

## Attachment C, Elm Creek Switching Station Comments

Date	September 30, 2004
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<b>From:</b>	
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Company	Lower Colorado River Authority

Based on the transfer studies conducted by ERCOT and the congestion management issues currently being experienced in the Marion area, LCRA would support an ERCOT recommendation to implement this project as scoped by CPS (i.e. a 345-kV switching station in a breaker-and-a-half configuration to initially accommodate the 8 resulting transmission lines). For reasons noted below, LCRA would further request that such an ERCOT recommendation include the following project to be completed in coordination with the Elm Creek project:

- Replace 10 345-kV circuit breakers at the Marion switching station

The construction of the 345-kV Elm Creek switching station increases the available fault current at the Marion 345-kV switching station. The increase in available fault current requires that 10 existing 40-kA, 345-kV circuit breakers at the Marion 345-kV station be replaced with circuit breakers of higher interrupting duty. These 345-kV circuit breakers were already candidates for possible replacement in the future due to increasing fault currents in the area - the Elm Creek project only accelerates this need. Two other 345-kV circuit breakers at Marion are already rated at 63 kA and two other are already in the plan to be replaced for other reasons. The approximate cost estimate for replacing these 10 circuit breakers is \$4.5M.

LCRA also offers the following comments:

The Central Texas to San Antonio transfer appears to be the most limiting in all cases. The report states that with the Elm Creek switching station in service, the transfer limit (560 MVA) is the CPS Marion to Skyline 345-kV transmission line. The next transfer limit (729 MVA) is the Seguin to Seguin West 138-kV transmission line. Based on more recent discussions, CPS plans to upgrade the capacity of the Marion to Skyline circuit to 1076 MVA (from 956 MVA) by summer 2005. With this CPS line upgrade completed, the actual FCITC would be the Seguin to Seguin West 138-kV transmission line that in the study case has a rating of 191 MVA; however, the actual present rating of this circuit is 600 amps (143 MVA) with emergency/15 minute ratings of 768/966 amps (183.6/230.9 MVA). LCRA is presently working with the owner of these facilities to plan minor substation facility upgrades as soon as possible and attain the full 220 MVA continuous rating of the Seguin to Seguin West 138-kV circuit. With these two upgrades completed (the CPS upgrade of the Marion to Skyline line and the upgrade of the Seguin to Seguin West circuit), will the next FTITC then potentially increase to some level above 1000 MVA?

On Table 3 of the report, the overload of the Texas Wind Power Project (TWPP) to Kunitz is a step-up transformer for a wind generator in Culberson County located in far West Texas. This limit should be discounted as a credible limit for the problem being examined in Central Texas.

Are the economic cost benefit analysis referenced on page 2 of the report, to be conducted by ERCOT,

in addition to data that has already been presented?

One of the concerns brought up at the RPG meeting on 9/15 was that the proposed schedule to construct the switching station was too long - 2007. Although at first glance it might appear as if this is a simple project to construct a new 345-kV switching station; it is somewhat more complicated and involved than it appears. LCRA supports an accelerated schedule to mitigate potential problems listed below.

- Possible schedule limitations on construction related outages of the 345-kV STP double circuit line and the Marion to San Miguel 345-kV double circuit line required to connect these into the new Elm Creek switching station.
- Present RAP to open the Schertz-Parkway transmission line is temporary, based on specific assumptions, and its effectiveness through 2007 has not been tested.

Based on previous studies conducted by LCRA addressing this problem, LCRA does not support pursuing the next feasible alternative discussed in the CPS report: Upgrade Cibolo Creek 138-kV Corridor to 351 MVA (alternative A in the report). As stated in the correspondence with ERCOT in September 2003 (see below), a project of this scope will only provide a short-term benefit yet cause significant resulting problems in the area due to the limited autotransformer capacity at the Marion Switching Station and associated 138-kV lines out of this station. LCRA contends that the construction of the 345-kV Elm Creek switching station effectively mitigates contingency condition overloads of the Marion autotransformer and the 138-kV lines out of this station. Of particular note, are performance improvements during the loss of the Marion-Hill Country / Marion-Skyline double circuit.

Finally, LCRA recommends that the Elm Creek switching station be designed to accommodate the addition of 345/138-kV autotransformer capacity at this site in the future. The location of this switching station offers an excellent site to support future load growth in this area.

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Letter sent to ERCOT on 9/25/2003

Mr. John Adams  
ERCOT Operations

Dear John:

Upon ERCOT's request, LCRA has reviewed the load flow cases that identify the overload condition of the 138 kV Schertz-Parkway transmission line under contingency conditions and specific generation transactions. As pointed out by ERCOT Operations, the worst contingency resulting in the overload condition is the CPSB 345 kV double circuit lines between Marion and Hill Country and Marion and Skyline. In April of this year, LCRA filed a remedial action plan (RAP) that calls for the opening of the Schertz-Parkway transmission line upon its overload due to the above mentioned conditions. This RAP should be temporary until long-term improvements can be implemented.

LCRA reviewed the impact of long-term transmission solutions that could have facilities in place within a two year period. One solution is to add a second 2.8-mile 138 kV 795 ACSR circuit between the Schertz and Parkway substations to improve power transfer capabilities in the area during the loss of the Marion-Hill Country / Marion-Skyline 345 kV double circuit. This project was estimated in early 2003 at a cost of \$2.1 million.

Using the most current ERCOT Data Set A base cases, the proposed Schertz-Parkway 138 kV circuit addition will increase the LCRA to CPS transfer level by approximately 150 MW during both Spring and Fall conditions. Under conditions presently modeled for Summer and Winter, the proposed circuit addition did not increase the LCRA to CPS transfer level. LCRA does not recommend the upgrading / addition of 138 kV facilities in the area to address this specific potential overload condition.

Instead, LCRA recommends further evaluation by ERCOT, with joint participation from Brazos Electric Cooperative (BEC) and City Public Service (CPS), of a solution that includes the construction of a 345 kV switching station at the 345 kV four-circuit crossing of the double circuits between the BEC owned Marion to San Miguel lines and the CPS owned STP-Hill Country and STP-Skyline lines. It appears that this improvement has the potential to significantly minimize the consequences of the noted contingency by providing an additional 345 kV path between the LCRA 345 kV Marion substation and the CPSB 345 kV stations Hill Country and Skyline. Additionally, this solution eliminates the potential for the outage of the four-circuit crossing in Guadalupe County.

Please let me know if we can provide further assistance in assisting ERCOT address this security concern.

Sergio Garza

cc: Ken Donohoo

## SCHERTZ-PARKWAY

### Project Background

The proposed project is to add a second 2.8 mile 138 kV 795 ACSR circuit between the Schertz and Parkway substations to improve power transfer capabilities in the area during the loss of the Marion-Hill Country / Marion-Skyline 345 kV double circuit. This project was estimated in early 2003 at a cost of \$2.1 million.

### 2004 Spring Maximum Case

Based upon load and generation conditions modeled in the ERCOT 2004 Spring Maximum base case, the proposed project will increase the LCRA to CPS transfer by approximately 150 MW. In this base case, the Schertz-Parkway line overloads at 103.2 percent during the loss of the Marion-Hill Country / Marion-Skyline double circuit. To test the impact of the proposed system addition during this contingency, the transfer between LCRA and CPS was reduced by 50 MW to eliminate the existing overload condition. From this point, the second circuit between Schertz and Parkway was added to create a new base case, and the LCRA to CPS transfer was then increased in 50 MW increments until the next overload condition appeared. At the 150 MW transfer level, the Marion-Cibolo and Cibolo-Schertz lines overload at 102.2 percent and 100.2 percent respectively. The Marion autotransformer is loaded to 95.2 percent at this transfer level.

