SPP Southwest Power Pool

System Impact Study For Transmission Service Requested By Duke Energy Trading and Marketing

From Oklahoma Gas and Electric Co. to Entergy

For a Reserved Amount Of 500MW From 6/1/01 To 6/2/02

SPP Transmission Planning

SPP IMPACT STUDY (#SPP-2000-098)
November 1, 2000

Table of Contents

1. Executive Summary

Duke Energy Trading and Marketing has requested a system impact study for long-term Firm Point-to-Point transmission service from Oklahoma Gas and Electric Company to Entergy. The period of the transaction is from 6/1/01 to 6/2/02. The request is for one reservation (208650), totaling 500MW.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 500MW transfer while maintaining system reliability. The analysis in this document shows that to accommodate an additional 500MW transfer, upgrades will be required on the SPP transmission systems.

The SPP is currently studying a Reliant 600MW ERCOTE to EES long-term Firm Point-to-Point transmission service request for 1/1/01 to 1/1/06, reservation 150680, and a 290MW CSWS to EES long-term Firm Point-to-Point transmission service request for 4/1/01 to 9/30/04, reservation 171555. Since the requests have higher priority, the customers of the requests have the first right to the available capacity of the system. The facilities identified in the study of the 600MW and 290MW transfers will need to be upgraded to support the 600MW and 290MW transfers, and the facilities may need additional upgrades to support the requested 500MW transfer. To ensure reliable operation of the transmission system, the 500MW transfer system impact was studied with the 600MW ERCOTE to EES and the 290MW CSWS to EES transfers included in the analysis.

The 500MW transfer impact on facilities identified for the previous requests are documented in Table 1. The facilities in Table 1 have zero ATC, due to the capacity being reserved for the previous customers mentioned above. The new facilities impacted by the 500MW transfer are listed in Table 2 and Table 3.

The SPP and effected member companies shall use due diligence to coordinate the addition of necessary facilities or transmission system upgrades to provide the requested transmission service. Duke Energy Trading and Marketing is to compensate SPP for such costs pursuant to the terms of section 27 of the SPP Open Access Transmission Tariff. Expedited procedures for new facilities are available to Duke Energy Trading and Marketing per section 19.8 of the SPP Open Access Transmission Service Tariff.

Engineering and construction of any new facilities or modifications will not start until after a transmission service agreement and/or construction agreement is in place and effected member companies receives the appropriate authorization to proceed from the SPP after they receive authorization from the transmission customer.

2. Introduction

Duke Energy Trading and Marketing has requested an impact study for transmission service from OKGE control area with a sink of EES.

The principal objective of this study is to identify the restraints on the SPP Regional Tariff System that may limit the transfer too less than 500MW. This study includes a steady-state contingency analysis (PSS/E function ACCC) and Available Transfer Capability (ATC) analysis.

The steady-state analysis considers the impact of the 500MW 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 analysis 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 500MW.

3. Study Methodology

A. Description

Two analyses were conducted to determine the impact of the 500MW transfer on the SPP system. The first analysis was conducted to document the 500MW transfer impact on facilities assigned to previous transmission customers. The second analysis was conducted to determine any new facilities overloaded 500MW transfer.

The analyses were done using two steps. The first step was to study the steady-state analysis impact of the 500MW on SPP and Non-SPP facilities. 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 ATC study portion was done using the requirements specified in the current SPP Criteria related to determination of ATC.

B. Model Updates

SPP used five seasonal models to study the 500MW request. The SPP 2000 Series Cases 2001 April (Spring Minimum), 2001 Spring Peak, 2001 Summer Peak, 2001 Fall Peak, and 2001/02 Winter Peak were used to study the impact of the 500MW transfer on the SPP system during the transaction period of 6/1/01 to 6/2/02. The 2001 April (Spring Minimum) and 2001 Spring Peak are considered representative of the 2002 Spring Season.

Seasonal Case	2001 Summer Peak	2001 Fall Peak	2001/02 Winter Peak	2001 April	2001 Spring Peak
Abbreviation	01SP	01FA	01WP	02AP	02SR

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 2000 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 thru 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 determined ATC value if calculated, any SPP identification or assignment of the event, and any solutions received from the transmission owners.

Table 1 documents the 500MW transfer impact on previously assigned facilities. The facilities have zero available capacity, until the assigned upgrades can be constructed. Table 1 shows the contingent loading of the circuits with and without the 500MW transfer and the assigned upgrades and costs to the previous customers and any additional upgrades needed to cover the additional loading.

Tables 2 and 3 contain new facility overloads caused by the 500MW transfer. Table 2 contains the facility overloads on SPP Regional Tariff participants' transmission systems. Table 3 documents overloads on Non SPP Regional Tariff participants' transmission systems. The overloads found in Table 2 can be directly assigned to the OKGE to EES 500MW transfer. The overloads found in Table 2 have either not been previously assigned or reoccur as new limits in additional seasonal cases.

