



***System Impact Study SPP-2001-229  
For Transmission Service  
Requested By  
InterGen Services, Inc.***

***From OKGE To EES***

***For a Reserved Amount Of 1100MW  
From 5/1/03  
To 5/1/06***

***SPP Coordinated Planning***

## **System Impact Study**

InterGen Services, Inc. has requested a system impact study for long-term Firm Point-to-Point transmission service from OKGE to EES. The period of the transaction is from 5/1/03 to 5/1/06. The request is for OASIS reservations 263142, 263146, 263148, 263149, 263151, 263153 and 263155 for a total amount of 1100 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 1100 MW of service requested.

SPP used seven seasonal models to study the OKGE to EES 1100 MW transfer for the requested service period for each scenario. The SPP 2002 Series Cases 2003 Spring Peak, 2003 Summer Peak, 2003 Fall Peak, 2003/04 Winter Peak, 2004 Spring Peak, 2005 Summer Peak, and 2005/06 Winter Peak were used to study the impact of the 1100 MW transfer on the SPP system during the requested service period of 5/1/2003 to 5/1/2006. 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 the OKGE to EES 1100 MW transfer as the highest priority request in the queue, the study results show that limiting constraints exist. These limitations are documented in Table 1. 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 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.

The cost estimates for incrementing levels of ATC are given in Table 2.

**Table 1 – SPP facility upgrades required for the OKGE to EES transfer**

Study Year	From Area - To Area	Branch Over 100% Rate B	ATC	Rate B	Outaged Branch Causing Overload	Solution	Estimated Cost
03G	AEPW-AEPW	South Shreveport - Wallace Lake 138kV	903	210	Dolet Hills 345/230kV Transformer	Dolet Hills Operating Guide	\$ -
03G	OKGE-OKGE	Pecan Creek 161/345kV Transformer	600	369	Muskogee - Ft Smith 345kV	See Previous	See Previous
03G	SWPA-SWPA	Glencoe - Norfolk 161kV	828	112	New -IN - Newpo 161kV	Remove wave trap. Switch relaying channel to fiber optic shield wire. To be completed by SWPA for own needs.	Not Available
03G	WERE-WERE	Athens Sw Sta - Coffey County No. 4 Vernon 69kV	0	45	Wolf Creek - Lacygne 345kV	May be relieved due to Westar Transmission Operating Directive 1304	Not Available
03G	WERE-WERE	Auburn Road - Indian Hills 115kV	0	118	Hoyt - Jeffery Energy Center 345kV	May be relieved due to Westar Transmission Operating Directive 400	Not Available
03G	WERE-WERE	Auburn Road - Jeffrey Energy Center 230kV	0	565	Hoyt - Jeffery Energy Center 345kV	May be relieved due to Westar Transmission Operating Directive 400	Not Available
03G	WERE-WERE	Auburn Road - South Gage (West) 115kV	0	75	Hoyt - Jeffery Energy Center 345kV	May be relieved due to Westar Transmission Operating Directive 400	Not Available
03G	WERE-WERE	Auburn Road - South Gage (West) 115kV ckt 2	0	97	Hoyt - Jeffery Energy Center 345kV Ckt 1	May be relieved due to Westar Transmission Operating Directive 400	Not Available
03G	WERE-WERE	Circleville - Hoyt Hti Sw Junction 115kV	0	97	Hoyt - Stranger Creek 345kV	Replace 82 structures	\$ 742,000
03G	WERE-WERE	Circleville - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	May be relieved due to Westar Transmission Operating Directive 803	Not Available
03G	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	0	45	Wolf Creek - Lacygne 345kV	May be relieved due to Westar Transmission Operating Directive 1304	Not Available
03G	WERE-WERE	East Street - West Emporia 115kV	284	92	Morris County - West Emporia 115kV	May be relieved due to Westar Transmission Operating Directive 1209	Not Available
03G	WERE-WERE	Fort Jct Sw Sta - West Jct City Jct (East) 115kV ckt 1	700	68	Fort Jct Sw Sta - West Jct City Jct (East) 115kV Ckt 2	May be relieved due to Westar Transmission Operating Directive 1217	Not Available
03G	WERE-WERE	Kelly - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	May be relieved due to Westar Transmission Operating Directive 803	Not Available
03G	WERE-WERE	Mockingbird Hill Sw Station - Stull Sw Station 115kV	680	92	Hoyt - Stranger Creek 345kV	May be relieved due to Westar Transmission Operating Directive 803	Not Available
03G	WERE-WERE	Tecumseh Hill - Stull Sw Station 115kV	0	92	Hoyt - Stranger Creek 345kV	May be relieved due to Westar Transmission Operating Directive 803	Not Available
03G	WFEC-WFEC	Acme - Franklin Sw 69kV	0	34	Canadian Sw 69/138kV Transformer	Solution Undetermined	Not Available
03G	WFEC-WFEC	Goldsby - Oklahoma University Sw 69kV	0	34	Franklin Sw 69/138kV Transformer	Solution Undetermined	Not Available
03SP	AEPW-AEPW	Alumax Tap - Bann 138kV	0	261	Nw Texarkana-Bann T - Northwest Texarkana 138kV	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
03SP	AEPW-AEPW	Alumax Tap - Northwest Texarkana 138kV	0	261	Nw Texarkana-Bann T - Northwest Texarkana 138kV	Replace Switches Alumax Tap	\$ 30,000
03SP	AEPW-AEPW	Big Sandy - Perdue 69kV	0	85	Perdue - Lake Hawkins 138kV	Solution Undetermined	Not Available

