



# **SPP** *Southwest Power Pool*

***System Impact Study SPP-2002-018  
For Transmission Service  
Requested By  
Aquila Energy Marketing  
Corporation***

***From AEPW To ERCOTE***

***For a Reserved Amount Of 200 MW  
From 6/1/02  
To 6/1/03***

***SPP Coordinated Planning***

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## **1. Executive Summary**

Aquila Energy Marketing Corporation (AEMC) has requested a system impact study for long-term Firm Point-to-Point transmission service from AEPW to ERCOTE. The period of the transaction is from 6/1/02 to 6/1/03. The request is for OASIS reservation 338087, 338088, 338089 and 338090 totaling 200 MW. OASIS reservation 338087, 338088, 338089, and 338090 are the renewals of OASIS reservation 316432, 316430, 316429, and 316428 respectively.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 200 MW transfer while maintaining system reliability.

New overloads caused by the 200 MW transfer were identified along with determining the impact of the transfer on any previously assigned and identified facilities.

No facilities in SPP restrict the requested AEPW to ERCOTE 200 MW transfer; therefore the reservations will be accepted.

## **2. Introduction**

Aquila Energy Marketing Corporation (AEMC) has requested an impact study for transmission service from AEPW to ERCOTE.

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 200 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 200 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 200 MW transfer on the system. The first analysis was conducted to identify any new overloads caused by the 200 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 200 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 five seasonal models to study the AEPW to ERCOTE 200 MW transfer. The SPP 2002 Series Cases: 2002 Summer Peak, 2002 Fall Peak, 2002/03 Winter Peak, 2003 April Minimum, and 2003 Spring Peak were used to study the impact of the 200 MW transfer on the SPP system during the transaction period of 6/1/02 to 6/1/03.

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 SPP facility overloads caused by the 200 MW transfer. Available solutions are given in the table.

Table 2 documents overloads on Non SPP Regional Tariff participants' transmission systems caused by the 200 MW transfer.

Table 3 documents the 200 MW transfer impact on previously assigned and identified SPP facilities. Available solutions are given in the table.

**Table 1** – SPP Facility Overloads caused by the AEPW to ERCOTE 200 MW Transfer

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Solution
02SP		NONE					200	
02FA		NONE					200	
02WP		NONE					200	
03AP		NONE					200	
03G		NONE					200	

**Table 2** – Non - SPP Facility Overloads caused by the AEPW to ERCOTE 200 MW Transfer

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload
02SP		NONE				
02FA		NONE				
02WP	AECI-AECI	96120 5THMHIL 161 TO 96126 5MOBTAP 161 CKT 1	386	99.9	100.1	96044 7MCCRED 345 TO 96049 7THOMHL 345 CKT 1 96043 7KINGDM 345 TO 96044 7MCCRED 345 CKT 1
03AP		NONE				
03G		NONE				

**Table 3** – Previously Assigned and Identified SPP Facilities Impacted by the AEPW to ERCOTE 200 MW Transfer

Study Year	From Area To Area	Branch Over 100% Rate B	Rate B	BC %Loading	TC %Loading	Outaged Branch That Caused Overload	ATC	Assignment
02SP		NONE					200	
02FA		NONE					200	
02WP		NONE					200	
03AP		NONE					200	
03G		NONE					200	

## **5. Conclusion**

The requested 200 MW of firm point-to-point transmission service was studied for the time period of the request (6/1/02-6/1/03).

No facilities in SPP restrict the requested AEPW to ERCOTE 200 MW transfer; therefore the reservations will be accepted.



## 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