SPP Southwest Power Pool

Facility Study for Generation Interconnection Request GEN-2004-008

SPP Tariff Studies

#GEN-2004-008)

December, 2005

Summary

Kansas City Power & Light (KCPL) performed the following Study at the request of the Southwest Power Pool (SPP) for Generation Interconnection request GEN-2004-008. The request for interconnection was placed with SPP in accordance SPP's Open Access Transmission Tariff, which covers new generation interconnections on SPP's transmission system.

Pursuant to the tariff, KCPL was asked to perform a detailed Facility Study of the generation interconnection request to satisfy the Facility Study Agreement executed by the requesting customer and SPP.

FACILITY STUDY
FOR
SOUTHWEST POWER POOL
GENERATION INTERCONNECT STUDY

SPP-GEN-2004-008

Interconnection Customer
900 MW Iatan 2 Generating Unit
Platte County, MO

Prepared By: KCPL Transmission Planning
801 Charlotte
Kansas City, MO

December 12, 2005

Interconnection Facilities

OVERVIEW

The Interconnection Customer (IC) has proposed construction of a new 900 Mw coal fired generating unit that will be interconnected with the Kansas City Power & Light (KCPL) 345kV transmission system at the Iatan substation in northern Platte County, Missouri. The existing Iatan 345kV bus will be expanded to accommodate the new generating unit, one (1) unit auxiliary transformer and a terminal position for a new 345/161kV autotransformer. The 345kV ring bus work is a Stand Alone Network Upgrade. A new 3-breaker 161kV ring bus will be constructed to accommodate 161kV line terminals for new 161kV lines to the Platte City-Stranger Creek 161kV transmission line owned by a third party Transmission Owner (TTO). The new autotransformer and 161kV line terminals are necessary to mitigate contingent overloads on the existing Iatan 345kV lines at the point of the interconnection due to the increased generation and are considered Capacity Upgrades. The TTO will install a 6-ohm line reactor and upgrade terminal equipment at Platte City to mitigate contingent overloads on the Iatan autotransformer and Iatan-Platte City 161kV transmission line. Six (6) 345kV and three (3) 161kV circuit breakers and their associated switches, relaying, metering, and communication equipment will be required for this project. IC will construct and own the generating plant and maintain the equipment including the 345kV disconnect switches at the ownership boundary between the IC and KCPL. KCPL will retain ownership and operating authority of the 345kV switchyard up to the 345kV disconnect switches and will have similar responsibility for the new autotransformer and the new 161kV switchyard at Iatan.

Construction will be complete and facilities operational by June 2009. IC will pay KCPL's costs of the design and construction of the Iatan bus expansion and will ensure that the interface equipment between IC and KCPL is constructed in accordance with KCPL design specifications. IC will also pay the third party Transmission Owner's costs for design and construction of the 161kV lines from Iatan that intersect the Platte City-Stranger Creek line and the improvements at Platte City 161kV substation.

KCPL's preliminary cost estimate for its part of the Stand Alone Network Upgrade is $6,140,000 and is detailed in Table 1 below. KCPL's preliminary cost estimate of its part of the Capacity Upgrades is $4,510,000 and is detailed in Table 2. This amount does not include any additional charges of approximately 25-30% resulting from contribution in aid to construction (CIAC) fees that are to be paid by IC. The construction of the KCPL interconnection facilities is expected to last 34 months for the station work once zoning and construction permits have been obtained. The estimated project schedule for KCPL's part of the interconnection facilities is included in Tables 3 & 4.

The TTO will be responsible for the planning and construction of the new double circuit transmission lines (approximately 4 miles) from the Iatan 161kV substation bus to the Platte City-Stranger Creek 161kV line and for improvements at the Platte City substation. The TTO's preliminary cost estimate for its part of Capacity Upgrades is $8,177,000 and is detailed in Table 5 below. This amount does not include any additional charges of approximately 25-30% resulting from contribution in aid to construction (CIAC) fees that are to be paid by IC. Estimated construction schedule including the route selection and right-of-way acquisition issues for this part of the Capacity Upgrades, will be developed by TTO.