2004 SPG1	Marion Auto 478 MVA		Marion-Cibolo 279 MVA		Cibolo-Schertz 279 MVA		Schertz-Parkway 220 MVA	
	MVA	%	MVA	%	MVA	%	MVA	%
	Load	Load	Load	Load	Load	Load	Load	Load
Original Case	429.8	89.9	257.7	92.4	242.5	86.9	227.0	103.2
LCRA to CPS Export reduced 50 MW to eliminate existing overloads								
	420.8	88.0	248.6	89.1	230.5	82.6	215.1	97.8
Add Schertz-Parkway ckt # 2								
New Base Case	426.9	89.3	256.5	92.0	241.9	86.7	2x113.3	51.5
50 MW Transfer	436.3	91.3	266.1	95.4	254.5	91.2	2x119.5	54.3
100 MW Transfer	445.8	93.3	275.6	98.8	267.1	95.7	2x125.6	57.2

150 MW Transfer	455.2	95.2	285.1	102.2	279.6	100.2	2x132.1	60.0
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#### 2004 Summer Maximum Case

Based upon load and generation conditions modeled in the ERCOT 2004 Summer Maximum base case, the proposed project will not increase the LCRA to CPS transfer. In this base case, the Marion autotransformer is loaded to 97.8 percent during the loss of the Marion-Hill Country / Marion-Skyline double circuit. Loading on the Schertz-Parkway line is at 79.8 percent. The addition of the second circuit between Schertz and Parkway and the resultant reduction in impedance will increase the loading on the Marion autotransformer to 98.8 percent with no change in the LCRA to CPS transfer level.

2004SUM1	Marion Auto 478 MVA		Marion-Cibolo 279 MVA		Cibolo-Schertz 279 MVA		Schertz-Parkway 220 MVA	
	MVA Load	% Load	MVA Load	% Load	MVA Load	% Load	MVA Load	% Load
Original Case	467.2	97.8	242.9	87.1	193.9	69.5	175.6	79.8
Add Schertz-Parkway ckt # 2								
New Base Case	472.3	98.8	249.5	89.4	203.2	72.8	2x92.4	42.0

#### 2004 Fall Maximum Case

Based upon load and generation conditions modeled in the ERCOT 2004 Fall Maximum base case, the proposed project will increase the LCRA to CPS transfer by approximately 150 MW. In this base case, the Marion-Cibolo, Cibolo-Schertz, and Schertz-Parkway lines overload at 108.0 percent, 108.9 percent, and 131.1 percent respectively during the loss of the Marion-Hill Country / Marion-Skyline double circuit. To test the impact of the proposed system addition during this contingency, the transfer between LCRA and CPS was reduced by 300 MW to eliminate the existing overload conditions. From this point, the second circuit between Schertz and Parkway was added to create a new base case, and the LCRA to CPS transfer was then increased in 50 MW increments until the next overload condition appeared. At the 150 MW transfer level, the Marion-Cibolo and Cibolo-Schertz lines overload at 101.4 percent and 100.6 percent respectively. The Marion autotransformer is loaded to 93.1 percent at this transfer level.

2004FAL1	Marion Auto 478 MVA		Marion-Cibolo 279 MVA		Cibolo-Schertz 279 MVA		Schertz-Parkway 220 MVA	
	MVA Load	% Load	MVA Load	% Load	MVA Load	% Load	MVA Load	% Load
Original Case	466.0	97.5	301.2	108.0	303.7	108.9	288.5	131.1
LCRA to CPS Export reduced 300 MW to eliminate existing overloads								
	410.3	85.8	246.0	88.2	231.2	82.9	216.1	98.2
Add Schertz-Parkway ckt # 2								
New Base Case	416.4	87.1	254.0	91.0	242.6	87.0	2x113.8	51.7
50 MW Transfer	426.0	89.1	263.6	94.5	255.3	91.5	2x120.1	54.6
100 MW Transfer	435.6	91.1	273.2	97.9	268.0	96.1	2x126.4	57.5

150 MW Transfer	445.2	93.1	282.8	101.4	280.7	100.6	2x132.8	60.4
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## 2004 Winter Maximum Case

Based upon load and generation conditions modeled in the ERCOT 2004 Winter Maximum base case, the proposed project will not increase the LCRA to CPS transfer. In this base case, the Marion autotransformer is loaded to 98.2 percent during the loss of the Marion-Hill Country / Marion-Skyline double circuit. Loading on the Schertz-Parkway line is at 86.9 percent. The addition of the second circuit between Schertz and Parkway and the resultant reduction in impedance will increase the loading on the Marion autotransformer to 99.3 percent with no change in the LCRA to CPS transfer level.

2004WIN1	Marion Auto		Marion-Cibolo		Cibolo-Schertz		Schertz-Parkway	
	478 MVA		279 MVA		279 MVA		220 MVA	
	MVA	%	MVA	%	MVA	%	MVA	%
	Load	Load	Load	Load	Load	Load	Load	Load
Original Case	469.3	98.2	247.2	88.6	208.9	74.9	191.1	86.9
Add Schertz-Parkway ckt # 2								
New Base Case	474.6	99.3	254.1	91.1	219.0	78.5	2x100.6	45.7

## Conclusions

Using the most current ERCOT Data Set A base cases, the proposed Schertz-Parkway 138 kV circuit addition will increase the LCRA to CPS transfer level by approximately 150 MW during both Spring and Fall conditions. Under conditions presently modeled for Summer and Winter, the proposed circuit addition did not increase the LCRA to CPS transfer level.

<b>Date</b>	Wednesday, October 6 <sup>th</sup> , 2004
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<b>From:</b>	
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Company	ERCOT

The attached document labeled "ERCOT\_2006ElmCreek\_10062004" (Elm Creek Supplemental Study: 2006 Transfer Analysis) is being submitted as a comment for the Elm Creek project proposal. The focus of this document is to address questions brought up at the Sept. 15<sup>th</sup> South Regional Planning Meeting concerning a possible in-service date of 2006.



<b>Elm Creek Supplemental Study: 2006 Transfer Analysis</b>	
<b>October 6, 2004</b>	
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## **DISCLAIMER**

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## **GLOSSARY**

CSC	Commercially Significant Constraint
CPS	City Public Service (Transmission Service Provider)
FCITC	First Contingency Incremental Transfer Capability
LCRA	Lower Colorado River Authority (Transmission Service Provider)
MUST	Managing and Utilizing System Transmission
PMax	Maximum MW capability of a generator
SSWG	Steady-State Working Group



