
Revision History

Date or Version Number	Author	Change Description	Comments
11/18/2014	Staff	Initial Draft	
12/18/2013	Staff	Modified during TWG Net Conference	Requested additional language on definition of reliability need in CBA scenario
12/20/2013	Staff	Added language to CBA section	
01/03/2014	Staff	TWG Approval	

Table of Contents

Revision History	1
Overview	3
Objective	4
Data inputs	5
A. <i>Load</i>	5
B. <i>Generation Resources</i>	5
C. <i>Model Topology</i>	5
D. <i>Transmission Service</i>	5
E. <i>Consolidated Balancing Authority</i>	5
F. <i>Demand Response</i>	6
Analysis	7
A. <i>Steady state assessment</i>	7
B. <i>Solution development</i>	7
C. <i>Shunt reactive requirements assessment</i>	7
D. <i>Stability analysis</i>	7
E. <i>Final reliability assessment</i>	7
Seams	8
Study Process	9
Timeline	10
Deliverables	11
Changes in Process and Assumptions	12

Overview

This document presents the scope and schedule of work for the 2015 Integrated Transmission Planning (ITP) Near-Term (NT) Assessment.

Objective

The third phase of the ITP process is the Near-Term Assessment (ITPNT). The main objectives of 2015 ITPNT are to evaluate the reliability of the SPP transmission system in the near-term planning horizon, collaborate on the development of improvements with stakeholders, and identify necessary upgrades for approval and construction. The 2015 ITPNT's primary focus is identifying solutions required to meet the reliability criteria defined in OATT Attachment O Section III.6. The process will also include coordination of transmission plans with the ITP20, ITP10, Aggregate Study, and Generation Interconnection processes.

The 2015 ITPNT will develop an effective near-term plan for the SPP footprint which identifies solutions to potential issues for system intact and (N-1) conditions using the following principles:

- Identifying potential reliability-based problems (NERC Reliability Standards TPL-001 and TPL-002, SPP and local criteria)
- Utilizing Transmission Operating Guides
- Developing additional mitigation plans including transmission upgrades to meet the region's needs and maintain SPP and local reliability/planning standards

The 2015 ITPNT study horizon will include modeling of the transmission system for six years (i.e. 2020). This will provide enough lead time requirements such that NTC letters can be issued and project owners can begin work in a timely fashion to enable the completion of more complex projects by the identified need date.

The process is open and transparent, allowing for stakeholder input. Study results are coordinated with other entities and regions responsible for transmission assessment and planning. TWG will review and vet components of the 2015 ITPNT process, which includes but is not limited to the following items: model development, reliability analysis, stability analysis, transmission plan development, seams impacts, and 2015 ITPNT Report.

Data inputs

SPP will consider power flow models with individual Balancing Authorities (BA) as well as models with a Consolidated Balancing Authority (CBA Scenario). SPP will use 2015, 2016, and 2020 models in the 2015 ITPNT for the following seasons: 2015 light load, 2015 summer peak, 2016 summer peak, 2020 light load, and 2020 summer peak. Thus, 15 model scenarios will be analyzed as part of the 2015 ITPNT Assessment. The modeling assumptions are detailed in sections below.

A. Load

The load density and distribution for the steady state analysis will be provided through the MDWG model building process¹. The load will represent each individual BA's coincident conditions per season (i.e. non-coincident conditions for the SPP region). Resource obligations will be determined for the footprint taking into consideration what load is industrial, non-scalable type loads and which load grows over time.

B. Generation Resources

Existing generating resources will be represented in the power flow models taking into account planned retirements and retirements. New generating resources included in the power flow models will be limited to resources with a FERC filed Interconnection Agreement not on suspension or resources with an executed Service Agreement. Exceptions to these qualifications are addressed in the ITP Manual.

C. Model Topology

The topology used to account for the transmission system excluding generation will be the current transmission system and the following transmission upgrades: SPP approved for construction upgrades, SPP Transmission Owners' planned (zonal sponsored) upgrades, and first tier entities' planned upgrades (AECI, Entergy, MEC, and WAPA). The model development processes for SPP MDWG and SERC account for long-term transmission line outages as forecasted by each process's member transmission owners.