Table 1 – OKGE to EES 500MW transfer impact on previously assigned SPP Facilities with zero ATC. The upgrades and costs available are included.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	Base Case %Loading	500MW Transfer Case %Loading	Outaged Branch That Caused Overload	Upgrades And Costs Assigned to Previous Customers	New Rate B <MVA>	% Rate B Increase	Additional Upgrades and Costs Required
01SP	CESW-CESW	**IPC JEFFERSON to LIEBERMAN 138KV** 53548 IPCJEFF4 to 53420 LIEBERM4 1	115	136.7	146.0	**LONGWOOD to WILKES, 345 KV** 53424 LONGWD 7 to 53620 WILKES 7 1	Conductor Limited 26.51 Miles			Not Available
01SP	CESW-CESW	**CHEROKEE REC TO KNOX LEE 138KV** 53522 CHEROKE4 to 53557 KNOXLEE4 1	209	127.7	132.5	**Multiple Outage Contingency** **SW SHREVEPORT to DIANA 345KV** 53454 SW SHV 7 to 53528 DIANA 7 CKT1 **SW SHREVEPORT to LONGWOOD 345KV** 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Reconductor 3.25 miles of 666 ACSR with 1272 ACSR, $720,000	287	37.3	None
01SP	CESW-CESW	"	209	117.1	120.6	**LONGWOOD to WILKES, 345 KV** 53424 LONGWD 7 to 53620 WILKES 7 1	"	"	"	"
01SP	CESW-CESW	"	209	112.8	114.1	**STONEWALL to WESTERN ELECTRIC T 138 KV** 53450 STONWAL4 to 53464 WESTELT4 1	Reconductor 3.25 miles of 666 ACSR with 1272 ACSR, $720,000	287	37.3	None
01SP	CESW-CESW	**JEFFRSN SWITCHING TO IPC JEFFRSN 138KV** 53551 JEFFRSN4 to 53548 IPCJEFF4 1	136	122.7	130.7	**LONGWOOD to WILKES, 345 KV** 53424 LONGWD 7 to 53620 WILKES 7 1	None, 1999-014 2001SP Jefferson 138KV Line Rebuild,1.49 miles, 795MCM	268	97.1	None
01SP	CESW-CESW	**TATUM TO CHEROKEE REC 138KV** 53611 TATUM 4 to 53522 CHEROKE4 1	209	121.3	126.1	**Multiple Outage Contingency** **SW SHREVEPORT to DIANA 345KV** 53454 SW SHV 7 to 53528 DIANA 7 CKT1 **SW SHREVEPORT to LONGWOOD 345KV** 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Reconductor 6.25 miles of 666 ACSR with 1272 ACSR, $1,300,000	287	37.3	None
01SP	CESW-CESW	**ROCK HILL TO TATUM 138KV** 53598 ROKHILL4 to 53611 TATUM 4 1	209	119.7	124.5	**Multiple Outage Contingency** **SW SHREVEPORT to DIANA 345KV** 53454 SW SHV 7 to 53528 DIANA 7 CKT1 **SW SHREVEPORT to LONGWOOD 345KV** 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	SPP-2000-086 01SP Reconductor 0.81 miles of 666 ACSR with 1272 ACSR. Replace 800A trap with new 2000A trap, $190,000 Additional Upgrade SPP-2000-011 New Rate B 235MVA 106.5% Overloaded, Reconductor other 5.76 miles of 795 with 1272 ACSR Cost Not Available	287	37.3	None

Table 1 continued – OKGE to EES 500MW transfer impact on previously assigned SPP Facilities with zero ATC. The upgrades and costs available are included.

Study Year	From –To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	Base Case %Loading	500MW Transfer Case %Loading	Outaged Branch That Caused Overload	Upgrades And Costs Assigned to Previous Customers	New Rate B <MVA>	% Rate B Increase	Additional Upgrades and Costs Required
01SP	CESW-CESW	**NORTHWEST HENDERSON TO POYNTER 69KV** 53583 NWHENDR2 to 53595 POYNTER2 1	59	104.4	105.3	**CHEROKEE REC TO KNOX LEE, 138 KV** 53522 CHEROKE4 to 53557 KNOXLEE4 1	Replace 4/0 jumpers and bus at Poynter $45,700	72	22.0	None
01SP	CESW-CESW	"	59	102.2	103.0	**TATUM TO CHEROKEE REC, 138KV** 53611 TATUM 4 to 53522 CHEROKE4 1	"	"	"	"
01SP	CESW-CESW	"	59	101.6	102.5	**ROCK HILL TO TATUM, 138KV** 53598 ROKHILL4 to 53611 TATUM 4 1	"	"	"	"
01SP	CESW-CESW	**NORTH MARSHALL TO WOODLAWN 69KV** 53579 NMARSHL2 to 53621 WOODLWN2 1	51	101.1	105.1	**Multiple Outage Contingency** **SW SHREVEPORT to DIANA 345KV** 53454 SW SHV 7 to 53528 DIANA 7 CKT1 **SW SHREVEPORT to LONGWOOD 345KV** 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	Initial Limit-Jumpers			Not Available
01SP	CESW-CESW	**WATERWORKS TO ARSENAL HILL 69KV** 53462 WATERWK2 to 53385 ARSHILL2 1	95	101.0	101.6	**FLOURNOY138/69KV TRANSFORMER** 53404 FLOURNY2 to 53405 FLOURNY4 1	Initial Limit-500cu Bus			Not Available
01SP	CESW-CESW	**ELM SPRINGS REC TO FLINT CREEK 161KV** 53194 ELMSPRR5 to 53139 FLINTCR5 1	335	100.1	101.1	**FLINT CREEK TO GENTRY REC, 161KV** 53139 FLINTCR5 to 53187 GENTRYR5 1	Initial Limit-Switch			Not Available
01SP	SWPA-AECI	**CARTH AGE TO REEDS 69KV** 52690 CARTHG 2 to 96751 2REEDS 1	36	102.8	107.7	**CARTHAGE TO LARUSSEL, 161KV** 52688 CARTHAG5 to 59479 LAR382 5 1	None, 2000-003 2001SP Change CT's Ratio Settings, $1,000			None
01SP	SWPA-AECI	"	36	102.6	107.7	**MONETT TO BROOKLINE, 345KV** 59481 MON383 7 to 59984 BRKLNE 7 1	"			"
01SP	SWPA-AECI	"	36	102.3	107.6	**FLINTCREEK TO MONETT, 345KV** 53140 FLINTCR7 to 59481 MON383 7 1	"			"
01SP	SWPA-AECI	**CARTHAGE TO JASPER 69KV** 52690 CARTHG 2 to 96649 2JASPER 1	36	102.2	105.5	**NEVADA TO BUTLER, 161KV** 59208 NEVADA 5 to 59216 BUTLER_5 1	None, 2000-003 2001SP Change CT's Ratio Settings, $1,000			None
01SP	SWPA-AECI	"	36	100.4	104.3	**AURORA HT TO MONETT, 161KV** 59468 AUR124 5 to 59480 MON383 5 1	"			"
01SP	EES-SWPA	**MIDWAY TO BULL SHOALS 161KV** 17875 5MIDWAY# to 52660 BULL SH5 1	162	100.9	105.4	**BATESVILLE-NORTH TO CUSHMAN 161KV** 17850 5BATEVL to 17858 5CUSHMN 1	Initial Limit-600A Switches			Not Available

Table 1 continued – OKGE to EES 500MW transfer impact on previously assigned SPP Facilities with zero ATC. The upgrades and costs available are included.

