



SPP

*Southwest
Power Pool*

***System Impact Study SPP-2002-166
For Transmission Service***

***Requested By
Empire District Electric Company***

From WFEC To EDE

For a Reserved Amount Of 50MW

From 6/1/03

To 6/1/04

SPP Coordinated Planning

System Impact Study

Empire District Electric Company (EDE) has requested a system impact study for Network Service from WFEC to EDE. The period of the transaction is from 6/1/03 to 6/1/04. The request is for OASIS reservation 397272 for an amount of 50 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 50 MW of service requested.

The WFEC to EDE 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 50 MW WFEC to EDE transfer.

SPP used four seasonal models to study the WFEC to EDE 50 MW transfer for the requested service period. The SPP 2002 Series Cases 2003 Summer Peak, 2003Fall, 2003/04 Winter Peak, and 2004 Spring were used to study the impact of the 50 MW transfer on the SPP system during the requested service period of 6/1/2003 to 6/1/2004. 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 WFEC to EDE 50 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 WFEC to EDE transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
03SP	WERE-WERE	166Th Street - Jarbalo Junction Switching Station 115kV	97	Midland Junction - Pentagon 115kV	0	May be relieved due to Westar Transmission Operating Directive 1202	Not Available
03SP	WFEC-WFEC	Acme - West Norman 69kV	38	Canadian Sw - Goldsby 69kV	13	Solution Undetermined	Not Available
03SP	GRRD-GRRD	Afton 161/69kV Transformer	50	Miami - Afton 161kV	0	Replace 50 MVA Transformer with 84 MVA unit	\$ 833,000
03SP	AEPW-AEPW	Alumax Tap - Bann 138kV	261	NW Texarkana-Bann T - Northwest 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
03SP	AEPW-AEPW	Alumax Tap - Northwest Texarkana 138kV	261	NW Texarkana-Bann T - Northwest Texarkana 138kV	0	Replace Switches Alumax Tap	\$ 30,000
03SP	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
03SP	WERE-WERE	Auburn Road - South Gage (West) 115kV	75	Hoyt - Jeffery Energy Center 345kV	0	May be relieved due to Westar Transmission Operating Directive 400	Not Available
03SP	WERE-WERE	Auburn Road - South Gage (West) 115kV ckt 2	97	Hoyt - Jeffery Energy Center 345kV Ckt 1	0	May be relieved due to Westar Transmission Operating Directive 400	Not Available
03SP	AEPW-AEPW	Big Sandy - Perdue 69kV	85	Perdue - Lake Hawkins 138kV	0	Solution Undetermined	Not Available
03SP	AEPW-AEPW	Carson-Center 138/13.8kV Transformer	33	Carson South - Tulsa Power Station 138kV	0	Solution Undetermined	Not Available
03SP	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
03SP	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
03SP	WERE-WERE	Circleville - Hoyt Hti Switching Junction 115kV	97	Hoyt - Stranger Creek 345kV	0	Replace 82 structures	\$ 742,000
03SP	WERE-WERE	Circleville - King Hill N.M. Coop 115kV	92	Hoyt - Stranger Creek 345kV	0	May be relieved due to Westar Transmission Operating Directive 803	Not Available
03SP	GRRD-GRRD	Claremore 161/69kV Transformer ckt 1	84	Claremore 161/69kV Transformer Ckt 2	0	Solution Undetermined	Not Available
03SP	GRRD-GRRD	Claremore 161/69kV Transformer ckt 2	84	Claremore 161/69kV Transformer Ckt 1	0	Solution Undetermined	Not Available
03SP	AEPW-AEPW	Denver Center 138/13.8kV Transformer	33	Denver Tap - 46Th Street East 138kV	0	See Previous	See Previous
03SP	AEPW-AEPW	Denver-West 138/13.8kV Transformer	33	Carson South - Kenosha West 138kV	0	Solution Undetermined	Not Available
03SP	AEPW-AEPW	Diana - Perdue 138kV	237	Harrison Road - Liberty City Tap 138kV	0	Replace Breaker 10070 @ Perdue	\$ 150,000
03SP	AEPW-AEPW	Dyess - Chamber Springs 161kV	244	Chamber Springs - Farmington Aecc 161kV	0	AEPW Planned Tontitown Project	\$ -
03SP	AEPW-AEPW	Dyess - East Rogers 161kV	244	Flint Creek - Gentry Rec 161kV	0	AEPW Planned Tontitown Project	\$ -
03SP	AEPW-AEPW	East Centerton - Gentry Rec 161kV	353	Flint Creek - Elm Springs Rec 161kV	0	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR	\$ 8,000,000
03SP	AEPW-AEPW	Flint Creek - Gentry Rec 161kV	353	Flint Creek - Elm Springs Rec 161kV	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR.	\$ 400,000
03SP	WERE-WERE	Gatz - Golden Plains Junction 69kV	32	Halstead - Mud Creek Junction 69kV	0	Local area problem within Newton division	\$ -
03SP	WERE-WERE	Gill Energy Center East - Macarthur 69kV	68	Gill Energy Center East - Oatville 69kV	0	Replace substation bus and jumpers at MacArthur 69 kV	\$ 22,000
03SP	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
03SP	WERE-WERE	Golden Plains Junction - Hesston 69kV	32	Halstead - Mud Creek Junction 69kV	0	Local area problem within Newton division	\$ -
03SP	AEPW-AEPW	Greggton - Lake Lamond 69kV	107	Diana - Perdue 138kV	0	Solution Undetermined	Not Available
03SP	WERE-WERE	Kelly - King Hill N.M. Coop 115kV	92	Hoyt - Stranger Creek 345kV	0	May be relieved due to Westar Transmission Operating Directive 803	Not Available
03SP	AEPW-AEPW	Marshall 138/69kV Transformer ckt 1	107	Marshall 138/69kV Transformer Ckt 2	0	Replace 755 ACAR Strain Bus	\$ 25,000