**Table 1 - continued** – SPP facility upgrades required for the OKGE to EES transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	ATC	Rate B	Outaged Branch Causing Overload	Solution	Estimated Cost
03SP	AEPW-AEPW	Blue Circle - Catoosa 69kV	789	72	Lynn Lane West Tap - Lynn Lane Tap 138kV	Solution Undetermined	Not Available
03SP	AEPW-AEPW	Carson-Center 138/13.8kV Transformer	0	33	Carson South - Tulsa Power Station 138kV	Solution Undetermined	Not Available
03SP	AEPW-AEPW	Catoosa 138/69kV Transformer	0	55	Lynn Lane West Tap - Lynn Lane Tap 138kV	Solution Undetermined	Not Available
03SP	AEPW-AEPW	Cherokee Rec - Knox Lee 138kV	0	209	Multiple Outage Contingency , Southwest Shreveport - Longwood 345kV, Southwest Shreveport to Diana 345kV	Reconductor 3.25 miles of 666 ACSR with 1272 ACSR	\$ 981,000
03SP	AEPW-AEPW	Cherokee Rec - Tatum 138kV	212	209	Multiple Outage Contingency , Southwest Shreveport - Longwood 345kV, Southwest Shreveport to Diana 345kV	Reconductor 3.25 miles of 666 ACSR with 1272 ACSR	\$ 1,641,000
03SP	AEPW-AEPW	Denver-West 138/13.8kV Transformer	0	33	Carson South - Kenosha West 138kV	Solution Undetermined	Not Available
03SP	AEPW-AEPW	Diana - Perdue 138kV	0	237	Harrison Road - Liberty City Tap 138kV	Replace Breaker 10070 @ Perdue	\$ 150,000
03SP	AEPW-AEPW	Dyess - Chamber Springs 161kV	0	244	Chamber Springs - Farmington Aecc 161kV	AEPW Planned Tontitown Project	\$ -
03SP	AEPW-AEPW	Dyess - East Rogers 161kV	0	244	Flint Creek - Gentry Rec 161kV	AEPW Planned Tontitown Project	\$ -
03SP	AEPW-AEPW	East Centerton - Gentry Rec 161kV	0	353	Flint Creek - Elm Springs Rec 161kV	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR	\$ 8,000,000
03SP	AEPW-AEPW	Flint Creek - Elm Springs Rec 161kV	0	312	Flint Creek - Gentry Rec 161kV	AEPW Planned Tontitown Project	\$ -
03SP	AEPW-AEPW	Flint Creek - Gentry Rec 161kV	0	353	Flint Creek - Elm Springs Rec 161kV	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR.	\$ 400,000
03SP	AEPW-AEPW	Greggton - Lake Lamond 69kV	0	107	Diana - Perdue 138kV	Solution Undetermined	Not Available
03SP	AEPW-AEPW	Lieberman - IPC Jefferson 138kV	676	136	Longwood - Wilkes 345kV	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
03SP	AEPW-AEPW	Longwood - Noram 138kV	159	234	Multiple Outage Contingency , Southwest Shreveport - Longwood 345kV, Southwest Shreveport to Diana 345kV	Reconductor 4.66 miles of bundled 266 ACSR with 1590 ACSR and replace jumpers & Bus Riser jumpers	\$ 1,577,000
03SP	AEPW-AEPW	Marshall 138/69kV Transformer ckt 1	0	107	Marshall 138/69kV Transformer Ckt 2	Replace 755 ACAR Strain Bus	\$ 25,000
03SP	AEPW-AEPW	Marshall 138/69kV Transformer ckt 2	0	107	Marshall 138/69kV Transformer Ckt 1	Replace 755 ACAR Strain Bus	\$ 25,000
03SP	AEPW-AEPW	Pittsburg - Ferndale Lake Tap 69kV	0	79	Adora Rec - Adora T 69kV	Reset CTs @ Pittsburg	\$ 10,000
03SP	AEPW-AEPW	Raines - Noram 138kV	566	234	Multiple Outage Contingency , Southwest Shreveport - Longwood 345kV, Southwest Shreveport to Diana 345kV	Rebuild 5.58 miles of 2-266 ACSR with 1590 ACSR	\$ 2,000,000
03SP	AEPW-AEPW	Rock Hill - Tatum 138kV	486	209	Multiple Outage Contingency , Southwest Shreveport - Longwood 345kV, Southwest Shreveport to Diana 345kV	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
03SP	AEPW-WERE	Coffeyville Tap - Dearing 138kV	923	210	Delaware - Neosho 345kV	Replace wave trap to increase rating to conductor rating (2000 A)	\$ 20,000
03SP	EMDE-EMDE	Oronogo Jct. - Joplin Oakland North 161kV	409	214	Tipton Ford - Joplin Southwest 161kV	Reconstruct and replace 1.4 miles of 556 ACSR with Bundled 556 ACSR	\$ 800,000
03SP	GRRD-GRRD	Claremore 161/69kV Transformer ckt 1	183	84	Claremore 161/69kV Transformer Ckt 2	Solution Undetermined	Not Available