D. Transmission Service

To account for the confirmed long-term transmission service SPP will develop two scenario models representing individual BAs. The first scenario (S0) contains projected transmission transfers between individual BA's and generation dispatch on the system. The second scenario (S5) contains all confirmed long-term firm transmission service with its necessary generation dispatch.

E. Consolidated Balancing Authority

In order to account for the impacts of the Integrated Marketplace on the SPP footprint a Consolidated Balancing Authority (CBA) scenario model will be developed as part of the 2015 ITPNT Assessment. The CBA scenario will model SPP as a single Balancing Authority and will only model transmission transfers across the SPP seams. The CBA scenario will utilize the SPP

¹ [SPP MDWG Powerflow Procedure Manual](#)

portion of the NERC Book of Flowgates updated with information from the 2014 Flowgate Assessment, 2015 ITPNT transmission topology, and 2015 ITP10 economic dispatch data. The goal will be to attain a security-constrained unit commitment and economic dispatch (SCUC/SCED) for each year and season identified as part of the 2015 ITPNT Assessment. In order to simulate changes that will occur to the SPP portion of the NERC Book of Flowgates due to upgrades coming into service during the defined study period of the 2015 ITPNT Assessment, a constraint assessment will be completed to determine if any constraints should be added, removed, or modified before the SCUC/SCED have been developed. The constraint list will be reviewed and approved by the TWG before being applied to the models.

Making use of the economic data from the 2015 ITP10, an economic DC tool will commit units and produce a dispatch to deliver the most economical power around the constraints approved by the TWG. This unit commitment and dispatch will be the SCUC/SCED that will be applied to the power flow model which will be used to complete the N-1 contingency analysis described in Part A of the Analysis section. The security constrained economic dispatch in the CBA will be applied to the SPP footprint only. The rest of the Eastern Interconnect remained unchanged.

Potential violations identified in the CBA model will be checked against scenario zero and five (S0/S5), by season, based upon criteria approved by the TWG in May 2013. These criteria which make up the definition of a reliability need in the CBA scenario for potential thermal and voltage violations are described as follows:

A potential thermal violation identified in the CBA model exceeding 100% loading of a monitored element's thermal rating and exceeding 95% of the same monitored element's thermal rating in the S0/S5 model.

A potential voltage violation identified in the CBA model is less than 0.90 p.u. and the matching monitored element is less than 0.92 p.u. in the S0/S5 model.

Upgrades identified to mitigate CBA issues, according to the definition of a reliability need in the CBA scenario, will be separately approved by the TWG, MOPC, and Board of Directors.

F. Demand Response

Demand response will be incorporated into the models through lower load and capacity forecasts, which is developed in Subsection A above.

Analysis

A. Steady state assessment

The steady state assessment will use the following models: 2015 light load and summer peak, 2016 summer peak, 2020 summer peak and light load using individual BA dispatch. Staff will also use consolidated Balancing Authority models of these same seasons. An N-1 contingency analysis will be conducted for the peak and off-peak cases for facilities 60 kV and above in SPP and facilities 100 kV above in first-tier. All facilities 60 kV and above in SPP and 100 kV and above in first-tier will be monitored for this analysis in consideration of 60 kV and above solutions to the problems identified.

B. Solution development

SPP will use a pool of possible solutions to evaluate upgrades used to develop the 2015 ITPNT plan. This pool of solutions will come from SPP transmission service studies, generation interconnection studies, previous ITP studies, local reliability planning studies by TOs, Attachment AQ studies, stakeholder input and staff evaluation.

C. Shunt reactive requirements assessment

If any 300 kV and above upgrades are identified as solutions and presented in the 2015 ITPNT Project Plan, line-end reactive requirements analysis will be performed for the new transmission lines greater than 300 kV system. This analysis will be performed on the 2020 light load models by opening each end of the new line to identify preliminary shunt reactive needs. The analysis will provide the amount of MVAR needed to maintain both 1.05 and 1.1 p.u. voltage at both ends of each new line identified. After performing the light load analysis, the reactor will be studied under steady state summer peak conditions to determine if switched capability is needed. This analysis will provide an indicative amount of reactor needs before design level studies are completed. This analysis will be completed with the entire 2015 ITPNT Project Plan included in the model.