Study Year	From –To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	Base Case %Loading	500MW Transfer Case %Loading	Outaged Branch That Caused Overload	Upgrades And Costs Assigned to Previous Customers	New Rate B <MVA>	% Rate B Increase	Additional Upgrades and Costs Required
01SP	GRRD-GRRD	**TAHLEQUAH TO MAID 161KV** 54455 TAHLQH 5 to 54448 MAID 5 1	148	101.1	106.2	**FLINTCREEK TO GRDA1, 345KV** 53140 FLINTCR7 to 54450 GRDA1 7 1	None, 2000-003 2001SP Taken Out by GRDA			None
01SP	EMDE-EMDE	**TIPTON FORD TO MONETT 161KV** 59472 TIP292 5 to 59480 MON383 5 1	157	102.4	107.0	**LARUSSEL TO MONETT, 161KV** 59479 LAR382 5 to 59480 MON383 5 1	Reconductor 30 miles of 336 ACSR with 795 MCM, $5,700,000	268	70.7	None
01SP	EMDE-EMDE	**MONETT TO AURORA HT 161KV** 59480 MON383 5 to 59468 AUR124 5 1	157	100.6	105.2	**DADEVILLE EAST TO MORGAN, 161KV** 59478 DAD368 5 to 96101 5MORGAN 1	1999-010 2005SP Mitigation Plan In Effect			None
01FA	CESW-CESW	**JACKSONVILLE TO PINE GROVE 138KV** 53549 JACKSNV4 to 53675 PINEGRV4 1	158	113.0	122.0	**NORTH MINEOLA TO LAKE HAWKINS, 138KV** 53526 CROCKET7 to 54061 TENASKA7 1	Reset 300/5 CTs at Jacksonville to 400/5 $1,000	210	32.9	None
01FA	CESW-CESW	**ROCK HILL TO TATUM 138KV** 53598 ROKHILL4 to 53611 TATUM 4 1	209	100.6	105.0	**Multiple Outage Contingency** **SW SHREVEPORT to DIANA 345KV** 53454 SW SHV 7 to 53528 DIANA 7 CKT1 **SW SHREVEPORT to LONGWOOD 345KV** 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	SPP-2000-086 01SP Reconductor 0.81 miles of 666 ACSR with 1272 ACSR. Replace 800A trap with new 2000A trap, $190,000 Additional Upgrade SPP-2000-011 New Rate B 235MVA 106.5% Overloaded, Reconductor other 5.76 miles of 795 with 1272 ACSR Cost Not Available	287	37.3	None
01WP	CESW-CESW	**IPC JEFFERSON TO LIEBERMAN 138KV** 53548 IPCJEFF4 to 53420 LIEBERM4 1	135	102.8	109.7	**LONGWOOD TO WILKES, 345KV** 53424 LONGWD 7 to 53620 WILKES 7 1	Conductor Limited 26.51 Miles			Not Available
01WP	CESW-CESW	**ROCK HILL TO TATUM 138KV** 53598 ROKHILL4 to 53611 TATUM 4 1	209	104.3	108.4	**Multiple Outage Contingency** **SW SHREVEPORT to DIANA 345KV** 53454 SW SHV 7 to 53528 DIANA 7 CKT1 **SW SHREVEPORT to LONGWOOD 345KV** 53454 SW SHV 7 to 53424 LONGWD 7 CKT1	SPP-2000-086 01SP Reconductor 0.81 miles of 666 ACSR with 1272 ACSR. Replace 800A trap with new 2000A trap, $190,000 Additional Upgrade SPP-2000-011 New Rate B 235MVA 106.5% Overloaded, Reconductor other 5.76 miles of 795 with 1272 ACSR Cost Not Available	287	37.3	None
01WP	CESW-CESW	**BIG SANDY TO HAWKINS 69KV** 53515 BIGSNDY2 to 53543 HAWKINS2 1	72	102.4	102.8	**NORTH MINEOLA TO LAKE HAWKINS, 138KV** 53581 NMINEOL4 to 53666 LHAWKIN4 1	Initial Limit-350cu Bus at Big Sandy			Not Available
02AP	CESW-CESW	**JACKSONVILLE to PINE GROVE 138KV** 53549 JACKSNV4 to 53675 PINEGRV4 1	158	119.0	125.7	**CROCKETT TO TENASKA, 345KV** 53526 CROCKET7 to 54061 TENASKA7 1	Reset 300/5 CTs at Jacksonville to 400/5 $1,000	210	32.9	None
02SR	CESW-CESW	**JACKSONVILLE to PINE GROVE 138KV** 53549 JACKSNV4 to 53675 PINEGRV4 1	158	117.3	126.2	**CROCKETT TO TENASKA, 345KV** 53526 CROCKET7 to 54061 TENASKA7 1	Reset 300/5 CTs at Jacksonville to 400/5 $1,000	210	32.9	None

Table 1 continued – OKGE to EES 500MW transfer impact on previously assigned SPP Facilities with zero ATC. The upgrades and costs available are included.

Study Year	From –To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	Base Case %Loading	500MW Transfer Case %Loading	Outaged Branch That Caused Overload	Upgrades And Costs Assigned to Previous Customers	New Rate B <MVA>	% Rate B Increase	Additional Upgrades and Costs Required
02SR	CESW-CESW	**PATTERSON TO ASHDOWN REC 115KV** 53305 PATTERS3 to 53225 ASHDWNR3 1	120	105.6	117.4	**LONGWOOD TO ELDORADO-EHV, 345** 53424 LONGWD 7 to 17529 7ELDEHV 1	Patterson Switch Replacement, 600A to 1200A $20,000	149	24.2	None
02SR	CESW-CESW	"	120	105.4	117.4	**ELDORADO-EHV 500/345KV TRANSFORMER** 17529 7ELDEHV to 17530 8ELDEHV 1	"	"	"	"
02SR	CESW-CESW	"	120	107.6	116.0	**MCNEIL 500/115KV TRANSFORMER** 17543 8MCNEIL to 17544 3MCNEIL 1	"	"	"	"
02SR	CESW-CESW	"	120	101.2	113.0	**CROCKETT TO GRIMES, 345KV** 53526 CROCKET7 to 16555 7GRIMES 1	"	"	"	"
02SR	CESW-CESW	**IPC JEFFERSON TO LIEBERMAN 138KV** 53548 IPCJEFF4 to 53420 LIEBERM4 1	135	101.8	109.4	**LONGWOOD TO WILKES, 345KV** 53424 LONGWD 7 to 53620 WILKES 7 1	Conductor Limited 26.51 Miles			Not Available
02SR	CESW-CESW	**DIERKS to SOUTH DIERKS 69KV** 53259 DIERKS 2 to 53317 SDIERKS2 1	72	106.8	107.9	**WICKES REC to DEQUEEN, 69KV** 53242 WICKES 2 to 53257 DEQUEEN2 1	Initial Limit-600A Breaker			Not Available

