of a transmission project.

## 4. Data Errors and Coordination

The following topics are addressed to expand the current practices of the MDWG and SPP staff in order to better address modeling errors and increase effectiveness of coordination efforts with neighboring regions and members.

### *A. Improve Identification of Major Model Changes and Errors*

**Issue:** Tools in our model building processes should be implemented both external and internal to SPP modeling that flag major data changes and errors.

**Solution:**

- ✓ The Docucheck program now being used by SPP will aid in correcting model errors.
  - o This python script developed for the MMWG produces reports of errors and warnings for review by each transmission owner.
  - o SPP and the MDWG should work to adjust and expand the data errors flagged in these reports.
- ✓ MOD Anomalies and MOD Detailed Case Build posted with each model set.
- ✓ SPP will develop tools and processes to compare the models to other data sources available to SPP, which will aid in data verification.
- ✓ SPP should provide a summary of changes between each final build of any one model series year.

**Benefit:** More effort in implementing secondary checks to validate major changes to the models will result in increased reliability of study results, avoiding project proposals and other issues that stem from simple modeling errors.

### *B. Improve Regional Data Coordination and Checks*

**Issue:** Due to the selection of seasons for a model series and the differing cycles of model building, SPP models inherently contain missing ties lines and outdated topology and

transactional data for neighboring systems. The SPP MDWG attaches the "best match" MMWG model as the external case and this can create confusion if not coordinated between the regions.

**Solution:**

- ✓ SPP shall coordinate with external regions to ensure understanding of seams throughout the model series.
- ✓ The MDWG should consider all internal and external processes it supports when selecting the seasons for an annual a model series.
  - o A one-to-one match for external regions is not always available and may require data modification.
  - o SPP shall swap data with 1st tier companies consistent with the obligations of seams agreements.
- ✓ All members within SPP and all regions shall use the MMWG Master Tie File for all updates to NERC regional ties.

**Benefit:** SPP and first tier data will be more accurate and produce more realistic representation of powerflow across seams.

### *C. Coordination Between G.I. and Modeling*

**Issue:** New generation (especially wind) with signed interconnection agreements interconnecting to the SPP footprint is often not coordinated directly into the MDWG Models by SPP Staff or SPP members.

- ✓ In the case of wind generation, accurate reactive capabilities are often not modeled if the generation is modeled at all.
- ✓ Proprietary stability models are being provided to the SPP for the purpose of the GI process and cannot be added to the MDWG models due to confidentiality reasons.
- ✓ Lack of good generic wind models in PSS/E Rev 30 is also an issue. Often wind generation plants are modeled with generic CIMTR1 or CIMTR3 models in lieu of more detailed generic wind models which are available in Rev 32.

**Solution:**

- ✓ Once a generator meets requirements to be included in the base model set, SPP Staff shall verify the data used in the SPP Generation Interconnection study and ensure that accurate data is submitted to MOD by Staff or the responsible SPP data reporting member.
- ✓ SPP shall step up enforcement of current data requirements of members and customers.
- ✓ SPP shall require that non-SPP member GI customers supply non-proprietary modeling data that can be added to the MDWG models.*
  - o If this data cannot be supplied in order to meet NERC MOD standards and SPP Tariff requirements then the GI request should be rejected.

**Staff Note: No SPP Tariff requirements currently exist that allow SPP reject GI requests based on failure to meet this criteria.*

**Benefit:** This will ensure all planned or operational generators with a signed interconnection agreement are included in the MDWG models, thereby improve accuracy of SPP models and provide for much better inputs into SPP study processes.

**Deleted:** host SPP

### *D. Model Sharing Instructions*

**Issue:** SPP transmission owning members are not allowed access to certain models sets because of sensitive data. This lack of access puts a burden on transmission owners when developing solutions for responding to study-related data requests.

**Solution:** The SPP non-disclosure agreement (NDA) shall be sufficient to allow full access and use of the various models developed in support of administration of the tariff to be used by signatories to validate study results.
**Benefit:** FERC jurisdictional or Public Power Entity SPP transmission owning members who have completed the necessary requirements will have model access to better replicate SPP study results and provide more accurate solutions for system violations.

