Southwest Power Pool

MODEL IMPROVEMENT TASK FORCE

October 19, 2011

1:30 P.M. – 2:30 P.M.

Teleconference

• M I N U T E S •

The following Model Improvement Task Force (MITF) members were in attendance:

Travis Hyde – Oklahoma Gas & Electric (OGE)
Mike Clifton – Oklahoma Gas & Electric (OGE)
Don Taylor – Westar Energy (WR)
John Fulton – Southwestern Public Service (SPS)
Dustin Betz – Nebraska Public Power District (NPPD)

The following guests were also in attendance:

Jason Shook – GDS Associates (GDS)
Nathan McNeil – Midwest Energy (MIDW)

Southwest Power Pool Staff in attendance included Kelsey Allen (Secretary), Scott Jordan, and Mitch Jackson.

Agenda Item 1 - Administrative

Travis Hyde called the meeting to order at 1:30 p.m.

Agenda Item 2 – MITF White Paper Update

The group reviewed the updates made to Section 1.A. of the MITF White Paper and the corresponding Appendix C addition. The language was changed slightly from the posted draft.

Don Taylor moved to adopt the SPP MITF White Paper as amended and forward the updated document to the MDWG (**Attachment 1 - Model Improvement White Paper_draft 20110913_MITF Approved.doc**). Mike Clifton seconded the motion. The motion passed unopposed.

Agenda Item 3 – Modeling Timeline Discussion

Staff presented the proposed transition schedule for the 2012 Series MDWG Model Build. The schedule consists of removing the second build of the powerflow model set

and developing the short circuit model set in conjunction with build 1. It also proposes adding projects slated to receive an NTC for the current ITP studies offline during the second pass as the project selection process should be nearing an end. Staff feels that these changes will help bring focus to and improve the major annual build on which internal SPP study models are based.

Don Taylor and John Fulton again expressed concern about outdated load forecasts in a Build 1 model if that were the only build supported by the MDWG. Don mentioned that Westar updates load forecast for internal studies anyway. John argued that SPP and its membership would still be in the same boat with SPP TPL assessments being different from internal membership TPL assessments.

John suggested the idea of a Build 1.5 to allow for member updates of load forecast data in the April timeframe. Staff argued that waiting for any build after the end of Build 1 would delay all study processes.

After discussion, the group agreed that ITP study IDEVs should be used to update the build 1 model set during the final pass (pass 3) and acknowledged staff's desire to transition to a single annual MDWG model build.

Don Taylor moved that the group adopt the 2012 MDWG Powerflow Model Development transition schedule as presented, including NTC projects (being developed in the current ITP Near-Term study) as late as possible in Pass 3. The motion passed with no opposition and no abstention.

Discussion continued with the stability model development schedule. Staff acknowledged and agreed that the ultimate goal should be to remove a third party dynamics coordinator from the stability model development process but in order to transition effectively feels that a period of education with the current contractor needs to occur during the 2012 series build. Concern about the timeliness of publication of the model set was expressed and it was suggested that the process begin earlier in the December time frame. Staff agreed.

Don Taylor moved that SPP look at reuse of the previous year's external dynamic reduction to facilitate an initialization of a current set of stability cases to have models available by the end of the first quarter 2012. John Fulton seconded the motion. The motion passed with no opposition and no abstention.

Agenda Item 4 – Stability Load Modeling

Don Taylor presented a piece of the comprehensive analysis of the Westar Blackstart Plan performed by Siemens PTI related to dynamic load composition. This suggested a standard for stability load modeling in terms of % of large and small motors, discharge lighting and constant power. Don asked the

The group concluded that dynamic load composition varies with each region and varies bus by bus within that region. This issue will be addressed by the newly formed stability task force.

Agenda Item 5 – Closing Administrative Duties

With no further business to discuss, the meeting was adjourned at 2:35 p.m.

Respectfully Submitted,

Kelsey Allen
MITF Secretary

SPP Model Improvement White Paper

Prepared by: Model Improvement Task Force

Formatted: Left

Version History

Formatted: Font: 14 pt

Approved by Model Development Working Group:	**October 4, 2010**
Approved by Transmission Working Group:	**October 18, 2010**
Section 1.A. Updated by the MITF:	**September, 2011**

