



*System Facilities Study  
For Transmission Service*

*Requested By Exelon (PECO Energy)*

*From Cogentrix To Ameren*

*For The Reserved Amount Of 400MW*

*From January 1, 2002 To January 1, 2003*

*SPP Transmission Planning  
(#SPP-2001-007)*

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**Southwest Power Pool  
Transmission Service Request #230098  
SPP System Facilities Study SPP-2001-007**

**Executive Summary**

At the request of Exelon (PECO Energy), the Southwest Power Pool developed this Facility Study for the purpose of evaluating the financial characteristics of Transmission Service Request 230098. This request is for 400MW of firm transmission service from American Electric Power West (Central & South West Services) (CSWS) to Ameren. For Transmission Service Request 230098, the requested Point-To-Point Service is from January 1, 2002 to January 1, 2003.

The projected base revenues for the requested transmission service are \$3,312,000 throughout the entire reservation period based on the available transfer capability of the existing transmission system with Network Upgrades. The maximum monthly base rate revenue requirements are \$276,000 for the reservation. Exelon as the Transmission Customer is required to pay the higher of either the base revenues or the costs associated with the Network Upgrades.

There are no significant Network Upgrade requirements to accommodate either of the transmission service requests. Annual available transfer capability (ATC) allocated to the Transmission Customer is determined by the least amount of seasonal ATC on a calendar year basis. As the estimated base rate revenues are higher than the estimated revenue requirements for Network Upgrades, Exelon shall pay the base rate revenue requirements for the transmission service request. Allocated ATC and associated revenue requirements are based on items received by May 4, 2001 including 1) a signed service agreement received by SPP, and 2) authorization to proceed with engineering and construction received by Transmission Owners from SPP.

Given the insignificant amount of Network Upgrade requirements to accommodate both transmission service requests, no irrevocable letter of credit is required for the initial engineering and construction costs to be incurred by the transmission owners. Also, this study provides no assurance of the availability of Transmission Capacity or the adequacy of existing or planned transmission facilities for Transmission Service in excess of the requested 400MW.

## **Introduction**

The principal objective of this Facility Study is to identify the costs of Network Upgrades that must be added or modified to provide the requested Transmission Service while maintaining a reliable transmission system. This study includes a good faith estimate of the Transmission Customer's assigned cost for the required Network Upgrades and the time required to complete such construction and to initiate the requested service. No Direct Assignment facilities are included in this study as none were identified to provide the requested Transmission Service.

The staff of SPP completed System Impact Study SPP-2001-006/007 that identified system limitations and required modifications to the SPP system necessary to provide the requested Transmission Services. The Network Facility Upgrades required to provide the requested transmission service 230098 are listed in Table 1. A Network Upgrade will be required on the OG+E Electric Services' (OKGE) transmission system. The in-service date of this Network Facility Upgrade will not limit and delay the requested transmission service 230098. The ATC values specified in Table 1 apply to this requested transmission service.

All Network Upgrades assigned to previous transmission requests were monitored to determine whether the previously assigned upgrades are adequate to support additional transmission requests. No previously assigned facilities were identified as needing additional upgrades due to the additional impact of the requested transmission service. In addition, no previously assigned facilities identified as limiting the requested transmission service in earlier years will require an

accelerated in-service date. Two facilities assigned to previous transmission requests that do not need accelerated in-service date are listed in Table 2. The previously assigned upgrades involving the East Centerton to Gentry 161kV line are needed for 2002 summer. As they were previously accelerated to accommodate Transmission Service Request 150680, no additional changes in project scheduling are required. Therefore, the estimated engineering and construction cost responsibility of the 400MW request 230098 remains unchanged due to the earlier in-service date of the two Network Facility Upgrades.

Given the estimated dates in which the Network Upgrades are required for the requested Transmission Service to be provided, there are no facility limits that will delay the start date of the requested service. The estimated time required to complete the engineering and construction of the first transfer-limiting facility within the 2001 winter is seven (7) months after OKGE's receipt of authorization to proceed from SPP. OKGE's Osage terminal modifications including CT ratio changes have a seven (7) month construction lead time. The constraint is due to the outage of the Kildare Tap to White Eagle 138kV line during the 2001 and 2002 winter peak periods as well as the 2002 fall period. The minimum available transfer capability (ATC) during the seasons in 2002 is 227 MW given the limit of the Osage to Black 69kV line. However, given that terminal modifications at OKGE's Osage Substation are to be completed before the start of the requested transmission service, no reduction in the requested capacity will be required.