Table 1 – Estimated Construction Costs for KCPL Stand Alone Network Upgrade
** Costs do not include any adders for CIAC*

Item	Description	Cost
1	Iatan 345 kV substation facilities and equipment	$5,490,000
2	Relocate Iatan-St. Joseph 345kV line terminal	$ 650,000
	Total Project Cost	$6,140,000*

Table 2 – Estimated Construction Costs for KCPL Capacity Upgrades
** Costs do not include any adders for CIAC*

Item	Description	Cost
1	New 550 Mva 345/161kV autotransfomer	$2,310,000
2	Iatan 161kV substation, ring bus, line terminals	$2,200,000
	Total Project Cost	$4,510,000*

Table 3 – Project Schedule for KCPL Stand Alone Network Upgrade
Project timeline does not include zoning and construction permits

Task	Description of Work	Start	End
1	Evaluation and budgetary approvals	9/1/06	1/31/07
2	Initial engineering	1/31/07	8/30/07
3	Materials ordering & procurement	3/1/07	2/1/08
4	Final engineering & design	8/30/07	10/22/07
5	Foundation, structural work	10/1/07	1/31/08
6	Transmission line & terminal work	1/15/08	3/4/08
7	Equipment, relay, metering installation	11/1/07	5/1/08
8	Testing and inspection	5/1/08	5/31/08
	Total Project Completion	9/1/06	6/1/08

Table 4 – Project Schedule for KCPL Capacity Upgrades *Project timeline does not include zoning and construction permits*			
Task	Description of Work	Start	End
1	Evaluation and budgetary approvals	9/1/06	1/31/07
2	Initial engineering	1/31/07	7/30/08
3	Materials ordering & procurement	10/1/07	2/1/09
4	Final engineering & design	7/30/08	11/22/08
5	Foundation, structural work	3/1/08	12/20/08
6	Transmission line & terminal work	9/01/08	4/01/09
7	Equipment, relay, metering installation	11/1/08	5/01/09
8	Testing and inspection	5/1/09	5/31/09
	Total Project Completion	9/1/06	6/1/09

Table 5 – Estimated Construction Costs for Third Party T.O. Capacity Upgrades ** Costs do not include any adders for CIAC*		
Item	Description	Cost
1	Double circuit 161kV transmission lines (4 miles)	$7,127,000
2	161kV line reactor – Platte City substation	$ 750,000
3	Platte City 161kV line terminal upgrades	$ 300,000
	Total Project Cost	$8,177,000*

DISCUSSION of PROJECT COMPONENTS

Iatan 345kV Switchyard

i) Property: The property for the Iatan 345kV substation expansion will be owned by KCPL.

ii) Site: KCPL will perform site evaluation and preparation.

iii) Bus design: The bus will be expanded to a breaker-and-a-half configuration with the addition of six new 345kV circuit breakers. This will accommodate one new line terminal, one generator interface position, and one unit auxiliary position. The existing St. Joseph 345kV line terminal will be moved to a new bus position on the expanded bus section and the new 345/161kV autotransformer will terminate at the existing St. Joseph line terminal position to eliminate crossing of the 345kV lines and the 161kV lines outside the switchyard.

iv) Control House: The existing control house will be expanded to contain relay, metering, communication equipment and battery power supply.

v) Switchyard: KCPL will enclose the 345kV switchyard with a chain-link perimeter fence and provide a crushed stone surface. IC is responsible for providing a graded pad site for the substation and the mitigation of any wetland areas if required. Location of the substation expansion area and the requirement for grading or wetland mitigation will not be known until IC completes detailed site plans.

vi) Ground grid: A ground grid will be installed to provide adequate station equipment grounding.

vii) Protection: Relaying will be provided for line and bus protection.

viii) Metering: Bi-Directional metering equipment will be installed to monitor plant output and off-line auxiliary load.

ix) Point of Interconnection: IC will install two disconnect switches at the plant interface to the 345kV switchyard. KCPL will provide transmission connections to these two disconnect switches.

Iatan 161kV Switchyard

i) Property: The property for the new Iatan 161kV substation expansion will be owned by KCPL.

ii) Site: KCPL will perform site evaluation and preparation.

iii) Bus design: The 161kV bus will consist of three 161kV circuit breakers in a ring bus configuration; two line terminals, and one transformer terminal.

iv) Control House: The existing control house will be expanded to contain relay, metering, communication equipment and battery power supply.

v) Switchyard: KCPL will enclose the 161kV switchyard with a chain-link perimeter fence and provide a crushed stone surface.

vi) Ground grid: A ground grid will be installed to provide adequate station equipment grounding.

vii) Protection: Relaying will be provided for line and bus protection.

viii) Metering: Bi-Directional metering equipment will be installed to monitor transmission line and transformer flows.

Iatan-Platte City and Iatan-Stranger Creek 161kV Lines

i) Right-of-Way: The right-of-way for these lines will be procured by third party Transmission Owner.

ii) Line Construction: Third party Transmission Owner will design, construct, own, and maintain the transmission lines from the Iatan 161kV substation to the existing Platte City-Stranger Creek 161kV line right-of-way. The line will be constructed using bundled 1195kcmil ACSR conductor on steel pole structures.

iii) The Stranger Creek portion of the new double circuit transmission lines will be designed and constructed to accommodate 345kV operation in the future.