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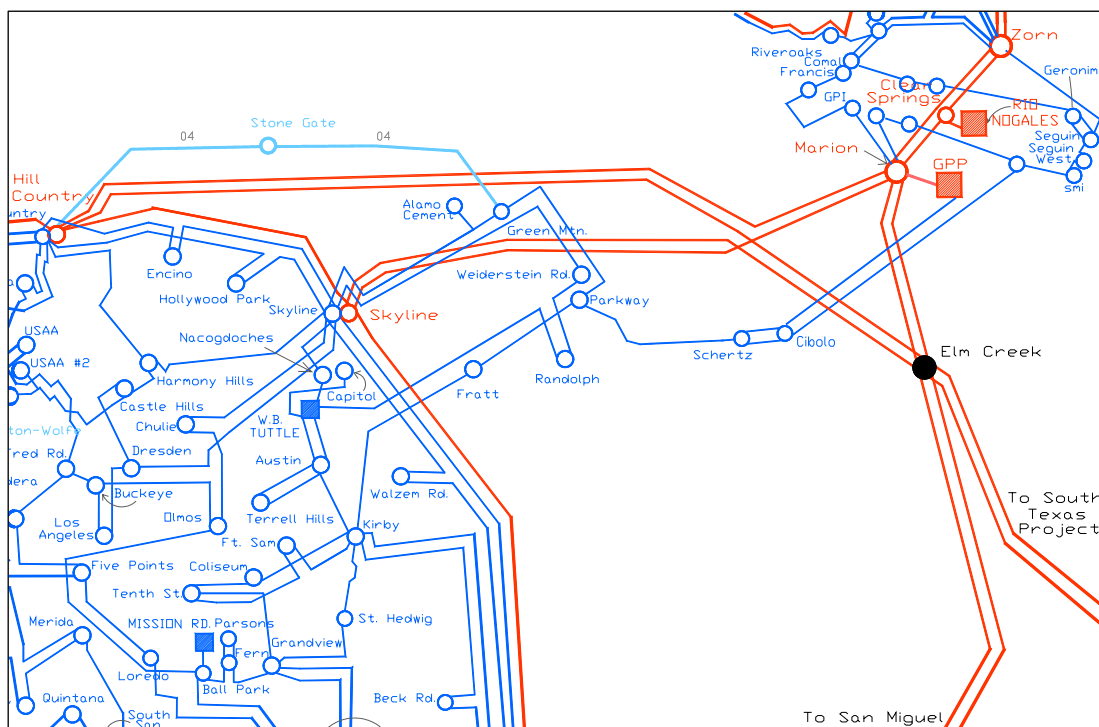
## SUMMARY

The Elm Creek 345-kV Switching Station project was presented at the September 15<sup>th</sup> South Regional Planning Meeting with an in-service date of summer 2007. During the presentation, several market participants expressed interest in the possibility of constructing the project for an in-service date of 2006. This report will show that moving the Elm Creek project to 2006 will still bring additional transfer capability into the CPS/San Antonio region, improve reliability in the region, and bring production cost savings to the market.

## INTRODUCTION

The analysis provided with the original Elm Creek project submittal was based on a 2009 SSWG Summer Peak CSC base case compiled on May 13, 2004, using the most current data provided at the time. The intent of using the 2009 case was to capture the benefit of the Elm Creek substation during the highest forecasted load and generation scenario available to ERCOT.

After an initial review of the Elm Creek proposal submitted by ERCOT, City Public Service took control of the project and began further analysis and cost-gathering for the project's submittal to the South Regional Planning Group. The project was submitted on September 14<sup>th</sup> and was presented the next day at the South RPG meeting. The in-service date presented was summer peak in 2007. The purpose of this analysis is to investigate the transfer benefits and cost savings benefits of putting Elm Creek in service by summer 2006. Figure 1 below shows the approximate site for the Elm Creek 345-kV switching station.





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## ASSUMPTIONS

The details of the analysis were based on the following:

- Two study cases and a base case were studied. The 2006 summer peak case with a Commercially Significant Constraint (CSC) dispatch from the latest 2004 Dataset B is defined as the Base Case in this analysis. The Base Case was compiled on August 31, 2004.
- The study cases were modified to include anticipated transmission improvements detailed in the comments submitted to the South Regional Planning Group by Sergio Garza (LCRA) on September 30, 2004. The Marion – Skyline 345-kV line was upgraded to a continuous and emergency rating of 1076 MVA and the Seguin – Seguin West 138-kV line was upgraded to a continuous and emergency rating of 220 MVA. See Appendix A for Sergio Garza's comments.
- **Case 1 is defined as the 2006 summer peak CSC case with the above-mentioned line upgrades implemented.**
- **Case 2 was created by adding the Elm Creek switching station to Case 1. The Elm Creek switching station was added using the IDEV submitted with the project study files.**
- MUST software was used to calculate the FCITC in each case. The contingency list used included the most recent set of double contingencies and all singles. This list was also updated to include the set of double contingencies created with the addition of the Elm Creek switching station.

The import region consisted of all the generators in the CPS system (Area 5). The export regions consisted of the following:

- 1) "All of ERCOT" – A region with all ERCOT generators other than the generators in the CPS system.
- 2) "Central Texas" – A region with generators in the Central Texas area, encompassed by the LCRA (Area 7) and AE (Area 9) systems. Kunitz Wind, Decker Creek Units 3-6, and all hydro units were excluded from this transfer region.

Many of the plants in the Central Texas export region were already generating at or near their PMax levels. In order to create sufficient export capacity for transfers above the near-max base case levels, the PMax at these plants was increased by 20%. These PMax increases did not change the base case dispatch. The old and new PMax values for the units in the Central Texas export region are shown in Figure 2. These increases were not applied for transfers from "All of ERCOT."



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Bus Number	Plant Name	Circuit ID	Unit PMax (MW)	PMAX + 20% New Unit PMax (MW)
7000	Ferguson	1	420	504
7004	Sam Gideon	1	140	168
7005		2	140	168
7006		3	342	410
7007	Lost Pines	1	167	200
7008		2	166	200
7009		3	183	220
7010	Fayette Power Project	1	605	726
7011		2	636	763
7012		3	450	540
7014	Hays Energy	1	275	330
7015		2	275	330
7016		3	275	330
7017		4	275	330
7800	Texas Independent Energy	1	175	210
7801		2	175	210
7802		3	175	210
7803		4	175	210
7804		5	205	246
7805		6	205	246
7807	Bastrop Energy	1	167	200
7808		1	167	200
7809		1	166	200
7810	Rio Nogales Power Project	1	210	252
7811		2	210	252
7812		3	210	252
7813		4	415	498
9000	Decker Creek	1	347	416
9001		2	432	518
9014	Holly	3	193	231
9015		4	194	231
9016	Sand Hill	1	48	58
9017		2	48	58
9018		3	48	58
9019		4	48	58
9020		5A	151	181
9021		5B	156	187

Figure 2. Changes Made to Generator PMax for “Central Texas” Exports



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## TRANSFER RESULTS

MUST transfers were studied for each of the three cases with imports into San Antonio from two different export regions; “All of ERCOT” and “Central Texas”. Details for all transfers can be seen in Appendices B – D.

Figure 3 is a summary of the analysis detailing the three most limiting elements for each of the transfers as well as the associated transfer limits. Negative limit values indicate that generation in that region would have to be backed down from the base case dispatch by that amount in order to be N-1 secure. Positive transfer levels indicate transfers above the base case dispatch. It should be noted again that many of the generators in the Central Texas region were already near their PMax, so positive limits indicate transfers above and beyond the PMax of generators in that region.