### *E. Auxiliary Files Coordination and Organization*

**Issue:** Currently, staff members that are involved in the STEP model building process are responsible for requesting updates to the auxiliary files used for analysis and reporting (monitor, subsystem, contingency, invalid contingency and common name). These requests can potentially come from a number of different SPP employees from different engineering groups.
**Solution:** In keeping with the effort to create a common data set for all study tracks, the MDWG shall take over coordination and organization of auxiliary files used for study analysis.

- ✓ A single contingency file should be used for a full planning horizon.
- ✓ The MDWG needs to develop a process to identify and track contingencies that change due to topology changes through a model series.

**Benefit:** Stakeholders will have more control over the schedule of updating and maintaining these files producing more accurate results in all study processes.

### *F. Integrity of Forecasted Load Data*

**Issue:** SPP staff has noted that discrepancies exist between load forecasts as they appear in the models produced by the MDWG and load forecasts submitted via other processes. No uniformity exists across the SPP footprint for developing load forecasts; each LSE or reporting BA has their own process.
**Solution:** The MITF believes that these concerns expressed by SPP staff are a non-issue.

- ✓ There is no one-for-one match of the different sources used to report load.
- ✓ EIA-411 is a separate data vehicle and should not be used for model verification.
  - o Load and losses are not separated in the reports as they are in the powerflow models.
  - o EIA-411 doesn't have the granularity of load forecasts as represented in the models.
- ✓ Some companies have multiple forecasts per year that are fed into different processes at different times.
- ✓ SPP should assess the need and consider the elimination of October updates to NITS Applications as required by the Tariff. These are redundant data updates that can be found in the powerflow models developed by the MDWG.
- ✓ MITF does not recommend pursuing a common load forecasting tool.
  - o Each company has developed a process that has been vetted by their own staff and necessary State Commissions.

**Comment [KJA16]:** Not opposed to going to a single contingency file as long as a process goes along with it to make sure it gets updated with every single project that gets committed in MOD that might affect existing contingencies. We might end up have 2 contingencies for every MOD project. One before and one after a project goes in-service.

**Comment [KJA17R16]:** Agreed. This should be a step in the MOD project review procedure. SPP will also need to rely on data submitters to be aware of this and make comments in project submissions if a non-single contingency is impacted. Even more important, helping SPP stay current with the invalid contingency file and non-singles that may need to be added because of breaker configurations that we may not be aware of.

## 5. Uniform Generation Dispatch

The following topics address the gap in process related to generation dispatch and resulting interchange between the current MDWG practices and those employed by SPP staff to develop the different STEP model sets.

### *A. Generation Dispatch Coordination and Expansion*

**Issue:** Generation dispatch is currently being requested by multiple groups within SPP Engineering for different model sets. For the MDWG and STEP models, these requests for generation profiles and generation dispatch orders are generally provided by the same member staff. Once the MDWG models are developed, SPP Planning and Transmission Service staff uses an automated process to redispatch generation when performing reliability analysis and studying new requests for transmission service.

**Solution:** In addition to the generation profiles developed for the MDWG models used for compliance, MDWG modeling contacts will aid SPP staff in developing generation dispatch orders during the annual model update.

- ✓ The dispatch orders used for these purposes need to include both intra-area and inter-area generation.
- ✓ Dispatch orders would be per LSE where remote generation would be dispatched according to the transaction workbook net scheduled interchange (NSI) requirements.
- ✓ Since the majority of joint owned resources and purchases are base load generation per LSE, joint ownership and purchases would be included in the host TO dispatch order with the Pmax being equal to the sum of the allocated amounts if the host TO has a Joint Ownership or purchase of the same resource.
    - o Exceptions to this would initially be manually dispatched when building models due to interchange and usage accounting requirements.
- ✓ The automated process incorporates:
    - o Must-run unit commitments
    - o Unit Outages
    - o Transmission operating directives
- ✓ Non-dispatchable generation (wind, hydro, ect…) profiles will not be changed by the automated dispatch and would still need to be developed by members.

**Benefit:** In developing both sets concurrently, the base models for all study tracks will have a more consistent generation dispatch. Once the automated process becomes more refined, consideration should be given to implementing it to develop the MDWG models. This would eliminate SPP staff's work to adjust MDWG models for ITP Reliability, Transmission Service, and Generation Interconnection studies as well as reduce the burden on the members to create separate MDWG dispatches by hand.

