



SPP *Southwest Power Pool*

***System Impact Study SPP-2002-152
For Transmission Service
Requested By
Calpine Energy Services L.P.***

From AEPW To WR

***For a Reserved Amount Of 300MW
From 6/1/2005 To 6/1/2010***

SPP Coordinated Planning

System Impact Study

Calpine Energy Services L.P. (CALP) has requested a system impact study for long-term Firm Point-to-Point transmission service from AEPW to WR. The period of the transaction is from 6/1/2005 to 6/1/2010. The request is for OASIS reservations 388979, 388980, 388993, and 388994 for a total amount of 300 MW.

The principal objective of this study is to identify constraints on the SPP Regional Tariff System and potential facility upgrades that may be necessary to facilitate the additional 300 MW of service requested.

The AEPW to WR transfer was studied to determine the facility upgrades required based on the actual queue position of the request with only those higher priority requests in Facility Study mode included in the models. Higher priority requests still in study that have not gone to facility study were not included in the models. These results are documented in Table 1 of the report. The results given in Table 1 include upgrades that may be assigned to higher priority requests. The results of this study give the customer an estimated cost of facility upgrades that may be required in order to accommodate the 300 MW AEPW to WR transfer.

SPP used four seasonal models to study the AEPW to WR 300 MW transfer for the requested service period. The SPP 2002 Series Cases 2005 Summer Peak, 2005/06 Winter Peak, 2008 Summer Peak and 2008/2009 Winter Peak were used to study the impact of the 300 MW transfer on the SPP system during the requested service period of 6/1/2005 to 6/1/2010. The Spring Peak models apply to April and May, the Summer Peak models apply to June through September, the Fall Peak models apply to October and November, and the Winter Peak models apply to December through March. The chosen base case models were modified to reflect the most current modeling information. The cases were modified to reflect firm transfers during the requested service period that were not already included in the January 2002 base case series models.

With only the higher priority requests that have signed Facility Study Agreements included in the models, the study results of the AEPW to WR 300 MW show that limiting constraints exist. Due to the number of limiting constraints identified, the Transmission Service Request cannot be granted. These results do not include an evaluation of potential constraints in the planning horizon beyond the reservation period that may limit the right to renew service. The upgrades and cost provided in the System Impact Study are planning estimates only. The final ATC and upgrades required may vary from these results due to the status of higher priority requests, unknown facility upgrades that will be identified during the facility study process, and the final results of the full AC analysis. Execution of a Facility Study Agreement is now required to maintain queue position. The final upgrade solutions and cost assignments will be determined upon the completion of the facility study.

