



***System Impact Study SPP-2002-069
For Transmission Service
Requested By
Kansas Municipal Energy Agency***

From EMDE To WRGS

***For a Reserved Amount Of 3 MW
From 7/1/02
To 7/1/03***

SPP Coordinated Planning

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1. Executive Summary

Kansas Municipal Energy Agency (KMEA) has requested a system impact study for long-term Firm Point-to-Point transmission service from EMDE to WRGS. The period of the transaction is from 7/1/02 to 7/1/03. The request is for OASIS reservation 351751 for 3 MW. OASIS reservation 351751 is a renewal of a grandfathered agreement that expires on 6/30/02.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 3 MW transfer while maintaining system reliability.

New overloads caused by the 3 MW transfer were identified along with determining the impact of the transfer on any previously assigned and identified facilities.

Because existing grandfathered service will continue to be used to deliver service to Westar's border with Empire, only overloads inside the Westar Energy control area are considered.

No facilities in the Westar Energy control area restrict the requested EMDE to WRGS 3 MW transfer for the transaction period; therefore, the reservations will be accepted for the transaction period of 7/1/02 to 7/1/03.

2. Introduction

Kansas Municipal Energy Agency (KMEA) has requested an impact study for transmission service from EMDE to WRGS.

The principal objective of this study is to identify the restraints on the SPP Regional Tariff System that may limit the transfer to less than 3 MW. This study includes steady-state contingency analyses (PSS/E function ACCC) and Available Transfer Capability (ATC) analyses.

The steady-state analyses consider the impact of the 3 MW transfer on transmission line loading and transmission bus voltages for outages of single and selected multiple transmission lines and transformers on the SPP system.

3. Study Methodology

A. Description

Two analyses were conducted to determine the impact of the 3 MW transfer on the system. The first analysis was conducted to identify any new overloads caused by the 3 MW transfer. The second analysis was done to ensure that available capacity exists on previously identified circuits.

The first analysis was to study the steady-state analysis impact of the 3 MW transfer on the SPP system. The second step was to study Available Transfer Capability (ATC) of the facilities identified in the steady-state analysis impact. The steady-state analysis was done to ensure current SPP Criteria and NERC Planning Standards requirements are fulfilled. The Southwest Power Pool (SPP) conforms to the NERC Planning Standards, which provide the strictest requirements, related to thermal overloads with a contingency. It requires that all facilities be within emergency ratings after a contingency.

The second analysis was done to determine the impact of the transfer on previously assigned and identified facilities.

B. Model Updates

SPP used thirteen seasonal models to study the EMDE to WRGS 3 MW transfer. The SPP 2002 Series Cases: 2002 Summer Peak, 2002 Fall, 2002/03 Winter Peak, 2003 April Minimum, 2003 Spring, 2003 Summer Peak, 2003 Fall, 2003/04 Winter Peak, 2004 Spring, 2005 Summer Peak, 2005/06 Winter Peak, 2008 Summer Peak, and 2008/09 Winter Peak were used to study the impact of the 3 MW transfer on the SPP system. Due to the FERC's recent ruling in the Exelon v. SPP case (Docket ER02-86), all long-term requests for firm service are studied to the end of the planning horizon.

The chosen base case models were modified to reflect the most current modeling information. The cases were modified to reflect future firm transfers during the request period that were not already included in the January 2002 base case series models.

C. Transfer Analysis

Using the created models and the ACCC function of PSS/E, single and select double contingency outages were analyzed. Then full AC solution was used to obtain the most accurate results possible. Any facility overloaded, using MVA ratings, in the transfer case and not overloaded in the base case was flagged. The PSS/E options chosen to conduct the Impact Study analysis can be found in Appendix A.

4. Study Results

A. Study Analysis Results

Tables 1, 2, and 3 contain the analysis results of the System Impact Study. The tables identify the seasonal case in which the event occurred; the emergency rating of the overloaded circuit (Rate B), the contingent loading percentage of circuit with and without the studied transfer, the estimated ATC value using interpolation if calculated, any SPP identification or assignment of the event, and any solutions received from the transmission owners.

Table 1 shows the new Westar Energy facility overloads caused by the 3 MW transfer. Available solutions are given in the table.

Table 2 documents overloads on Non-Westar Energy SPP Regional Tariff participants' transmission systems caused by the 3 MW transfer.

Table 3 documents the 3 MW transfer impact on previously assigned and identified Westar Energy facilities. Available solutions are given in the table.

