2018 SPP Deliverability Study Scope

SPP Resource Adequacy

REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION	COMMENTS
1/31/2018	SPP Staff	Initial Draft	
3/13/2018	SPP Staff	Incorporated ORWG suggestion	Suggestion to create report with Deliverability Study results
3/20/2018	SAWG	SAWG Approved Deliverability Study Scope	
5/3/2018	ORWG	ORWG endorsed Deliverability Study Scope	

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EXECUTIVE OVERVIEW

The annual Deliverability Study will evaluate and determine the deliverability of each resource registered in the Integrated Marketplace to the SPP Balancing Authority Area, and will allow a Load Responsible Entity (LRE) to rely on available capacity for its Planning Reserve Margin (PRM) portion of its Resource Adequacy Requirement. Capacity purchases by an LRE to satisfy the PRM portion of the Resource Adequacy Requirement will not require firm transmission service to support the capacity. If the LRE's power purchase agreement to satisfy the PRM portion of the Resource Adequacy Requirement also includes capacity needed to serve any portion of its Net Peak Demand, the LRE must secure firm transmission service for such capacity to serve any portion of its Net Peak Demand.

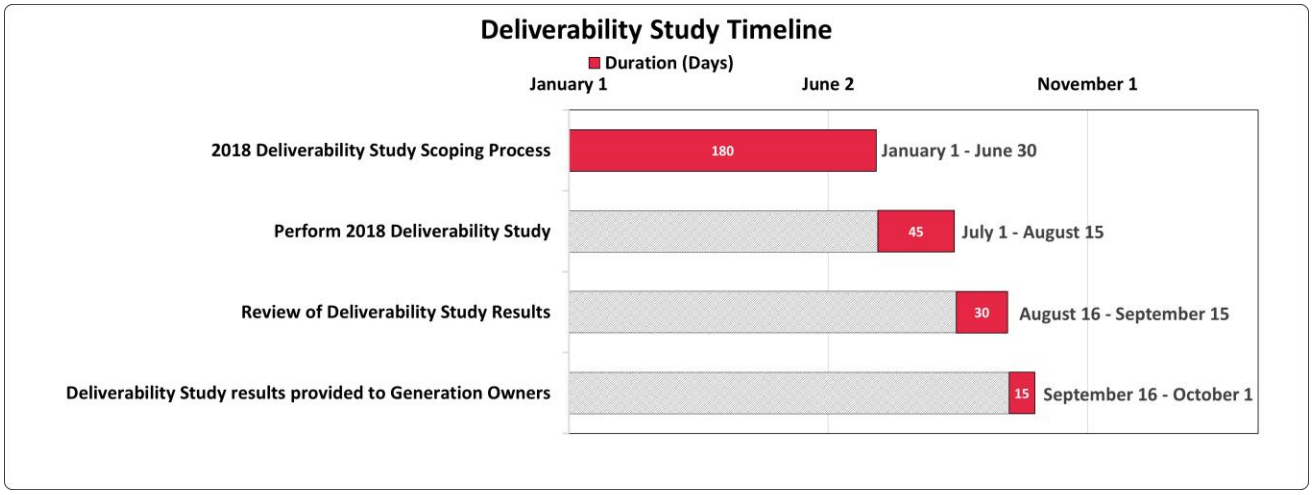
The Deliverability Study process starts with staff defining scope assumptions, which are then thoroughly vetted using the SPP stakeholder process. Once the scope is finalized, input data is collected based on the requirements listed in the scope. The data is then modeled using the appropriate software along with the assumptions for the study. This study will be performed for individual generating plants registered in the SPP Balancing Authority Area while incorporating a First Contingency Incremental Transfer Capability (FCITC) transfer limit analysis. Final metric results are compiled into a summary report and presented to the SPP Supply Adequacy Working Group (SAWG). The results for each plant will be populated in the applicable generator owner's Workbook[1] and provided no later than October 1st.

[1] Example of the Resource Adequacy Workbook is located on SPP.org under the Resource Adequacy home page.

OBJECTIVE

The Deliverability Study will analyze generation registered in the SPP Balancing Authority Area to determine the available capacity deliverable to all demand in the Balancing Authority Area and not to specific delivery points or zones within SPP.

