



**SPP** *Southwest  
Power Pool*

*System Impact Study  
SPP-2003-100-1  
For Transmission Service  
Requested By  
Westar Energy*

*From GRDA To AECI*

*For a Reserved Amount Of  
40MW From 7/1/2003 To 7/1/2005*

*SPP Engineering, Tariff Studies*

## **System Impact Study**

Westar Energy has requested a system impact study for long-term Firm Point-to-Point transmission service from GRDA to AECI for 40 MW. The period of the service requested is from 7/1/2003 to 7/1/2005. The OASIS reservation number is 503291. The principal objective of this study is to identify system constraints on the SPP Regional Tariff System and potential system facility upgrades that may be necessary to provide the requested service.

The GRDA to AECI request 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 mode that have not gone to facility study mode were not included in the models. The results of the transfer analysis are documented in Table 1. The results given in Table 1 include upgrades that may be assigned to higher priority requests. The results of this study gives the customer an estimated cost of the facility upgrades that may be required in order to accommodate the GRDA to AECI 40 MW request.

Nine seasonal models were used to study the GRDA to AECI 40 MW request for the requested service period with consideration of the elapsed request period. The SPP 2003 Series Cases 2003 Fall Peak (03FA), 2003/04 Winter Peak (03WP), 2004 April Min (04AP), 2004 Spring Peak (04G), 2004 Summer Peak (04SP), 2004 Fall Peak (04FA), 2004/05 Winter Peak (04WP), 2009 Summer Peak (09SP), and 2009/10 Winter Peak (09WP) were used to study the impact of the 40 MW request on the SPP system during a the requested service period of 7/1/2003 to 7/1/2005. 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 2003 base case series models.

PTI's MUST First Contingency Incremental Transfer Capability (FCITC) DC analysis was used to study the request. The MUST option to convert MVA branch ratings to estimated MW ratings was used to partially compensate for reactive loading.

With only the higher priority requests that have signed Facility Study Agreements included in the models, the study results of the GRDA to AECI 40 MW transfer show that limiting constraints exist. Due to the limiting constraints identified, the Transmission Service Request cannot be granted. Any solutions, upgrades, and costs 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 and proposed transmission plans that will be identified during the facility study process, and the final results of the full AC analysis. Evaluation of the right to renew for future years was not performed. Renewal rights will be evaluated as part of the facility study. 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 overloads identified for the GRDA to AECI transfer

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
03FA	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	161	Multiple Outage Contingency: 52648 NORFORK5 161 52661 BUFRDTP5 161 1 52660 BULL SH5 161 52661 BUFRDTP5 161 1	0	Replace disconnect switches, metering CTs and wave trap at Bull Shoals	\$150,000
03WP		NONE IDENTIFIED			40		
04AP		NONE IDENTIFIED			40		
04G	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	162	Multiple Outage Contingency: 52648 NORFORK5 161 52661 BUFRDTP5 161 1 52660 BULL SH5 161 52661 BUFRDTP5 161 1	0	See Previous	-
04SP	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	161	99817 5ISES 1 161 99826 5MORFLD 161 1	0	"	-
04SP	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	161	99798 5BATEVL 161 99826 5MORFLD 161 1	0	"	-
04SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	Rebuild 19.16 miles of 2-397.5 ACSR with 2156 ACSR. Replace East Centeron Wavetrap & jumpers	\$8,000,000
04SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	304	Base Case	0	See Previous	-
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	53139 FLINTCR5 161 53187 GENTRYR5 161 1	0	Rebuild 16.3 miles of 2-297 ACSR with 2156 ACSR. Replace Flint Creek wavetrap & jumpers. Replace Flint Creek switch # 1K75	\$8,200,000
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	0	See Previous	-
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	53154 CHAMSPR5 161 53170 TONTITN5 161 1	0	"	-
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	"	-
04SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	311	53154 CHAMSPR5 161 53155 CHAMSPR7 345 1	0	"	-
04SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	353	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	Rebuild 1.09 miles of 2-397.5 ACSR with 2156 ACSR. Replace Flint Creek wavetrap & jumpers	\$450,000
04SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	353	53144 LOWELL 5 161 53170 TONTITN5 161 1	0	See Previous	-
04SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	353	53144 LOWELL 5 161 53152 ROGERS 5 161 1	0	"	-
04SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	303	Base Case	0	"	-
04SP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	247	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	Rebuild 12 miles with 2156ACSR	\$7,200,000
04SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to Westar Transmission Operating Directive 901 Outage of the Lawrence Hill-Midland Junction 230kV Line	-
04SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	57252 MIDLAND3 115 *B114 MIDJ126X 1 1	0	May be relieved due to Westar Transmission Operating Directive 615 Loss of the Midland Junction 230/115kV Transformer	-
04SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	56855 MIDLAND6 230 *B114 MIDJ126X 1 1	0	"	-
04SP	WERE-WERE	56855 MIDLAND6 230 *B114 MIDJ126X 1 1	308	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	0	May be relieved due to Westar Transmission Operating Directive 631 Loss of the Lawrence Hill 230/115kV Transformer	-
04SP	WERE-WERE	56855 MIDLAND6 230 *B114 MIDJ126X 1 1	308	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	0	"	-
04SP	WERE-WERE	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	302	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to Westar Transmission Operating Directive 901 Outage of the Lawrence Hill-Midland Junction 230kV Line	-
04SP	WERE-WERE	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	302	56855 MIDLAND6 230 *B114 MIDJ126X 1 1	0	May be relieved due to Westar Transmission Operating Directive 615 Loss of the Midland Junction 230/115kV Transformer	-
04SP	WERE-WERE	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	302	57252 MIDLAND3 115 *B114 MIDJ126X 1 1	0	"	-
04SP	WERE-WERE	57252 MIDLAND3 115 *B114 MIDJ126X 1 1	308	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	0	May be relieved due to Westar Transmission Operating Directive 631 Loss of the Lawrence Hill 230/115kV Transformer	-
04SP	WERE-WERE	57252 MIDLAND3 115 *B114 MIDJ126X 1 1	308	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	0	"	-
04SP	EMDE-EMDE	59467 ORO110 5 161 59494 OAK432 5 161 1	214	59472 TIP292 5 161 59483 JOP389 5 161 1	0	Reconstruct and replace 1.4 miles of 556 ACSR with Bundled 556 ACSR	\$800,000