**Table 1 - continued** – SPP facility upgrades required for the OKGE to EES transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	ATC	Rate B	Outaged Branch Causing Overload	Solution	Estimated Cost
03SP	GRRD-GRRD	Claremore 161/69kV Transformer ckt 2	28	84	Claremore 161/69kV Transformer Ckt 1	Solution Undetermined	Not Available
03SP	GRRD-OKGE	Tahlequah - Highway 59 161kV	928	167	Muskogee - Ft Smith 345kV	Remove switches #130 and #132 to increase rating from 600A to conductor limit of 662 Amps for Rate B and replace structures	\$ 30,000
03SP	KACP-KACP	Stilwell - Lacygne 345kV	0	1251	West Gardner - Lacygne 345kV	Build new Linn County substation with 345/161kV 400 Mva transformer. Tap Wolf Creek to LaCygne 345kV line and Centerville to Paola 161kV line	\$ 6,945,000
03SP	MIDW-WEPL	Seward 69/115kV Transformer	0	44	Heizer 115/230kV Transformer	Solution Undetermined	Not Available
03SP	OKGE-OKGE	Ft Smith 161/345kV Transformer	1048	493	Ft Smith 345/500kV Transformer	Convert Ft. Smith 161kv to 1-1/2 breaker design and install 2nd 500-161kV transformer bank	\$ 10,000,000
03SP	OKGE-OKGE	Pecan Creek 161/345kV Transformer	766	369	Muskogee - Ft Smith 345kV	Add 2nd 345/161 kV 369MVA transformer.	\$ 3,000,000
03SP	SWPA-AEPW	Beaver - Eureka Springs 161kV	988	274	Flint Creek - Sub 383 - Monett 345kV	AEPW Reconductor 1.25 miles with 1590ACSR SWPA Reconnect CT's; Replace metering & reset relays	\$ 537,500
03SP	SWPA-AEPW	Broken Bow- Craig Junction 138kV	957	107	Bbdamp4 - Mountain River 138kV	Rebuild 7.66 miles of 3/0 CW CU with 795 ACSR	\$ 2,700,000
03SP	SWPA-EES	Bull Shoals - Midway 161kV	0	162	Ises - Morefield 161kV	Replace disconnect switches, metering CTs and wave trap at Bull Shoals	\$ 150,000
03SP	SWPA-EES	Carthage - Jasper 69kV	537	47	Milo - Clark 69kV	Third Party Facility	\$ -
03SP	SWPA-EES	Carthage - Reed Springs 69kV	0	36	Sub 292 - Tipton Ford - Sub 383 - Monett 161kV	Third Party Facility	\$ -
03SP	SWPA-OKGE	Van Buren - VBI 161kV	1053	335	Muskogee - Ft Smith 345kV	SPA: Replace metering CTs, disconnect switches, breakers, and bus differential relaying at Van Buren. OKGE: Replace Switch and reconnect CT ratio at VBI	\$ 1,050,000
03SP	SWPA-SWPA	Carthage 161/69kV Transformer ckt 1	0	84	Carthage 161/69kV Transformer Ckt 2	Third Party Facility	\$ -
03SP	SWPA-SWPA	Carthage 161/69kV Transformer ckt 2	113	84	Carthage 161/69kV Transformer Ckt 1	Transformers owned by City of Carthage and AECI	\$ -
03SP	SWPA-SWPA	Norfolk - Buford Tap 161kV	806	189	Bull Shoals - Midway 161kV	Resag conductor and replace structures as necessary	\$ 250,000
03SP	WERE-WERE	166Th Street - Jarbalo Junction Sw Station 115kV	0	97	Midland Junction - Pentagon 115kV	May be relieved due to Westar Transmission Operating Directive 1202	Not Available
03SP	WERE-WERE	Auburn Road - Jeffrey Energy Center 230kV	0	565	Hoyt - Jeffery Energy Center 345kV	See Previous	See Previous
03SP	WERE-WERE	Auburn Road - South Gage (West) 115kV	0	75	Hoyt - Jeffery Energy Center 345kV	See Previous	See Previous
03SP	WERE-WERE	Auburn Road - South Gage (West) 115kV	0	75	Auburn Road - Indian Hills 115kV	See Previous	See Previous
03SP	WERE-WERE	Auburn Road - South Gage (West) 115kV ckt 2	0	97	Hoyt - Jeffery Energy Center 345kV Ckt 1	See Previous	See Previous
03SP	WERE-WERE	Circleville - Hoyt Hti Sw Junction 115kV	0	97	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03SP	WERE-WERE	Circleville - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03SP	WERE-WERE	County Line - Hook Jct 115kV	0	92	Tecumseh Energy Center - Tecumseh Hill 115kV	Solution Undetermined	Not Available
03SP	WERE-WERE	Creswell - Paris 69kV	965	80	Creswell - Oak 69kV	Solution Undetermined	Not Available