STUDY TIMELINE



Deliverability Study Timeline

1. Develop Deliverability Study scope
2. Perform 2018 Deliverability Study
3. Review Deliverability Study Results
4. Provide Deliverability Study results to Generator Owners

INPUT DATA

SOFTWARE

The Deliverability Study will utilize Transmission Adequacy & Reliability Assessment (TARA) software package from PowerGEM©. TARA is a steady-state power flow software tool with modeling capabilities and analytical applications that extend beyond traditional power flow solution. Using linear (DC) and non-linear (AC) power flow calculations, TARA has the capabilities to perform data checking, N-1reliability analysis, transfer limit calculation, preventive and corrective dispatch, critical facility identification, reactive analysis, outage analysis, model building, and region specific tools for generation deliverability and reserve requirements analysis. The multi-transfer limit function in TARA will be used to perform the Deliverability Study.

BASE MODELS AND TOPOLOGY

SPP staff and stakeholders develop planning models representing specific system conditions as part of the Integrated Transmission Planning Near Term (ITPNT) process[2]. SPP stakeholders submit generator capability data to SPP that reflect the current capability ratings in the planning models. Transmission projects are developed through the ITPNT process to address needs in each model. Based on system conditions, the ITPNT BA model demonstrates expected transmission system flows under a Security Constrained Economic Dispatch (SCED) similar to the Integrated Marketplace dispatch and will be the base model for the Deliverability Study. Additional information about the ITPNT BA model can be found in the ITPNT Scope[3].

The topology included in the Deliverability Study will be for the current year +1 summer peak season. The 2018 Deliverability Study will utilize the 2019 summer season BA model from the 2018 ITPNT model build.

[2] Link to the latest ITP Manual: https://www.spp.org/engineering/transmission-planning/
[3] Link to the latest ITPNT process scope: https://www.spp.org/engineering/transmission-planning/

GENERATOR GROUPING

Each resource will be grouped into plants based on the site and point of interconnection for each resource. In order to capture reliability constraints caused by simultaneously increasing multiple plants in a localized area, additional analysis will be performed in order to group one or more plants together using a methodology based on Power Transfer Distribution Factors (PTDF). Generators connected at 300kV or greater that share PTDF impacts greater than 25% on any transmission element in SPP will be grouped together. Generators connected at less than 300kV that share PTDF impacts greater than 25% on transmission elements will be grouped together.

TRANSFER FILE

The transfer file will be created based on the difference between dispatched capacity and nameplate capacity of the plant. For example, if a plant with the nameplate capacity of 200 MW is dispatched at 150 MW, the amount for the transfer analysis would be 50 MW.

MONITORED AND CONTINGENT ELEMENTS

The monitored and contingent elements will include all SPP transmission facilities 100kV and above as well as first tier transmission facilities 230kV and above.

Known System Operating Limits (SOLs) 69 kV and above will be monitored during the analysis. The SOLs, which are studied in the annual flowgate assessment, will be captured from the most recent book of flowgates.

EXCLUDED CONTINGENCIES

The excluded contingencies will be invalid contingencies reported for the ITPNT process.

