Facility Study For Generation Interconnection Request GEN-2008-129

SPP Tariff Studies

(#GEN-2008-129)

May 2010

Summary

Kansas City Power & Light (KCPL) performed the following Study at the request of the Southwest Power Pool (SPP) for Generation Interconnection request Gen-2008-129. 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.

Transmission Owner Interconnection Facilities and Non Shared Network Upgrades

Per the following Facility Study, the Interconnection Customer is responsible for $150,000 of Transmission Owner Interconnection Facilities and non shared Network Upgrades.

Shared Network Upgrades

The GEN-2008-129 interconnection request was studied within the DISIS-2009-001 Impact Cluster Study posted in January, 2010. This request was restudied with the study posted in May, 2010. There are no shared network upgrades for the GEN-2008-129 interconnection request.

KCP&L Greater Missouri Operations Company

Facility Study for SPP

Generation Interconnection Request

GEN-2008-129

Prepared by: KCP&L Greater Missouri Operations Transmission Planning
April 13, 2010

Executive Summary

The customer requests interconnection for an 80-MW up-grade to existing combustion turbines at Pleasant Hill 345/161/69 kV sub-station. These combustion turbines shall not require additional circuit breakers or bus work to accommodate the 80-MW upgrade to the existing combustion turbines.

The Gen-2008-129 combustion turbine up-grade adds 80 MW to the existing 595 MW of generation. KCP&L Greater Missouri Operations Transmission Planning received the South West Power Pool's impact study. Southwest Power Pool conducted the impact study as a "cluster" study that reviews all generator interconnection requests in the Southwest Power Pool service territory. This impact study's title is DISIS-2009-001. DISIS-2009-001 (Definitive Interconnection System Impact Study for Generation Interconnection Requests) dated January 2010 and re-posted February 5, 2010, indicates there is a constraint due to a wavetrap limitation on the KC South – Longview 161 kV. KCP&L Greater Missouri Operations (GMO) Transmission Planning performed system studies and found no NERC Category A violation with the addition of 80 MW at the Pleasant Hill 161 kV bus. KCP&L then performed NERC Category B system studies and found several contingencies that caused the KC South – Longview 161 kV to exceed its emergency rating due to its wavetrap limitation.

The KCP&L Greater Missouri Operations Transmission system can accommodate the 80-MW combustion turbine upgrade at Dogwood generation after upgrading the KC South – Longview 161 kV line capacity by replacing the Longview wavetrap. The expected in service date for Generation Interconnection Request Gen-2008-129 is June 2010.

Discussion

General Description

The customer desires to upgrade existing Dogwood combustion turbines to accommodate an extra 80-MW of generating capacity at Pleasant Hill 345/161/69 kV sub-station.

General Description of Modifications at Dogwood generation and Pleasant Hill 345/161/69 kV sub-station.

1. **Modifications to existing Pleasant Hill 345/161/69 kV Sub-Station**: There are no planned changes

1.1 Location: Dogwood generation is located at Pleasant Hill 345/161/69 kV sub-station.

1.2 Bus Design: There are no planned changes to the existing Pleasant Hill 161 kV breaker and a half configuration.

1.3 Transformer: A transformer is not required.

1.4 Controls: There are no planned changes.

1.5 Line Reactors: Line reactors are not required.

1.6 Security Fence: There are no planned changes.

1.7 Ground Grid: There are no planned changes.

1.8 Site Grading: There are no planned changes.

1.9 Station Power: There are no planned changes.

1.10 Relay and Protection Scheme: There are no planned changes.

1.11 Revenue Metering: There are no planned changes.

1.12 Disturbance Monitoring Device: There are no planned changes to the existing disturbance monitoring device at Pleasant Hill 345/161/69 kV sub-station.

2. **Communications**: There are no planned changes to existing communication devices at Pleasant Hill 345/161/69 kV sub-station.

3. **Transmission Line**: Upgrade existing KC South – Longview 161 kV wavetrap using an estimated cost of $150,000.

4. **Right of Way (ROW)**: There are no planned changes; new right of way is not required for this interconnection/upgrade.

5. **Engineering and Construction Schedule**: The proposed in-service date for Generation Interconnection Gen-2008-129 is June 2010.

6. **Estimated Construction Costs**: There are no estimated construction costs at this time.

7. **Short Circuit Study Results:** KCP&L Greater Missouri Operations personnel performed short circuit studies on the Pleasant Hill 345 kV, 161 kV and 69 kV busses to determine if the added generation causes the calculated fault current using PSSE ANSI to exceed the interrupting capability of the smallest circuit breaker. All Greenwood and South Harper generation is on. The results are shown in Table 1 below:

Table 1: Short Circuit Results – Dogwood 80-MW Upgrade Interconnection

Fault Location		Fault Current (Amps)			Impedance (Ohms) Positive Sequence	
	Study Type	Fault Current Line - Ground	Fault Current Three-Phase	Interrupting Capability Smallest Circuit Breaker	Real	Reactive
Dogwood Generation 161 kV bus Bus Number 541225	ANSI	18,508	32,057	40,000	0.0005	0.0121
Dogwood Generation 345 kV bus Bus Number 541200	ANSI	10,053	17,413	40,000	0.0005	0.0098
Dogwood Generation 69 kV bus Bus Number 541280	ANSI	7,211	12,489	40,000	0.0032	0.076

The fault currents as seen in Table 1 are within the circuit breaker's interrupting capability with the addition of 80 MW contributed by Gen-2008-129.

8. **Discussion Points – Other Items Considered:** There are no other considerations.