

Interconnection Facilities Study For Generator Interconnection Request GEN-2014-028 (IFS-2014-002-07)

SPP Generator Interconnection Studies

> (#GEN-2014-028) (#IFS-2014-002-07)

> > September 2015

Revision History

Date	Author	Change Description	
8/24/2015	SPP	Draft Facility Study Report Revision 0 Issued	
9/28/2015	SPP	Final Interconnection Facilities Study Report Revision 0 Issued	

Summary

Empire District Electric Company (EMDE) performed a detailed Interconnection Facilities Study at the request of Southwest Power Pool (SPP) for Generator Interconnection Request GEN-2014-028/IFS-2014-002-07 which is a 35.00 MW uprate to GEN-2004-017 combustion and steam turbine generation plant located in Cherokee County, Kansas. The total generation for GEN-2004-017 and GEN-2014-028/IFS-2014-002-07 will be 250.00 MW Summer Peak and 300.00 MW Winter Peak. The Interconnection Customer's originally proposed in-service date for GEN-2014-028/IFS-2014-002-07 is January 1, 2016. Since no Network Upgrades or Interconnection Facilities are identified as needed by EMDE or SPP, SPP has proposed the full interconnection service in-service date will be determined during the Generation Interconnection Agreement (GIA) negotiation period. The request for interconnection was placed with SPP in accordance with SPP's Open Access Transmission Tariff, which covers new generation interconnections on SPP's transmission system.

Phases of Interconnection Service

It is not expected that interconnection service will require phases however, interconnection service will not be available until all interconnection facilities and network upgrades can be placed in service.

Interconnection Customer Interconnection Facilities

The Interconnection Customer's generation facility is an uprate to GEN-2004-017 to total generation nameplate capacity of 250.00 MW Summer Peak and 300.00 MW Winter Peak. The Interconnection Customer owned and maintained Generator Step Up (GSU) transformers for the combustion turbine (CT) and steam turbine (ST) for this facility are connected to an approximate one-third (1/3) of a mile 161kV transmission circuit which terminates GEN-2014-028/IFS-2014-002-07 to the Point of Interconnection (POI) at the existing EMDE owned 161kV bus at the Riverton Substation. The Interconnection Customer will be responsible for all of the transmission facilities connecting the Interconnection Customer owned substation to the Point of Interconnection (POI).

The Interconnection Customer will be responsible for any equipment located at the Customer substation necessary to maintain a power factor of 0.95 lagging and 0.95 leading at the POI. Also, the Interconnection Customer will need to coordinate with the Transmission Owner for relay, protection, control, and communication system configurations.

Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades

To allow interconnection the Transmission Owner has reviewed and approved existing associated terminal equipment for acceptance of the Interconnection Customer's Interconnection Facilities. At this time, GEN-2014-028/IFS-2014-002-07 is responsible for \$0 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. **Table 1** displays the estimated costs for Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades.

Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades Description	Allocated Cost (\$)	Allocated Percent (%)	Total Cost (\$)
Interconnection Substation - Transmission Owner Interconnection Facilities 161kV Substation work	\$0	n/a	\$0
Interconnection Substation - Network Upgrades 115kV Substation work	\$0	n/a	\$0
Total	\$0	n/a	\$0

Table 1: GEN-2014-028/IFS-2014-002-07 TOIF and Non-Shared Network Upgrades

Shared Network Upgrades

The Interconnection Customer was studied within the DISIS-2014-002 Impact Study and DISIS-2014-002-1 Impact Restudy as Energy Resource Interconnection Service (ERIS). At this time, the Interconnection Customer is allocated \$0 for Shared Network Upgrades. If higher queued interconnection customers withdraw from the queue, suspend or terminate their GIA, restudies will have to be conducted to determine the Interconnection Customers' allocation of Shared Network Upgrades. All studies have been conducted on the basis of higher queued interconnection requests and the upgrades associated with those higher queued interconnection requests being placed in service. At this time, the Interconnection Customer is allocated the following cost for Shared Network Upgrade:

Shared Network Upgrades Description	Allocated Cost (\$)	Allocated Percent (%)	Total Cost (\$)	
Currently, GEN-2014-028 is not allocated any Shared Network Upgrades	\$0	n/a	\$0	
Total	\$0	n/a	\$0	

Other Network Upgrades

Certain Other Network Upgrades are currently not the cost responsibility of the Customer but will be required for full Interconnection Service. Currently, no Other Network Upgrades are assigned to GEN-2014-028/IFS-2014-002-07.

Depending upon the status of higher or equally queued customers, the Interconnection Customer's in-service date is at risk of being delayed or their Interconnection Service is at risk of being reduced until the in-service date of these Other Network Upgrades.

Conclusion

Interconnection Service for GEN-2014-028/IFS-2014-002-07 will be after a fully executed Generation Interconnection Agreement (GIA). The Interconnection Customer is responsible for \$0 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. At this time, the Interconnection Customer is allocated \$0 for Shared Network Upgrades. After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 35.00 MW, as requested by GEN-2014-028/IFS-2014-002-07, can be allowed.

At this time the total allocation of costs assigned to GEN-2014-028/IFS-2014-002-07 for interconnection Service are estimated at \$0.

1. Introduction

<OMITTED TEXT> (Customer) has requested an Interconnection Facilities Study under the Southwest Power Pool Open Access Transmission Tariff (OATT) for interconnecting a 35 MW uprate to GEN-2004-017 combined cycle generation facility in Cherokee County, Kansas to the transmission system of Empire District Electric Company (EMDE). The generation facility studied is comprised of one (1) natural gas fired combustion turbine and one (1) steam turbine. This interconnection service uprate will utilize the GEN-2004-017 generation facility which interconnects to Riverton 161kV Substation.

2. Interconnection Facilities and Network Upgrades

The cost for the Interconnection Facilities and Network Upgrades is listed below in Table 1. The one-line diagram is shown in Figure 1.

Table 1: Required Transmission Owner Interconnection Facilities and Non Shared Network Upgrades

Project	Description	Estimated Cost
1	EMDE – Existing equipment and interconnection facilities are sufficient for the 35 MW uprate.	\$0
	Total:	\$0





- **2.1.** <u>**Customer Facilities**</u> The Customer will be responsible for its Generating Facility and its two 161/13.8 kV transformers that connect to the combined cycle generators to the Point of Interconnection. In addition, the Customer will be required to install the following equipment in its facilities.
 - **2.1.1.** <u>Reactive Power Equipment</u> The Customer will be responsible for reactive power compensation equipment to maintain 95% lagging (providing vars) and 95% leading (absorbing vars) power factor at the point of interconnection, which may be provided in part by the reactive power capability of the synchronous generators. Any capacitor banks installed by the Interconnection Customer shall not cause voltage distortion in accordance with Article 9.7.4 of the standard SPP Generation Interconnection Agreement.

3. <u>Conclusion</u>

The Interconnection Customer's Interconnection Facilities and Non-Shared Network Upgrades are estimated at \$0.