Table 1 - continued – SPP facility upgrades identified for the WFEC to EDE transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
03SP	AEPW-AEPW	Marshall 138/69kV Transformer ckt 2	107	Marshall 138/69kV Transformer Ckt 1	0	Replace 755 ACAR Strain Bus	\$ 25,000
03SP	WERE-WERE	Mockingbird Hill Swi Sta - Stull Switching Sta 115kV	92	Hoyt - Stranger Creek 345kV	0	May be relieved due to Westar Transmission Operating Directive 803	Not Available
03SP	WERE-WERE	NA Philips Junction (North) - Smoky Hill 115kV ckt 1	68	NA Philips Junction (North) - Smoky Hill 115kV Ckt 2	0	Solution Undetermined	Not Available
03SP	SWPS-SWPS	Northwest Interchange 69/115kV Transformer	46	East Plant Interchange - Van Buren 1 Tap 69kV	0	Solution Undetermined	Not Available
03SP	WERE-WERE	SW Lawrence - Wakarusa Jct Switching Station 115kV	92	Ku Campus - 19Th Street Junction 115kV	49	Solution Undetermined	Not Available
03SP	EMDE-EMDE	Sub 271 - Baxter Springs West - Sub 404 - Hockerville 69kV	61	Sub 167 - Riverton - Sub 404 - Hockerville 161kV	30	Solution Undetermined	Not Available
03SP	WERE-WERE	Tecumseh Energy Center - Hook Jct 115kV	160	Tecumseh Energy Center - Tecumseh Hill 115kV	0	Solution Undetermined	Not Available
03SP	WERE-WERE	Tecumseh Hill - Stull Switching Station 115kV	92	Hoyt - Stranger Creek 345kV	0	May be relieved due to Westar Transmission Operating Directive 803	Not Available
03FA	WERE-WERE	Athens Switching Sta - Coffey County No. 4 Vernon 69kV	45	Wolf Creek - Lacygne 345kV	0	May be relieved due to Westar Transmission Operating Directive 1304	Not Available
03FA	WERE-WERE	Auburn Road - Jeffery Energy Center 230kV	565	Hoyt - Jeffery Energy Center 345kV	0	See Previous	See Previous
03FA	WERE-WERE	Auburn Road - South Gage (West) 115kV	75	Hoyt - Jeffery Energy Center 345kV	0	See Previous	See Previous
03FA	WERE-WERE	Auburn Road - South Gage (West) 115kV ckt 2	97	Hoyt - Jeffery Energy Center 345kV Ckt 1	0	See Previous	See Previous
03FA	WERE-WERE	Circleville - Hoyt Hti Switching Junction 115kV	97	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
03FA	WERE-WERE	Circleville - King Hill N.M. Coop 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
03FA	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	45	Wolf Creek - Lacygne 345kV	0	See Previous	See Previous
03FA	AEPW-AEPW	Denver Center 138/13.8kV Transformer	33	Tulsa North - 46Th Street East 138kV	0	See Previous	See Previous
03FA	SWPA-AECI	Doniphan 161/69kV Transformer ckt 1	18.8	Doniphan 161/69kV Transformer Ckt 2	0	Solution Undetermined	Not Available
03FA	WFEC-WFEC	Goldsby - Oklahoma University Sw 69kV	34	Franklin Sw 69/138kV Transformer	3	Solution Undetermined	Not Available
03FA	WEPL-WEPL	Greensburg - Judson Large V 115kV	80	Mullergren - Spearville 230kV	0	Solution Undetermined	Not Available
03FA	WERE-WERE	Kelly - King Hill N.M. Coop 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
03FA	WERE-WERE	Mockingbird Hill Swi Sta - Stull Swi Sta 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
03FA	WERE-WERE	Tecumseh Hill - Stull Switching Station 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
03WP	WFEC-WFEC	Acme - Franklin Sw 69kV	34	Goldsby - Oklahoma University Sw 69kV	36	Solution Undetermined	Not Available
03WP	WFEC-WFEC	Acme - West Norman 69kV	38	Canadian Sw 69/138kV Transformer	25	See Previous	See Previous
03WP	WERE-WERE	Auburn Road - Jeffery Energy Center 230kV	565	Hoyt - Jeffery Energy Center 345kV	0	See Previous	See Previous
03WP	WERE-WERE	Auburn Road - South Gage (West) 115kV	75	Hoyt - Jeffery Energy Center 345kV	0	See Previous	See Previous
03WP	WERE-WERE	Auburn Road - South Gage (West) 115kV ckt 2	97	Hoyt - Jeffery Energy Center 345kV Ckt 1	0	See Previous	See Previous
03WP	WERE-WERE	Circleville - Hoyt Hti Switching Junction 115kV	97	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
03WP	WERE-WERE	Circleville - King Hill N.M. Coop 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
03WP	AEPW-AEPW	Denver Center 138/13.8kV Transformer	33	Tulsa North - 46Th Street East 138kV	0	See Previous	See Previous
03WP	AEPW-AEPW	Diana - Perdue 138kV	237	Harrison Road - Liberty City Tap 138kV	0	See Previous	See Previous
03WP	WEPL-WEPL	Greensburg - Judson Large V 115kV	80	Mullergren - Spearville 230kV	0	See Previous	See Previous
03WP	WERE-WERE	Kelly - King Hill N.M. Coop 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
03WP	WFEC-WFEC	Lexington - Paoli 69kV	34	Canadian Sw 69/138kV Transformer	0	Solution Undetermined	Not Available