Table 1 – SPP facility upgrades identified for the AEPW to WR transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
05SP	WERE-WERE	166Th Street - Jaggard Jct 115kV	97	Midland Jct - Pentagon 115kV	92	May be relieved due to Westar Transmission Operating Directive 1202	Not Available
05SP	WERE-WERE	166Th Street - Jarbalo Jct Switching Sta 115kV	97	Midland Jct - Pentagon 115kV	0	May be relieved due to Westar Transmission Operating Directive 1202	Not Available
05SP	GRRD-GRRD	Afton 161/69kV Transformer	50	Miami - Afton 161kV	0	Replace 50 MVA Transformer with 84 MVA unit	\$ 833,000
05SP	AEPW-AEPW	Alumax Tap - Northwest Texarkana 138kV	261	Nw Texarkana-Bann T - Northwest Texarkana 138kV	0	Replace Switches Alumax Tap	\$ 30,000
05SP	WERE-WERE	Auburn Road - Jeffrey Energy Center 230kV	565	Hoyt - Jeffery Energy Center 345kV	0	May be relieved due to Westar Transmission Operating Directive 400	Not Available
05SP	AEPW-AEPW	Blue Circle - Catoosa 69kV	72	Lynn Lane West Tap - Lynn Lane Tap 138kV	0	Solution Undetermined	Not Available
05SP	AEPW-AEPW	Broken Arrow 101St North - Oneta 138kV	210	Riverside Sta Auto 138/345kV Transformer	0	Replace wavetrap	\$ 30,000
05SP	SWPA-EES	Bull Shoals - Midway 161kV	162	Bull Shoals - Buford Tap 161kV	0	Replace disconnect switches, metering CTs and wave trap at Bull Shoals	\$ 150,000
05SP	AEPW-AEPW	Carson South 138/13.8kV Transformer	33	Carson Tap - Union Avenue 138kV	0	Solution Undetermined	Not Available
05SP	AEPW-AEPW	Carson-Center 138/13.8kV Transformer	33	Carson South - Tulsa Power Sta 138kV	0	Solution Undetermined	Not Available
05SP	SWPA-EES	Carthage - Reed Springs 69kV	36	Carthage - Jasper 69kV	0	Third Party Facility	\$ -
05SP	AEPW-AEPW	Catoosa 138/69kV Transformer	55	Lynn Lane West Tap - Lynn Lane Tap 138kV	0	Solution Undetermined	Not Available
05SP	AEPW-AEPW	Chamber Springs - Farmington Aecc 161kV	335	Chamber Springs - Tontitown 161kV	0	Replace Farmington switch	\$ 60,000
05SP	AEPW-AEPW	Chamber Springs - Tontitown 161kV	244	Muskogee - Ft Smith 345kV	0	Rebuild 12 miles with 2156ACSR	\$ 7,200,000
05SP	AEPW-AEPW	Cherokee Rec - Knox Lee 138kV	209	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	0	Reconductor 3.25 miles of 666 ACSR with 1272 ACSR	\$ 981,000
05SP	AEPW-AEPW	Cherokee Rec - Tatum 138kV	209	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	0	Reconductor 6.25 miles of 666 ACSR with 1272 ACSR	\$ 1,641,000
05SP	WERE-WERE	Circleville - Hoyt Hti Switching Jct 115kV	97	Knob Hill - Greenleaf 115kV	186	Replace 82 structures	\$ 742,000
05SP	GRRD-GRRD	Claremore 161/69kV Transformer ckt 1	84	Claremore 161/69kV Transformer Ckt 2	0	Solution Undetermined	Not Available
05SP	GRRD-GRRD	Claremore 161/69kV Transformer ckt 2	84	Claremore 161/69kV Transformer Ckt 1	0	Solution Undetermined	Not Available
05SP	AEPW-WERE	Coffeyville Tap - Dearing 138kV	210	Delaware - Neosho 345kV	127	Replace wave trap to increase rating to conductor rating (2000 A)	\$ 20,000
05SP	WERE-WERE	County Line - Hook Jct 115kV	92	Tecumseh Energy Center - Tecumseh Hill 115kV	0	Solution Undetermined	Not Available
05SP	WERE-WERE	County Line - Rock Creek 69kV	41	Hoyt - Stranger Creek 345kV	106	Solution Undetermined	Not Available
05SP	AEPW-AEPW	Denver Center 138/13.8kV Transformer	33	Tulsa North - 46Th Street East 138kV	0	Solution Undetermined	Not Available
05SP	AEPW-AEPW	Denver East 138/13.8kV Transformer	33	Denver-West 138/13.8kV Transformer	226	Solution Undetermined	Not Available
05SP	AEPW-AEPW	Denver-West 138/13.8kV Transformer	33	Carson South - Kenosha West 138kV	0	Solution Undetermined	Not Available
05SP	AEPW-AEPW	East Centerton - Gentry Rec 161kV	353	Flint Creek - Tontitown 161kV	0	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR	\$ 8,000,000
05SP	AEPW-AEPW	Elm Springs Rec - Tontitown 161kV	306	Dyess - Tontitown 161kV	0	Replace Switch and Elm Springs Strain Bus	\$ 100,000
05SP	AEPW-AEPW	Flint Creek - Gentry Rec 161kV	353	Flint Creek - Tontitown 161kV	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR.	\$ 400,000
05SP	AEPW-AEPW	Flint Creek - Tontitown 161kV	312	Chamber Springs - Tontitown 161kV	0	Replace switch and jumpers	\$ 45,000
05SP	WERE-WERE	Gill Energy Center East - Macarthur 69kV	68	Gill Energy Center East - Oatville 69kV	0	Replace subSta bus and jumpers at MacArthur 69 kV	\$ 22,000
05SP	WERE-WERE	Gill Energy Center East - Oatville 69kV	72	Gill Energy Center East - Macarthur 69kV	0	Replace disconnect switches at Gill 69 kV (use 800 A.), Replace line switch at Oatville 69 kV (use 800 A.)	\$ 45,000
05SP	AEPW-AEPW	Hallsville - Longview Heights 69kV	48	Marshall - Marshall Auto 69kV	0	Rebuild 7.07 miles of 4/0 ACSR with 795 ACSR	\$ 3,000,000