Platte City 161kV Substation

i) TTO will install a 161kV series line reactor (6 ohm) at the Platte City 161kV substation. This is necessary to mitigate overloading of the Iatan 345/161kV autotransformer for contingent loss of either the Iatan-St. Joseph or Iatan-Stranger Creek 345kV lines.

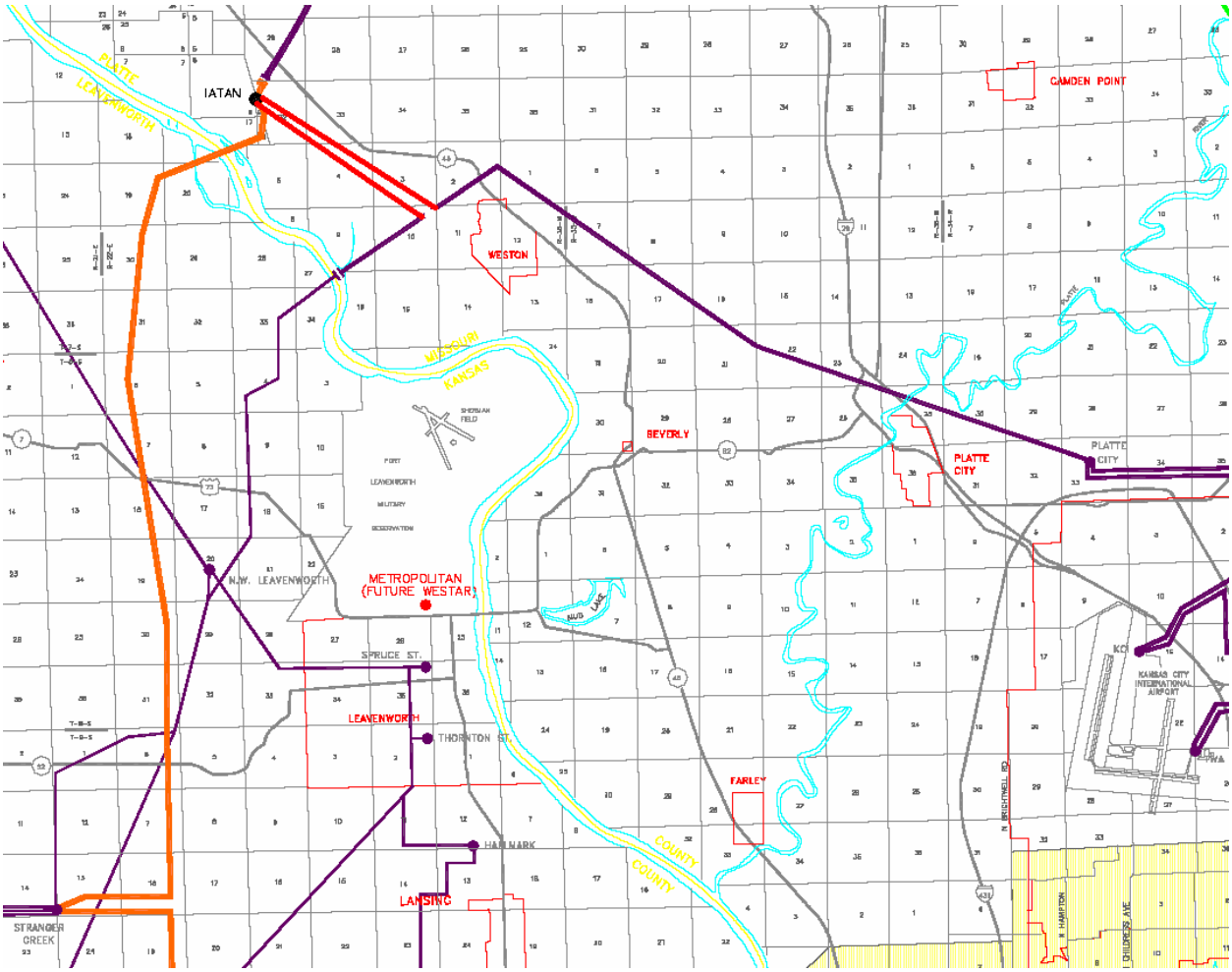
ii) TTO will upgrade substation terminal equipment for the Iatan 161kV line at Platte City to accommodate 2000 amp capability. This is necessary to mitigate overloading of the Iatan-Platte City 161kV transmission line for contingent loss of either the Iatan-St. Joseph or Iatan-Stranger Creek 345kV lines.

Interconnection Customer Facilities

i) IC will install all facility equipment up to and including the two disconnect switches located in the Iatan 345kV switchyard. This will be the point of change of ownership between IC and KCPL.