Table 1 – Westar Energy Facility Overloads caused by the EMDE to WRGS 3MW Transfer

| Study Year | From Area - To Area | Branch Over 100% Rate B | Rate B | BC % Loading | TC % Loading | Outaged Branch Causing Overload | ATC (MW) | Solution |
|------------|---------------------|---|--------|--------------|--------------|---|----------|----------------------------------|
| 02SP | | NONE | | | | | 3 | |
| 02FA | | NONE | | | | | 3 | |
| 02WP | | NONE | | | | | 3 | |
| 03AP | | NONE | | | | | 3 | |
| 03G | | NONE | | | | | 3 | |
| 03SP | WERE-WERE | HALSTEAD TO MUD CREEK JCT 69KV 57736 HALSTED269 TO 57744 MUDCRKJ269 | 59 | 100 | 100.1 | MOUNDRIDGE 138/69/13.2KV TR 57013 MOUND4138 TO 57742 MOUND269 TO 57095 MOUNDR1113.2 CKT 1 | 3 | exclude due to Westar Op. Guide. |
| 04G | | NONE | | | | | 3 | |
| 05SP | | NONE | | | | | 3 | |
| 05WP | | NONE | | | | | 3 | |
| 08SP | | NONE | | | | | 3 | |
| 08WP | WERE-WERE | MOCKINGBIRD HILL SW ST TO STULL SW ST, 115KV 57253 MOCKBRD3115 TO 57270 STULLT3115 CKT1 | 92 | 100 | 101.2 | STRANGER CREEK 345/115/14.4KV TR 56772 STRANGR7345 TO 57268 STRANGR3115 TO 56811 STRANGR114 CKT 1 | 3 | exclude due to Westar Op. Guide. |

Table 2 – Non – Westar Energy Facility Overloads caused by the EMDE to WRGS 3MW Transfer

| Study Year | From Area - To Area | Branch Over 100% Rate B | Rate B | BC % Loading | TC % Loading | Outaged Branch Causing Overload |
|------------|---------------------|--|--------|--------------|--------------|---|
| 02SP | | NONE | | | | |
| 02FA | | NONE | | | | |
| 02WP | | NONE | | | | |
| 03AP | | NONE | | | | |
| 03G | | NONE | | | | |
| 03SP | | NONE | | | | |
| 04G | | NONE | | | | |
| 05SP | EMDE-EMDE | SUB 124-AURORA H.T. 161/69/12.5KV TR 59468 AUR124 5161 TO AURORA3 | 41.7 | 100 | 101.1 | MONETT-SUB 383 161/69/12.5KV TR 59480 MON383 5161 TO 59591 MON383 269 TO 59712 MON383 112.5 CKT1 |
| 05WP | | NONE | | | | |
| 08SP | | NONE | | | | |
| 08WP | | NONE | | | | |

Table 3 – Previously Assigned and Identified SPP Facilities Impacted by the EMDE to WRGS 3MW Transfer

| Study Year | From Area - To Area | Branch Over 100% Rate B | Rate B | BC % Loading | TC % Loading | Outaged Branch Causing Overload | ATC (MW) | identified |
|------------|---------------------|---|--------|--------------|--------------|--|----------|--------------|
| 02SP | | NONE | | | | | 3 | |
| 02FA | | NONE | | | | | 3 | |
| 02WP | | NONE | | | | | 3 | |
| 03AP | | NONE | | | | | 3 | |
| 03G | | NONE | | | | | 3 | |
| 03SP | | NONE | | | | | 3 | |
| 04G | | NONE | | | | | 3 | |
| 05SP | | NONE | | | | | 3 | |
| 05WP | | NONE | | | | | 3 | |
| 08SP | | NONE | | | | | 3 | |
| 08WP | WERE-WERE | EVANS ENERGY CENTER NORTH TO CHISHOLM 138KV 57040 EVANS N4 138 to 57035 CHISLHM4 138 CKT 1 | 382 | 103.7 | 103.8 | EVANS ENERGY CENTER SOUTH TO LAKERIDGE 138KV 57041 EVANS S4 138 to 57053 LAKERDGM4 138 CKT1 | 0 | SPP-2000-109 |

5. Conclusion

The requested 3 MW of firm point-to-point transmission service was studied from the start date of the request to the end of the planning horizon.

No facilities in the Westar Energy control area restrict the requested EMDE to WRGS 3MW transfer for the transaction period of 7/1/02 to 7/1/03; therefore the reservations will be accepted for the transaction period.

The previously identified overload of Evans Energy Center North to Chisholm 138kV facility limits the ATC to zero in 2008/09 Winter Peak. The overload of Sub 124-Aurora H.T. 161/69/12.5kV Transformer limits the ATC to zero in 2005 Summer Peak.

Appendix A

PSS/E CHOICES IN RUNNING LOAD FLOW PROGRAM AND ACCC

BASE CASES:

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

1. Tap adjustment – Stepping
2. Area interchange control – Tie lines only
3. Var limits – Apply immediately
4. Solution options - Phase shift adjustment
 - Flat start
 - Lock DC taps
 - Lock switched shunts

ACCC CASES:

Solutions – AC contingency checking (ACCC)

1. MW mismatch tolerance – 0.5
2. Contingency case rating – Rate B
3. Percent of rating – 100
4. Output code – Summary
5. Min flow change in overload report – 1mw
6. Excl'd cases w/ no overloads form report – YES
7. Exclude interfaces from report – NO
8. Perform voltage limit check – YES
9. Elements in available capacity table – 60000
10. Cutoff threshold for available capacity table – 99999.0
11. Min. contng. case Vltg chng for report – 0.02
12. Sorted output – None

Newton Solution:

1. Tap adjustment – Stepping
2. Area interchange control – Tie lines only
3. Var limits - Apply automatically
4. Solution options - Phase shift adjustment
 - Flat start
 - Lock DC taps
 - Lock switched shunts