



SPP *Southwest
Power Pool*

*Screening Study
SPP-DPT-2010-003
OASIS Request #74475378
From MPS to WR*

*For a Reserved Amount of 1 MW
From 10/1/2010
To 6/1/2016*

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1. Executive Summary

KCPS has requested a screening study to determine the impacts on SPP and first-tier third party facilities due to a transfer of 1 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 10/1/2010 to 6/1/2016.

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 results of OASIS request number 1214263 in the 2007-AG1 Aggregate Study have been relied upon in the analysis of this DPT request. An analysis was conducted on the planning horizon from 10/1/2010 to 6/1/2016.

The details of the 2007-AG1 study can be found in the report posted on SPP's OASIS.

2. Introduction

KCPS has requested a screening study to determine the impacts on SPP and first-tier third party facilities for a Delivery Point Transfer of 1 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.

This study includes steady-state contingency analysis (PSS/E function ACCC). The steady-state 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.

The groups and scenarios used for the study can be found in the report for 2007-AG1 posted on SPP's OASIS.

3. Study Methodology

A. Description

The screening study analysis was conducted to determine the steady-state impact of the requested service on the SPP and first-tier third party control area systems. The steady-state analysis was done to ensure current SPP Criteria and NERC Planning Standards requirements are fulfilled. The Southwest Power Pool conforms to the NERC Planning Standards, which provide the strictest requirements, related to voltage violations and thermal overloads during normal conditions and during a contingency. It requires that all facilities 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 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 third party 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 third party control area branches and ties 115 kV and above with the exception of ENTR in which ENTR flowgates were monitored. 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 third party control area facilities, a 3 % TDF cutoff was applied to AECl, AMRN, and ENTR and a 2 % TDF cutoff was applied to MEC, NPPD, and OPPD. 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.

B. Model Updates

For the model series and seasons used for the study, refer to the posted report for 2007-AG1.

C. Transmission Request Modeling

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.

D. Transfer Analysis

Using the selected cases both with and without the requested transfers modeled, the PSS/E Activity ACCC was run on the cases and compared to determine the facility overloads caused or impacted by the transfer. Transfer distribution factor cutoffs (SPP and first-tier) and voltage threshold (0.02 change) were applied to determine the impacted facilities. The PSS/E options chosen to conduct the analysis can be found in Appendix A.

4. Study Results

A. Study Analysis Results

It was determined that the results of OASIS # 1214263 posted in 2007-AG1 are valid for the requested DPT study. Refer to the posted report for 2007-AG1 for the analysis results.

5. Conclusion

The results of the screening study relied on the results posted for equest 1214263 in the 2007-AG1 study for the 1 MW DPT. No new 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 revised service agreement to indicate a start date of 10/1/2010.

6. Appendix A

PSS/E CHOICES IN RUNNING LOAD FLOW PROGRAM AND ACCC

BASE CASES:

Solutions - Fixed slope decoupled Newton-Raphson solution (FDNS):

- Tap adjustment – Stepping
- Area interchange control – Tie lines and loads
- VAR limits – Apply immediately
- Solution options - Phase shift adjustment
 - _ Flat start
 - _ Lock DC taps
 - _ Lock switched shunts

ACCC CASES for system intact:

Solutions – AC contingency checking (ACCC):

- MW mismatch tolerance – 0.5
- Contingency case rating – Rate A
- Percent of rating – 100
- Output code – Summary
- Min flow change in overload report – 3 MW
- Excluded cases w/ no overloads form report – YES
- Exclude interfaces from report – NO
- Perform voltage limit check – YES
- Elements in available capacity table – 60000
- Cutoff threshold for available capacity table – 99999.0
- Min. contingency case voltage change for report – 0.02
- Sorted output – None

Newton Solution:

- Tap adjustment – Stepping
- Area interchange control – Tie lines and loads
- VAR limits - Apply automatically
- Solution options - Phase shift adjustment
 - _ Flat start
 - _ Lock DC taps
 - _ Lock switched shunts

ACCC CASES for branch and transformer contingencies:

Solutions – AC contingency checking (ACCC):

- MW mismatch tolerance – 0.5
- Contingency case rating – Rate B
- Percent of rating – 100
- Output code – Summary
- Min flow change in overload report – 3mw
- Excluded cases w/ no overloads form report – YES
- Exclude interfaces from report – NO
- Perform voltage limit check – YES

- Elements in available capacity table – 60000
- Cutoff threshold for available capacity table – 99999.0
- Min. contingency case voltage change for report – 0.02
- Sorted output – None

Newton Solution:

- Tap adjustment – Stepping
- Area interchange control – Tie lines and loads
- Solution options - X Phase shift adjustment
 - _ Flat start
 - _ Lock DC taps
 - _ Lock switched shunts

ACCC CASES for generator contingencies (largest machine at a bus):

Solutions – AC contingency checking (ACCC):

- MW mismatch tolerance – 0.5
- Contingency case rating – Rate B
- Percent of rating – 100
- Output code – Summary
- Min flow change in overload report – 3mw
- Excluded cases w/ no overloads form report – YES
- Exclude interfaces from report – NO
- Perform voltage limit check – YES
- Elements in available capacity table – 60000
- Cutoff threshold for available capacity table – 99999.0
- Min. contingency case voltage change for report – 0.02
- Sorted output – None

Newton Solution:

- Tap adjustment – Stepping
- Area interchange control – Disabled
- Var limits - Apply automatically
- Solution options - X Phase shift adjustment
 - _ Flat start
 - _ Lock DC taps
 - _ Lock switched shunts