Table 1 - continued – SPP facility upgrades identified for the AEPW to WR transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
05SP	KACY-KACY	Kaw 2 - Everett 2 69kV	68	Muncie 2 - Levee 2 69kV	37	Solution Undetermined	Not Available
05SP	WERE-WERE	Lawrence Hill - Wren 115kV	141	Mockingbird Hill Switching Sta - SW Lawrence 115kV	0	May be relieved due to Westar Transmission Operating Directive 1210	Not Available
05SP	AEPW-AEPW	Longwood - Noram 138kV	234	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	0	Reconductor 4.66 miles of bundled 266 ACSR with 1590 ACSR and replace jumpers & Bus Riser jumpers	\$ 1,577,000
05SP	AEPW-AEPW	Marshall - North Marshall 69kV	72	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	0	Replace 350 CU bus & jumpers @ North Marshall.	\$ 23,300
05SP	AEPW-AEPW	Marshall 138/69kV Transformer ckt 1	107	Marshall 138/69kV Transformer Ckt 2	0	Replace 755 ACAR Strain Bus	\$ 25,000
05SP	WERE-WERE	Mockingbird Hill Swi Sta - Stull Swi Sta 115kV	92	Hoyt - Stranger Creek 345kV	0	May be relieved due to Westar Transmission Operating Directive 803	Not Available
05SP	KACY-KACY	Muncie 2 - Levee 2 69kV	82	Everett 2 - Quindaro 2 69kV	44	Solution Undetermined	Not Available
05SP	SWPA-SWPA	Norfolk 161/69kV Transformer ckt 1	25	Norfolk 161/69kV Transformer Ckt 2	0	Replace Norfolk Transformer by SWPA In-Service Date 6/1/2005	Not Available
05SP	AEPW-AEPW	North Marshall - Woodlawn 69kV	51	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	24	Replace 3/0 CU jumpers @ North Marshall	\$ 15,000
05SP	KACY-KACY	Owens Corning 2 - Levee 2 69kV	82	Quindaro 2 - Victory West 2 69kV	27	Solution Undetermined	Not Available
05SP	KACY-KACY	Owens Corning 2 - Quindaro 2 69kV ckt 1	82	Owens Corning 2 - Quindaro 2 69kV Ckt 2	117	Solution Undetermined	Not Available
05SP	KACY-KACY	Owens Corning 2 - Quindaro 2 69kV ckt 2	82	Owens Corning 2 - Quindaro 2 69kV Ckt 1	92	Solution Undetermined	Not Available
05SP	OKGE-OKGE	Pecan Creek 161/345kV Transformer	369	Muskogee - Ft Smith 345kV	53	Add 2nd 345/161 kV 369MVA transformer.	\$ 3,000,000
05SP	AEPW-AEPW	Raines - Noram 138kV	234	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	46	Rebuild 5.58 miles of 2-266 ACSR with 1590 ACSR	\$ 2,000,000
05SP	AEPW-AEPW	Rock Hill - Tatum 138kV	209	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	0	Reconductor 0.81 miles 666MCM to 1272 ACSR - Reconductor other 5.76 miles of 795 ACSR with 1272 ACSR. Reset CTs and relay settings @ Rock Hill	\$ 342,970
05SP	MIDW-WEPL	Seward 69/115kV Transformer	44	Heizer 115/230kV Transformer	0	Solution Undetermined	Not Available
05SP	WERE-WERE	SW Lawrence - Wakarusa Jct Swi Sta 115kV	92	Ku Campus - 19Th Street Jct 115kV	0	Solution Undetermined	Not Available
05SP	AEPW-WFEC	Southwest Sta - Anadarko 138kV	203	Elk City 138/69kV Transformer	27	Replace bus, jumpers, switches, supports and foundations at Anadarko Switch Sta	\$ 450,000
05SP	SWPA-SPRM	Springfield - Brookline 161kV	323	Jct - Brookline 161kV	0	Solution Undetermined	Not Available
05SP	EMDE-EMDE	Baxter Springs West - Hockerville 69kV	61	Sub 167 - Riverton - Sub 404 - Hockerville 161kV	105	Solution Undetermined	Not Available
05SP	GRRD-GRRD	Tahlequah 69/161kV Transformer ckt 1	78	Tahlequah 69/161kV Transformer Ckt 2	12	Solution Undetermined	Not Available
05SP	GRRD-GRRD	Tahlequah 69/161kV Transformer ckt 2	78	Tahlequah 69/161kV Transformer Ckt 1	0	Solution Undetermined	Not Available
05SP	WERE-WERE	Tecumseh Energy Center - Hook Jct 115kV	160	Tecumseh Energy Center - Tecumseh Hill 115kV	0	Solution Undetermined	Not Available
05SP	WERE-WERE	Tecumseh Hill - Stull Switching Sta 115kV	92	Hoyt - Stranger Creek 345kV	0	May be relieved due to Westar Transmission Operating Directive 803	Not Available
05SP	OKGE-OKGE	Tinker #4 - Tinker #2 138kV	100	Horseshoe Lake - Midway 138kV	0	Invalid Overload	\$ -
05WP	WERE-WERE	166Th Street - Jarbalo Jct Switching Sta 115kV	97	Midland Jct - Pentagon 115kV	49	See Previous	See Previous
05WP	GRRD-GRRD	Afton 161/69kV Transformer	50	Miami - Afton 161kV	183	See Previous	See Previous
05WP	WERE-WERE	Auburn Road - Jeffrey Energy Center 230kV	565	Hoyt - Jeffrey Energy Center 345kV	0	See Previous	See Previous
05WP	AEPW-AEPW	Catoosa 138/69kV Transformer	55	Lynn Lane West Tap - Lynn Lane Tap 138kV	0	See Previous	See Previous