**Table 1 - continued** – SPP facility upgrades required for the OKGE to EES transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	ATC	Rate B	Outaged Branch Causing Overload	Solution	Estimated Cost
03SP	WERE-WERE	Gatz - Golden Plains Junction 69kV	0	32	Halstead - Mud Creek Junction 69kV	Local area problem within Newton division	\$ -
03SP	WERE-WERE	Gill Energy Center East - Macarthur 69kV	0	68	Gill Energy Center East - Oatville 69kV	Replace substation bus and jumpers at MacArthur 69 kV	\$ 22,000
03SP	WERE-WERE	Gill Energy Center East - Oatville 69kV	0	72	Gill Energy Center East - Macarthur 69kV	Replace disconnect switches at Gill 69 kV (use 800 A.), Replace line switch at Oatville 69 kV (use 800 A.)	\$ 45,000
03SP	WERE-WERE	Golden Plains Junction - Hesston 69kV	0	32	Halstead - Mud Creek Junction 69kV	Local area problem within Newton division	\$ -
03SP	WERE-WERE	Kelly - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03SP	WERE-WERE	Mockingbird Hill Sw Station - Stull Sw Station 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03SP	WERE-WERE	Tecumseh Energy Center - Hook Jct 115kV	0	160	Tecumseh Energy Center - Tecumseh Hill 115kV	Solution Undetermined	Not Available
03SP	WERE-WERE	Tecumseh Hill - Stull Sw Station 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03SP	WFEC-WFEC	Acme - Franklin Sw 69kV	0	34	Canadian Sw - Goldsby 69kV	See Previous	See Previous
03SP	WFEC-WFEC	Acme - West Norman 69kV	0	38	Canadian Sw 69/138kV Transformer	Solution Undetermined	Not Available
03SP	WFEC-WFEC	Goldsby - Oklahoma University Sw 69kV	0	34	Franklin Sw 69/138kV Transformer	See Previous	See Previous
03FA	SWPA-AECI	Doniphan 161/69kV Transformer ckt 1	390	18.7	Doniphan 161/69kV Transformer Ckt 2	Solution Undetermined	Not Available
03FA	SWPA-AEPW	Broken Bow - Craig Junction 138kV	482	122	Bbdamp4 - Mountain River 138kV	See Previous	See Previous
03FA	SWPA-EES	Bull Shoals - Midway 161kV	0	162	Bull Shoals - Buford Tap 161kV	See Previous	See Previous
03FA	SWPA-EES	Carthage - Reed Springs 69kV	932	36	Carthage - Sub 382 - Larussel 161kV	See Previous	See Previous
03FA	SWPA-EMDE	Carthage - Sub 109 - Atlas Jct. 161kV	606	167	Tipton Ford - Joplin Southwest 161kV	Solution Undetermined	Not Available
03FA	WERE-WERE	Athens Sw Sta - Coffey County No. 4 Vernon 69kV	547	45	Wolf Creek - Lacygne 345kV	See Previous	See Previous
03FA	WERE-WERE	Auburn Road - Jeffrey Energy Center 230kV	0	565	Hoyt - Jeffery Energy Center 345kV	See Previous	See Previous
03FA	WERE-WERE	Auburn Road - South Gage (West) 115kV	0	75	Hoyt - Jeffery Energy Center 345kV	See Previous	See Previous
03FA	WERE-WERE	Auburn Road - South Gage (West) 115kV ckt 2	0	97	Hoyt - Jeffery Energy Center 345kV Ckt 1	See Previous	See Previous
03FA	WERE-WERE	Circleville - Hoyt Hti Sw Junction 115kV	0	97	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03FA	WERE-WERE	Circleville - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03FA	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	126	45	Wolf Creek - Lacygne 345kV	See Previous	See Previous
03FA	WERE-WERE	El Paso - Gill Energy Center South 138kV	0	210	Evans Energy Ctr Nth - Evans Energy Ctr Sth 138kV	Solution Undetermined	Not Available
03FA	WERE-WERE	Kelly - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03FA	WERE-WERE	Mockingbird Hill Sw Station - Stull Sw Station 115kV	448	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03FA	WERE-WERE	Tecumseh Hill - Stull Sw Station 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03FA	WFEC-WFEC	Acme - Franklin Sw 69kV	0	34	Canadian Sw 69/138kV Transformer	See Previous	See Previous
03FA	WFEC-WFEC	Goldsby - Oklahoma University Sw 69kV	0	34	Franklin Sw 69/138kV Transformer	See Previous	See Previous
03WP	AEPW-AEPW	Denver East 138/13.8kV Transformer	844	33	Carson South - Kenosha West 138kV	Solution Undetermined	Not Available
03WP	AEPW-AEPW	Diana - Perdue 138kV	0	237	Harrison Road - Liberty City Tap 138kV	See Previous	See Previous
03WP	OKGE-OKGE	Eastern Ave - Memorial 138kV	959	191	Memorial - Skyline 138kV	Solution Undetermined	Not Available
03WP	OKGE-OKGE	Pecan Creek 161/345kV Transformer	498	369	Muskogee - Ft Smith 345kV	See Previous	See Previous
03WP	SWPA-EES	Carthage - Reed Springs 69kV	4	43	Carthage - Jasper 69kV	See Previous	See Previous
03WP	WERE-WERE	Auburn Road - Jeffrey Energy Center 230kV	0	565	Hoyt - Jeffery Energy Center 345kV	See Previous	See Previous
03WP	WERE-WERE	Auburn Road - South Gage (West) 115kV	0	75	Hoyt - Jeffery Energy Center 345kV	See Previous	See Previous
03WP	WERE-WERE	Auburn Road - South Gage (West) 115kV ckt 2	546	97	Hoyt - Jeffery Energy Center 345kV Ckt 1	See Previous	See Previous
03WP	WERE-WERE	Circleville - Hoyt Hti Sw Junction 115kV	0	97	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03WP	WERE-WERE	Circleville - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous

**Table 1 - continued** – SPP facility upgrades required for the OKGE to EES transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	ATC	Rate B	Outaged Branch Causing Overload	Solution	Estimated Cost
03WP	WERE-WERE	El Paso - Gill Energy Center South 138kV	0	210	Evans Energy Ctr Nth - Evans Energy Ctr Sth 138kV	See Previous	See Previous
03WP	WERE-WERE	Kelly - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03WP	WERE-WERE	Mockingbird Hill Sw Station - Stull Sw Station 115kV	121	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03WP	WERE-WERE	Tecumseh Hill - Stull Sw Station 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
03WP	WFEC-WFEC	Acme - Franklin Sw 69kV	0	34	Canadian Sw - Goldsby 69kV	See Previous	See Previous
03WP	WFEC-WFEC	Acme - West Norman 69kV	0	38	Canadian Sw 69/138kV Transformer	See Previous	See Previous
03WP	WFEC-WFEC	Canadian Sw - Noble 69kV	825	38	Paoli 69/138kV Transformer	Solution Undetermined	Not Available
03WP	WFEC-WFEC	Goldsby - Oklahoma University Sw 69kV	0	34	Franklin Sw 69/138kV Transformer	See Previous	See Previous
03WP	WFEC-WFEC	Lexington - Paoli 69kV	44	34	Canadian Sw 69/138kV Transformer	Solution Undetermined	Not Available
03WP	WFEC-WFEC	Little Axe - Noble 69kV	0	26	Paoli 69/138kV Transformer	Solution Undetermined	Not Available
04G	AEPW-AEPW	South Shreveport - Wallace Lake 138kV	698	210	Dolet Hills 345/230kV Transformer	See Previous	See Previous
04G	OKGE-OKGE	Eastern Ave - Memorial 138kV	1070	191	Memorial - Skyline 138kV	See Previous	See Previous
04G	OKGE-OKGE	Pecan Creek 161/345kV Transformer	477	369	Muskogee - Ft Smith 345kV	See Previous	See Previous
04G	SWPA-EES	Bull Shoals - Midway 161kV	177	162	Bull Shoals - Buford Tap 161kV	See Previous	See Previous
04G	WERE-WERE	Athens Sw Sta - Coffey County No. 4 Vernon 69kV	0	45	Wolf Creek - Lacygne 345kV	See Previous	See Previous
04G	WERE-WERE	Auburn Road - Jeffrey Energy Center 230kV	0	565	Hoyt - Jeffrey Energy Center 345kV	See Previous	See Previous
04G	WERE-WERE	Auburn Road - South Gage (West) 115kV	0	75	Hoyt - Jeffrey Energy Center 345kV	See Previous	See Previous
04G	WERE-WERE	Auburn Road - South Gage (West) 115kV ckt 2	0	97	Hoyt - Jeffrey Energy Center 345kV Ckt 1	See Previous	See Previous
04G	WERE-WERE	Circleville - Hoyt Hti Sw Junction 115kV	0	97	Hoyt - Stranger Creek 345kV	See Previous	See Previous
04G	WERE-WERE	Circleville - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
04G	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	0	45	Wolf Creek - Lacygne 345kV	See Previous	See Previous
04G	WERE-WERE	Kelly - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
04G	WERE-WERE	Mockingbird Hill Sw Station - Stull Sw Station 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
04G	WERE-WERE	Tecumseh Hill - Stull Sw Station 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
04G	WFEC-WFEC	Acme - Franklin Sw 69kV	0	34	Canadian Sw 69/138kV Transformer	See Previous	See Previous
05SP	AECI-AECI	Bristow 138/69kV Transformer ckt 1	0	56	Bristow 138/69kV Transformer Ckt 2	Solution Undetermined	Not Available
05SP	AECI-AECI	Bristow 138/69kV Transformer ckt 2	0	56	Bristow 138/69kV Transformer Ckt 1	Solution Undetermined	Not Available
05SP	AECI-AECI	Stilwell - Titanic Tap 69kV	1082	36	Kansas - Watts 69kV	Line Owned by GRDA - Solution Undetermined	Not Available
05SP	AEPW-AEPW	Alumax Tap - Bann 138kV	358	261	Nw Texarkana-Bann T - Northwest Texarkana 138kV	See Previous	See Previous
05SP	AEPW-AEPW	Alumax Tap - Northwest Texarkana 138kV	0	261	Nw Texarkana-Bann T - Northwest Texarkana 138kV	See Previous	See Previous
05SP	AEPW-AEPW	Blue Circle - Catoosa 69kV	0	72	Lynn Lane West Tap - Lynn Lane Tap 138kV	See Previous	See Previous
05SP	AEPW-AEPW	Broken Arrow 101St North - Oneta 138kV	0	210	Riverside Station Auto 138/345kV Transformer	Replace wavetrapp	\$ 30,000
05SP	AEPW-AEPW	Carson-Center 138/13.8kV Transformer	0	33	Carson South - Tulsa Power Station 138kV	See Previous	See Previous
05SP	AEPW-AEPW	Catoosa 138/69kV Transformer	0	55	Lynn Lane West Tap - Lynn Lane Tap 138kV	See Previous	See Previous
05SP	AEPW-AEPW	Chamber Springs - Farmington Aecc 161kV	0	335	Chamber Springs - Tontitown 161kV	Replace Farmington switch	\$ 60,000
05SP	AEPW-AEPW	Chamber Springs - Tontitown 161kV	0	244	Flint Creek - Tontitown 161kV	Rebuild 12 miles with 2156ACSR	\$ 7,200,000
05SP	AEPW-AEPW	Cherokee Rec - Knox Lee 138kV	0	209	Georgia-Pacific - Logansport 138kV	See Previous	See Previous
05SP	AEPW-AEPW	Cherokee Rec - Tatum 138kV	0	209	Multiple Outage Contingency , Southwest Shreveport - Longwood 345kV, Southwest Shreveport to Diana 345kV	See Previous	See Previous
05SP	AEPW-AEPW	Denver Center 138/13.8kV Transformer	0	33	Denver-West - Sand Springs 138kV	Solution Undetermined	Not Available

