



Screening Study SPP-DPT-2012-001

3/15/2012

SPP Engineering, SPP Transmission Service Studies



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Executive Summary

The City of Neligh has requested a screening study to determine the impacts on SPP and first-tier third party facilities due to a Delivery Point Transfer of 7 MW. Third party includes both first-tier neighboring facilities outside SPP and Transmission Owner facilities within SPP that are not under the SPP OATT. The service type requested for this screening study is Delivery Point Transfer (DPT). The period of the service requested is from 4/1/2012 to 4/2/2017.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the DPT request while maintaining system reliability. The service under consideration is for a transfer from NPPD to NPPD and from WAPA to NPPD.

The requested service does not significantly impact facilities on the SPP system. Tables 1 and 2 summarize the results of the screening study analysis for the new source location for the scenarios listed in the table. Table 1 lists SPP and first-tier third party thermal transfer limitations identified. Table 2 lists SPP and first-tier third party voltage transfer limitations identified. Table 3 lists the network upgrades required to mitigate the limitations impacted by this request. Table 4 lists the potential redispatch relief pairs to prevent deferral of service, if applicable.

Introduction

The City of Neligh has requested a screening study to determine the impacts on SPP and first-tier third party facilities for a Delivery Point Transfer of 7 MW. The principal objective of this study is to identify the constraints on the SPP and first-tier third party transmission systems that may limit the requested service and to determine the potential least cost solutions required to alleviate the limiting facilities.

This analysis considers the impact of the request on transmission line and transformer loadings, and bus voltages for outages of single transmission lines, transformers, and generating units, and selected multiple transmission lines and transformers on the SPP and first-tier third party systems for the NPPD to NPPD and WAPA to NPPD transfers.

Study Methodology

Description

The facility study analysis was conducted to determine the impact of the requested service on the SPP and first tier non-SPP control area systems. The analysis was performed to ensure current SPP Criteria and NERC Reliability Standards requirements are fulfilled. SPP conforms to NERC Reliability Standards, which provide strict requirements related to voltage violations and thermal overloads during normal conditions and during a contingency. NERC Standards require all facilities to be within normal operating ratings for normal system conditions and within emergency ratings after a contingency.

Normal operating ratings and emergency operating ratings monitored are Rate A and B in the SPP Model Development Working Group (MDWG) models, respectively. The upper bound and lower bound of the normal voltage range monitored is 105% and 95%. The upper bound and lower bound of the emergency voltage range monitored is 105% and 90%. Transmission Owner voltage monitoring criteria is used if more restrictive. The SPS Tuco 230 kV bus voltage is monitored at 92.5% due to pre-determined system stability limitations. The WERE Wolf Creek 345 kV bus voltage is monitored at 103.5% and 98.5% due to transmission operating procedure.

The contingency set includes all SPP control area branches and ties 69 kV and above; first tier non-SPP control area branches and ties 115 kV and above; any defined contingencies for these control areas; and generation unit outages for the control areas with SPP reserve share program redispatch. The monitor elements include all SPP control area branches, ties, and buses 69 kV and above, and all first tier non-SPP control area branches and ties 115 kV and above. Voltage monitoring was performed for SPP control area buses 69 kV and above.

A 3 % transfer distribution factor (TDF) cutoff was applied to all SPP control area facilities. For first tier non-SPP control area facilities, a 3 % TDF cutoff was applied to AECL, AMRN (Ameren), and ENTR (Entergy) control areas. A 2 % TDF cutoff was applied to WAPA. For voltage monitoring, a

0.02 per unit change in voltage must occur due to the transfer or modeling upgrades to be considered a valid limit to the transfer.

Transmission Request Modeling

Network Integration Transmission Service requests are modeled as Generation to Load transfers in addition to Generation to Generation transfers. Network Integration Transmission Service requests are modeled as Generation to Load transfers in addition to Generation to Generation because the requested Network Integration Transmission Service is a request to serve network load with the new designated network resource, and the impacts on Transmission System are determined accordingly. Generation to Generation transfers are accomplished by developing a post-transfer case for comparison by dispatching the request source and redispatching the request sink.

Transfer Sensitivity Analysis

A sensitivity analysis was used to determine whether the requested service would impact facilities on the SPP system. This sensitivity took into consideration the load flow and system characteristics for the determination of thermal transfer limitations and voltage transfer limitations.

Study Results

Study Analysis Results

Tables 1 and 2 contain the analysis results of the DPT. The tables are attached to the end of this report, if applicable. The tables identify the scenario and season in which the event occurred, the transfer amount studied, the facility control area location, applicable ratings of the thermal transfer limitations and voltage transfer limitations, and the loading percentage and voltage per unit (pu).

Table 1 lists the SPP and first-tier third party thermal transfer limitations caused or impacted by the 7 MW DPT for applicable scenarios. Solutions are identified for the limitations in this table.

Table 2 lists the SPP and first-tier third party voltage transfer limitations caused or impacted by the 7 MW DPT for applicable scenarios. Solutions are identified for the violations in this table.

Table 3 lists the network upgrades required to mitigate the limitations caused or impacted by this request. Engineering and construction costs are provided for assigned upgrades in this table.

Table 4 lists the potential redispatch relief pairs to prevent deferral of service.

Conclusion

The results of the screening study show that limiting constraints do not exist on the SPP system for the 7 MW DPT. No significant impacts were identified for the requested term of this DPT. Since no additional limitations were identified, the request will be accepted. Once the request has been confirmed, SPP will issue a service agreement.

Table 1 - SPP Facility Thermal Transfer Limitations

Scenario	Season	From Area	To Area	Monitored Branch Over 100% Rate B	Base Case Loading (%)	Transfer Case Loading (%)	TDF (%)	Outaged Branch Causing Overload	Upgrade Name	Solution
				None						

Table 2 - SPP Facility Voltage Transfer Limitations

Scenario	Season	Area	Monitored Bus with Violation	Post-transfer Voltage (PU)	Outaged Branch Causing Overload	Upgrade Name	Solution
			None				

Table 3 - Upgrade Requirements and Solutions Needed

Transmission Owner	Upgrade	Solution	Earliest Date Upgrade Required (DUN)	Estimated Date of Upgrade Completion (EOC)	NTC
	None				

Table 4 - Potential Redispatch Relief Pairs to Prevent Deferral of Service

Limitations were not identified; therefore, redispatch was not calculated.