Table 1 - continued – SPP facility upgrades identified for the AEPW to WR transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
05WP	AEPW-AEPW	Chamber Springs - Tontitown 161kV	275	Chamber Springs - Farmington Aecc 161kV	2	See Previous	See Previous
05WP	AEPW-WERE	Coffeyville Tap - Dearing 138kV	210	Delaware - Neosho 345kV	242	See Previous	See Previous
05WP	AEPW-AEPW	Denver Center 138/13.8kV Transformer	33	Denver Tap - 46Th Street East 138kV	0	See Previous	See Previous
05WP	WERE-WERE	El Paso - Gill Energy Center South 138kV	210	Evans Energy Ctr Nth - Evans Energy Ctr Sth 138kV	0	Solution Undetermined	Not Available
05WP	WERE-WERE	Mockingbird Hill Swi Sta - Stull Swi Sta 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
05WP	SWPA-SWPA	Norfolk 161/69kV Transformer ckt 1	25	Norfolk 161/69kV Transformer Ckt 2	0	See Previous	See Previous
05WP	SWPA-SPRM	Springfield - Brookline 161kV	323	Jct - Brookline 161kV	0	See Previous	See Previous
05WP	WERE-WERE	Tecumseh Hill - Stull Switching Sta 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
08SP	WERE-WERE	166Th Street - Jaggard Jct 115kV	97	Midland Jct - Pentagon 115kV	52	See Previous	See Previous
08SP	WERE-WERE	166Th Street - Jarbalo Jct Switching Sta 115kV	97	Midland Jct - Pentagon 115kV	0	See Previous	See Previous
08SP	GRRD-GRRD	412Sub - Kansas Tap 161kV	338	Flint Creek - Grda1 345kV	0	Reconductor 9.7 miles with 1590MCM ACSR	\$ 1,488,000
08SP	GRRD-GRRD	Afton 161/69kV Transformer	50	Miami - Afton 161kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Alumax Tap - Bann 138kV	261	NW Texarkana-Bann T - NW Texarkana 138kV	0	Replace six (6) 138 kV switches, five at Bann & one at Alumax Tap. Rebuild 0.67 miles of 1024 ACAR with 2156 ACSR. Replace wavetrap jumpers @ Bann. Replace breaker 3300 @ Bann.	\$ 630,000
08SP	AEPW-AEPW	Alumax Tap - Northwest Texarkana 138kV	261	NW Texarkana-Bann T - NW Texarkana 138kV	0	See Previous	See Previous
08SP	WFEC-WFEC	Anadarko - Cyril 69kV	61	Anadarko - Georgia 138kV	223	Reconductor 13 miles of 336MCM ACSR with 795MCM	\$ 2,626,000
08SP	WERE-WERE	Auburn Road - Indian Hills 115kV	223	Hoyt - Jeffery Energy Center 345kV	0	May be relieved due to Westar Transmission Operating Directive 400	Not Available
08SP	WERE-WERE	Auburn Road - Jeffrey Energy Center 230kV	565	Hoyt - Jeffery Energy Center 345kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Blue Circle - Catoosa 69kV	72	Lynn Lane West Tap - Lynn Lane Tap 138kV	0	See Previous	See Previous
08SP	AEPW-OKGE	Bonanza - Bonanza Tap 161kV	177	Aes - Tarby 161kV	60	Rebuild 0.06 miles of 397.5 ACSR with 795MCM ACSR	\$ 50,000
08SP	AEPW-AEPW	Broken Arrow 101St North - Oneta 138kV	210	Tulsa Power Sta - 36Th & Lewis 138kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Broken Arrow 81St - Broken Arrow 101St Nth 138kV	235	Riverside Sta Auto 138/345kV Transformer	0	Rebuild 2.05 miles of 795 ACSR with 1590 ACSR	\$ 1,100,000
08SP	AEPW-AEPW	Broken Arrow North - North Tap - Oneta 138kV	235	Broken Arrow 101St North - Oneta 138kV	0	Solution Undetermined	Not Available
08SP	AEPW-AEPW	Broken Arrow Nth - Sth Tap - Lynn Lane Tap 138kV	235	Tulsa North - Northeast Sta 345kV	0	Rebuild 4.63 miles of 795 ACSR with 1590 ACSR	\$ 2,600,000
08SP	AEPW-AEPW	Broken Arrow North - South Tap - Oneta 138kV	235	Tulsa North - Northeast Sta 345kV	0	Rebuild 4.31 miles of 795 ACSR with 1590 ACSR.	\$ 2,370,500
08SP	SWPA-EES	Bull Shoals - Midway 161kV	162	Bull Shoals - Buford Tap 161kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Carson South 138/13.8kV Transformer	33	Carson Tap - Union Avenue 138kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Carson-Center 138/13.8kV Transformer	33	Carson South - Tulsa Power Sta 138kV	0	See Previous	See Previous
08SP	WFEC-WFEC	Carter Jct - Lake Creek 69kV	26	Elk City 138/69kV Transformer	0	Solution Undetermined	Not Available
08SP	SWPA-EES	Carthage - Jasper 69kV	47	Milo - Clark 69kV	0	Third Party Facility	\$ -
08SP	SWPA-EES	Carthage - Reed Springs 69kV	36	Sub 124 - Aurora H.T. - Sub 383 - Monett 161kV	0	See Previous	See Previous
08SP	SWPA-SWPA	Carthage 161/69kV Transformer ckt 1	84	Carthage 161/69kV Transformer Ckt 2	46	Third Party Facility	\$ -
08SP	SWPA-SWPA	Carthage 161/69kV Transformer ckt 2	84	Carthage 161/69kV Transformer Ckt 1	116	Third Party Facility	\$ -
08SP	AEPW-AEPW	Catoosa 138/69kV Transformer	55	Lynn Lane West Tap - Lynn Lane Tap 138kV	0	See Previous	See Previous