AC First Contingency Incremental Transfer Limit to San Antonio Import Region					
		Export from All of ERCOT Subregion		Export from Central Texas Subregion	
		Limit	Element	Limit	Element
Base	2006 SSWG Summer Peak with CSC Dispatch	-866.4 L: 7228 SEGUIN13 138 7229 SEGUWE13 138 1		-704 L: 7228 SEGUIN13 138 7229 SEGUWE13 138 1	
		-528.4 L: 7608 CIBOLO13 138 7610 SCHERT13 138 1		-438.2 L: 7608 CIBOLO13 138 7610 SCHERT13 138 1	
		-388.7 L: 7610 SCHERT13 138 7611 PARKWA13 138 1		-319.8 L: 7610 SCHERT13 138 7611 PARKWA13 138 1	
Case 1	Base + Seguin & Marion Line Upgrades	-575.7 L: 7608 CIBOLO13 138 7610 SCHERT13 138 1		-438.2 L: 7608 CIBOLO13 138 7610 SCHERT13 138 1	
		-423.3 L: 7602 S-XXXX13 138 7229 SEGUWE13 138 1		-438.2 L: 7608 CIBOLO13 138 7610 SCHERT13 138 1	
		-142.7 L: 7608 CIBOLO13 138 7178 MARION13 138 1		-108.4 L: 7608 CIBOLO13 138 7178 MARION13 138 1	
Case 2	Base + Seguin & Marion Line Upgrades + Elm Creek	-700.0 L: 7228 SEGUIN13 138 7229 SEGUWE13 138 1		-587.1 L: 7228 SEGUIN13 138 7229 SEGUWE13 138 1	
		-358.9 L: 7602 S-XXXX13 138 7229 SEGUWE13 138 1		-266.6 L: 7602 S-XXXX13 138 7229 SEGUWE13 138 1	
		-150.9 L: 7608 CIBOLO13 138 7178 MARION13 138 1		-150.9 L: 7608 CIBOLO13 138 7178 MARION13 138 1	

Figure 3- Summary of GP S San Antonio Import Transfer Analysis

Base Case

In the Base Case, the San Antonio region is unable to import power from the two export regions. The limiting elements shown in Figure 3 and Appendix A are the same.

Figure 3: Summary of CTS/San Antonio Import Transfer Analysis

In the Base Case, the San Antonio region is unable to import power from the two export regions. The limiting elements shown in Figure 3 and Appendix B are the same.

congested elements often seen in real-time operations. The limiting element in both export regions is the 138-kV line between Seguin and Seguin West for the contingency loss of the Marion – Zorn/Clear Springs 345-kV double circuit.

In the initial 2009 transfer analysis, this line was not seen as a significant limiting constraint for transfers into San Antonio. After some investigation, this was due to more generation being on in San Antonio and also some generation being turned on south of San Antonio to serve higher 2009 loads. The Seguin – Seguin West line also had an incorrect rating of 191 MVA in the initial analysis. This line was properly rated at 143 MVA for the Base Case transfer.

The next limiting elements from both regions are the lines in the Cibolo Creek – Schertz – Parkway corridor. Congestion along this corridor is caused by the contingency loss of the Marion – Skyline/Hill Country 345-kV double circuit.

### Case 1

As observed by LCRA, upgrading the 138-kV Seguin – Seguin West line to its 220-MVA conductor rating improves transfer capability into the San Antonio region, but does not



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fully eliminate the congestion in the area. In fact, the Seguin – Seguin West line is still seen as a limiting element further down the MUST transfer list (see Appendix B). With the Seguin upgrade, the Cibolo Creek – Schertz – Parkway corridor becomes the most limiting element. A fix for the congestion would be to reconductor those lines, but due to the limited autotransformer capacity at Marion, this fix would only relieve congestion in the short term. The planned Clear Springs to Seguin and New Berlin – Hickory Forest – Seguin 138-kV upgrade projects are reliability driven projects that indicate the area is already unfit to serve forecasted load growth. Upgrading the Cibolo Creek corridor would most likely require more upgrades in the area to accommodate larger power transfers.

## Case 2

With the Elm Creek substation in-service, transfers above and beyond the base case dispatch are possible to the San Antonio region. Figure 4 below shows the amount of transfer capability gained with Elm Creek in-service when compared to the Base Case and Case 1.

Transfer Benefit with Elm Creek In-Service (Case 2)		
	All of ERCOT (MVA)	Central Texas (MVA)
vs. Base Case	945.4	762.7

~~Figure 4 Transfer Benefit of “Case 2 vs. Base Case” and “Case 2 vs. Case 1”~~  
Note that these results take into consideration the line upgrades from Seguin to Seguin West and Marion to Skyline. Transfers performed without those line upgrades showed that the Elm Creek switching station did very little to improve transfer capability into San Antonio. With the line upgrades and the Elm Creek switching station, transfer capability into San Antonio is increased by 945 MVA from “All of ERCOT” and by 763 MVA from “Central Texas” over Base Case transfers in 2006.

The transfer from “All of ERCOT” in the original 2009 analysis saw approximately 475 MVA of transfer benefit over the base case with Elm Creek in-service. Similarly, the transfer from “Central Texas” saw approximately 390 MVA of transfer benefit over the 2009 base case. Note that the regions in the 2009 study were similarly defined, but not the same. Also, all cases used in the 2009 study had the Seguin – Seguin West line rated at 191 MVA, so this overload was somewhat “masked.”

For Case 2, the Seguin – Seguin West 138-kV line is seen again as the most limiting element with Elm Creek in-service. Reconductoring this line may further increase transfer capability into San Antonio.

## PRODUCTION COST SAVINGS

The savings from completing the Elm Creek switching station a year earlier than originally proposed were estimated using UPlan on the Base Case case to determine if expediting the project had any economic benefit to the system in that year. Two different sets of available generators were used for this study. The only difference



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between the two sets of available generators was that one case had the Hayes units online, and the other set continued to model the Hayes units as mothballed. Four studies were prepared for this analysis as follows:

- 1) Base Case without Elm Creek and without Hayes
- 2) Base Case without Elm Creek and with Hayes
- 3) Base Case with Elm Creek and without Hayes
- 4) Base Case with Elm Creek and with Hayes

Figure 5, shown below, illustrates the production cost differences between the studies. With the Hayes units in-service, the Elm Creek switching station can save approximately \$11.5 Million in energy production costs. If the Hayes units happen to continue to carry a mothballed status into the 2006 year, the Elm Creek switching station can achieve a \$4.5 Million savings in 2006. Note that these cases were built and run through UPlan before Sergio Garza's comments were submitted, so the line upgrades from Seguin – Seguin West and Marion – Skyline were not included for production cost analysis.

Production Cost (M\$)	With Elm	Without Elm	Production Cost Savings of Elm Creek (M\$)
With Hayes	15130.083	15141.509	11.426
Without Hayes	15122.849	15127.479	4.63

Figure 5. Production Cost Breakdown of the Elm Creek switching station.

## CONCLUSION

The analysis performed with Elm Creek in-service by summer peak 2006, in conjunction with proposed line upgrades in the area, showed significant transfer gains into the San Antonio region from “All of ERCOT” and “Central Texas.” These transfer benefits were observed when comparing the Elm Creek case to the 2006 SSWG summer peak CSC dispatch case and a case with only the Seguin – Seguin West 138-kV and Marion – Skyline 345-kV line upgrades.

The focus of this study was to answer questions raised at the September 15<sup>th</sup> S. Regional Planning Meeting concerning the advancement of the Elm Creek project from summer 2007 to summer 2006. Production cost runs from UPlan show potential savings to the market in the range of \$4.5 to \$11.5 million in 2006 alone. City Public Service has estimated the cost of installing the Elm Creek switching station to be \$11.8 million.

The findings in this study also supplement findings from the 2009 transfer analysis originally detailed in the Elm Creek project proposal. Despite topology and dispatch differences, the “trend” of transfer benefit realized with the installation of Elm Creek is similar. Transfers from “All of ERCOT” are consistently higher than those from “Central Texas” in both years. Limiting elements observed in both cases were also the same and reacted similarly to transmission improvements and generation changes made during transfer analyses.