**Table 1 continued** – SPP facility overloads identified for the GRDA to AECI transfer

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
04FA	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	162	Multiple Outage Contingency: 52648 NORFORK5 161 52661 BUFRDTP5 161 1 52660 BULL SH5 161 52661 BUFRDTP5 161 1	0	See Previous	-
04FA	SWPA-EMDE	52688 CARTHAG5 161 59466 ATL109 5 161 1	167	59472 TIP292 5 161 59483 JOP389 5 161 1	0	Replace 600 Amp disconnect switches	\$60,000
04WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	333	53139 FLINTCR5 161 53187 GENTRYR5 161 1	0	See Previous	-
04WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	333	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	0	"	-
09SP	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	162	99817 5ISES 1 161 99826 5MORFLD 161 1	0	See Previous	-
09SP	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	162	99798 5BATEVL 161 99826 5MORFLD 161 1	0	"	-
09SP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLINE 5 161 1	309	59954 SWPS 5 161 59960 SWDISP 5 161 1	0	Replace disconnect switches at Springfield.	\$60,000
09SP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLINE 5 161 1	309	59959 BATFLD 5 161 59960 SWDISP 5 161 1	0	See Previous	-
09SP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLINE 5 161 1	309	59955 JUNCTN 5 161 59969 BRKLINE 5 161 1	0	"	-
09SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous	-
09SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	53144 LOWELL 5 161 53170 TONTITN5 161 1	0	"	-
09SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	53144 LOWELL 5 161 53152 ROGERS 5 161 1	0	"	-
09SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	"	-
09SP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	353	53154 CHAMSPR5 161 53170 TONTITN5 161 1	0	"	-
09SP	AEPW-ENTR	53136 EUREKA 5 161 99832 5OSAGE # 161 1	244	52660 BULL SH5 161 99802 5BULLSH* 161 1	0	Rebuild 5.34 miles of 666 ACSR with 1590 ACSR. Replace wavetrap jumpers @ Eureka Springs	\$2,400,000
09SP	AEPW-ENTR	53136 EUREKA 5 161 99832 5OSAGE # 161 1	244	99802 5BULLSH* 161 99809 5FLIPN 161 1	0	See Previous	-
09SP	AEPW-AEPW	53139 FLINTCR5 161 53154 CHAMSPR5 161 1	330	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	Rebuild 14.33 Miles with 2156 ACSR and Replace Terminal Equipment	\$7,200,000
09SP	AEPW-AEPW	53139 FLINTCR5 161 53154 CHAMSPR5 161 1	330	53154 CHAMSPR5 161 53155 CHAMSPR7 345 1	0	See Previous	-
09SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	305	53139 FLINTCR5 161 53187 GENTRYR5 161 1	0	See Previous	-
09SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	305	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	0	"	-
09SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	305	53154 CHAMSPR5 161 53170 TONTITN5 161 1	0	"	-
09SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	305	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	"	-
09SP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	305	53154 CHAMSPR5 161 53155 CHAMSPR7 345 1	0	"	-
09SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	349	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous	-
09SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	349	53144 LOWELL 5 161 53170 TONTITN5 161 1	0	"	-
09SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	349	53144 LOWELL 5 161 53152 ROGERS 5 161 1	0	"	-
09SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	349	53154 CHAMSPR5 161 53195 FARMGTN5 161 1	0	"	-
09SP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	349	53154 CHAMSPR5 161 53170 TONTITN5 161 1	0	"	-
09SP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	244	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous	-
09SP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	244	53140 FLINTCR7 345 54450 GRDA1 7 345 1	0	"	-
09SP	AEPW-AEPW	53170 TONTITN5 161 53194 ELMSPR5 161 1	335	53131 DYESS 5 161 53170 TONTITN5 161 1	0	Rebuild 1.6 miles of 2-397 ACSR with 2156 ACSR. Replace Elm Springs Switch and Strain Bus	\$1,000,000
09SP	WERE-WERE	56851 AUBURN 6 230 *B015 AUBRN77X 1 1	304	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to Westar Transmission Operating Directive 400 Outage of the JEC to Hoyt 345kV Line	-
09SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to Westar Transmission Operating Directive 901 Outage of the Lawrence Hill-Midland Junction 230kV Line	-
09SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	56855 MIDLAND6 230 *B115 MIDJ126X 1 1	0	May be relieved due to Westar Transmission Operating Directive 615 Loss of the Midland Junction 230/115kV Transformer	-
09SP	WERE-WERE	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	298	57252 MIDLAND3 115 *B115 MIDJ126X 1 1	0	"	-
09SP	WERE-WERE	56855 MIDLAND6 230 *B115 MIDJ126X 1 1	308	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	0	May be relieved due to Westar Transmission Operating Directive 631 Loss of the Lawrence Hill 230/115kV Transformer	-
09SP	WERE-WERE	56855 MIDLAND6 230 *B115 MIDJ126X 1 1	308	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	0	"	-