Table of Contents

Formatted: Font: Bold

Formatted: Font: Bold

Formatted: Font: Bold

Deleted: History and Background . 3¶
Purpose and Objective . 3¶
1. Modeling Data Requirements . 3¶
A. Uniform Generation Modeling . 3¶
B. Uniform Load Modeling . 4¶
C. Stability Load Modeling . 4¶
D. Explicit Modeling of Reactive Control Devices . 4¶
E. Identification of Generation Types . 4¶
2. Detailed Reporting and Data Synching . 5¶
A. Joint-Owned Unit Coordination and Reports . 5¶
B. Delivery Point Changes and Load Owner Reports . 5¶
C. MDWG Transaction Improvement . 6¶
3. Modeling Methods . 6¶
A. Forecasting of Rollover Rights . 6¶
B. Modeling New Generation and Transmission Projects . 7¶
C. Review, Expansion, and Implications of MOD Project Types . 7¶
D. Modeling Projects in MOD before the RTO Need Date . 8¶
4. Data Errors and Coordination . 8¶
A. Improve Identification of Major Model Changes and Errors . 8¶
B. Improve Regional Data Coordination and Checks . 8¶
C. Coordination Between G.I. and Modeling . 9¶
D. Model Sharing Instructions . 9¶
E. Auxiliary Files Coordination and Organization . 10¶
5. Uniform Generation Dispatch . 10¶
A. Generation Dispatch Coordination and Expansion . 11¶
B. LSEs That Cannot Meet Their Load . 11¶
C. Determining Generation and NSI Profiles . 12¶

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.
- ✓ 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 PMAX should be modeled as a gross value with auxiliary load modeled explicitly for machines greater than 20 MVA or plants with an aggregate capacity greater than 20 MVA. Otherwise, auxiliary load should be netted with generator gross capability.
  - o Location of generator auxiliary load should be modeled accurately or approximated by one of the modeling methods described in Appendix C.
    - ▪ Option 2 of Appendix C is the generic preferred method for combined cycle plants.
    - ▪ Option 3 of Appendix C is the generic preferred method for other fuel types.

Deleted: Net c

Deleted: should be

Deleted: included in net capability of units

Formatted

Formatted

Deleted: .

- Complex power load requirements should be modeled as maximum, regardless of seasonal generator output. This provides for a more conservative analysis and allows for special application in the event generator capability needs to be netted with auxiliary load.
- For generator auxiliary load not modeled on the generator bus, reports shall be provided detailing the bus number and ID for auxiliary load associated with each generator or plant in order for auxiliary load to be netted with generator capability in special applications.

✓ Ownership assignments shall be modeled with each machine.

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.
  - 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.
  - 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 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.

Formatted

Deleted: If an individual member company prefers to model gross generator capability,

Deleted: section

- ✓ 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.
- ✓ 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.

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.

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

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

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.
- ✓ 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

- 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.

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.
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.
  - This python script developed for the MMWG produces reports of errors and warnings for review by each transmission owner.
  - 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.*

- 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.

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.
  - Load and losses are not separated in the reports as they are in the powerflow models.
  - 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.

Deleted: ¶
Page Break

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.

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.

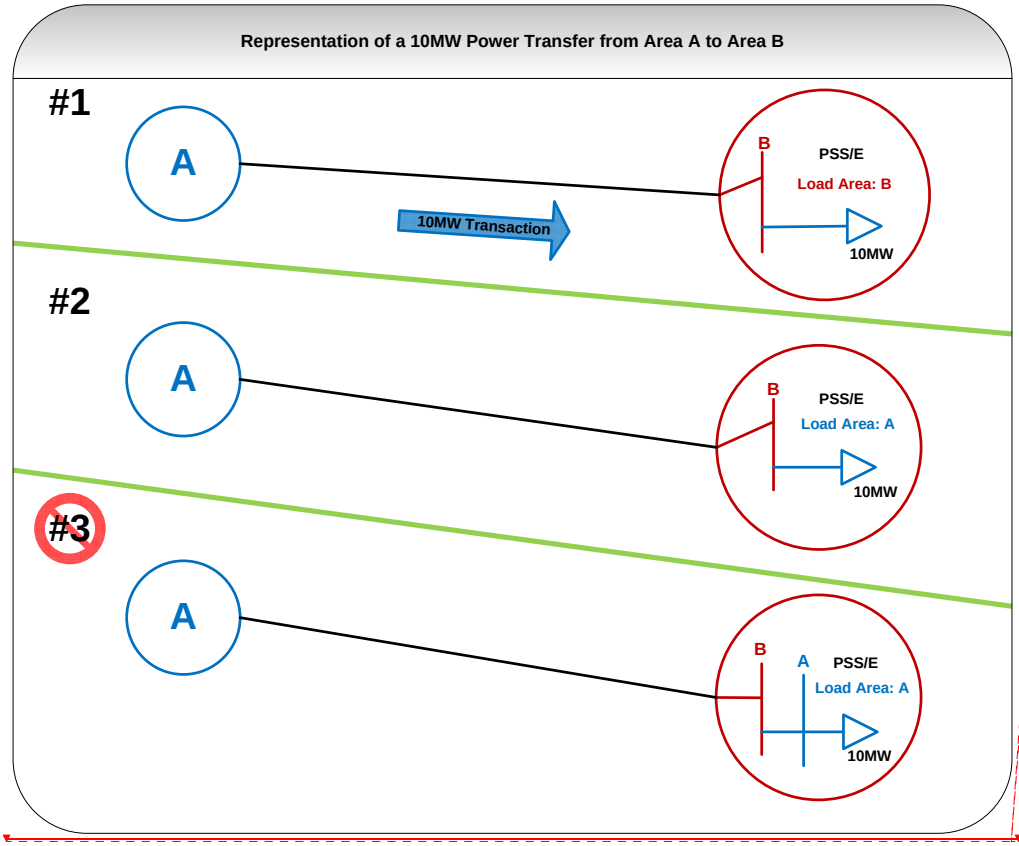
Benefit: Applying these processes at the MDWG level will save both staff and members time in creating and verifying generation and NSI profiles.