# Elm Creek Comment Form

ERCOT intends to perform further analysis of the Elm Creek project to determine short and long term reliability and production cost benefits in conjunction with other projects under review.





# Elm Creek Comment Form

## APPENDIX A – Comments submitted by Sergio Garza (LCRA) on Sept. 30, 2004

Date	September 30, 2004
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<b>From:</b>	
Name	Sergio Garza
E-mail Address	<a href="mailto:sgarza@lcra.org">sgarza@lcra.org</a>
Company	Lower Colorado River Authority

Based on the transfer studies conducted by ERCOT and the congestion management issues currently being experienced in the Marion area, LCRA would support an ERCOT recommendation to implement this project as scoped by CPS (i.e. a 345-kV switching station in a breaker-and-a-half configuration to initially accommodate the 8 resulting transmission lines). For reasons noted below, LCRA would further request that such an ERCOT recommendation include the following project to be completed in coordination with the Elm Creek project:

- Replace 10 345-kV circuit breakers at the Marion switching station

The construction of the 345-kV Elm Creek switching station increases the available fault current at the Marion 345-kV switching station. The increase in available fault current requires that 10 existing 40-kA, 345-kV circuit breakers at the Marion 345-kV station be replaced with circuit breakers of higher interrupting duty. These 345-kV circuit breakers were already candidates for possible replacement in the future due to increasing fault currents in the area - the Elm Creek project only accelerates this need. Two other 345-kV circuit breakers at Marion are already rated at 63 kA and two other are already in the plan to be replaced for other reasons. The approximate cost estimate for replacing these 10 circuit breakers is \$4.5M.

LCRA also offers the following comments:

The Central Texas to San Antonio transfer appears to be the most limiting in all cases. The report states that with the Elm Creek switching station in service, the transfer limit (560 MVA) is the CPS Marion to Skyline 345-kV transmission line. The next transfer limit (729 MVA) is the Seguin to Seguin West 138-kV transmission line. Based on more recent discussions, CPS plans to upgrade the capacity of the Marion to Skyline circuit to 1076 MVA (from 956 MVA) by summer 2005. With this CPS line upgrade completed, the actual FCITC would be the Seguin to Seguin West 138-kV transmission line that in the study case has a rating of 191 MVA; however, the actual present rating of this circuit is 600 amps (143 MVA) with emergency/15 minute ratings of 768/966 amps (183.6/230.9 MVA). LCRA is presently working with the owner of these facilities to plan minor substation facility upgrades as soon as possible and attain the full 220 MVA continuous rating of the Seguin to Seguin West 138-kV circuit. With these two upgrades completed (the CPS upgrade of the Marion to Skyline line and the upgrade of the Seguin to Seguin West circuit), will the next FTITC then potentially



# Elm Creek Comment Form

increase to some level above 1000 MVA?

On Table 3 of the report, the overload of the Texas Wind Power Project (TWPP) to Kunitz is a step-up transformer for a wind generator in Culberson County located in far West Texas. This limit should be discounted as a credible limit for the problem being examined in Central Texas.

Are the economic cost benefit analysis referenced on page 2 of the report, to be conducted by ERCOT, in addition to data that has already been presented?

One of the concerns brought up at the RPG meeting on 9/15 was that the proposed schedule to construct the switching station was too long - 2007. Although at first glance it might appear as if this is a simple project to construct a new 345-kV switching station; it is somewhat more complicated and involved than it appears. LCRA supports an accelerated schedule to mitigate potential problems listed below.

- o Possible schedule limitations on construction related outages of the 345-kV STP double circuit line and the Marion to San Miguel 345-kV double circuit line required to connect these into the new Elm Creek switching station.
- o Present RAP to open the Schertz-Parkway transmission line is temporary, based on specific assumptions, and its effectiveness through 2007 has not been tested.

Based on previous studies conducted by LCRA addressing this problem, LCRA does not support pursuing the next feasible alternative discussed in the CPS report: Upgrade Cibolo Creek 138-kV Corridor to 351 MVA (alternative A in the report). As stated in the correspondence with ERCOT in September 2003 (see below), a project of this scope will only provide a short-term benefit yet cause significant resulting problems in the area due to the limited autotransformer capacity at the Marion Switching Station and associated 138-kV lines out of this station. LCRA contends that the construction of the 345-kV Elm Creek switching station effectively mitigates contingency condition overloads of the Marion autotransformer and the 138-kV lines out of this station. Of particular note, are performance improvements during the loss of the Marion-Hill Country / Marion-Skyline double circuit.

Finally, LCRA recommends that the Elm Creek switching station be designed to accommodate the addition of 345/138-kV autotransformer capacity at this site in the future. The location of this switching station offers an excellent site to support future load growth in this area.

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Letter sent to ERCOT on 9/25/2003

Mr. John Adams  
ERCOT Operations

Dear John:

Upon ERCOT's request, LCRA has reviewed the load flow cases that identify the overload condition of the 138 kV Schertz-Parkway transmission line under contingency conditions and specific generation transactions. As pointed out by ERCOT Operations, the worst contingency resulting in the overload condition is the CPSB 345 kV double



# Elm Creek Comment Form

circuit lines between Marion and Hill Country and Marion and Skyline. In April of this year, LCRA filed a remedial action plan (RAP) that calls for the opening of the Schertz-Parkway transmission line upon its overload due to the above mentioned conditions. This RAP should be temporary until long-term improvements can be implemented.

LCRA reviewed the impact of long-term transmission solutions that could have facilities in place within a two year period. One solution is to add a second 2.8-mile 138 kV 795 ACSR circuit between the Schertz and Parkway substations to improve power transfer capabilities in the area during the loss of the Marion-Hill Country / Marion-Skyline 345 kV double circuit. This project was estimated in early 2003 at a cost of \$2.1 million.

Using the most current ERCOT Data Set A base cases, the proposed Schertz-Parkway 138 kV circuit addition will increase the LCRA to CPS transfer level by approximately 150 MW during both Spring and Fall conditions. Under conditions presently modeled for Summer and Winter, the proposed circuit addition did not increase the LCRA to CPS transfer level. LCRA does not recommend the upgrading / addition of 138 kV facilities in the area to address this specific potential overload condition.

Instead, LCRA recommends further evaluation by ERCOT, with joint participation from Brazos Electric Cooperative (BEC) and City Public Service (CPS), of a solution that includes the construction of a 345 kV switching station at the 345 kV four-circuit crossing of the double circuits between the BEC owned Marion to San Miguel lines and the CPS owned STP-Hill Country and STP-Skyline lines. It appears that this improvement has the potential to significantly minimize the consequences of the noted contingency by providing an additional 345 kV path between the LCRA 345 kV Marion substation and the CPSB 345 kV stations Hill Country and Skyline. Additionally, this solution eliminates the potential for the outage of the four-circuit crossing in Guadalupe County.

Please let me know if we can provide further assistance in assisting ERCOT address this security concern.

Sergio Garza

cc: Ken Donohoo

## SCHERTZ-PARKWAY

### Project Background

The proposed project is to add a second 2.8 mile 138 kV 795 ACSR circuit between the Schertz and Parkway substations to improve power transfer capabilities in the area during the loss of the Marion-Hill Country / Marion-Skyline 345 kV double circuit. This project was estimated in early 2003 at a cost of \$2.1 million.