The estimated time required to complete the engineering and construction of the second transfer-limiting facility in the summer of 2002 is twelve (12) and six (6) months for the East Centerton breaker and switch replacements and Gentry switch replacements respectively within the East Centerton to Gentry 161kV line after American Electric Power West's (Central & South West Services) (CSWS) receipt of authorization to proceed from SPP. The constraint is due to the outage of the Dyess to Elm Springs 161kV line during the 2002 summer peak period. The minimum available transfer capability (ATC) during the season in 2002 is 119 MW given the limit of the East Centerton to Gentry 161kV line. However, given that terminal

modifications at CSWS's East Centerton and Gentry Substations are to be completed before the 2002 Summer Peak of the requested transmission service, no reduction in the requested capacity will be required.

Firm Point-To-Point Transmission Service may be provided to Exelon (PECO Energy) in the amount requested after the Osage, East Centerton and Gentry facility upgrades are in service. If a completed service agreement is received by SPP on or before May 4, 2001, then the requested service 230098 may be provided on approximately January 1, 2002 and service continued throughout the summer given no unexpected delays in design and construction. SPP does not accept and approve requests for firm transmission service without restrictions if the design criteria specified in the corresponding impact study is not met. However, given the estimated lead times of the upgrades for the specified constraints, the requested capacity level will be available to the Transmission Customer. If Exelon is agreeable to these terms, then SPP will accept and approve the requested service beginning after 1) a signed service agreement is received by SPP, and 2) all transmission owners' receipt of authorization from SPP to proceed with the Network Upgrades.

### **Financial Analysis**

A present worth analysis is conducted based on each transmission owner's annual fixed charge rates including weighted cost of capital. Each request for Transmission Service is evaluated independently as the cost associated with each Network Upgrade is assigned to a request. For new facilities, the Transmission Customer shall pay the total cost through the reservation period including engineering and construction costs and other annual operating costs. When upgrading facilities, the Transmission Customer shall, throughout the reservation period, 1) pay the total engineering and construction costs and other annual operating costs associated with the new facilities, and 2) receive credits associated with the depreciated book value of removed usable

facilities, salvage value of removed non-usable facilities, and the carrying charges, excluding depreciation, associated with all removed facilities based on their respective book values.

The amortization period of Network Upgrades and Direct Assignment facilities shall be the lesser of either 1) the reservation period, or 2) the period between the completion of construction within the reservation period and the end of the reservation period. The annual carrying charge rate (fixed charge rates in per-unit) for each transmission owner shall be based on the sum of expenses for a previous calendar year, including weighted cost of capital, composite income tax, other tax, administrative & general, operation & maintenance, allocation of general plant, and deferred income tax credit, divided by the plant investment for the same year.

Categories of costs and credits associated with Network Upgrades and Direct Assignment facilities shall include those specified below. The costs allocated to the Transmission Customer over the reservation period shall be the sum of the levelized present worth of each of the identified cost and credit components based on each transmission owner's weighted cost of capital.

1. Amortized engineering and construction costs associated with the new facilities.
2. Annual carrying charges, excluding depreciation, based on the product of 1) total engineering and construction costs associated with the new facilities, and 2) annual carrying charge rate (per-unit).
3. Amortized existing facility credit associated with the replaced facilities including the sum of the depreciated book values of only the reusable facilities within the lesser of either 1) the respective remaining depreciation periods, or 2) the reservation period.
4. The salvage value credit of non-usable facilities.
5. Annual carrying charge credits, excluding depreciation, based on the product of 1) book values associated with all replaced facilities, and 2) annual carrying charge rate (per-unit).



The zone interfaced to the sink with the lowest rate for firm point-to-point transmission service is Southwestern Power Administration (SPA). The current base rate of SPA is \$690/MW-Month. Table 4 includes a summary of ATC values with all assigned Network Upgrades energized by the Date Available specified in Table 3. Given the lesser of these values of ATC and the requested capacity, corresponding base rate revenues are listed on a monthly basis in Table 5. The projected base revenues from the requested service are estimated to be \$3,312,000.

The estimate of total Revenue Requirements listed in Table 6 for the assigned Network Upgrade throughout the requested transaction period is \$156 for Transmission Service Request 230098. The estimate of monthly Revenue Requirements is \$13 throughout the requested transaction period. The estimated Revenue Requirements for the required Network Upgrade are estimated to be less than the projected base revenues from the requested service over the requested transaction period. Therefore, the Transmission Customer will be responsible for the Base Rate Revenues. The total estimated base rate revenues for each of the requested Transmission Services throughout the transaction periods are \$3,312,000.

The Southwest Power Pool and the affected transmission owners including CSWS and OKGE shall use due diligence to add necessary facilities or upgrade the Transmission System to provide the requested Transmission Service, provided Exelon (PECO Energy) agrees to compensate SPP for such costs pursuant to the terms of Section 27 of the SPP Open Access Transmission Tariff. Partial Interim Service is available to Exelon per Section 19.7 of the SPP Open Access Transmission Service Tariff.