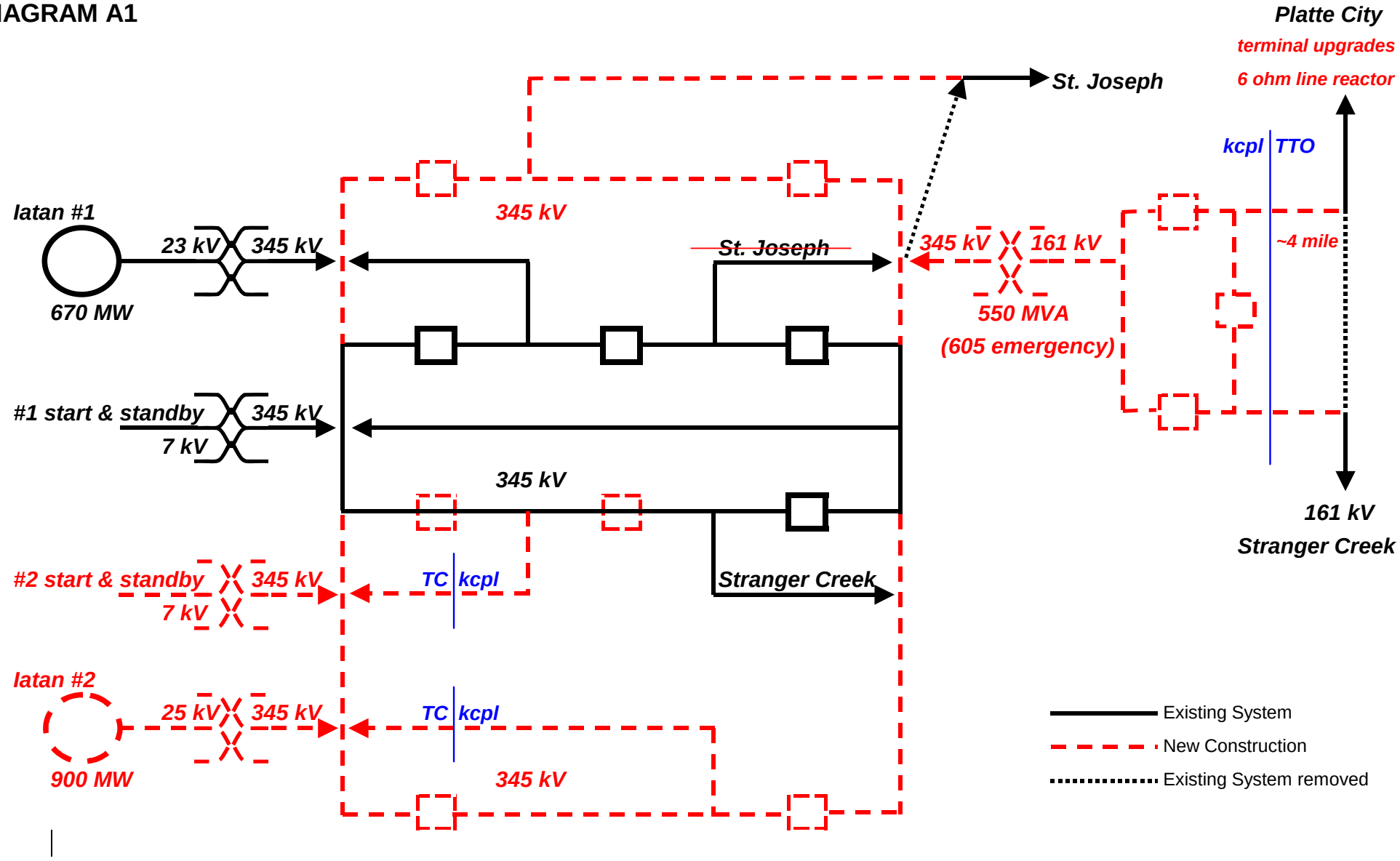
Other Facility Improvements

i) Current capacity of the Iatan-St. Joseph 345kV transmission line is not adequate to carry contingent flows for loss of the Iatan-Stranger Creek 345kV with the Iatan 2 generation and the above facility improvements. TTO had prior budgetary plans to increase the capacity of the St. Joseph terminal equipment that will mitigate this contingent overload. Therefore, the IC will not pay for those upgrades.



Proposed new 161kV line additions (in red) for new 900 Mw generating unit at Iatan.

DIAGRAM A1


Platte City
terminal upgrades
6 ohm line reactor
St. Joseph
kcpl
TTO
~4 mile
Iatan #1
23 kV
345 kV
670 MW
345 kV
St. Joseph
345 kV
161 kV
550 MVA
(605 emergency)
#1 start & standby
345 kV
7 kV
345 kV
161 kV
Stranger Creek
#2 start & standby
345 kV
7 kV
TC
kcpl
Stranger Creek
Iatan #2
25 kV
345 kV
900 MW
TC
kcpl
345 kV
Existing System
New Construction
Existing System removed