### *B. LSEs That Cannot Meet Their Load*

**Issue:** Clear guidelines are not available to account for the issue of how to solve cases where a LSE doesn't have enough designated network resources to serve their load in a far-term case. Currently, members add fictitious generation or transactions to address this deficit. To build the STEP base models, these generators are removed; when there is a shortfall between Interchange, generation and load, the process described in Appendix B is used.

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**Solution:** The shortfall process described in the document referenced above is implemented through the automated dispatch process described in the Generation Dispatch Coordination and Expansion issue and would be fine-tuned to prepare for future implementation at the MDWG level. The MDWG should include this detailed process as an option to modeling proposed generation in the MDWG model set used for compliance.
**Benefit:** Any LSE that is not able to meet their load in a far term case will have specific guidelines to solving their case in a manner that is uniform across the SPP footprint. Additionally, this will improve the documentation of SPP Processes.

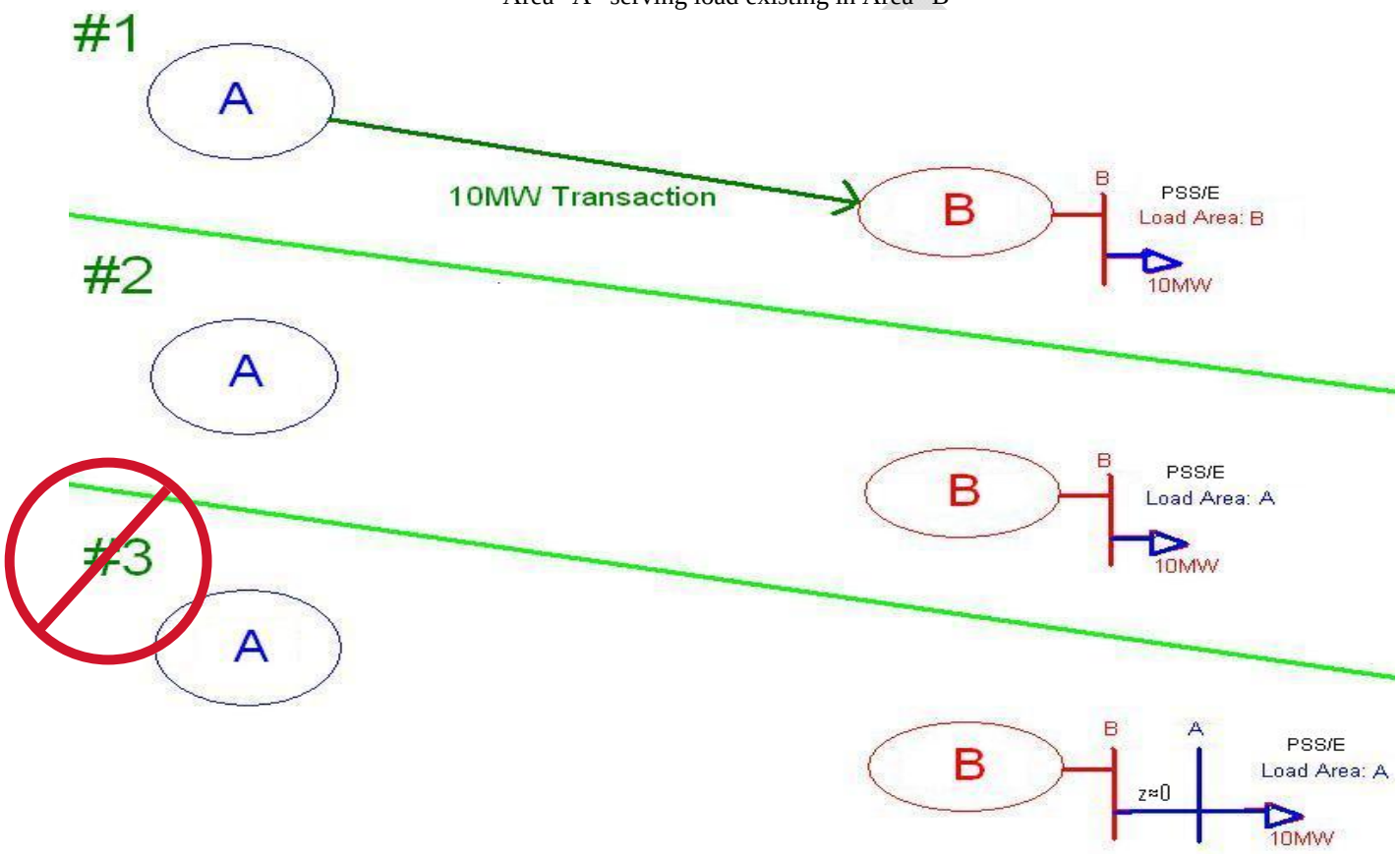
### *C. Determining Generation and NSI Profiles*

