



# **SPP** *Southwest Power Pool*

***System Impact Study SPP-2001-193  
For Transmission Service  
Requested By  
Tex-La Electric Cooperative of  
Texas, Inc.***

***From AEPW to ERCOTE***

***For a Reserved Amount Of 41MW  
From 1/1/02  
To 1/1/07***

***SPP Transmission Planning***

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## **1. Executive Summary**

Tex-La Electric Cooperative of Texas, Inc. 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 1/1/02 to 1/1/07. The request is for reservation 256409 for 41MW.

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 41MW.

This study found no constraints limiting the 41MW transfer.

The import capability of ERCOTE is 600MW. With the 41MW transfer, this limit has been met through 6/01/2002.

## **2. Introduction**

Tex-La Electric Cooperative of Texas, Inc has requested an impact study for transmission service from AEPW control area with a sink of 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 41MW. This study includes steady-state contingency analyses (PSS/E function ACCC) and Available Transfer Capability (ATC) analyses.

The steady-state analysis considers the impact of the 41MW transfer on transmission line loading and transmission bus voltages for outages of single and selected multiple transmission lines and transformers on the SPP system.

ATC analyses shows the amount of First Contingency Incremental Transfer Capabilities (FCITC) between the given study systems and what the limitations are, if any, for transferring up to 41MW.

### **3. Study Methodology**

#### **A. Description**

Two analyses were conducted to determine the impact of the 41MW transfer on the system. The first analysis was conducted to identify any new overloads caused by the 41MW 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 41MW 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 nine seasonal models to study the 41MW request. The SPP 2001 Series Cases 2001/02 Winter Peak, 2002 Spring Peak, 2002 Summer Peak, 2002/03 Winter Peak, 2003 Spring Peak, 2004 Summer Peak, 2004/05 Winter Peak, 2006 Summer Peak, and 2006/07 Winter Peak were used to study the impact of the 41MW transfer on the SPP system during the transaction period of 1/1/02 to 1/1/07.

|                     |                     |                  |                  |                     |                  |
|---------------------|---------------------|------------------|------------------|---------------------|------------------|
| Seasonal Case       | 2001/02 Winter Peak | 2002 Spring Peak | 2002 Summer Peak | 2002/03 Winter Peak | 2003 Spring Peak |
| <b>Abbreviation</b> | 01WP                | 02G              | 02SP             | 02WP                | 03G              |

|                     |                  |                    |                  |                     |
|---------------------|------------------|--------------------|------------------|---------------------|
| Seasonal Case       | 2004 Summer Peak | 2004/5 Winter Peak | 2006 Summer Peak | 2006/07 Winter Peak |
| <b>Abbreviation</b> | 04SP             | 04WP               | 06SP             | 06WP                |

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 2001 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**

Table 1 shows the new facility overloads caused by the 41MW transfer. Upgrades associated with these new overloads can be directly assigned to the AEPW to ERCOTE 41MW transfer.

Table 2 documents overloads on Non SPP Regional Tariff participants' transmission systems caused by the 41MW transfer.

Table 3 documents the 41MW transfer impact on previously assigned and identified facilities.

Table 4 documents the previously confirmed reservations into ERCOTE totaling 559MW plus this 41MW request for the period 6/01/2001 to 6/01/2002.

**Table 1** – Overloads Caused by 41MW AEPW to ERCOTE Transfer

| Study Year        | From Area - To Area | Branch Over 100% Rate B | RATEB | BC % I Loading | TC % I Loading | Outaged Branch Causing Overload | ATC | Initial Limit, Available Solution and Cost, or Previous Assignment |
|-------------------|---------------------|-------------------------|-------|----------------|----------------|---------------------------------|-----|--|
| All Study Periods |                     | NONE                    |       |                |                | NONE                            |     |  |

**Table 2** – Non - SPP Facility Overloads caused by the AEPW to ERCOTE 41MW Transfer

| Study Year        | From Area - To Area | Branch Over 100% Rate B | Rate B | BC % I Loading | TC % I Loading | Outaged Branch That Caused Overload |
|-------------------|---------------------|-------------------------|--------|----------------|----------------|-------------------------------------|
| All Study Periods |                     | NONE                    |        |                |                | NONE                                |