Table 1 - continued – SPP facility upgrades identified for the AEPW to WR transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
08SP	AEPW-AEPW	Chamber Springs - Tontitown 161kV	244	East Rogers - Rogers West Rec 161kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Chamber Springs 161/345kV Transformer	660	Flint Creek - Grda1 345kV	0	Install 2nd 345/161 kV Auto-transformer	\$ 4,000,000
08SP	AEPW-AEPW	Cherokee Rec - Knox Lee 138kV	209	Stonewall - Western Electric T 138kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Cherokee Rec - Tatum 138kV	209	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	0	See Previous	See Previous
08SP	WERE-WERE	Circleville - Hoyt Hti Switching Jct 115kV	97	Concordia 115/230kV Transformer	195	See Previous	See Previous
08SP	GRRD-GRRD	Claremore 161/69kV Transformer ckt 1	84	Claremore 161/69kV Transformer Ckt 2	0	See Previous	See Previous
08SP	GRRD-GRRD	Claremore 161/69kV Transformer ckt 2	84	Claremore 161/69kV Transformer Ckt 1	0	See Previous	See Previous
08SP	SPRM-AECI	Clay - Logan 161kV	185	Multiple Outage Contingency Franks - Huben 345kV Huben - Morgan 345kV	116	Replace transmission line structures to allow operation at 100C	\$ 250,000
08SP	AEPW-WERE	Coffeyville Tap - Dearing 138kV	210	Delaware - Neosho 345kV	0	See Previous	See Previous
08SP	WERE-WERE	County Line - Hook Jct 115kV	92	Tecumseh Energy Center - Tecumseh Hill 115kV	0	See Previous	See Previous
08SP	WERE-WERE	County Line - Rock Creek 69kV	41	Stranger Creek 345/951kV Transformer Ckt 0	0	See Previous	See Previous
08SP	KACP-KACP	Craig - College 161kV	335	West Gardner - Moonlight 161kV	20	Solution Undetermined	Not Available
08SP	WERE-WERE	Crawford - Neosho 69kV	57	Neosho 345/791kV Transformer Ckt 0	0	Solution Undetermined	Not Available
08SP	WERE-WERE	Crawford - Sekan No. 1 Greenbush 69kV	57	Neosho 345/791kV Transformer Ckt 0	0	Solution Undetermined	Not Available
08SP	AEPW-AEPW	Denver Center 138/13.8kV Transformer	33	Tulsa North - 46Th Street East 138kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Denver-West 138/13.8kV Transformer	33	Carson South - Kenosha West 138kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Diana - Perdue 138kV	237	Harrison Road - Liberty City Tap 138kV	0	Replace Breaker 10070 @ Perdue	\$ 150,000
08SP	AEPW-AEPW	East Centerton - Gentry Rec 161kV	353	Flint Creek - East Centerton 345kV	0	See Previous	See Previous
08SP	INDN-AECI	Eckles 5 - PITTSV 161kV	163	Clinton - Holden 161kV	15	Solution Undetermined	Not Available
08SP	AEPW-AEPW	Elm Springs Rec - Tontitown 161kV	306	Chamber Springs - Farmington Aecc 161kV	0	See Previous	See Previous
08SP	KACY-KACY	Everett 2 - Kaw 2 69kV	68	Muncie 2 - Levee 2 69kV	30	Solution Undetermined	Not Available
08SP	WERE-WERE	Farmer's Consumer - Wakarusa Jct Swi Sta 115kV	92	SW Lawrence - Wakarusa Jct Switching Sta 115kV	138	Solution Undetermined	Not Available
08SP	AEPW-AEPW	Flint Creek - Gentry Rec 161kV	353	Flint Creek - East Centerton 345kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Flint Creek - Tontitown 161kV	312	Chamber Springs - Clarksville 345kV	0	See Previous	See Previous
08SP	AEPW-EES	Fulton - Patmos 115kV	174	Dolet Hills 345/230kV Transformer	0	Using 1590MCM ACSR, reconductor 7.1 miles	\$ 2,300,000
08SP	WERE-WERE	Gill Energy Center East - Macarthur 69kV	68	Gill Energy Center East - Oatville 69kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Hallsville - Longview Heights 69kV	48	Marshall - Marshall Auto 69kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Jacksonville (Swe-Rc-Etec) - Overton 138kV	235	Crockett - Tenaska Rusk County 345kV	0	Reset relays at Jacksonville & Overton	\$ 15,000
08SP	GRRD-GRRD	Kerr - 412Sub 161kV	338	Flint Creek - Grda1 345kV	0	Reconductor 12.5 miles with 1590MCM ACSR.	\$ 1,918,000
08SP	OKGE-WFEC	Knobhill - Mooreland 138kV	59	Cleveland Tap - South 4Th St 69kV	0	Solution Undetermined	Not Available
08SP	AEPW-AEPW	Knox Lee - Oak Hill #2 138kV	210	Knox Lee - Monroe Corners Rec 138kV	0	Replace wavetrap @ Knoxlee	\$ 20,000
08SP	WERE-WERE	Lawrence Hill - Wren 115kV	141	Bismark Jct Swi Sta -Farmer's Consumer 115kV	0	See Previous	See Previous

