



**SPP** *Southwest  
Power Pool*

*System Facilities Study  
For Transmission Service*

*Requested By  
Kansas Municipal Energy Agency*

*From The Grand River Dam Authority  
To Kansas City Power & Light And  
To Western Resources*

*For Reserved Amounts Of 15 & 24MW  
From May 1, 2000  
To May 1, 2010*

*SPP Transmission Planning  
(#SPP-2000-003 & SPP-2000-004)*

Revised May 15, 2000

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**Southwest Power Pool**  
**Transmission Service Requests #163951, 163958**  
**SPP System Facilities Study SPP-2000-004 & SPP-2000-003**

**Executive Summary**

The projected base revenues for the requested transmission service 163951 (GRDA to WR) and 163958 (GRDA to KCPL) are \$3,746,052 and \$1,584,868 respectively (\$31,217 and \$13,207 per month). The customer is required to pay the higher of the transmission revenues or the construction cost revenue requirements.

The construction cost revenue requirements for providing the complete transmission service requested is \$12,335,335 and \$1,660,749 based on the required facility upgrades. However, if the customer is willing to have 0MWs transmission capability with request 163951 for the summer of 2009, the construction costs are reduced to \$6,667,870 and \$1,660,749. The monthly revenue requirement would then increase from a base of approximately \$31,217 and \$13,207 to \$55,566 and \$13,839 for this alternative. This requires an irrevocable letter of credit for \$5,217,000 for the initial engineering and construction cost to be incurred by the transmission owners.

**Introduction**

Kansas Municipal Energy Agency has requested a Facility Study for Transmission Service from the Grand River Dam Authority to Kansas City Power & Light and Western Resources. This Transmission Service for 39 MW (2 reservations of 24MW and 15MW respectively) has been requested from May 1, 2000 to May 1, 2010. 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 39MW.

Given the constraints identified in the System Impact Study SPP-2000-003, 04 and further evaluation in this Facility Study, estimated costs and lead times for construction of Network Upgrades are provided. These estimated costs are for only those facilities required to provide the requested service. No Direct Assignment facilities are included in this study that may be required to complete the requested service.

Based on the results of the Impact Study SPP-2000-003, 04 and further evaluation in this Facility Study, Network Upgrades that were identified as required to provide the requested transmission service are listed in Table 1 and Table 2 below. Table 1 lists the Network Upgrades required to accommodate Transmission Service Requests 163951 from the Grand River Dam Authority to Western Resources. Table 2 lists the Network Upgrades required to accommodate Transmission Service Requests 163958 from the Grand River Dam Authority to Kansas City Power & Light. Lead times required for each individual project are provided. These 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.

Table 1A lists the Network Upgrades required to accommodate Transmission Service Request 163951 if KMEA agrees to redispatch in 2009. Some facilities identified in the Impact Study SPP-2000-003, 04 are not included in this Facility Study as the Transmission Owners defined them as not required due to various reasons. A list of these facilities is included in Tables 4 and 5 by Transmission Service Request.

Several facilities were identified in the Impact Study SPP-2000-003, 04 as being overloaded for the specified contingencies in the year 2010. Based on this information and additional analyses of the same contingencies in 2006, the year that each facility identified in the Impact Study is required was determined by interpolation. Based on this evaluation, several of the facilities are not required until the summer peak period starting June 1, 2010. As the requested Transmission

Service ends May 1, 2010, the facilities that are required after May 1, 2010 are not included in this Facility Study. These facilities are listed in Table 6.

Throughout the transaction period of the requested Transmission Service, the estimate of the Revenue Requirements for the required Network Upgrades is \$12,335,335 and \$1,660,749 for Transmission Service Requests 163951 and 163958 respectively. The base revenues for requests 163951 and 163958 are \$3,746,052 and \$1,584,868 respectively. As the Revenue Requirements for the required Network Upgrades is higher than the base rate revenues for both requests, the revenue requirements from the Transmission Customer are those required for the Network Upgrades.

For this alternative eliminating the requirement of the Lyons – Wheatland 115kV line in 2009, the estimate of the Revenue Requirements for the required Network Upgrades is \$6,667,870 and \$1,660,749 for Transmission Service Requests 163951 and 163958 respectively throughout the transaction period of the requested Transmission Service. The base revenues for requests 163951 and 163958 are \$3,746,052 and \$1,584,868 respectively. As the Revenue Requirements for the required Network Upgrades is higher than the base rate revenues for both requests, the revenue requirements from the Transmission Customer are those required for the Network Upgrades.