### 2004 Spring Maximum Case

Based upon load and generation conditions modeled in the ERCOT 2004 Spring Maximum base case, the proposed project will increase the LCRA to CPS transfer by approximately 150 MW. In this base case, the Schertz-Parkway line overloads at 103.2 percent during the loss of the Marion-Hill Country / Marion-Skyline double circuit. To test the impact of the proposed system addition during this contingency, the transfer between LCRA and CPS was reduced by 50 MW to eliminate the existing overload condition. From this point, the second circuit between Schertz and Parkway was added to create a new base case, and the LCRA to CPS transfer was then increased in 50 MW increments until the next overload condition appeared. At the 150 MW transfer level, the Marion-Cibolo and Cibolo-Schertz lines overload at 102.2 percent and 100.2 percent respectively. The Marion autotransformer is loaded to 95.2 percent at this transfer level.

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2004 SPG1

Marion Auto

Marion-Cibolo

Cibolo-Schertz

Schertz-Parkway



# Elm Creek Comment Form

	478 MVA		279 MVA		279 MVA		220 MVA	
	MVA Load	% Load	MVA Load	% Load	MVA Load	% Load	MVA Load	% Load
Original Case	429.8	89.9	257.7	92.4	242.5	86.9	227.0	103.2
LCRA to CPS Export reduced 50 MW to eliminate existing overloads								
	420.8	88.0	248.6	89.1	230.5	82.6	215.1	97.8
Add Schertz-Parkway ckt # 2								
New Base Case	426.9	89.3	256.5	92.0	241.9	86.7	2x113.3	51.5
50 MW Transfer	436.3	91.3	266.1	95.4	254.5	91.2	2x119.5	54.3
100 MW Transfer	445.8	93.3	275.6	98.8	267.1	95.7	2x125.6	57.2
150 MW Transfer	455.2	95.2	285.1	102.2	279.6	100.2	2x132.1	60.0

## 2004 Summer Maximum Case

Based upon load and generation conditions modeled in the ERCOT 2004 Summer Maximum base case, the proposed project will not increase the LCRA to CPS transfer. In this base case, the Marion autotransformer is loaded to 97.8 percent during the loss of the Marion-Hill Country / Marion-Skyline double circuit. Loading on the Schertz-Parkway line is at 79.8 percent. The addition of the second circuit between Schertz and Parkway and the resultant reduction in impedance will increase the loading on the Marion autotransformer to 98.8 percent with no change in the LCRA to CPS transfer level.

2004SUM1	Marion Auto		Marion-Cibolo		Cibolo-Schertz		Schertz-Parkway	
	478 MVA		279 MVA		279 MVA		220 MVA	
	MVA Load	% Load	MVA Load	% Load	MVA Load	% Load	MVA Load	% Load
Original Case	467.2	97.8	242.9	87.1	193.9	69.5	175.6	79.8
Add Schertz-Parkway ckt # 2								
New Base Case	472.3	98.8	249.5	89.4	203.2	72.8	2x92.4	42.0

## 2004 Fall Maximum Case

Based upon load and generation conditions modeled in the ERCOT 2004 Fall Maximum base case, the proposed project will increase the LCRA to CPS transfer by approximately 150 MW. In this base case, the Marion-Cibolo, Cibolo-Schertz, and Schertz-Parkway lines overload at 108.0 percent, 108.9 percent, and 131.1 percent respectively during the loss of the Marion-Hill Country / Marion-Skyline double circuit. To test the impact of the proposed system addition during this contingency, the transfer between LCRA and CPS was reduced by 300 MW to eliminate the existing overload conditions. From this point, the second circuit between Schertz and Parkway was added to create a new base case, and the LCRA to CPS transfer was then increased in 50 MW increments until the next overload condition appeared. At the 150 MW transfer level, the Marion-Cibolo and Cibolo-Schertz lines overload at 101.4 percent and 100.6 percent respectively. The Marion autotransformer is loaded to 93.1 percent at this transfer level.



# Elm Creek Comment Form

2004FAL1	Marion Auto		Marion-Cibolo		Cibolo-Schertz		Schertz-Parkway	
	478 MVA		279 MVA		279 MVA		220 MVA	
	MVA	%	MVA	%	MVA	%	MVA	%
	Load	Load	Load	Load	Load	Load	Load	Load
Original Case	466.0	97.5	301.2	108.0	303.7	108.9	288.5	131.1
LCRA to CPS Export reduced 300 MW to eliminate existing overloads								
	410.3	85.8	246.0	88.2	231.2	82.9	216.1	98.2
Add Schertz-Parkway ckt # 2								
New Base Case	416.4	87.1	254.0	91.0	242.6	87.0	2x113.8	51.7
50 MW Transfer	426.0	89.1	263.6	94.5	255.3	91.5	2x120.1	54.6
100 MW Transfer	435.6	91.1	273.2	97.9	268.0	96.1	2x126.4	57.5
150 MW Transfer	445.2	93.1	282.8	101.4	280.7	100.6	2x132.8	60.4

## 2004 Winter Maximum Case

Based upon load and generation conditions modeled in the ERCOT 2004 Winter Maximum base case, the proposed project will not increase the LCRA to CPS transfer. In this base case, the Marion autotransformer is loaded to 98.2 percent during the loss of the Marion-Hill Country / Marion-Skyline double circuit. Loading on the Schertz-Parkway line is at 86.9 percent. The addition of the second circuit between Schertz and Parkway and the resultant reduction in impedance will increase the loading on the Marion autotransformer to 99.3 percent with no change in the LCRA to CPS transfer level.

2004WIN1	Marion Auto		Marion-Cibolo		Cibolo-Schertz		Schertz-Parkway	
	478 MVA		279 MVA		279 MVA		220 MVA	
	MVA	%	MVA	%	MVA	%	MVA	%
	Load	Load	Load	Load	Load	Load	Load	Load
Original Case	469.3	98.2	247.2	88.6	208.9	74.9	191.1	86.9
Add Schertz-Parkway ckt # 2								
New Base Case	474.6	99.3	254.1	91.1	219.0	78.5	2x100.6	45.7

## Conclusions

Using the most current ERCOT Data Set A base cases, the proposed Schertz-Parkway 138 kV circuit addition will increase the LCRA to CPS transfer level by approximately 150 MW during both Spring and Fall conditions. Under conditions presently modeled for Summer and Winter, the proposed circuit addition did not increase the LCRA to CPS transfer level.