**Table 1 continued** – SPP facility overloads identified for the GRDA to AECI transfer

Study Case	From Area - To Area	Branch Overload	Rating <MW>	Outaged Branch Causing Overload	ATC <MW>	Solution	Estimated Cost
09SP	WERE-WERE	57151 AUBURN 3 115 *B015 AUBRN77X 1 1	306	56765 HOYT 7 345 56766 JEC N 7 345 1	0	May be relieved due to Westar Transmission Operating Directive 400 Outage of the JEC to Hoyt 345kV Line	-
09SP	WERE-WERE	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	302	56853 LAWHILL6 230 56855 MIDLAND6 230 1	0	May be relieved due to Westar Transmission Operating Directive 901 Outage of the Lawrence Hill-Midland Junction 230kV Line	-
09SP	WERE-WERE	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	302	56855 MIDLAND6 230 *B115 MIDJ126X 1 1	0	May be relieved due to Westar Transmission Operating Directive 615 Loss of the Midland Junction 230/115kV Transformer	-
09SP	WERE-WERE	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	302	57252 MIDLAND3 115 *B115 MIDJ126X 1 1	0	"	-
09SP	WERE-WERE	57252 MIDLAND3 115 *B115 MIDJ126X 1 1	308	56853 LAWHILL6 230 *B101 LAWHL29X 1 1	0	May be relieved due to Westar Transmission Operating Directive 631 Loss of the Lawrence Hill 230/115kV Transformer	-
09SP	WERE-WERE	57252 MIDLAND3 115 *B115 MIDJ126X 1 1	308	57250 LWRNCHL3 115 *B101 LAWHL29X 1 1	0	"	-
09SP	EMDE-EMDE	59467 ORO110 5 161 59494 OAK432 5 161 1	214	59472 TIP292 5 161 59483 JOP389 5 161 1	0	See Previous	-
09WP	SWPA-ENTR	52660 BULL SH5 161 99825 5MIDWAY# 161 1	161	99817 5ISES 1 161 99826 5MORFLD 161 1	0	See Previous	-
09WP	SWPA-SPRM	52692 SPRGFLD5 161 59969 BRKLNE 5 161 1	318	59955 JUNCTN 5 161 59969 BRKLNE 5 161 1	0	See Previous	-
09WP	SWPA-SPRM	52692 SPRGFLD5 161 59970 CLAY 5 161 1	167	Multiple Outage Contingency: 96041 7FRANKS 345 96042 7HUBEN 345 1 96042 7HUBEN 345 96045 7MORGAN 345 1	0	Replace disconnect switches at Springfield.	\$200,000
09WP	AEPW-AEPW	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	367	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous	-
09WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	329	53139 FLINTCR5 161 53187 GENTRYR5 161 1	0	See Previous	-
09WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	329	53133 ECNTRTN5 161 53187 GENTRYR5 161 1	0	"	-
09WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	329	53154 CHAMSPR5 161 53170 TONTITN5 161 1	0	"	-
09WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	329	53155 CHAMSPR7 345 53756 CLARKSV7 345 1	0	"	-
09WP	AEPW-AEPW	53139 FLINTCR5 161 53170 TONTITN5 161 1	329	53154 CHAMSPR5 161 53155 CHAMSPR7 345 1	0	"	-
09WP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	360	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous	-
09WP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	360	53144 LOWELL 5 161 53170 TONTITN5 161 1	0	"	-
09WP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	360	53144 LOWELL 5 161 53152 ROGERS 5 161 1	0	"	-
09WP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	360	53140 FLINTCR7 345 59481 MON383 7 345 1	0	"	-
09WP	AEPW-AEPW	53139 FLINTCR5 161 53187 GENTRYR5 161 1	360	59481 MON383 7 345 59984 BRKLNE 7 345 1	0	"	-
09WP	AEPW-AEPW	53154 CHAMSPR5 161 53170 TONTITN5 161 1	243	53139 FLINTCR5 161 53170 TONTITN5 161 1	0	See Previous	-
Total Estimated Cost							\$35,720,000