### **Conclusion**

At the request of the Kansas Municipal Energy Agency, the Southwest Power Pool staff evaluated Transmission Service Requests 163951 and 163958. These requests are for a total of 39 MW of firm transmission service from the Grand River Dam Authority's control area to Western Resource's and Kansas City Power & Light's control areas (2 reservations of 24MW and 15MW respectively). The requested Point-To-Point Service is from May 1, 2000 to May 1, 2010.

The principal objective of this 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. As the evaluation of Transmission Service Request 163958 is based on the confirmation of 163951, the Transmission Customer must confirm the Transmission Service Request 163951 if 163958 is confirmed. Otherwise, the Network Upgrade requirements for Transmission Service Request 163958 must be reevaluated.

The staff of SPP completed the System Impact Study SPP-2000-003, 04 that identified system limitations and required modifications to the SPP system necessary to provide the requested Transmission Service. Network Upgrades will be required on the Central and Southwest Services (CSWS), Southwest Power Administration (SPA) and Western Resource (WR) transmission systems. These Network Upgrades include reconductoring one 161kV, one 115kV and one 69kV transmission lines, replacing a 138kV switch and jumpers, replacing 69kV jumpers and resetting CTs and relays. The estimated total cost to engineer and construct these upgrades in year 2000 dollars is \$11,537,000. The estimated time required to complete the engineering and construction of the first transfer-limiting project is eighteen (18) months after CSWS's receipt of authorization to proceed from SPP. Given the estimated dates in which the Network Upgrades are required for the requested Transmission Service to be provided, there are facility limits that will delay the start date of the service.

Firm Point-To-Point Transmission Service may be provided to the Kansas Municipal Energy Agency (KMEA) in the amounts requested approximately eighteen (18) months after CSWS's receipt of authorization to proceed from SPP. If a completed service agreement is received by SPP on or before May 29, 2000, then the requested service may be provided on approximately December 1, 2001 given no unexpected delays in design, permitting and construction. This requested service is limited by one operating contingency. This constraint is the outage of the East Centerton-to-Gentry 161kV line that will result in the overload of the Dyess-to-East Rogers 161kV line during the 2001 summer peak period. However, if KMEA agrees to redispatch generation at KMEA's expense lowering the transfer, from GRDA to WR, to 9MW from the

requested 24MW only during the summer peak period in 2001, the requested Transmission Service may be accepted by SPP.

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, SPP may accept a request if the Transmission Customer agrees to the interruption of Transmission Service for a designated constraint with no financial discounts by redispatching generation. Therefore, if KMEA is willing to accept the entire risk of having the requested firm transmission service interrupted during the summer peak period of June 1 through September 30, 2001, SPP will accept and approve the requested service given this potential constraint. If KMEA 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) WR's receipt of authorization from SPP to proceed with the terminal upgrades of the Creswell-to-Oak 69kV line.

The amortization period for each facility is determined by 1) the date that construction is completed and the facility is energized and 2) the end date of the requested Transmission Service. A present worth analysis is conducted based on this information and 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.

The estimate of the Revenue Requirements for the required Network Upgrades throughout the requested transaction period is \$13,996,084. The estimate of the monthly Revenue Requirements is \$116,602 throughout the requested transaction period. The projected base revenues from the requested service are estimated to be \$5,330,920. The projected base revenues from the requested service are estimated to be less than the estimated Revenue Requirements for the required Network Upgrades over the requested transaction period. Therefore, there will be costs assigned to the Transmission Customer for the Network Upgrades. The total estimated cost for the requested Transmission Service, including both base revenues and Network Upgrade costs, throughout the transaction period is \$13,996,084.

The Southwest Power Pool and the affected transmission owners including CSWS, SPA and WR shall use due diligence to add necessary facilities or upgrade the Transmission System to provide the requested Transmission Service, provided Kansas Municipal Energy Agency 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 Kansas Municipal Energy Agency 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 in the amount of no less than \$11,537,000 for the initial engineering and construction costs to be incurred by the transmission owners. This amount does not include or offset other letters of credit or deposits as may be required under the tariff.