**Table 1 - continued** – SPP facility upgrades required for the OKGE to EES transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	ATC	Rate B	Outaged Branch Causing Overload	Solution	Estimated Cost
05SP	AEPW-AEPW	Denver East 138/13.8kV Transformer	968	33	Denver-West 138/13.8kV Transformer	See Previous	See Previous
05SP	AEPW-AEPW	Denver-West 138/13.8kV Transformer	0	33	Carson South - Kenosha West 138kV	See Previous	See Previous
05SP	AEPW-AEPW	East Centerton - Gentry Rec 161kV	0	353	Flint Creek - Tontitown 161kV	See Previous	See Previous
05SP	AEPW-AEPW	Elm Springs Rec - Tontitown 161kV	0	306	Dyess - Tontitown 161kV	Replace Switch and Elm Springs Strain Bus	\$ 100,000
05SP	AEPW-AEPW	Flint Creek - Gentry Rec 161kV	0	353	Flint Creek - Tontitown 161kV	See Previous	See Previous
05SP	AEPW-AEPW	Flint Creek - Tontitown 161kV	0	312	Flint Creek - Gentry Rec 161kV	Replace switch and jumpers	\$ 45,000
05SP	AEPW-AEPW	Hallsville - Longview Heights 69kV	0	48	Marshall - Marshall Auto 69kV	Rebuild 7.07 miles of 4/0 ACSR with 795 ACSR	\$ 3,000,000
05SP	AEPW-AEPW	Jacksonville (SweRc-Etec) - Overton 138kV	940	235	Crockett - Tenaska Rusk County 345kV	Reset relays at Jacksonville & Overton	\$ 15,000
05SP	AEPW-AEPW	Lieberman - IPC Jefferson 138kV	475	136	Longwood - Wilkes 345kV	See Previous	See Previous
05SP	AEPW-AEPW	Longwood - Noram 138kV	0	234	Multiple Outage Contingency , Southwest Shreveport - Longwood 345kV, Southwest Shreveport to Diana 345kV	See Previous	See Previous
05SP	AEPW-AEPW	Marshall - North Marshall 69kV	0	72	Multiple Outage Contingency , Southwest Shreveport - Longwood 345kV, Southwest Shreveport to Diana 345kV	Replace 350 CU bus & jumpers @ North Marshall.	\$ 23,300
05SP	AEPW-AEPW	Marshall 138/69kV Transformer ckt 1	0	107	Marshall 138/69kV Transformer Ckt 2	See Previous	See Previous
05SP	AEPW-AEPW	Marshall 138/69kV Transformer ckt 2	0	107	Marshall 138/69kV Transformer Ckt 1	See Previous	See Previous
05SP	AEPW-AEPW	North Marshall - Woodlawn 69kV	589	51	Multiple Outage Contingency , Southwest Shreveport - Longwood 345kV, Southwest Shreveport to Diana 345kV	Replace 3/0 CU jumpers @ North Marshall	\$ 15,000
05SP	AEPW-AEPW	Raines - Noram 138kV	106	234	Multiple Outage Contingency , Southwest Shreveport - Longwood 345kV, Southwest Shreveport to Diana 345kV	See Previous	See Previous
05SP	AEPW-AEPW	Rock Hill - Tatum 138kV	0	209	Multiple Outage Contingency , Southwest Shreveport - Longwood 345kV, Southwest Shreveport to Diana 345kV	See Previous	See Previous
05SP	AEPW-OKGE	Bonanza - Bonanza Tap 161kV	913	177	Ft Smith - ANO 500kV	Rebuild 0.06 miles of 397.5 ACSR with 795MCM ACSR	\$ 50,000
05SP	AEPW-OKGE	Fitzhugh - Altus 69kV	0	72	Avec Ozark - Helberg 69kV	Solution Undetermined	Not Available
05SP	AEPW-WERE	Coffeyville Tap - Dearing 138kV	948	210	Delaware - Neosho 345kV	See Previous	See Previous
05SP	AEPW-WFEC	Cornville - Corn Tap 138kV	0	105	Southwest Station - Anadarko 138kV	Solution Undetermined	Not Available
05SP	AEPW-WFEC	Southwest Station - Anadarko 138kV	0	203	Midwest Tap - Franklin Sw 138kV	Replace bus, jumpers, switches, supports and foundations at Anadarko Switch Station	\$ 450,000
05SP	EMDE-EMDE	Oronogo Jct. - Joplin Oakland North 161kV	167	214	Tipton Ford - Joplin Southwest 161kV	See Previous	See Previous
05SP	GRRD-GRRD	Afton 161/69kV Transformer	418	50	Miami - Afton 161kV	Replace 50 MVA Transformer with 84 MVA unit	\$ 833,000
05SP	GRRD-GRRD	Claremore 161/69kV Transformer ckt 1	0	84	Claremore 161/69kV Transformer Ckt 2	See Previous	See Previous
05SP	GRRD-GRRD	Claremore 161/69kV Transformer ckt 2	0	84	Claremore 161/69kV Transformer Ckt 1	See Previous	See Previous
05SP	GRRD-OKGE	Tahlequah - Highway 59 161kV	811	167	Muskogee - Ft Smith 345kV	See Previous	See Previous
05SP	KACP-KACP	Stilwell - Lacygne 345kV	0	1251	West Gardner - Lacygne 345kV	See Previous	See Previous