Table 1 - continued – SPP facility upgrades identified for the WFEC to EDE transfer

Study Year	From Area - To Area	Branch Over 100% Rate B	Rate B	Outaged Branch Causing Overload	ATC	Solution	Estimated Cost
03WP	WFEC-WFEC	Little Axe - Noble 69kV	26	Paoli 69/138kV Transformer	23	Solution Undetermined	Not Available
03WP	WEPL-WEPL	Medicine Lodge - Sun City 115kV	80	Mullergren - Spearville 230kV	0	Solution Undetermined	Not Available
03WP	WERE-WERE	Mockingbird Hill Swi Sta - Stull Swi Sta 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
03WP	WERE-WERE	Tecumseh Hill - Stull Switching Station 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
04G	WERE-WERE	166Th Street - Jarbalo Junction Switching Station 115kV	97	Midland Junction - Pentagon 115kV	23	See Previous	See Previous
04G	WERE-WERE	Athens Switching Sta - Coffey County No. 4 Vernon 69kV	45	Wolf Creek - Lacygne 345kV	0	See Previous	See Previous
04G	WERE-WERE	Auburn Road - Jeffrey Energy Center 230kV	565	Hoyt - Jeffery Energy Center 345kV	0	See Previous	See Previous
04G	WERE-WERE	Auburn Road - South Gage (West) 115kV	75	Hoyt - Jeffery Energy Center 345kV	0	See Previous	See Previous
04G	WERE-WERE	Auburn Road - South Gage (West) 115kV ckt 2	97	Hoyt - Jeffery Energy Center 345kV Ckt 1	0	See Previous	See Previous
04G	WERE-WERE	Coffey County No. 4 Vernon - Green 69kV	45	Wolf Creek - Lacygne 345kV	0	May be relieved due to Westar Transmission Operating Directive 1304	Not Available
04G	AEPW-AEPW	Denver Center 138/13.8kV Transformer	33	Tulsa North - 46Th Street East 138kV	0	See Previous	See Previous
04G	WERE-WERE	Mockingbird Hill Swi Sta - Stull Swi Sta 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
04G	EMDE-EMDE	Baxter Springs West - Hockerville 69kV	61	Sub 167 - Riverton - Sub 404 - Hockerville 161kV	21	See Previous	See Previous
04G	WERE-WERE	Tecumseh Hill - Stull Switching Station 115kV	92	Hoyt - Stranger Creek 345kV	0	See Previous	See Previous
Total (Excludes Costs Not Available)							\$ 13,524,000