Engineering and construction of any new facilities or modifications will not start until after a Service Agreement is in place and the affected transmission owners receive the appropriate authorization to proceed from the SPP. In accordance with section 19.4 of the SPP Open Access Transmission Service Tariff, the Transmission Customer shall provide and maintain in effect, during the term of the transmission service agreement, an unconditional and irrevocable

letter of credit to the SPP for the initial engineering and construction costs to be incurred by the transmission owners. Given that there are no significant Network Upgrades required to accommodate the Transmission Service Request, no letter of credit is required of Exelon. This does not include or offset other letters of credit or deposits as may be required under the tariff.

## **Conclusion**

Given the constraints identified in the System Impact Study SPP-2001-006/007, estimated engineering and construction costs in addition to lead times for construction of Network Upgrades are provided. These estimated costs are for facilities required to provide the requested service. The lead times do not include any allowances for possible delays due to outage conflicts during construction, conflicts with construction during the summer peak, engineering and construction manpower constraints, etc. The lead times are based on engineering starting when SPP provides the transmission owners approval to start on the projects.

Based on the results of the Impact Study SPP-2001-006/007, Network Upgrades that were identified as required to provide the requested transmission service are listed in Tables 1 and 2. Table 1 includes the Network Upgrades and Costs assigned to Exelon (PECO Energy) to accommodate Transmission Service Request 230098 from CSWS to Ameren. Table 2 includes previously assigned Network Facility Upgrades requiring an accelerated in-service date to accommodate Transmission Service Request 230098.

Throughout the transaction period of the requested Transmission Service, the estimate of the Revenue Requirements for the required Network Upgrades is \$156 for Transmission Service Request 230098. ATC allocated to the Transmission Customer is determined by the least amount of seasonal ATC on a calendar year basis. A listing of ATC values and monthly revenue requirements for the required Network Upgrades are in Table 6. The base revenues are

estimated to be \$3,312,000 for the Transmission Service Request and the monthly revenue requirements are listed in Table 5. As the Base Rate revenues are higher than the revenue requirements for the required Network Upgrades, the revenue requirements from the Transmission Customer are the Base Rate Revenue Requirements.

**Table 1**  
**Estimated Network Upgrade Costs, Lead Times And Required Dates**  
**For Transmission Service Request 230098 From CSWS To AMRN**  
**During The Period From January 1, 2002 To January 1, 2003**

NETWORK SYSTEM IMPROVEMENT	ENGINEERING & CONSTRUCTION COSTS (\$ 2001 )	ENGINEERING & CONSTRUCTION LEAD TIME	REQUIRED DATE (M/D/Y)	DATE IN SERVICE (M/D/Y) (1)
Osage – Continental Blacks 69kV: Increase CT Ratio on Osage PCB9 To 800/5 By OKGE, Expedited From 1/1/03 (3)	\$2,000 (2)	Seven (7) Months 01WP ATC = 355 02FA ATC = 227 02WP ATC = 294	1/1/02	1/1/02
SUBTOTAL	\$2,000			

Note: \* Limits start of requested 400MW transfer amount (In this analysis, no such limit exists).

- Note:
- (1) For upgrades of transmission lines and substations, if the Calculated Date Available is 1) between June 1 and September 15, or 2) between September 15 and 4.5 months thereafter, then 4.5 months are added to September 15 as these facilities will not be taken out of service during the summer peaking period for upgrading. Therefore, the projected End Of Construction is February 1 of the next year.
  - (2) Given that OKGE planned to change the CT ratio by 1/1/03, the pre-planned project with an estimated cost of \$2,000 is expedited one (1) year. Therefore, the cost allocated to the Transmission Customer is only the interest cost associated with expediting the project one year. Given the Transmission Owner's weighted cost of capital of 8.39% annually, the interest cost allocated is \$156 over the reservation period.
  - (3) Further research indicated that the limiting component of this line is a 600/5 CT ratio at the Osage Substation instead of switches as documented in the Impact Study.

**Table 2**  
**Estimated Network Upgrade Costs, Lead Times And Required Dates**  
**For Facilities Requiring Accelerated In-Service Dates**  
**For Transmission Service Request 230098**

NETWORK SYSTEM IMPROVEMENT	ENGINEERING & CONSTRUCTION COSTS (\$ 2000 )	ENGINEERING & CONSTRUCTION LEAD TIME	REQUIRED DATE (M/D/Y)	DATE IN SERVICE (M/D/Y) (1)
East Centerton - Gentry REC 161kV: Replace Breaker & Switches by AEPW <b>(Accelerated)</b>	167,960 (2)	Twelve (12) Months 02SP ATC = 119	6/1/02	4/1/02
East Centerton - Gentry REC 161kV: Replace Line Switches At Gentry by AEPW <b>(Accelerated)</b>	37,845 (2)	Six (6) Months 02SP ATC = 119	6/1/02	4/1/02
SUBTOTAL	\$205,805			

Note: \* Limits start of requested 400MW transfer amount (In this analysis, no such limit exists).