Table 2 – SPP Facility Overloads caused by the 500MW OKGE to EES transfer.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	Base Case %Loading	500MW Transfer Case %Loading	Outaged Branch That Caused Overload	ATC <MW>	Initial Limit, Available Solution and Cost, or Previous Assignment
01SP	CESW-CESW	**CHAMSPR5 TO DYESS 161KV** 53154 CHAMSPR5 to 53131 DYESS 5 1	244	99.7	103.0	**SOUTH FAYETTEVILLE TO FARMINGTON AECC, 161KV** 53157 SFAYTVL5 to 53195 FARMGTN5 1	47	Reconductor 18.73 miles of 666 ACSR with 1590 ACSR $4,700,000
01SP	CESW-CESW	**SABINE MINING CO. T TO PIRKEY 138KV** 53602 SABMINT4 to 53592 PIRKEY 4 1	287	98.5	102.5	**LONGWOOD TO WILKES, 345KV** 53424 LONGWD 7 to 53620 WILKES 7 1	185	Initial Limit - 1200 Amp Breaker
01SP	CESW-SWPA	**EUREKA SPRINGS TO BEAVER 161KV** 53136 EUREKA 5 to 52680 BEAVER 5 1	274	96.2	106.0	**MUSKOGEE TO FORT SMITH, 345KV** 55224 MSKGE7 to 55302 FTSMI7 1	198	2000-011 2004SP SWPA Cost Not Available CSWS Cost-Reconductor 1.25 miles of 795 ACSR with 1590 ACSR (CSW owns 1.25 of 7.22 miles of the line) $515,000
01SP	CESW-SWPA	"	274	93.1	101.0	**NEOSHO TO MORGAN, 345KV** 56756 NEOSHO 7 to 96045 7MORGAN 1	441	"
01SP	CESW-SWPA	"	274	93.9	100.6	**BULL SHOALS TO BULL SHOALS SS, 161KV** 52660 BULL SH5 to 17853 5BULLSH* 1	461	"
01SP	CESW-CESW	**WILKES TO JEFFERSON SWITCHING 138KV** 53619 WILKES 4 to 53551 JEFFRSN4 1	210	93.4	101.2	**LONGWOOD TO WILKES, 345KV** 53424 LONGWD 7 to 53620 WILKES 7 1	428	Initial Limit - Wavetrap
01SP	EMDE-EMDE	**ORONOGO JCT. TO OAKLAND NORTH 161KV** 59467 ORO110 5 to 59494 OAK432 5 1	214	99.3	102.5	**TIPTON FORD TO JOPLIN SOUTHWEST, 161KV** 59472 TIP292 5 to 59483 JOP389 5 1	159	Not Available
01SP	EES-EMDE	**OMAHA TO POWERSITE 161KV** 17879 5OMAHA * to 59474 OZD312 5 1	162	96.1	103.9	**EUREKA SPRINGS TO OSAGE, 161KV** 53136 EUREKA 5 to 17880 5OSAGE # 1	256	Not Available
01SP	GRRD-GRRD	**ZENA TAP TO JAY 69KV** 54467 ZENA TP2 to 54520 JAY GR 2 1	41	99.7	102.2	**KERR TO KANSAS TAP, 161KV** 54435 KERR GR5 to 54514 KANSATP5 1	60	2000-003 2001SP Taken Out by GRDA
01SP	OKGE-OKGE	**PLEASANT VALLEY TO MCCLAIN 138KV** 54929 PLVAL4 to 54902 MCAIN4 1	478	0	101.6	**SARA ROAD TO MCCLAIN, 138KV** 54895 SARA 4 to 54902 MCAIN4 1	492	Replace 2000 Amp Switches and Breakers
01SP	OKGE-OKGE	**SARA ROAD TO MCCLAIN 138KV** 54895 SARA 4 to 54902 MCAIN4 1	478	0	101.3	**PLEASANT VALLEY TO MCCLAIN 138KV** 54929 PLVAL4 to 54902 MCAIN4 1	493	Replace 2000 Amp Switches and Breakers