Table 1 - continued – SPP facility upgrades identified for the AEPW to WR transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
08SP	AEPW-AEPW	Lieberman - IPC Jefferson 138kV	136	Longwood - Wilkes 345kV	0	Reconductor 26.35 miles of 336 ACSR with 795 ACSR, Replace Switches @ Lieberman, Reset Relays @ Jefferson IPC, & Reconductor 0.65 miles 397MCM to 795MCM	\$ 7,411,000
08SP	WFEC-WFEC	Lindsay Sw - Wallville 69kV	26	Fletcher - Marlow Jct 69kV	0	Solution Undetermined	Not Available
08SP	AEPW-AEPW	Longwood - Noram 138kV	234	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Marshall - North Marshall 69kV	72	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Marshall 138/69kV Transformer ckt 1	107	Marshall 138/69kV Transformer Ckt 2	0	See Previous	See Previous
08SP	AEPW-AEPW	Marshall 138/69kV Transformer ckt 2	107	Marshall 138/69kV Transformer Ckt 1	0	Replace 755 ACAR Strain Bus	\$ 25,000
08SP	OKGE-WFEC	Midwest Tap - Franklin Sw 138kV	215	Midwest Tap - Hollywood 138kV	19	Replace 600A metering CTs with 1200A	\$ 55,000
08SP	WERE-WERE	Mockingbird Hill Swi Sta - Stull Swi Sta 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
08SP	KACY-KACY	Muncie 2 - Levee 2 69kV	82	Everett 2 - Quindaro 2 69kV	37	See Previous	See Previous
08SP	SWPA-SWPA	Norfolk 161/69kV Transformer	25	Norfolk - West Plains 161kV	0	Replace Norfolk Transformer by SWPA In-Service Date 6/1/2005	Not Available
08SP	SWPA-SWPA	Norfolk 161/69kV Transformer ckt 1	25	Norfolk 161/69kV Transformer Ckt 2	0	See Previous	See Previous
08SP	SWPA-SWPA	Norfolk 161/69kV Transformer ckt 2	25	Norfolk 161/69kV Transformer Ckt 1	0	Solution Undetermined	Not Available
08SP	WERE-WERE	NA Philips - NA Philips Jct (South) 115kV	160	East Mcpherson - Summit 230kV	0	Solution Undetermined	Not Available
08SP	WERE-WERE	NA Philips Jct (North) - Smoky Hill 115kV ckt 1	68	NA Philips Jct (North) - Smoky Hill 115kV Ckt 2	0	Solution Undetermined	Not Available
08SP	WERE-WERE	NA Philips Jct (Sth) - West Mcpherson 115kV ckt 1	68	NA Philips Jct (Sth) - West Mcpherson 115kV Ckt 2	0	May be relieved due to Westar Transmission Operating Directive 613	Not Available
08SP	WERE-WERE	NA Philips Jct (Sth) - West Mcpherson 115kV ckt 2	92	East Mcpherson - Summit 230kV Ckt 1	0	May be relieved due to Westar Transmission Operating Directive 613	Not Available
08SP	AEPW-AEPW	North Bartlesville - Bartlesville Southeast 138kV	210	Delaware - Northeast Sta 345kV	213	Replace Bartlesville Southeast Wavetrap	\$ 30,000
08SP	AEPW-AEPW	North Marshall - Woodlawn 69kV	51	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	0	See Previous	See Previous
08SP	OKGE-OKGE	Osage - Continental Blacks 69kV	111	Kildare - White Eagle 138kV	134	Rebuild & Reconductor 0.57 Miles, replace Wavetrap and increase CT ratio	\$ 255,000
08SP	KACY-KACY	Owens Corning 2 - Levee 2 69kV	82	Quindaro 2 - Victory West 2 69kV	22	See Previous	See Previous
08SP	KACY-KACY	Owens Corning 2 - Quindaro 2 69kV ckt 1	82	Owens Corning 2 - Quindaro 2 69kV Ckt 2	110	See Previous	See Previous
08SP	KACY-KACY	Owens Corning 2 - Quindaro 2 69kV ckt 2	82	Owens Corning 2 - Quindaro 2 69kV Ckt 1	84	See Previous	See Previous
08SP	OKGE-OKGE	Pecan Creek 161/345kV Transformer	369	Muskogee - Ft Smith 345kV	0	See Previous	See Previous
08SP	GRRD-GRRD	Pensacola - Gray Tap 69kV	47	Kansas Tap - Kansas 161kV	225	See Previous	See Previous
08SP	WEPL-WEPL	Phillipsburg - Smith Center 115kV	40	Knoll - Summit 230kV	56	Solution Undetermined	Not Available
08SP	AEPW-AEPW	Raines - Noram 138kV	234	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	0	See Previous	See Previous
08SP	AEPW-AEPW	Rock Hill - Tatum 138kV	209	Multiple Outage Contingency Southwest Shreveport - Longwood 345kV Southwest Shreveport to Diana 345kV	0	See Previous	See Previous