The requirement for upgrading the Lyons – Wheatland 115kV line in 2009 adds a substantial cost to the Transmission Customer in the amount of an estimated \$6,320,000 for engineering and construction. One alternative for KMEA to reduce costs is to redispatch generation such that the Lyons – Wheatland 115kV line in 2009 is not overloaded by reducing the transfer, from GRDA to WR, to 0MW from the scheduled 24MW only during the summer peak period in 2009. Therefore, if KMEA is willing to have the reserved transmission capacity go to zero during the summer peak period, including June 1 through September 30, of 2009, SPP will accept and approve the requested service given this potential constraint. The redispatch must be to generation units located at the loads such that no additional transmission service is required. Otherwise, impact studies must be conducted to evaluate transfers from other generation resources.

For this alternative eliminating the requirement of the Lyons – Wheatland 115kV line in 2009, 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 in the amount of no less than \$5,217,000 for the initial engineering and construction costs to be incurred by the transmission owners. This amount does not include or offset other letters of credit or deposits as may be required under the tariff. The estimate of the Revenue Requirements for the required Network Upgrades throughout the requested transaction period is \$8,328,619. The estimate of the monthly Revenue Requirements is \$69,386 throughout the requested transaction period. The projected base revenues from the requested service are estimated to be \$5,330,920 with a monthly estimate of \$44,424. The projected base revenues from the requested service are estimated to be less than the estimated Revenue Requirements for the required Network Upgrades over the requested transaction period. Therefore, there will be costs assigned to the Transmission Customer for the Network Upgrades. The total estimated cost for the requested Transmission Service, including both base revenues and Network Upgrade costs, throughout the transaction period is \$8,328,619.

**Table 1**  
**Estimated Network Upgrade Costs, Lead Times And Required Dates**  
**For Transmission Service Request 163951**  
**From The Grand River Dam Authority To Western Resources**  
**During The Period From May 1, 2000 Through May 1, 2010**

NETWORK SYSTEM IMPROVEMENT	ENGINEERING & CONSTRUCTION COSTS (\$ 2000 )	ENGINEERING & CONSTRUCTION LEAD TIME	DATE IN SERVICE (M/D/Y)
Dyess - E. Rogers 161kV Line Upgrade To 1590MCM By CSWS	\$4,000,000	Eighteen (18) Months	12/1/01
Creswell – Oak 69kV Jumpers & Relay Setting Changes By WR	\$20,000	Two (2) Weeks	5/30/00
Lyons – Wheatland 115kV Rebuild By WR	\$6,320,000	Six (6) Months	6/1/09
TOTAL	\$10,340,000	Eighteen (18) Months	12/1/01

**Table 1A**  
**Estimated Network Upgrade Costs, Lead Times And Required Dates**  
**For Transmission Service Request 163951**  
**From The Grand River Dam Authority To Western Resources**  
**During The Period From May 1, 2000 Through May 1, 2010**  
**With Redispatch By KMEA in 2009**  
**Eliminating Overload Of WR's Lyons – Wheatland 115kV Line From 100.2%**  
**Due To Outage Of WR's Circle - Rice County 115kV Line**

NETWORK SYSTEM IMPROVEMENT	ENGINEERING & CONSTRUCTION COSTS (\$2000 )	ENGINEERING & CONSTRUCTION LEAD TIME	DATE IN SERVICE (M/D/Y)
Dyess - E. Rogers 161kV Line Upgrade To 1590MCM By CSWS	\$4,000,000	Eighteen (18) Months	12/1/01
Creswell – Oak 69kV Jumpers & Relay Setting Changes By WR	\$20,000	Two (2) Weeks	5/30/00
Lyons – Wheatland 115kV Rebuild By WR	\$0	0	0
Redispatch Generation For Outage Of Circle-Rice County 115kV Line Of WR.	Undefined Cost To KMEA		
<b>TOTAL</b>	<b>\$4,020,000</b>	<b>Eighteen (18) Months</b>	<b>12/1/01</b>

**Table 2**  
**Estimated Network Upgrade Costs, Lead Times And Required Dates**  
**For Transmission Service Request 163958**  
**From The Grand River Dam Authority To Kansas City Power & Light**  
**During The Period From May 1, 2000 Through May 1, 2010**