**Table 1 - continued** – SPP facility upgrades required for the OKGE to EES transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	ATC	Rate B	Outaged Branch Causing Overload	Solution	Estimated Cost
05SP	MIDW-WEPL	Seward 69/115kV Transformer	0	44	Heizer 115/230kV Transformer	See Previous	See Previous
05SP	OKGE-OKGE	Draper Lake 138/345kV Transformer ckt 1	76	493	Draper Lake 138/345kV Transformer Ckt 2	May be relieved due to OKGE Operating Guide	Not Available
05SP	OKGE-OKGE	Draper Lake 138/345kV Transformer ckt 2	76	493	Draper Lake 138/345kV Transformer Ckt 1	May be relieved due to OKGE Operating Guide	Not Available
05SP	OKGE-OKGE	Ft Smith 161/345kV Transformer	826	493	Ft Smith 345/500kV Transformer	See Previous	See Previous
05SP	OKGE-OKGE	Osage - Continental Blacks 69kV	931	111	Kildare - White Eagle 138kV	Rebuild & Reconductor 0.57 Miles, replace Wavetrap and increase CT ratio	\$ 255,000
05SP	OKGE-OKGE	Pecan Creek 161/345kV Transformer	213	369	Muskogee - Ft Smith 345kV	See Previous	See Previous
05SP	OKGE-WFEC	Midwest Tap - Franklin Sw 138kV	937	215	Midwest Tap - Hollywood 138kV	Replace 600A metering CTs with 1200A	\$ 55,000
05SP	SPRM-AECI	Clay - Logan 161kV	0	185	Multiple Outage Contingency, Franks - Huben 345kV, Huben - Morgan 345kV	Replace transmission line structures to allow operation at 100C	\$ 250,000
05SP	SWPA-AEPW	Beaver - Eureka Springs 161kV	958	274	Flint Creek - Sub 383 - Monett 345kV	See Previous	See Previous
05SP	SWPA-AEPW	Broken Bow - Craig Junction 138kV	873	107	Bbdamp4 - Mountain River 138kV	See Previous	See Previous
05SP	SWPA-EES	Bull Shoals - Midway 161kV	0	162	Iles - Morefield 161kV	See Previous	See Previous
05SP	SWPA-EES	Carthage - Jasper 69kV	0	47	Milo - Clark 69kV	See Previous	See Previous
05SP	SWPA-EES	Carthage - Reed Springs 69kV	0	36	Sub 446 - Chesapeake - 2MTVRN 69kV	See Previous	See Previous
05SP	SWPA-OKGE	Van Buren - VBI 161kV	862	335	Muskogee - Ft Smith 345kV	See Previous	See Previous
05SP	SWPA-SPRM	Springfield - Brookline 161kV	158	323	Southwest - Southwest Disposal 161kV	Solution Undetermined	Not Available
05SP	SWPA-SWPA	Carthage 161/69kV Transformer ckt 1	0	84	Carthage 161/69kV Transformer Ckt 2	See Previous	See Previous
05SP	SWPA-SWPA	Carthage 161/69kV Transformer ckt 2	0	84	Carthage 161/69kV Transformer Ckt 1	See Previous	See Previous
05SP	SWPA-SWPA	Gore - Muskogee Tap 161kV	1061	206	Muskogee - Ft Smith 345kV	Reconductor 16 miles of 477 ACSR line with 795 ACSR	\$ 4,000,000
05SP	SWPA-SWPA	Norfolk - Buford Tap 161kV	692	189	Bull Shoals - Midway 161kV	See Previous	See Previous
05SP	SWPA-SWPA	Sallisaw - Gore 161kV	938	189	Muskogee - Ft Smith 345kV	Increase clearances of approximately ten spans to allow operation of line at 100C, This will increase the line capacity to 223MVA	\$ 500,000
05SP	WERE-WERE	166Th Street - Jarbalo Junction Sw Station 115kV	0	97	Midland Junction - Pentagon 115kV	See Previous	See Previous
05SP	WERE-WERE	Auburn Road - Jeffrey Energy Center 230kV	0	565	Hoyt - Jeffrey Energy Center 345kV	See Previous	See Previous
05SP	WERE-WERE	Circleville - Hoyt Hti Sw Junction 115kV	0	97	Hoyt - Stranger Creek 345kV	See Previous	See Previous
05SP	WERE-WERE	Circleville - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
05SP	WERE-WERE	County Line - Hook Jct 115kV	0	92	Tecumseh Energy Center - Tecumseh Hill 115kV	See Previous	See Previous
05SP	WERE-WERE	Gill Energy Center East - Macarthur 69kV	0	68	Gill Energy Center East - Oatville 69kV	See Previous	See Previous
05SP	WERE-WERE	Gill Energy Center East - Oatville 69kV	0	72	Gill Energy Center East - Macarthur 69kV	See Previous	See Previous
05SP	WERE-WERE	Kelly - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
05SP	WERE-WERE	Lawrence Hill - Wren 115kV	0	141	Mockingbird Hill Sw Station - SW Lawrence 115kV	May be relieved due to Westar Transmission Operating Directive 1210	Not Available
05SP	WERE-WERE	Mockingbird Hill Sw Station - Stull Sw Station 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
05SP	WERE-WERE	SW Lawrence - Wakarusa Jct Sw Station 115kV	434	92	Ku Campus - 19Th Street Junction 115kV	Solution Undetermined	Not Available
05SP	WERE-WERE	Tecumseh Energy Center - Hook Jct 115kV	0	160	Tecumseh Energy Center - Tecumseh Hill 115kV	See Previous	See Previous