STUDY PROCESS AND ASSUMPTIONS SUMMARY

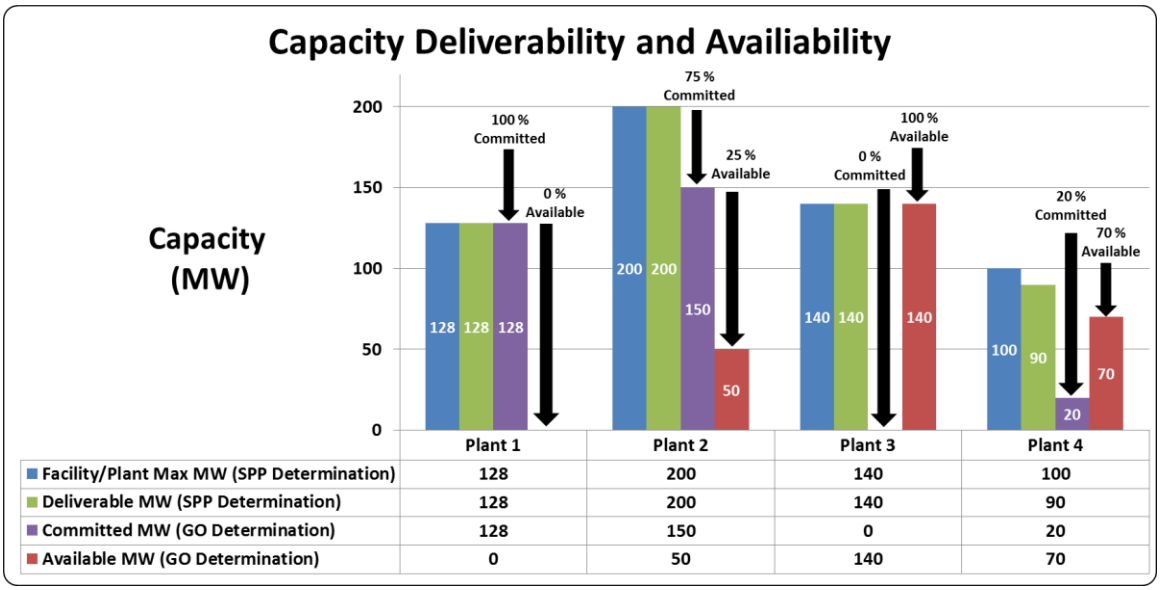
The 2019 summer ITPNT Balancing Authority Area planning model will be used to evaluate deliverability of each group of resources in the Balancing Authority Area. The initial dispatch amount in the base model is automatically deliverable to the SPP Balancing Authority Area since the model dispatches around constraints and sets dispatch amounts for each resource. Each modeled resource that was not committed or dispatched at its maximum is then evaluated to determine the resource's deliverability. The deliverability amount of a plant will be the amount deliverable to the SPP Balancing Authority Area.

A plant's maximum output is the summation of the maximum output of all resources at the same site. Each plant is grouped using the grouping methodology and studied to capture the maximum possible injection at the point of interconnect as opposed to an individual resource analysis that might only identify the deliverability of a plant's largest resource. The transfer amount above the group of resource's initial dispatch will be analyzed as a generation to load transfer sinking to the SPP Balancing Authority Area. As generation is increased for each group of resources, the SPP Balancing Authority Area demand uniformly increases. A FCITC analysis of each transfer will be performed to determine deliverability limits. If the FCITC is equal to the amount of the group of resources when the group is fully deliverable to the SPP Balancing Authority Area. In order to analyze each group of resources individually, the group of resources in each completed transfer analysis will be reduced to their initial dispatch before the next group of resources is analyzed. SPP facilities 100 kV and above will be included in the FCITC analysis. Limits associated with invalid contingencies and Transmission Operating Guides will be excluded as constraints. A three percent (3%) Transfer Distribution Factor (TDF) threshold will be used to analyze constraints impacted by the transfer.

APPLICABILITY

The results from the Deliverability Study indicate the available, but not the committed, capacity of a plant. An LRE may enter into a capacity contract to meet all or part of its PRM portion of the Resource Adequacy Requirement with a Generator Owner that has available capacity not already committed. The Deliverability Study results can only be used to arrange capacity contracts for the Summer Peak Season. The amount of capacity contracted can be eligible for up to two consecutive Summer Peak Seasons[4].

The amount of committed capacity, as determined by the Generator Owner, would be subtracted from the amount determined to be available. This amount will reflect the capacity that could be made available for purchase for the PRM portion of the Resource Adequacy Requirement. Figure 1 shows four different examples of how the amount of available capacity can be determined.



	Plant 1	Plant 2	Plant 3	Plant 4
Facility/Plant Max MW (SPP Determination)	128	200	140	100
Deliverable MW (SPP Determination)	128	200	140	90
Committed MW (GO Determination)	128	150	0	20
Available MW (GO Determination)	0	50	140	70

Figure 1: Chart representation of deliverable, committed, and available capacity

JOINTLY OWNED UNITS (JOU)

Deliverability Study results for each plant will consist of the total plant deliverability percentage and MW amounts without generator ownership percentage breakdown. The

[4] The Summer Peak Season is defined as June 1st to September 30th.

deliverable amount based on percentage of ownership will be determined by each Generator Owner.

REPORTING AND DELIVERABLES

The Deliverability Study scope and results will be reviewed and approved by the Supply Adequacy Working Group with additional review by the Operational Reliability Working Group and the Transmission Working Group.

The Deliverability Study results will be inserted into individual Workbooks for each owner of a Resource and posted no later than October 1. A report incorporating a summary of the 2018 Deliverability Study results will be created and presented to the Supply Adequacy Working Group, Operational Reliability Working Group, and the Transmission Working Group.