NETWORK SYSTEM IMPROVEMENT	ENGINEERING & CONSTRUCTION COSTS (\$2000 )	ENGINEERING & CONSTRUCTION LEAD TIME	DATE IN SERVICE (M/D/Y)
Flint Creek – Gentry 161kV Switch Replacement By CSWS	\$60,000	Six (6) Months	6/1/04
Rice Creek – Bartlesville SE 138kV Wave Trap & Jumpers By CSWS	\$15,000	Six (6) Months	6/1/01
Creswell – Paris 69kV Rebuild By WR	\$1,120,000	Two (2) Months	6/1/04
Carthage – Jasper 69kV CT Setting Changes By SPA	\$1,000	One (1) Month	6/1/01
Carthage – Reeds 69kV CT Setting Changes By SPA	\$1,000	One (1) Month	6/1/01
TOTAL	\$1,197,000	Six (6) Months	6/1/01

Note: The facilities listed above and their associated costs are specified based on the condition that Transmission Service Request 163951 will be confirmed by the Transmission Customer. If this request is not confirmed, then the facility requirements to accommodate only Transmission Service Request 163958 must be reevaluated.

**Table 3**  
**Cost Summary Of Revenue Requirements By Alternative**  
**For Both Transmission Service Requests 163951 And 163958**  
**From The Grand River Dam Authority**  
**To Both Kansas City Power & Light And Western Resources**  
**Starting May 1, 2000**

Transmission Service Description	Revenue Requirements, Resv. 163951, 24MW GRDA – WR (\$)	Revenue Requirements, Resv. 163958, 15MW GRDA – KCPL (\$)	Revenue Requirements, Total (\$)
Requested Service 5/1/00-5/1/10	\$12,335,335	\$1,660,749	\$13,996,084
Alternative #1: Including redispatch by KMEA in 2009 eliminating Lyons-Wheatland 115kV line rebuild. *	\$6,667,870	\$1,660,749	\$8,328,619

Note: \* Redispatch by KMEA is at the expense of KMEA and this expense is not included in the cost estimate. Redispatch is to lower the overload of the Lyons-Wheatland 115kV line in the event of an outage of the Circle – Rice County 115kV line owned by WR. The amounts of overload are estimated to be 100.2% and 103.1% in 2009 and 2010 summer peak periods respectively where the summer peak is June 1 through September 30. The redispatch must be to generation units located at the loads such that no additional transmission service is required. Otherwise, impact studies must be conducted to evaluate transfers from other generation resources.

**Table 4**

**Estimated Network Upgrades, Costs, Transmission Owners And Required Dates  
Including Facilities Being Upgraded Or Having Loading Reductions Due To New Facilities  
At The Expense Of The Transmission Owners  
For Transmission Service Request 163951  
From The Grand River Dam Authority To Western Resources  
During The Period From May 1, 2000 Through May 1, 2010**

<b>NETWORK SYSTEM IMPROVEMENT</b>	<b>ENGINEERING &amp; CONSTRUCTION COSTS (\$ 2000 )</b>	<b>TRANSMISSION OWNER</b>	<b>DATE IN SERVICE (M/D/Y)</b>
Pensacola-Gray Tap 69kV	\$0	Northeast Oklahoma Electric Coop (By GRDA)	12/1/00
Maid-Tahlequah	\$0	Grand River Dam Authority	6/1/01
Zena Tap - Jay	\$0	Northeast Oklahoma Electric Coop (By GRDA)	6/1/01

**Table 5**

**Estimated Network Upgrades, Costs, Transmission Owners And Required Dates  
Including Facilities Being Upgraded Or Having Loading Reductions Due To New Facilities  
At The Expense Of The Transmission Owners  
For Transmission Service Request 163958  
From The Grand River Dam Authority To Kansas City Power & Light  
During The Period From May 1, 2000 Through May 1, 2010**

NETWORK SYSTEM IMPROVEMENT	ENGINEERING & CONSTRUCTION COSTS (\$ 2000 )	TRANSMISSION OWNER	DATE IN SERVICE (M/D/Y)
Craig Junction-Pentagon 115kV	\$0	WR	6/1/04
Jay-Colcotp 69kV	\$0	Northeast Oklahoma Electric Coop (By GRDA)	6/1/06

**Table 6**

**Estimated Network Upgrades, Costs And Transmission Owners  
Excluded Due To Requirement During Summer Peak of 2010  
After Term Of Transmission Service Request**

NETWORK SYSTEM IMPROVEMENT	ENGINEERING & CONSTRUCTION COSTS (\$ 2000 )	TRANSMISSION OWNER
Weaver-Rose Hill 69kV	\$0	WR
Ken Mar-Northeast 69kV	\$0	WR
McArth-Oatville 69kV	\$0	WR
Northeast Parsons-Neosho 138kV	\$0	WR