**Table 3** – Previously Assigned and Identified SPP Facilities Impacted by the AEPW to ERCOTE 41MW Transfer.

| Study Year        | From Area - To Area | Branch Over 100% Rate B | Rate B | BC % I Loading | TC % I Loading | Outaged Branch That Caused Overload |
|-------------------|---------------------|-------------------------|--------|----------------|----------------|-------------------------------------|
| All Study Periods |                     | NONE                    |        |                |                | NONE                                |

**Table 4** – Confirmed Reservations Into ERCOTE for 6/1/01 to 6/1/02

| Request                      | From      | To        | POR  | POD    | Amount | Customer | Type   | Jun-01 | Jul-01 | Aug-01 | Sep-01 | Oct-01 | Nov-01 | Dec-01 | Jan-02 | Feb-02 | Mar-02 | Apr-02 | May-02 |
|------------------------------|-----------|-----------|------|--------|--------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 213499                       | 6/1/2001  | 6/1/2002  | CLEC | ERCOTE | 50     | DYPM     | Yearly | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     |
| 231124                       | 2/5/2001  | 1/20/2002 | AEPW | ERCOTE | 50     | AEMC     | Yearly | 50     | 50     | 50     | 50     | 50     | 50     | 50     |        |        |        |        |        |
| 231125                       | 2/5/2001  | 1/20/2002 | AEPW | ERCOTE | 50     | AEMC     | Yearly | 50     | 50     | 50     | 50     | 50     | 50     | 50     |        |        |        |        |        |
| 231669                       | 6/1/2001  | 6/1/2002  | CLEC | ERCOTE | 50     | AEMC     | Yearly | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     |
| 231671                       | 6/1/2001  | 6/1/2002  | CLEC | ERCOTE | 50     | AEMC     | Yearly | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     |
| 231672                       | 6/1/2001  | 6/1/2002  | CLEC | ERCOTE | 50     | AEMC     | Yearly | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     |
| 231680                       | 6/1/2001  | 6/1/2002  | AEPW | ERCOTE | 50     | AEMC     | Yearly | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     |
| 231681                       | 6/1/2001  | 6/1/2002  | AEPW | ERCOTE | 50     | AEMC     | Yearly | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     |
| 231682                       | 6/1/2001  | 6/1/2002  | AEPW | ERCOTE | 50     | AEMC     | Yearly | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     |
| 231683                       | 6/1/2001  | 6/1/2002  | AEPW | ERCOTE | 50     | AEMC     | Yearly | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     |
| 231684                       | 6/1/2001  | 6/1/2002  | AEPW | ERCOTE | 50     | AEMC     | Yearly | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     | 50     |
| 239038                       | 6/1/2001  | 6/1/2002  | AEPW | ERCOTE | 9      | TNSK     | Yearly | 9      | 9      | 9      | 9      | 9      | 9      | 9      | 9      | 9      | 9      | 9      | 9      |
| 239061                       | 1/20/2002 | 1/20/2003 | CLEC | ERCOTE | 50     | AEMC     | Yearly |        |        |        |        |        |        |        |        | 50     | 50     | 50     | 50     |
| 239062                       | 1/20/2002 | 1/20/2003 | CLEC | ERCOTE | 50     | AEMC     | Yearly |        |        |        |        |        |        |        |        | 50     | 50     | 50     | 50     |
| 256409                       | 1/01/2002 | 1/02/2007 | AEPW | ERCOTE | 41     | TEXL     | Yearly | 41     | 41     | 41     | 41     | 41     | 41     | 41     | 41     | 41     | 41     | 41     | 41     |
| Total Confirmed Firm Service |           |           |      |        |        |          | Yearly | 600    | 600    | 600    | 600    | 600    | 600    | 600    | 600    | 600    | 600    | 600    | 600    |



## **5. Conclusion**

We found no facilities in SPP to restrict the requested AEPW to ERCOTE 41MW reservation; therefore, it 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 –1.0
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