Appendix A

Formatted: Heading 1, Left, Don't adjust space between Latin and Asian text

Formatted: Width: 612 pt, Height: 792 pt

External Load Modeling Methods



Deleted: Area "A" serving load existing in Area "B"¶
<sp>

Deleted: <sp>

Appendix B

Formatted: Heading 1, Left, Don't adjust space between Latin and Asian text

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

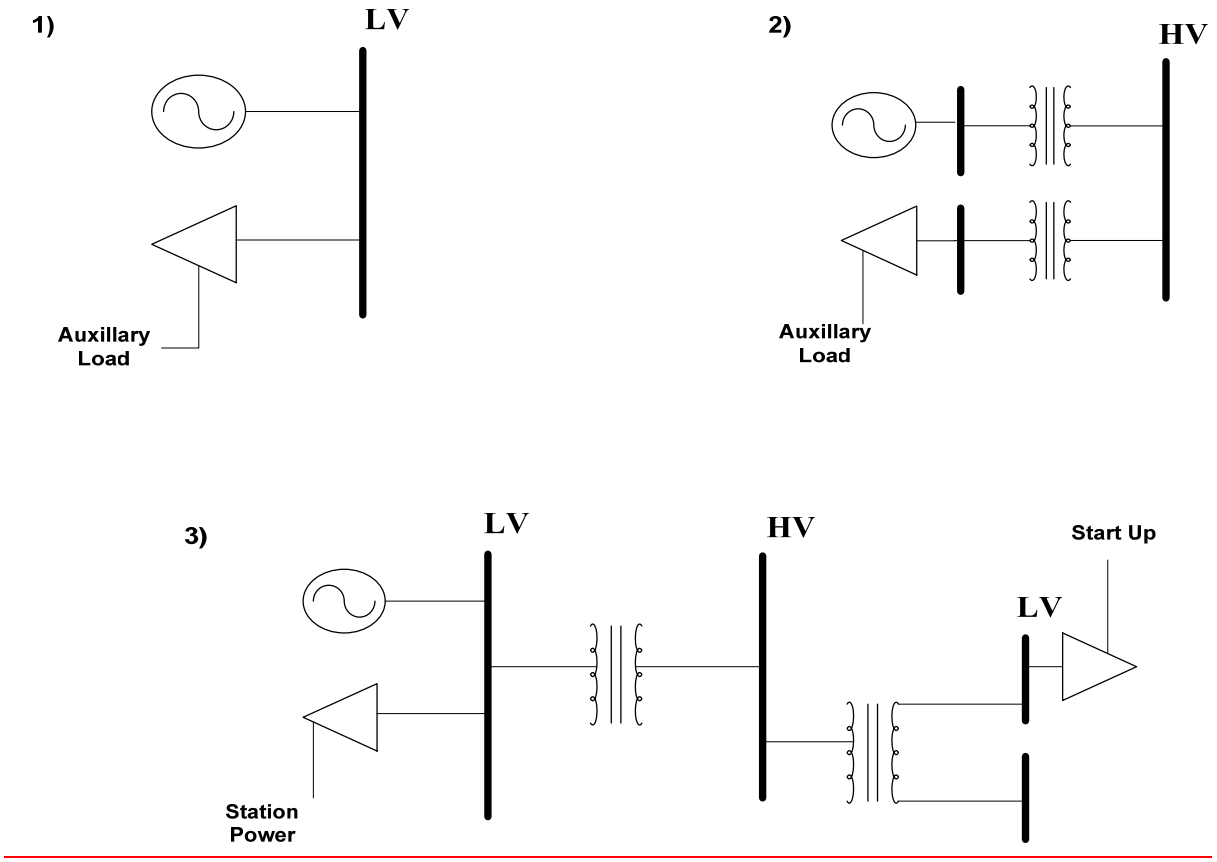
iv. Step Four: If the customer's network load cannot be served after the above steps, exhaust Independent Power Producer's ("IPP") existing generation in the Host Transmission Owner's modeling area.
   a. Exhaust IPP generation on a pro rata, as available basis accounting for firm transmission commitments. 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.

Appendix C

Generator Auxiliary Load Modeling



Formatted: Heading 1, Left, Don't adjust space between Latin and Asian text

Formatted: Section start: New page, Width: 792 pt, Height: 612 pt

Formatted: Centered