**Table 1 - continued** – SPP facility upgrades required for the OKGE to EES transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	ATC	Rate B	Outaged Branch Causing Overload	Solution	Estimated Cost
05SP	WERE-WERE	Tecumseh Hill - Stull Sw Station 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
05SP	WFEC-WFEC	Little Axe - Noble 69kV	151	26	Paoli 69/138kV Transformer	See Previous	See Previous
05WP	AEPW-AEPW	Catoosa 138/69kV Transformer	0	55	Lynn Lane West Tap - Lynn Lane Tap 138kV	See Previous	See Previous
05WP	AEPW-AEPW	Chamber Springs - Tontitown 161kV	668	275	Chamber Springs - Farmington Aecc 161kV	See Previous	See Previous
05WP	AEPW-AEPW	South Shreveport - Wallace Lake 138kV	544	210	Dolet Hills 345/230kV Transformer	See Previous	See Previous
05WP	OKGE-OKGE	Pecan Creek 161/345kV Transformer	570	369	Muskogee - Ft Smith 345kV	See Previous	See Previous
05WP	SPRM-AECI	Clay - Logan 161kV	93	232	Multiple Outage Contingency, Franks - Huben 345kV, Huben - Morgan 345kV	See Previous	See Previous
05WP	SWPA-EES	Carthage - Reed Springs 69kV	0	43	Carthage - Jasper 69kV	See Previous	See Previous
05WP	SWPA-SPRM	Springfield - Clay 161kV	89	167	Multiple Outage Contingency, Franks - Huben 345kV, Huben - Morgan 345kV	Replace disconnect switches at Springfield	\$ 200,000
05WP	WERE-WERE	Auburn Road - Jeffrey Energy Center 230kV	0	565	Hoyt - Jeffrey Energy Center 345kV	See Previous	See Previous
05WP	WERE-WERE	Circleville - Hoyt Hti Sw Junction 115kV	0	97	Hoyt - Stranger Creek 345kV	See Previous	See Previous
05WP	WERE-WERE	Circleville - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
05WP	WERE-WERE	El Paso - Gill Energy Center South 138kV	0	210	Evans Energy Ctr Nth - Evans Energy Ctr Sth 138kV	See Previous	See Previous
05WP	WERE-WERE	Fort Junction Sw Station - West Junction City Junction (East) 115kV ckt 1	841	68	Fort Jct Sw Sta - West Jct City Jct (East) 115kV Ckt 2	See Previous	See Previous
05WP	WERE-WERE	Kelly - King Hill N.M. Coop 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
05WP	WERE-WERE	Mockingbird Hill Sw Station - Stull Sw Station 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
05WP	WERE-WERE	Tecumseh Hill - Stull Sw Station 115kV	0	92	Hoyt - Stranger Creek 345kV	See Previous	See Previous
<b>Total (Excludes Costs Not Available)</b>							\$ 66,595,770

**Table 2** – Cost estimates for incrementing levels of ATC for OKGE to EES transfer

ATC	Estimated Cost (Excludes Costs Not Available)
75MW	\$ 32,874,300
100MW	\$ 33,074,300
175MW	\$ 35,874,300
275MW	\$ 38,874,300
400MW	\$ 38,874,300
550MW	\$ 49,818,300
825MW	\$ 50,113,300
950MW	\$ 61,008,300
1100MW	\$ 66,595,770