Note: (1) For upgrades of transmission lines and substations, if the Calculated Date Available is 1) between June 1 and September 15, or 2) between September 15 and 4.5 months thereafter, then 4.5 months are added to September 15 as these facilities will not be taken out of service during the summer peaking period for upgrading. Therefore, the projected End Of Construction is February 1 of the next year.

(2) These projects were previously expedited, with an in-service date of 4/1/02, in Facility Study SPP-2000-086 for Transmission Service Request 150680. Therefore, there is no additional cost allocated to this Transmission Customer for 230098.

**Table 3**  
**Network Elements That Limit The Requested Transfer Amount**  
**To Less Than 400MW Due To Engineering And Construction Requirements**

Network System Improvement	Date Available (M/D/Y)	ATC (MW)	ATC Models	Restricted Seasons/Years (M/D - M/D) (Years)
None				

Note: Date Available is based on items received by May 4, 2001 including 1) a signed service agreement received by SPP, and 2) authorization to proceed with engineering and construction received by Transmission Owners from SPP.

ATC Models

Example Season Designation: From Date – To Date (M/D/Y), Season Description

01AP: 4/1/01 – 6/1/01, Spring Minimum

01SR: 4/1/01 – 6/1/01, Spring Peak

01SP: 6/1/01 – 10/1/01, Summer Peak

**Table 4**

**Summary Of Available Transfer Capability With All Network Upgrades  
For Transmission Service Request 230098 From CSWS To Ameren  
During The Period From January 1, 2002 To January 1, 2003**

Operating Period (Year)	Operating Period (M/D - M/D)	ATC (MW)
2002	1/1 – 4/1	400
2002	4/1 – 6/1	400
2002	6/1 – 10/1	400
2002 - 2003	10/1 – 1/1	400

Note: Values of ATC are based on items received by May 4, 2001 including 1) a signed service agreement received by SPP, and 2) authorization to proceed with engineering and construction received by Transmission Owners from SPP.

**Table 5**  
**Summary Of Available Transfer Capability With All Network Upgrades**  
**And Base Rate Revenues, The Total Revenue Requirements,**  
**Excluding Cost Of Network Upgrades**  
**For Transmission Service Request 230098 From CSWS To Ameren**  
**During The Period From January 1, 2002 To January 1, 2003**

Operating Period (Month)	2001 ATC (MW)	2001 Base Revenues (\$)	2002 ATC (MW)	2002 Base Revenues (\$)
January	N/A	\$0	400	\$276,000
February	N/A	\$0	400	\$276,000
March	N/A	\$0	400	\$276,000
April	N/A	\$0	400	\$276,000
May	N/A	\$0	400	\$276,000
June	N/A	\$0	400	\$276,000
July	N/A	\$0	400	\$276,000
August	N/A	\$0	400	\$276,000
September	N/A	\$0	400	\$276,000
October	N/A	\$0	400	\$276,000
November	N/A	\$0	400	\$276,000
December	N/A	\$0	400	\$276,000
Subtotal				\$3,312,000
Total, All Years				\$3,312,000

Note: Values of ATC are based on items received by May 4, 2001 including 1) a signed service agreement received by SPP, and 2) authorization to proceed with engineering and construction received by Transmission Owners from SPP.



**Table 6**  
**Summary Of Available Transfer Capability With All Network Upgrades**  
**And The Network Upgrade Revenue Requirements**  
**For Transmission Service Request 230098 From CSWS To Ameren**  
**During The Period From January 1, 2002 To January 1, 2003**

Operating Period (Month)	2001 ATC (MW)	2001 Network Upgrade Revenues (\$)	2002 ATC (MW)	2002 Network Upgrade Revenues (\$)
January	N/A	N/A	400	\$13
February	N/A	N/A	400	\$13
March	N/A	N/A	400	\$13
April	N/A	N/A	400	\$13
May	N/A	N/A	400	\$13
June	N/A	N/A	400	\$13
July	N/A	N/A	400	\$13
August	N/A	N/A	400	\$13
September	N/A	N/A	400	\$13
October	N/A	N/A	400	\$13
November	N/A	N/A	400	\$13
December	N/A	N/A	400	\$13
Subtotal				\$156
Total, All Years				\$156

Note: Values of ATC are based on items received by May 4, 2001 including 1) a signed service agreement received by SPP, and 2) authorization to proceed with engineering and construction received by Transmission Owners from SPP. SPP annual ATC is determined by the least amount of ATC available on a calendar year basis.