Table 2 continued – SPP Facility Overloads caused by the 500MW OKGE to EES transfer.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	Base Case %Loading	500MW Transfer Case %Loading	Outaged Branch That Caused Overload	ATC <MW>	Initial Limit, Available Solution and Cost, or Previous Assignment
01SP	SWPA-SWPA	**SALLISAW TO GORE 161KV** 52750 SALISAW5 to 52752 GORE 5 1	167	86.1	102.8	**MUSKOGEE TO FORT SMITH, 345KV** 55224 MSKGE7 to 55302 FTSMI7 1	416	Initial Limit - Switches
01FA	CESW-CESW	**DIERKS TO SOUTH DIERKS 69KV** 53259 DIERKS 2 to 53317 SDIERKS2 1	72	99.4	101.0	**WICKES REC TO DEQUEEN, 69KV** 53242 WICKES 2 to 53257 DEQUEEN2 1	200	2000-086 2001SR Initial Limit-600A Breaker
01FA	CESW-CESW	**PATTERSON TO ASHDOWN REC 115KV** 53305 PATTERS3 to 53225 ASHDWNR3 1	120	94.1	102.8	**LONGWOOD TO ELDORADO-EHV, 345KV** 53424 LONGWD 7 to 17529 7ELDEHV 1	342	2000-086 2001SR Patterson Switch Replacement, 600A to 1200A $20,000
01FA	CESW-CESW	"	120	93.9	102.1	**ELDORADO-EHV 500/345KV TRANSFORMER** 17529 7ELDEHV to 17530 8ELDEHV 1	356	"
01FA	CESW-CESW	"	120	95.0	100.3	**MCNEIL 500/115KV TRANSFORMER** 17543 8MCNEIL to 17544 3MCNEIL 1	474	"
01FA	CESW-CESW	**LONE STAR SOUTH to DIANA 138KV** 53276 LSSOUTH4 53527 DIANA 4 1	287	99	100.6	**Multiple Outage Contingency** **WELSH to WILKES, 345KV** 53615 WELSH 7 to 53620 WILKES 7 1 **WELSH to NORTHWEST TEXARKANA, 345KV** 53615 WELSH 7 to 53301 NWTXARK7 1	358	Initial Limit - 1200 Amp Breaker
01FA	OKGE-OKGE	**PLEASANT VALLEY TO MCCLAIN 138KV** 54929 PLVAL4 to 54902 MCAIN4 1	478	0	101.6	**SARA ROAD TO MCCLAIN, 138KV** 54895 SARA 4 to 54902 MCAIN4 1	492	Replace 2000 Amp Switches and Breakers
01FA	OKGE-OKGE	**SARA ROAD TO MCCLAIN 138KV** 54895 SARA 4 to 54902 MCAIN4 1	478	0	101.6	**PLEASANT VALLEY TO MCCLAIN 138KV** 54929 PLVAL4 to 54902 MCAIN4 1	492	Replace 2000 Amp Switches and Breakers
01FA	SWPA-SWPA	**ROBERT S. KERR TO VAN BUREN 161KV** 52782 RS KERR5 to 52722 VAN BUR5 1	167	97.3	104.8	**BONZT5 TO AES COGEN, 161KV** 55261 BONZT5 to 55262 AES 5 1	183	Replace 161-kV Disconnect Switches 31,33,35,&37 with 1200A Switches, $105,000
01WP	CESW-CESW	**PATTERSON TO SOUTH NASHVILLE 138KV** 53306 PATTERS4 to 53321 SNASHVL4 1	105	98.8	107.6	**LONGWOOD TO ELDORADO-EHV, 345KV** 53424 LONGWD 7 to 17529 7ELDEHV 1	73	Initial Limit - Wavetrap
01WP	CESW-CESW	"	105	98.7	107.4	**ELDORADO-EHV 500/345KV TRANSFORMER** 17529 7ELDEHV to 17530 8ELDEHV 1	84	"

Table 2 continued – SPP Facility Overloads caused by the 500MW OKGE to EES transfer.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	Base Case %Loading	500MW Transfer Case %Loading	Outaged Branch That Caused Overload	ATC <MW>	Initial Limit, Available Solution and Cost, or Previous Assignment
						Multiple Outage Contingency		
						SW SHREVEPORT to DIANA 345KV		
						53454 SW SHV 7 to 53528 DIANA 7 CKT1		
		CHEROKEE REC TO KNOX LEE 138KV				**SW SHREVEPORT to LONGWOOD 345KV**		
01WP	CESW-CESW	53522 CHEROKE4 to 53557 KNOXLEE4 1	209	98.5	102.2	53454 SW SHV 7 to 53424 LONGWD 7 CKT1	199	2000-086 2001SPReconductor 3.25 miles of 666 ACSR with 1272 ACSR, $720,000
		JEFFERSON SWITCHING TO IPC JEFFERSON 138KV				**LONGWOOD TO WILKES, 345KV**		
01WP	CESW-CESW	53551 JEFFRSN4 to 53548 IPCJEFF4 1	154	96.4	102.6	53424 LONGWD 7 to 53620 WILKES 7 1	306	1999-014 2001SP Jefferson 138KV Line Rebuild,1.49 miles, 795MCM, $380,000
		SOUTH COFFEYVILLE TO DEARING 138KV				**DELWARE TO NEOSHO, 345KV**		
01WP	CESW-WERE	53972 SCOFVLE4 to 56832 DEARING4 1	143	99.7	107.1	53929 DELWARE7 to 56756 NEOSHO 7 1	22	Initial Limit - Dearing CT
		PLEASANT VALLEY TO MCCLAIN 138KV				**SARA ROAD TO MCCLAIN, 138KV**		
01WP	OKGE-OKGE	54929 PLVAL4 to 54902 MCAIN4 1	478	0	101.6	54895 SARA 4 to 54902 MCAIN4 1	492	Replace 2000 Amp Switches and Breakers
		SARA ROAD TO MCCLAIN 138KV				**PLEASANT VALLEY TO MCCLAIN 138KV**		
01WP	OKGE-OKGE	54895 SARA 4 to 54902 MCAIN4 1	478	0	101.6	54929 PLVAL4 to 54902 MCAIN4 1	492	Replace 2000 Amp Switches and Breakers
		CARTHAGE TO REEDS 69KV				**CARTHAGE TO JASPER, 69KV**		
01WP	SWPA-AECI	52690 CARTHG 2 to 96751 2REEDS 1	43	98.6	102.4	52690 CARTHG 2 to 96649 2JASPER 1	188	2000-003 2001SP Change CT's Ratio Settings at Carthage $1,000
						AURORA HT TO MONETT, 161KV		
01WP	SWPA-AECI	"	43	97.5	101.7	59468 AUR124 5 to 59480 MON383 5 1	303	"
		CARTHAGE TO JASPER 69KV				**ARCHIE TO ADRIAN, 161KV**		
01WP	SWPA-AECI	52690 CARTHG 2 to 96649 2JASPER 1	43	97.9	100.4	59207 ARCHIE 5 to 59240 ADRIAN 5 1	434	2000-003 2001SP Change CT's Ratio Settings at Carthage $1,000
		FRANKLIN SW 138/69KV TRANSFORMER				**CANADIAN TAP TO CANADIAN SW, 138KV**		
01WP	WFEC-WFEC	55917 FRNKLNS4 to 55916 FRNKLNS2 1	70	97.4	102.1	54947 CANDN4 to 55842 CANADNS4 1	280	Limit- Transformer
						CANADIAN SW 138/69KV TRANSFORMER		
01WP	WFEC-WFEC	"	70	97.4	102.1	55841 CANADNS2 to 55842 CANADNS4 1	280	"
		CANADIAN SW TO CANADIAN TAP 138KV				**MIDWEST TAP TO FRANKLIN SW, 138KV**		
01WP	WFEC-OKGE	55842 CANADNS4 to 54947 CANDN4 1	70	88.2	108.8	54946 MDWST4 to 55917 FRNKLNS4 1	295	Limit- Transformer and CT at WFEC Canadian