Table 1 - continued – SPP facility upgrades identified for the AEPW to WR transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
08SP	MIDW-WEPL	Seward 69/115kV Transformer	44	Heizer 115/230kV Transformer	0	See Previous	See Previous
08SP	AEPW-AEPW	South Fayetteville - Farmington Aecc 161kV	313	Chamber Springs - Tontitown 161kV	0	Solution Undetermined	Not Available
08SP	WERE-WERE	SW Lawrence - Wakarusa Jct Switching Sta 115kV	92	Ku Campus - 19Th Street Jct 115kV	0	See Previous	See Previous
08SP	SWPA-SWPA	Springfield 161/69kV Transformer ckt 3	25	Springfield 161/69kV Transformer Ckt 1	0	Replace 25/25MVA transformer #3 with 80MVA unit to eliminate overload of both 25MVA #3 and 80MVA #1 transformers	\$ 1,300,000
08SP	AECI-AECI	Stilwell - Titanic Tap 69kV	36	Sallisaw - Brushy 69kV	0	Line Owned by GRDA - Solution Undetermined	Not Available
08SP	KACP-KACP	Stilwell 345/161kV Transformer ckt 11	605	Stilwell 345/161kV Transformer Ckt 22	240	Solution Undetermined	Not Available
08SP	EMDE-EMDE	Baxter Springs West - Hockerville 69kV	61	Sub 167 - Riverton - Sub 404 - Hockerville 161kV	174	See Previous	See Previous
08SP	EMDE-AECI	Sub 446 - Chesapeake - 2MTVRN 69kV	36	Sub 124 - Aurora H.T. - Sub 355 - Aurora West 69kV	0	Solution Undetermined	Not Available
08SP	GRRD-GRRD	Tahlequah 69/161kV Transformer ckt 1	78	Tahlequah 69/161kV Transformer Ckt 2	0	See Previous	See Previous
08SP	GRRD-GRRD	Tahlequah 69/161kV Transformer ckt 2	78	Tahlequah 69/161kV Transformer Ckt 1	0	See Previous	See Previous
08SP	WERE-WERE	Tecumseh Energy Center - Hook Jct 115kV	160	Tecumseh Energy Center - Tecumseh Hill 115kV	0	See Previous	See Previous
08SP	WERE-WERE	Tecumseh Energy Center - Tecumseh Hill 115kV	236	Hoyt - Stranger Creek 345kV	0	May be relieved due to Westar Transmission Operating Directive 803	Not Available
08SP	WERE-WERE	Tecumseh Hill - Stull Switching Sta 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
08SP	OKGE-OKGE	Tinker #4 - Tinker #2 138kV	100	Horseshoe Lake - Midway 138kV	0	See Previous	See Previous
08WP	WERE-WERE	166Th Street - Jaggard Jct 115kV	97	Midland Jct - Pentagon 115kV	222	May be relieved due to Westar Transmission Operating Directive 1202	Not Available
08WP	WERE-WERE	166Th Street - Jarbalo Jct Switching Sta 115kV	97	Midland Jct - Pentagon 115kV	0	See Previous	See Previous
08WP	GRRD-GRRD	Afton 161/69kV Transformer	50	Miami - Afton 161kV	0	See Previous	See Previous
08WP	WERE-WERE	Auburn Road - Jeffrey Energy Center 230kV	565	Hoyt - Jeffrey Energy Center 345kV	0	See Previous	See Previous
08WP	WFEC-WFEC	Carter Jct - Lake Creek 69kV	26	Elk City 138/69kV Transformer	0	See Previous	See Previous
08WP	AEPW-AEPW	Catoosa 138/69kV Transformer	55	Lynn Lane West Tap - Lynn Lane Tap 138kV	0	See Previous	See Previous