From	To	Transfer Level	AC FCITC	DC FCITC	Delta FCITC	Contingency	Ncon	PreShift	PostShift	Rating	AC TDF	DC TDF
CENTRALTX_E	SANANTONIO_I	1000.0	-704.1	-703.2	-0.9	L: 7228 SEGUIN13 138 7229 SEGUWE13 138 1						
						C:228-MARION34-CRLSPG34&MARION34-ZORN	3800	215.7	143.2	143.4	0.10305	0.10271
						Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
						Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			-438.2	-439.7	1.5	L: 7608 CIBOLO13 138 7610 SCHERT13 138 1		299.3	219.9	219.9	0.18127	0.18336
						C:473-HILL CTY-MARION34&SKYLINE-MARION3	4043					
						Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
						Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			-319.8	-323.7	3.9	L: 7610 SCHERT13 138 7611 PARKWA13 138 1		278.6	220.5	220.0	0.18184	0.18336
						C:473-HILL CTY-MARION34&SKYLINE-MARION3	4043					
						Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
						Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			-255.1	-278.5	23.5	L: 7044 MARION34 345 5371 SKYLINE 345 1		1067.9	956.0	956.0	0.43854	0.44617
						C:472-HILL CTY-SO TEX 5&HILL CTY-MARION	4042					
						Open 5211 HILL CTY 345 5915 SO TEX 5 34 5 1						
						Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
			-110.1	-137.2	27.1	L: 7044 MARION34 345 5371 SKYLINE 345 1		1002.0	956.0	956.0	0.41754	0.42568
						C: 7044 MARION34 345 5211 HILL CTY 345 1	2182					
						Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
			-108.4	-123.6	15.2	L: 7608 CIBOLO13 138 7178 MARION13 138 1		292.6	279.0	279.0	0.12541	-0.12549
						C:473-HILL CTY-MARION34&SKYLINE-MARION3	4043					
						Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
						Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			248.3	261.4	-13.2	L: 7602 S-XXX13 138 7229 SEGUWE13 138 1		194.5	220.3	220.0	0.10412	-0.10271
						C:228-MARION34-CRLSPG34&MARION34-ZORN	3800					
						Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
						Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			466.3	434.7	31.7	L: 5211 HILL CTY 345 7044 MARION34 345 1		907.0	1076.0	1076.0	0.36249	-0.36575
						C:479-SKYLINE-SO TEX 5&SKYLINE-MARION34	4049					
						Open 5371 SKYLINE 345 5915 SO TEX 5 34 5 1						
						Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			520.7	576.9	-56.2	L: 7680 CLRSPG13 138 7050 CLRSPG34 345 1		433.6	478.0	478.0	0.08522	-0.08274
						C:228-MARION34-CRLSPG34&MARION34-ZORN	3800					
						Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
						Open 7						





# Elm Creek Comment Form

## Appendix C – Case 1 Transfer Results

From	To	Transfer Level	AC FCITC	DC FCITC	Delta FCITC	i m	Contingency	Ncon	PreShift	PostShift	Rating	AC TDF	DC TDF
CENTRALTX_E	SANANTONIO_I	1000.0	-438.2	-439.7	1.5	L:	7608 CIBOLO13 138 7610 SCHERT13 138 1		299.3	219.9	219.9	0.18127	0.18336
							C:473-HILL CTY-MARION34&SKYLINE-MARION3	4043					
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
							Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			-319.8	-323.7	3.9	L:	7610 SCHERT13 138 7611 PARKWA13 138 1		278.6	220.5	220.0	0.18184	0.18336
							C:473-HILL CTY-MARION34&SKYLINE-MARION3	4043					
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
							Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			-108.4	-123.6	15.2	L:	7608 CIBOLO13 138 7178 MARION13 138 1		292.6	279.0	279.0	0.12541	-0.12549
							C:473-HILL CTY-MARION34&SKYLINE-MARION3	4043					
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
							Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			18.3	-9.6	27.8	L:	7044 MARION34 345 5371 SKYLINE 345 1		1067.9	1075.9	1076.0	0.43935	0.44617
							C:472-HILL CTY-SO TEX 5&HILL CTY-MARION	4042					
							Open 5211 HILL CTY 345 5915 SO TEX 5 34 5 1						
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
			41.6	42.5	-0.9	L:	7228 SEGUIN13 138 7229 SEGUWE13 138 1		215.7	220.1	220.0	0.10413	0.10271
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3800					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			177.1	144.7	32.4	L:	7044 MARION34 345 5371 SKYLINE 345 1		1002.0	1076.0	1076.0	0.41807	0.42568
							C: 7044 MARION34 345 5211 HILL CTY 345 1	2182					
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
			248.3	261.4	-13.2	L:	7602 S-XXXX13 138 7229 SEGUWE13 138 1		194.5	220.3	220.0	0.10412	-0.10271
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3800					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			466.3	434.7	31.7	L:	5211 HILL CTY 345 7044 MARION34 345 1		907.0	1076.0	1076.0	0.36249	-0.36575
							C:479-SKYLINE-SO TEX 5&SKYLINE-MARION34	4049					
							Open 5371 SKYLINE 345 5915 SO TEX 5 34 5 1						
							Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			537.9	527.2	10.7	L:	7608 CIBOLO13 138 7610 SCHERT13 138 1		154.8	219.9	219.9	0.12107	0.12382
							C:479-SKYLINE-SO TEX 5&SKYLINE-MARION34	4049					
							Open 5371 SKYLINE 345 5915 SO TEX 5 34 5 1						
							Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			520.7	576.9	-56.2	L:	7680 CLRSPG13 138 7050 CLRSPG34 345 1		433.6	478.0	478.0	0.08522	-0.08274
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3800					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
ERCOT_E	SANANTONIO_I	1000.0	-575.7	-572.4	-3.3	L:	7608 CIBOLO13 138 7610 SCHERT13 138 1		299.3	219.9	219.9	0.13794	0.14084
							C:473-HILL CTY-MARION34&SKYLINE-MARION3	4043					
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
							Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			-423.4	-421.4	-2.0	L:	7610 SCHERT13 138 7611 PARKWA13 138 1		278.6	220.0	220.0	0.13848	0.14084
							C:473-HILL CTY-MARION34&SKYLINE-MARION3	4043					
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
							Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			-142.7	-162.7	20.0	L:	7608 CIBOLO13 138 7178 MARION13 138 1		292.6	279.1	279.0	0.09465	-0.09535
							C:473-HILL CTY-MARION34&SKYLINE-MARION3	4043					
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
							Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			24.7	-13.0	37.6	L:	7044 MARION34 345 5371 SKYLINE 345 1		1067.9	1075.8	1076.0	0.32373	0.33015
							C:472-HILL CTY-SO TEX 5&HILL CTY-MARION	4042					
							Open 5211 HILL CTY 345 5915 SO TEX 5 34 5 1						
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
			54.9	56.1	-1.2	L:	7228 SEGUIN13 138 7229 SEGUWE13 138 1		215.7	220.0	220.0	0.07809	0.07774
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3800					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			260.5	211.6	48.9	L:	7044 MARION34 345 5371 SKYLINE 345 1		1002.0	1076.0	1076.0	0.28414	0.29111
							C: 7044 MARION34 345 5211 HILL CTY 345 1	2182					
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
			328.0	345.4	-17.4	L:	7602 S-XXXX13 138 7229 SEGUWE13 138 1		194.5	219.8	220.0	0.07715	-0.07774
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3800					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			627.5	583.7	43.8	L:	5211 HILL CTY 345 7044 MARION34 345 1		907.0	1076.0	1076.0	0.26937	-0.27238
							C:479-SKYLINE-SO TEX 5&SKYLINE-MARION34	4049					
							Open 5371 SKYLINE 345 5915 SO TEX 5 34 5 1						
							Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			783.3	874.1	-90.8	L:	7680 CLRSPG13 138 7050 CLRSPG34 345 1		433.6	477.9	478.0	0.05661	-0.05461
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3800					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			932.0	890.1	41.9	L:	7044 MARION34 345 5371 SKYLINE 345 1		809.4	1076.0	1076.0	0.28607	0.28945
							C:676-HILL CTY-SO TEX 5&SKYLINE-SO TEX	4229					
							Open 5211 HILL CTY 345 5915 SO TEX 5 34 5 1						