Table 2 continued – SPP Facility Overloads caused by the 500MW OKGE to EES transfer.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	Base Case %Loading	500MW Transfer Case %Loading	Outaged Branch That Caused Overload	ATC <MW>	Initial Limit, Available Solution and Cost, or Previous Assignment
02AP	CESW-CELE	**WALLACE LAKE TO INTERNATIONAL PAPER 138KV** 53461 WALLAKE4 to 50090 IPAPER 4 1	236	93.7	102.6	**DOLET HILLS 345/230KV TRANSFORMER** 50045 DOLHILL7 to 50046 DOLHILL6 1	369	Conductor Limited 6.86 miles of 666ACSR
02AP	OKGE-OKGE	**SARA ROAD TO MCCLAIN 138KV** 54895 SARA 4 to 54902 MCAIN4 1	478	0	104.7	**PLEASANT VALLEY TO MCCLAIN 138KV** 54929 PLVAL4 to 54902 MCAIN4 1	477	Replace 2000 Amp Switches and Breakers
02AP	OKGE-OKGE	**PLEASANT VALLEY TO MCCLAIN 138KV** 54929 PLVAL4 to 54902 MCAIN4 1	478	0	102.7	**SARA ROAD TO MCCLAIN, 138KV** 54895 SARA 4 to 54902 MCAIN4 1	487	Replace 2000 Amp Switches and Breakers
02AP	OKGE-OKGE	**SARA ROAD TO CIMARRON 138 kV** 54895 SARA 4 to 54898 CMARN4 1	478	4.5	100.4	**PLEASANT VALLEY TO MCCLAIN 138KV** 54929 PLVAL4 to 54902 MCAIN4 1	498	Replace 2000 Amp Switches and Breakers
02SR	CESW-CELE	**WALLACE LAKE TO INTERNATIONAL PAPER 138KV** 53461 WALLAKE4 to 50090 IPAPER 4 1	236	97.2	105.6	**DOLET HILLS 345/230KV TRANSFORMER** 50045 DOLHILL7 to 50046 DOLHILL6 1	167	Conductor Limited 6.86 miles of 666ACSR
02SR	CESW-CESW	**WALLACE LAKE TO SOUTH SHREVEPORT 138KV** 53461 WALLAKE4 to 53446 S SHV 4 1	236	97.2	104.6	**DOLET HILLS 345/230KV TRANSFORMER** 50045 DOLHILL7 to 50046 DOLHILL6 1	189	Conductor Limited 11.18 miles of 666ACSR
02SR	CESW-CESW	**JEFFERSON SWITCHING TO IPC JEFFERSON 138KV** 53551 JEFFRSN4 to 53548 IPCJEFF4 1	154	95.5	102.3	**LONGWOOD TO WILKES, 345KV** 53424 LONGWD 7 to 53620 WILKES 7 1	349	1999-014 2001SP Jefferson 138KV Line Rebuild,1.49 miles, 795MCM
02SR	OKGE-OKGE	**SARA ROAD TO MCCLAIN 138KV** 54895 SARA 4 to 54902 MCAIN4 1	478	0	101.6	**PLEASANT VALLEY TO MCCLAIN 138KV** 54929 PLVAL4 to 54902 MCAIN4 1	492	Replace 2000 Amp Switches and Breakers
02SR	OKGE-OKGE	**PLEASANT VALLEY TO MCCLAIN 138KV** 54929 PLVAL4 to 54902 MCAIN4 1	478	0	101.6	**SARA ROAD TO MCCLAIN, 138KV** 54895 SARA 4 to 54902 MCAIN4 1	492	Replace 2000 Amp Switches and Breakers
02SR	SWPA-SWPA	**ROBERT S. KERR TO VAN BUREN 161KV** 52782 RS KERR5 to 52722 VAN BUR5 1	167	95.7	103.4	**BONZT5 TO AES COGEN, 161KV** 55261 BONZT5 to 55262 AES 5 1	281	Replace 161-kV Disconnect Switches 31,33,35,&37 with 1200A Switches, $105,000