**Issue:** Generation and Net Scheduled Interchange (NSI) data rely heavily on our transmission owners to develop snap shots. Additional profiles are needed for other model sets which would require much more work from the transmission owners to develop these following the current MDWG process.
**Solution:** SPP processes are available to aid in the development of the generation and NSI profiles for the Transmission owners to review. Profiles are already being developed by staff for other STEP model sets, yet these processes need to be expanded.
**Benefit:** Applying these processes at the MDWG level will save both staff and members time in creating and verifying generation and NSI profiles.

# Appendix A

**External Load Modeling Methods**

Area “A” serving load existing in Area “B”



# Appendix B

**LSEs That Cannot Meet Their Load**

1. MDWG Compliance Models - The dispatch orders will include a NERC Standard Compliance flag to allow for new generation and existing generation capacity changes that do not meet the requirements for inclusion in the STEP and ATSS to be dispatched in merit order. If there is a shortfall between generation and load then the detailed shortfall process for the STEP and ATSS will be utilized.

2. ITP Near-Term Reliability Assessment and ATSS Models - When there is a shortfall between the amount of designated network resources and designated network load for a LSE or transmission customer, the following sequential steps are outlined below.

    i. Step One: Exhaust the customer's designated network resources until the network resources are sufficient to meet network load.

        a. Dispatch generation by using dispatch orders provided by the transmission planning personnel of the SPP data reporting members and by representatives of the transmission service customers.

        b. Add generation from behind the meter generating units. This generation consists of dispatchable behind the meter generation that may not already included in the SPP Model Development Working Group Base Cases.

        c. Non-dispatchable wind generation or other generation with operating restrictions or forecasted projections shall not be used.

    ii. Step Two: If the customer's designated load cannot be served after Step One, then exhaust the customer's other operational generation that is not designated.

        a. Dispatch generation by using dispatch orders provided by the transmission planning personnel of the SPP data reporting members and by representatives of the transmission service customers.

        b. Add generation from behind the meter generating units. This generation consists of behind the meter generation that may

Deleted: Transmission Owners

Deleted: Transmission Owners

not already included in the SPP Model Development Working Group Base Cases.

c. Non-dispatchable wind generation or other generation with operating restrictions or forecasted projections shall not be used.

iii. Step Three: If the customer's designated load cannot be served after Step One and Step Two, Exhaust the Host Transmission Owner's existing generation. These intra-area transfers will be documented in the LSE reports.

a. Dispatch generation by using dispatch orders provided by the transmission planning personnel of the SPP data reporting members and by representatives of the transmission service customers.

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b. Non-dispatchable wind generation or other generation with operating restrictions or forecasted projections shall not be used.

iv. Step Four: If the customer's network load cannot be served after the above steps, exhaust Independent Power Producer's ("IPP") existing generation in the Host Transmission Owner's modeling area.

a. Exhaust IPP generation on a pro rata, as available basis accounting for firm transmission commitments. In other words, Use power from each IPP to meet the customer's designated load. The amount of power from each IPP will be determined using the total amounts available based on the IPP's historical generating levels minus the amount of power to model existing transmission service from the IPP.

b. Non-dispatchable wind generation or other generation with operating restrictions or forecasted projections shall not be used.

v. Step Five: Finally, if a customer's network load cannot be served after applying the above steps, exhaust existing primary modeling area generation with includes IPP's existing generation and existing primary modeling area generation.

a. Similar to Step Four, exhaust this generation on a pro rata, as available basis for firm transmission commitments. The amount of power from each IPP and from each primary modeling area generation will be determined using the total amounts available based on the maximum generating levels minus the amount of power to model existing transmission service from the IPP and primary modeling area generation.

b. Non-dispatchable wind generation or other generation with operating restrictions or forecasted projections shall not be used.

3. ITP 10 Year and 20 Year - The studies will use ESWG approved resource plans and futures for the SPP region.