# Elm Creek Comment Form

## Appendix D – Case 2 Transfer Results

From	To	Transfer Level	AC FCITC	DC FCITC	Delta FCITC	i m	Contingency	Neon	PreShift	PostShift	Rating	AC TDF	DC TDF
CENTRALTX_E	SANANTONIO_I	1000.0	58.7	57.6	1.1	L:	7228 SEGUIN13 138 7229 SEGUWE13 138 1		214.0	220.1	220.0	0.10320	0.10212
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3804					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			266.6	277.8	-11.2	L:	7602 S-XXXX13 138 7229 SEGUWE13 138 1		192.8	220.3	220.0	0.10320	-0.10212
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3804					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			358.3	321.5	36.7	L:	7044 MARION34 345 5371 SKYLINE 345 1		944.0	1076.0	1076.0	0.36836	0.37286
							C:856-HILL CTY-ELMCREEK&HILL CTY-MARION	4362					
							Open 5211 HILL CTY 345 90000 ELMCREEK 34 5 1						
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
			512.4	502.2	10.3	L:	7608 CIBOLO13 138 7610 SCHERT13 138 1		159.4	219.9	219.9	0.11810	0.12073
							C:473-HILL CTY-MARION34&SKYLINE-MARION3	4046					
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
							Open 7044 MARION34 345 5371 SKYLINE 34 5 1						
			591.0	544.2	46.7	L:	7044 MARION34 345 5371 SKYLINE 345 1		883.9	1076.0	1076.0	0.32517	0.33022
							C:861-ELMCREEK-MARION34&ELMCREEK-MARION	4367					
							Open 7044 MARION34 345 90000 ELMCREEK 34 5 1						
							Open 7044 MARION34 345 90000 ELMCREEK 34 5 2						
			792.9	591.3	201.6	L:	7050 CLRSPG34 345 7051 RIONO 34 345 1		1022.9	1099.5	1099.5	0.09657	-0.09873
							C: 7050 CLRSPG34 345 7051 RIONO 34 345 2	2465					
							Open 7050 CLRSPG34 345 7051 RIONO 34 34 5 2						
			792.9	591.3	201.6	L:	7050 CLRSPG34 345 7051 RIONO 34 345 2		1022.9	1099.5	1099.5	0.09657	-0.09873
							C: 7050 CLRSPG34 345 7051 RIONO 34 345 1	2464					
							Open 7050 CLRSPG34 345 7051 RIONO 34 34 5 1						
			542.3	595.9	-53.6	L:	7680 CLRSPG13 138 7050 CLRSPG34 345 1		432.2	478.0	478.0	0.08448	-0.08224
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3804					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			700.4	631.6	68.8	L:	7608 CIBOLO13 138 7610 SCHERT13 138 1		134.9	220.0	219.9	0.12146	0.12724
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3804					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			671.0	633.3	37.7	L:	7044 MARION34 345 5371 SKYLINE 345 1		840.9	1076.0	1076.0	0.35042	0.35380
							C:858-HILL CTY-ELMCREEK&SKYLINE-ELMCREEK	4364					
							Open 5211 HILL CTY 345 90000 ELMCREEK 34 5 1						
							Open 5371 SKYLINE 345 90000 ELMCREEK 34 5 1						
ERCOT_E	SANANTONIO_I	1000.0	79.0	77.5	1.5	L:	7228 SEGUIN13 138 7229 SEGUWE13 138 1		214.0	220.0	220.0	0.07583	0.07586
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3804					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			358.9	373.9	-15.1	L:	7602 S-XXXX13 138 7229 SEGUWE13 138 1		192.8	219.7	220.0	0.07501	-0.07586
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3804					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			430.0	384.8	45.2	L:	7044 MARION34 345 5371 SKYLINE 345 1		944.0	1076.0	1076.0	0.30693	0.31157
							C:856-HILL CTY-ELMCREEK&HILL CTY-MARION	4362					
							Open 5211 HILL CTY 345 90000 ELMCREEK 34 5 1						
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
			760.2	713.6	46.6	L:	7044 MARION34 345 5371 SKYLINE 345 1		840.9	1076.0	1076.0	0.30927	0.31397
							C:858-HILL CTY-ELMCREEK&SKYLINE-ELMCREEK	4364					
							Open 5211 HILL CTY 345 90000 ELMCREEK 34 5 1						
							Open 5371 SKYLINE 345 90000 ELMCREEK 34 5 1						
			837.6	924.1	-86.5	L:	7680 CLRSPG13 138 7050 CLRSPG34 345 1		432.2	477.9	478.0	0.05467	-0.05303
							C:228-MARION34-CRLSPG34&MARION34-ZORN	3804					
							Open 7044 MARION34 345 7050 CLRSPG34 34 5 1						
							Open 7042 ZORN 34 345 7044 MARION34 34 5 1						
			1000.0	956.8	43.2	L:	7044 MARION34 345 5371 SKYLINE 345 1		814.0	1072.6	1076.0	0.25857	0.26259
			NoLimit				C: 7044 MARION34 345 5211 HILL CTY 345 1	2181					
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
			992.0	960.0	32.0	L:	5371 SKYLINE 345 90000 ELMCREEK 345 1		644.0	898.0	898.0	0.25604	-0.25600
							C:473-HILL CTY-MARION34&SKYLINE-MARION3	4046					
							Open 7044 MARION34 345 5211 HILL CTY 34 5 1						
							Open 7044 MARION34 345 5371 SKYLINE 34 5 1						





# Elm Creek Comment Form

<b>Date</b>	October 6, 2004
<b>From:</b>	
Name	Robert Lane, P.E.
E-mail Address	rob_lane@txu.com
Company	TXU Energy

TXU Energy wishes to express appreciation for the opportunity to review and strongly support CPS's proposed Elm Creek Project. The Elm Creek proposal clearly reduces the severity of contingencies that would impact import capability into the San Antonio Area. Due to the significant benefit of adding a 0.04 p.u. series reactor in the Marion – Skyline 345 kV Line (page 11), TXU Energy would like to see this included, and approved as a part of the overall Elm Creek project.

The annual TCOS impact of the project, in addition to the series reactor should be in the \$2 million range, far less than the congestion costs of \$14.7 million experienced (described on page 6). Given this substantial savings potential, in addition to the deferral of the Kendall – Cagnon 345 kV project to May 2007, TXU Energy would like to see this project expedited with a target in-service date of May 2006, in order for the market to begin capturing the savings as soon as possible.

TXU Energy appreciates the opportunity to comment.



# Elm Creek Comment Form

Date	10-6-04
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<b>From:</b>	
Name	Glenn Pressler
E-mail Address	<a href="mailto:gpressler@cps-satx.com">gpressler@cps-satx.com</a>
Company	City Public Service

The "Voltage Level Consideration" section of the Elm Creek Report discusses the need to coordinate scheduled voltages with nearby generation plants to ensure that the South Texas Project (STP) continues to comply with NRC requirements.

Today, 10/6/04, I received the following from the STP Switchyard Subcommittee:

"scheduled voltage set point will need to be re-coordinated with Guadalupe Power Partners (GPP) and Rio Nogales (RN), perhaps others, to maintain NRC-licensing basis voltage range at South Texas switchyard (369.5 - 347.8 kV). It would be preferable to reset the South Texas switchyard voltage range lower if possible, so that the upper end of the range is 363 kV or so. In any event, requires San Antonio and/or ERCOT led process to determine feasibility of re-setting voltages among affected generators. To the extent GPP and RN voltages are reset, may affect multiple voltage set-points in Central Texas.

Can ERCOT please verify that ERCOT can properly coordinate scheduled voltages, especially at GPP, RN, and San Miguel so that STP's nuclear operating license is not negatively impacted. Will a NRC review be necessary?