Table 3 – Non-SPP Facility Overloads caused by the 500MW OKGE to EES transfer.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	Base Case %Loading	500MW Transfer Case %Loading	Outaged Branch That Caused Overload
01SP	CELE-EES	**CARROLL TO RINGGOLD, 138/115KV** 50024 CARROLL4 to 17450 3RINGLD 1	125	98.5	104.0	**CARROLL TO MESSICK, 230KV** 50023 CARROLL6 to 50126 MESSICK6 1
01SP	CELE-EES	"	125	97.9	100.3	**WINNFIELD 230/115KV TRANSFORMER** 17397 3WINFLD to 17398 6WINFLD 1
01SP	CELE-EES	"	125	97.8	100.3	**WINNFIELD TO MONTGOMERY, 230KV** 17398 6WINFLD to 17401 6MONTGY 1
01SP	EES-EES	**NEWTON BULK TO HLYSPG, 138KV** 16618 4NEWTONB to 17917 4HLYSPG 1	112	98.9	100.7	**CYPRESS TO HARTBURG, 500KV** 16661 8CYPRESS to 16686 8HARTBRG 1
01SP	EES-EES	"	112	98.8	100.6	**CYPRESS 800/138KV TRANSFORMER** 16660 4CYPRESS to 16661 8CYPRESS 1
01SP	EES-EES	**PLUM POINT TO HORN LAKE, 115KV** 17175 3PLUM PT to 17174 3HN LAK 1	120	99.4	100.5	**BATESVILLE 230/115KV TRANSFORMER** 17196 6BATESV to 17197 3BATESV 1
01SP	EES-EES	**RINGGOLD TO SAILES, 115KV** 17450 3RINGLD to 17451 3SAILES 1	115	96.8	102.9	**CARROLL TO MESSICK, 230KV** 50023 CARROLL6 to 50126 MESSICK6 1
01SP	EES-EES	**MURFREESBORO TO MURFREESBORO-SOUTH,138/115KV** 17609 4MURFRE to 17607 3MURF-S 1	60	95.4	111.8	**CROCKETT TO TENASKA, 345KV** 53526 CROCKET7 to 54061 TENASKA7 1
01SP	EES-EES	"	60	93.8	109.6	**LONGWOOD TO WILKES, 345KV** 53424 LONGWD 7 to 53620 WILKES 7 1
01SP	EES-EES	"	60	91.6	107.3	**DOLET HILLS 345/230KV TRANSFORMER** 50045 DOLHILL7 to 50046 DOLHILL6 1
01FA	CELE-EES	**CARROLL TO RINGGOLD, 138/115KV** 50024 CARROLL4 to 17450 3RINGLD 1	125	97.3	103.2	**LONGWOOD TO ELDORADO-EHV, 345KV** 53424 LONGWD 7 to 17529 7ELDEHV 1
01FA	CELE-EES	"	125	97.4	103.0	**ELDORADO-EHV 500/345KV TRANSFORMER** 17529 7ELDEHV to 17530 8ELDEHV 1
01FA	CELE-EES	"	125	95.8	101.5	**CARROLL TO MESSICK, 230KV** 50023 CARROLL6 to 50126 MESSICK6 1
01FA	EES-EES	**GRIMES TO MT ZION, 138KV** 16556 4GRIMES to 16534 4MT.ZION 1	206	93.2	102.9	**DOLET HILLS 345/230KV TRANSFORMER** 50045 DOLHILL7 to 50046 DOLHILL6 1
01FA	EES-EES	"	206	94.6	102.9	**LONGWOOD TO ELDORADO-EHV, 345KV** 53424 LONGWD 7 to 17529 7ELDEHV 1
01FA	EES-EES	**LEACH TO NEWTON BULK, 138KV** 16657 4LEACH to 16618 4NEWTONB 1	144.6	99.1	104.6	**CROCKETT TO GRIMES, 345KV** 53526 CROCKET7 to 16555 7GRIMES 1
01FA	EES-EES	**TOLEDO BEND TO LEACH, 138KV** 16677 4TOLEDO to 16657 4LEACH 1	144.6	99.9	105.4	**CROCKETT TO GRIMES, 345KV** 53526 CROCKET7 to 16555 7GRIMES 1
01FA	EES-EES	**RINGGOLD TO SAILES, 115KV** 17450 3RINGLD to 17451 3SAILES 1	115	98.5	104.7	**CARROLL TO MESSICK, 230KV** 50023 CARROLL6 to 50126 MESSICK6 1
01FA	EES-EES	**HLYSPG TO JASPER, 138KV** 17917 4HLYSPG to 16668 4JASPER 1	112	97.5	101.6	**CROCKETT TO GRIMES, 345KV** 53526 CROCKET7 to 16555 7GRIMES 1

Table 3 continued – Non-SPP Facility Overloads caused by the 500MW OKGE to EES transfer.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	Base Case %Loading	500MW Transfer Case %Loading	Outaged Branch That Caused Overload
01WP	CELE-CELE	**DOLET HILLS 345/230KV TRANSFORMER** 50046 DOLHILL6 to 50045 DOLHILL7 1	700	94.3	101.2	**LONGWOOD TO ELDORADO-EHV, 345KV** 53424 LONGWD 7 to 17529 7ELDEHV 1
01WP	CELE-CELE	"	700	94.2	100.9	**ELDORADO-EHV 500/345KV TRANSFORMER** 17529 7ELDEHV to 17530 8ELDEHV 1
01WP	CELE-EES	**CARROLL TO RINGGOLD, 138/115KV** 50024 CARROLL4 to 17450 3RINGLD 1	125	99.8	102.4	**CROCKETT TO GRIMES, 345KV** 53526 CROCKET7 to 16555 7GRIMES 1
01WP	CELE-EES	"	125	99.6	100.9	**MCKNIGHT TO FRANKLIN, 500KV** 16897 8MCKNT to 17361 8FRKLIN 1
01WP	CELE-EES	"	125	97.9	100.3	**CROCKETT TO TENASKA, 345KV** 53526 CROCKET7 to 54061 TENASKA7 1
01WP	EES-EES	**RINGGOLD TO SAILES, 115KV** 17450 3RINGLD to 17451 3SAILES 1	115	98.8	101.4	**CROCKETT TO TENASKA, 345KV** 53526 CROCKET7 to 54061 TENASKA7 1
01WP	EES-EES	"	115	98.9	100.9	**MOUNT OLIVE 500/230KV TRANSFORMER** 17445 8MTOLIV to 17446 6MTOLIV 1
01WP	EES-EES	**MURFREESBORO TO MURFREESBORO-SOUTH,138/115KV** 17609 4MURFRE to 17607 3MURF-S 1	60	95.9	113.8	**FORT SMITH TO ARKANSAS NUCLEAR ONE, 500KV** 55305 FTSMI8 to 17632 8ANO 1
01WP	EES-EES	"	60	99.2	112.5	**WELSH TO WILKES, 345KV** 53615 WELSH 7 to 53620 WILKES 7 1
02AP	EES-EES	**LINE 485 TAP OF 558 TO HUNTSVILLE,138KV** 16528 4L558T48 to 16532 4HUNTSVL 1	206	97.5	104.4	**DOLET HILLS 345/230KV TRANSFORMER** 50045 DOLHILL7 to 50046 DOLHILL6 1
02AP	EES-EES	"	206	96.8	104.0	**LONGWOOD TO ELDORADO-EHV, 345KV** 53424 LONGWD 7 to 17529 7ELDEHV 1
02AP	EES-EES	"	206	96.7	103.9	**ELDORADO-EHV 500/345KV TRANSFORMER** 17529 7ELDEHV to 17530 8ELDEHV 1
02AP	EES-EES	**MT ZION TO LINE 485 TAP OF 558** 16534 4MT.ZION to 16528 4L558T48 1	206	99.4	106.2	**DOLET HILLS 345/230KV TRANSFORMER** 50045 DOLHILL7 to 50046 DOLHILL6 1
02AP	EES-EES	"	206	98.6	105.8	**LONGWOOD TO ELDORADO-EHV, 345KV** 53424 LONGWD 7 to 17529 7ELDEHV 1
02AP	EES-EES	"	206	98.5	105.7	**ELDORADO-EHV 500/345KV TRANSFORMER** 17529 7ELDEHV to 17530 8ELDEHV 1
02AP	EES-EES	**GRIMES 345/138KV TRANSFORMER 1** 16555 7GRIMES to 16556 4GRIMES 1	525	95.5	101.3	**GRIMES 345/138KV TRANSFORMER CKT 2** 16555 7GRIMES to 16556 4GRIMES 2
02AP	EES-EES	"	525	95.5	101.3	**GRIMES 345/138KV TRANSFORMER CKT 1** 16555 7GRIMES to 16556 4GRIMES 1
02AP	EES-EES	**GRIMES TO MT ZION, 138KV** 16556 4GRIMES to 16534 4MT.ZION 1	206	97.7	103.5	**MOUNT OLIVE TO ELDORADO-EHV, 500KV** 17445 8MTOLIV to 17530 8ELDEHV 1
02AP	EES-EES	"	206	97.3	102.2	**CYPRESS TO HARTBURG, 500KV** 16661 8CYPRESS to 16686 8HARTBRG 1
02AP	EES-EES	"	206	97.2	102.1	**CYPRESS 500/138KV TRANSFORMER** 16660 4CYPRESS to 16661 8CYPRESS 1