08WP	AEPW-AEPW	Chamber Springs - Tontitown 161kV	275	Chamber Springs - Farmington Aecc 161kV	0	See Previous	See Previous
08WP	WERE-WERE	Circleville - Hoyt Hti Switching Jct 115kV	97	Cooper - S1280 5 161kV	103	See Previous	See Previous
08WP	AEPW-WERE	Coffeyville Tap - Dearing 138kV	210	Delaware - Neosho 345kV	72	See Previous	See Previous
08WP	WERE-WERE	County Line - Hook Jct 115kV	92	Tecumseh Energy Center - Tecumseh Hill 115kV	0	See Previous	See Previous
08WP	AEPW-AEPW	Denver Center 138/13.8kV Transformer	33	Denver Tap - 46Th Street East 138kV	0	See Previous	See Previous
08WP	AEPW-AEPW	Denver-West 138/13.8kV Transformer	33	Carson South - Kenosha West 138kV	0	See Previous	See Previous
08WP	AEPW-AEPW	Diana - Perdue 138kV	237	Harrison Road - Liberty City Tap 138kV	0	See Previous	See Previous
08WP	SWPA-AECI	Doniphan 161/69kV Transformer ckt 1	18.8	Doniphan 161/69kV Transformer Ckt 2	0	Solution Undetermined	Not Available
08WP	WERE-WERE	El Paso - Gill Energy Center South 138kV	210	Evans Energy Ctr Nth - Evans Energy Ctr Sth 138kV	0	See Previous	See Previous
08WP	AEPW-AEPW	Jacksonville (Swe-Rc-Etec) - Overton 138kV	265	Crockett - Tenaska Rusk County 345kV	0	See Previous	See Previous
08WP	AEPW-AEPW	Marshall 138/69kV Transformer ckt 1	121	Marshall 138/69kV Transformer Ckt 2	0	See Previous	See Previous
08WP	AEPW-AEPW	Marshall 138/69kV Transformer ckt 2	121	Marshall 138/69kV Transformer Ckt 1	0	See Previous	See Previous
08WP	WERE-WERE	Mockingbird Hill Swi Sta - Stull Swi Sta 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
08WP	SWPA-SWPA	Norfolk 161/69kV Transformer	25	Norfolk - West Plains 161kV	0	See Previous	See Previous

Table 1 - continued – SPP facility upgrades identified for the AEPW to WR transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
08WP	SWPA-SWPA	Norfolk 161/69kV Transformer ckt 1	25	Norfolk 161/69kV Transformer Ckt 2	0	See Previous	See Previous
08WP	AEPW-AEPW	North Bartlesville - Bartlesville Southeast 138kV	210	Delaware - Northeast Sta 345kV	194	See Previous	See Previous
08WP	OKGE-OKGE	Pecan Creek 161/345kV Transformer	369	Muskogee - Ft Smith 345kV	12	See Previous	See Previous
08WP	WERE-WERE	SW Lawrence - Wakarusa Jct Switching Sta 115kV	92	Ku Campus - 19Th Street Jct 115kV	0	See Previous	See Previous
08WP	WERE-WERE	Tecumseh Energy Center - Hook Jct 115kV	160	Tecumseh Energy Center - Tecumseh Hill 115kV	0	See Previous	See Previous
08WP	WERE-WERE	Tecumseh Hill - Stull Switching Sta 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
08WP	KACP-KACP	West Gardner 345/161kV Transformer	440	West Gardner - Craig 345kV Ckt 1	219	Solution Undetermined	Not Available
Total (Excludes Costs Not Available)							\$ 59,325,770