D. Stability analysis

SPP will perform stability analysis on the final portfolio of upgrades as part of the 2015 ITPNT Assessment.

E. Final reliability assessment

After all upgrades have been identified and incorporated into the power flow models, a steady state N-1 contingency analysis will be conducted to identify any new issues.

Seams

In the development of 2015 ITPNT, Staff will review expansion plans of neighboring utilities and Regional Transmission Organizations (RTOs) and include first-tier party's planned projects in the 2015 ITPNT models. Based upon that review, Staff may take into account other external plans. The models used in the 2015 ITPNT incorporate the latest data from the neighboring utilities and RTOs through the MMWG model development process.

Potential impacts of the 2015 ITPNT on neighboring systems will be considered. Coordination is done in accordance with existing Seams agreements. For those without an explicit agreement, those neighbors will be contacted in order to discuss the potential impacts of the ITP on their systems.

Study Process

1. The resource additions and retirements, load profiles, and transmission service inclusion processes will be developed through stakeholder reviews.
2. The TWG/MDWG will oversee the development of the models that incorporate the assumptions developed in step #1 above, including review of data and results. A model review will be conducted by MDWG to verify the models before analysis proceeds.
3. An initial steady state analysis will be performed using applicable planning standards on power flow models that represent the applicable load profiles and generation dispatch per year and season. The assessment will be for the horizon years 1-6. Within SPP all facilities 60 kV and above in the models will be monitored and within the first-tier for all facilities 100 kV and above will be monitored in this analysis as a means to determine 60 kV and above solutions in the SPP footprint.
4. With input from stakeholders, 60 kV and above solutions will be developed to mitigate potential criteria violations. Solutions will be coordinated with the Aggregate (AG) and Generation Interconnection (GI) Study processes for the SPP transmission system footprint. An NTC will not be automatically issued for a potential violation identified in the CBA scenario models.
 - a. Since Transmission Operating Guides (TOG) are tools used to mitigate violations in the daily management of the transmission grid, TOGs may be used as alternatives to planned projects and are tested annually to determine effectiveness in mitigating violations. For the purpose of this study, the 2015 ITPNT will identify all solutions where the use of TOGs is deemed not effective.
 - b. A check will be performed to determine if projects identified in the ITP20 or ITP10 assessments will eliminate or defer any projects identified in the 2015 ITPNT.
5. A follow-up analysis will be performed repeating the steps above on the identified solutions to validate the solutions and check for new potential violations.
6. Stability analysis will be performed on the final portfolio of upgrades.

Timeline

The study will begin in January 2014 with final results complete by January 2015. The estimated study timeline is as follows:

	Group to review/endorse	Start Date	Completion Date
Scoping	TWG	November 2013	February 2014
Model Development (S0, S5)	TWG	November 2013	May 2014
Model Development (CBA)*	TWG	February 2014	August 2014
Reliability Assessment (S0, S5)	TWG	June 2014	
Reliability Assessment (CBA)	TWG	September 2014	
Solution Development	TWG	June 2014	December 2014
Final Reliability Assessment	TWG	December 2014	
Review report	TWG	October 2014	December 2014
Final report with recommended plan	TWG	December 2014	January 2015
	MOPC/BOD	January 2015	

*Note: Model Development for the CBA Scenario includes TWG review of constraints to be used in the models

Staff plans to hold stakeholder planning summits at least twice during the 2014 calendar but may hold more as appropriate.

Deliverables

The results from the 2015 ITPNT, which define a set of transmission upgrades needed to meet the near-term needs of the system, will be compiled into a report detailing the findings and recommendations of SPP Staff.

Changes in Process and Assumptions

In order to protect against changes in process and assumptions that could present a significant risk to the completion of the ITPNT, any such changes must be vetted. If TWG votes on any process steps or assumptions to be used in the study, those assumptions will be used for the 2015 ITPNT. Changes to process or assumptions recommended by stakeholders must be approved by the TWG. This process will allow for changes if they are deemed necessary and critical to the ITP, while also ensuring that changes, and the risks and benefits of those changes, will be fully vetted and discussed.