Table 3 continued – Non-SPP Facility Overloads caused by the 500MW OKGE to EES transfer.

Study Year	From -To Area(s)	Branch Over 100% Rate B	Rate B <MVA>	Base Case %Loading	500MW Transfer Case %Loading	Outaged Branch That Caused Overload
02AP	EES-EES	**LEACH TO NEWTON BULK, 138KV** 16657 4LEACH to 16618 4NEWTONB 1	144.6	95.5	100.7	**HARTBURG TO MOUNT OLIVE, 500KV** 16686 8HARTBRG to 17445 8MTOLIV 1
02AP	EES-EES	**TOLEDO BEND TO LEACH, 138KV** 16677 4TOLEDO to 16657 4LEACH 1	144.6	95.9	101.1	**HARTBURG TO MOUNT OLIVE, 500KV** 16686 8HARTBRG to 17445 8MTOLIV 1
02AP	EES-EES	**RINGGOLD TO SAILES, 115KV** 17450 3RINGLD to 17451 3SAILES 1	115	93.6	100.5	**CARROLL TO MESSICK, 230KV** 50023 CARROLL6 to 50126 MESSICK6 1
02SR	CELE-CELE	**DOLET HILLS 345/230KV TRANSFORMER** 50046 DOLHILL6 to 50045 DOLHILL7 1	700	97.8	105.2	**ELDORADO-EHV 500/345KV TRANSFORMER** 17529 7ELDEHV to 17530 8ELDEHV 1
02SR	CELE-CELE	"	700	97.9	105.2	**LONGWOOD TO ELDORADO-EHV, 345KV** 53424 LONGWD 7 to 17529 7ELDEHV 1
02SR	CELE-CELE	"	700	97.7	104.8	**CROCKETT TO GRIMES, 345KV** 53526 CROCKET7 to 16555 7GRIMES 1
02SR	CELE-EES	**CARROLL TO RINGGOLD, 138/115KV** 50024 CARROLL4 to 17450 3RINGLD 1	125	96.5	102.6	**CLARENCE TO MESSICK, 230KV** 50027 CLARN 6 to 50126 MESSICK6 1
02SR	EES-EES	**MT ZION TO LINE 485 TAP OF 558** 16534 4MT.ZION to 16528 4L558T48 1	206	94.8	102.7	**DOLET HILLS 345/230KV TRANSFORMER** 50045 DOLHILL7 to 50046 DOLHILL6 1
02SR	EES-EES	"	206	94.4	102.5	**LONGWOOD TO ELDORADO-EHV, 345KV** 53424 LONGWD 7 to 17529 7ELDEHV 1
02SR	EES-EES	**MT ZION TO LINE 485 TAP OF 558** 16534 4MT.ZION to 16528 4L558T48 1	206	94.2	102.5	**ELDORADO-EHV 500/345KV TRANSFORMER** 17529 7ELDEHV to 17530 8ELDEHV 1
02SR	EES-EES	**GRIMES 345/138KV TRANSFORMER 1** 16555 7GRIMES to 16556 4GRIMES 1	525	94.6	101.6	**GRIMES 345/138KV TRANSFORMER** 16555 7GRIMES to 16556 4GRIMES 2
02SR	EES-EES	**GRIMES 345/138KV TRANSFORMER 2** 16555 7GRIMES to 16556 4GRIMES 2	525	94.6	101.6	**GRIMES 345/138KV TRANSFORMER CKT 1** 16555 7GRIMES to 16556 4GRIMES 1
02SR	EES-EES	**GRIMES TO MT ZION, 138KV** 16556 4GRIMES to 16534 4MT.ZION 1	206	99.3	107.1	**DOLET HILLS 345/230KV TRANSFORMER** 50045 DOLHILL7 to 50046 DOLHILL6 1
02SR	EES-EES	"	206	98.8	106.9	**LONGWOOD TO ELDORADO-EHV, 345KV** 53424 LONGWD 7 to 17529 7ELDEHV 1
02SR	EES-EES	"	206	98.7	106.9	**ELDORADO-EHV 500/345KV TRANSFORMER** 17529 7ELDEHV to 17530 8ELDEHV 1
02SR	EES-EES	**RINGGOLD TO SAILES, 115KV** 17450 3RINGLD to 17451 3SAILES 1	115	98.2	104.8	**CLARENCE TO MESSICK, 230KV** 50027 CLARN 6 to 50126 MESSICK6 1
02SR	EES-EES	**MURFREESBORO TO MURFREESBORO-SOUTH,138/115KV** 17609 4MURFRE to 17607 3MURF-S 1	60	99.1	116.7	**CROCKETT TO GRIMES, 345KV** 53526 CROCKET7 to 16555 7GRIMES 1
02SR	EES-EES	"	60	92.8	109.5	**CROCKETT TO TENASKA, 345KV** 53526 CROCKET7 to 54061 TENASKA7 1

5. Conclusion

The results of the study show that before the 500MW transfer can take place system improvements will need to be completed. The facility upgrades assigned to previous customers (Table 1), any additional facility upgrades, and facility upgrades of new overloads (Table 2) will be required before the 500MW transmission service request can take place.

The final cost assignment of facilities and ATC to Duke Energy Trading and Marketing will be determined upon the completion of a facility study.

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 - X 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. Excld 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 - X Phase shift adjustment
   _ Flat start
   _ Lock DC taps
   _ Lock switched shunts