



SPP *Southwest
Power Pool*

**Facility Study
For
Generator Interconnection
Request
GEN-2013-028**

*SPP Generator
Interconnection Studies*

(#GEN-2013-028)

September 2014

Revision History

Date	Author	Change Description
09/24/2014	SPP	Facility Study Report Issued

Summary

Grand River Dam Authority (GRDA) performed a detailed Facility Study at the request of Southwest Power Pool (SPP) for Generation Interconnection request GEN-2013-028 (495MW Summer Peak\ 538.1MW Winter Peak, Thermal Generation) located in Mayes County, Oklahoma. The proposed in-service date for GEN-2013-028 is April 17th, 2017. SPP has proposed the in-service date will be after the assigned Interconnection Facilities and Non-Shared Network Upgrades are constructed. Full Interconnection Service will require the Network Upgrades listed in the “Other Network Upgrades” section. 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 will be responsible for all of the transmission facilities connecting the customer owned substation to the Point of Interconnection (POI), at a new GRDA owned 345kV Substation tapping the Tulsa North (AEPW) – GRDA2 transmission line circuit. The Interconnection Customer will also be responsible for any equipment located at the Customer substation necessary to maintain a power factor of 0.95 lagging to 0.95 leading at the POI.

Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades

To allow interconnection the Transmission Owner will need construct a new breaker and half bus configuration at a new substation along with associated terminal equipment that is acceptable for the addition of the Interconnection Customer’s Interconnection Facilities. In addition, GEN-2013-028 will require new relay settings at American Electric Power’s (AEPW) North Tulsa Substation. At this time GEN-2013-028 is responsible for \$23,431,333 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades.

Shared Network Upgrades

The Interconnection Customer was studied within the DISIS-2013-002-1 Impact Restudy. At this time, the Interconnection Customer is allocated \$0.00 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:

Share Network Upgrade Description	Allocated Cost	Total Cost
None	\$0.00	\$0.00
Total	\$0.00	

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, the following Other Network Upgrades are required:

- None

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-2013-028 will be delayed until the Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades are constructed. The Interconnection Customer is responsible for \$23,431,333 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. At this time, the Interconnection Customer is allocated \$0.00 for Shared Network Upgrades. After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 495MW Summer Peak and 538.1MW Winter Peak, as requested by GEN-2013-028, can be allowed.

At this time the total allocation of costs assigned to GEN-2013-028 for Interconnection Service are estimated at \$23,431,333.

GRAND River ENERGY Center

A GRDA Power Generating Facility



FACILITY STUDY

Generation Interconnection Request 2013-028
495 MW Summer Peak and 538.1 MW Winter
Peak Combined Cycle Facility in Mayes County
Near Chouteau, Oklahoma

Fultz, Joe

8/14/2014

GRDA performed a Facility Study at the request of the Southwest Power Pool to identify the project details and requirements by GRDA of an interconnecting entity to connect to the GRDA system.

Executive Summary

Pursuant to the tariff and at the request of the Southwest Power Pool (SPP), GRDA performed the following Facility Study to satisfy the Facility Study Agreement executed by the requesting customer for SPP Generation Interconnection request GEN-2013-028 in reference to DISIS-2013-002. This Facility Study is for the purpose of interconnecting a new 495MW Summer Peak and 538.1MW Winter Peak of generation to the service territory of Grand River Dam Authority (GRDA).

Introduction

The Southwest Power Pool has requested a Facility Study for the purpose of interconnecting 495MW Summer Peak and 559.5MW Winter Peak of combined-cycle generation within the service territory of Grand River Dam Authority (GRDA) in Mayes County, Oklahoma. This would be replacing the older GRDA Unit 1 with a similar capacity value. The proposed 345kV point of interconnection will be at a new 345kV substation called GRDA3 located on the same property and approximately a half mile to the south of the existing GRDA2 345kV substation. The substation will connect on the GRDA2 to Tulsa North (AEP) 345kV transmission line located in Mayes County, Oklahoma. This substation along with all interconnected facilities will be owned by GRDA. The proposed in-service date is April 17, 2017.

Steady State

Power flow analysis has indicated that for the power flow cases studied, it is possible to interconnect the 495MW Summer Peak and 538.1MW Winter Peak of generation with transmission system reinforcements within the local transmission system. Given the Point of Interconnection (POI) at a new 345kV substation; GRDA3. There are additional requirements for interconnection including bus, breakers, switches, relaying, metering, etc.

Short Circuit

It is standard practice for GRDA to recommend replacing a circuit breaker when the current through the breaker for a fault exceeds 100% of its nameplate interrupting rating. For this generator interconnection, no circuit breakers were found to exceed their interrupting capability after the addition of the 495 MW Summer Peak and 559.5MW Winter Peak generator and related facilities. Therefore, there is no short circuit upgrade costs associated with the Gen-2013-028 interconnection.

Facilities

The primary objective of this study is to identify attachment facilities. The requirements for interconnection consist of adding a new breaker and a half scheme in a new 345kV station. This 345kV station will be constructed and maintained by GRDA. The property is owned by GRDA and no additional land purchase is required.

The total cost for GRDA to add a new 345kV station, with 5-345kV terminals, is estimated at \$23.4 million. This cost does not include the generator turbines and step up transformers. The projected Network Upgrade cost will be \$17.8 million which is included in the total cost stated previously.

This Facility Study does not guarantee the availability of transmission service necessary to deliver the additional generation to any specific point inside or outside the SPP network integrated transmission system. The transmission network facilities may not be adequate to deliver the additional generation output to the transmission system. If the customer requests firm transmission service under the SPP Open Access Transmission Tariff at a future date, Network Upgrades or other new construction may be required to provide the service requested under the SPP OATT.

The costs of interconnecting the new facility to the GRDA transmission system are listed in Table 1.

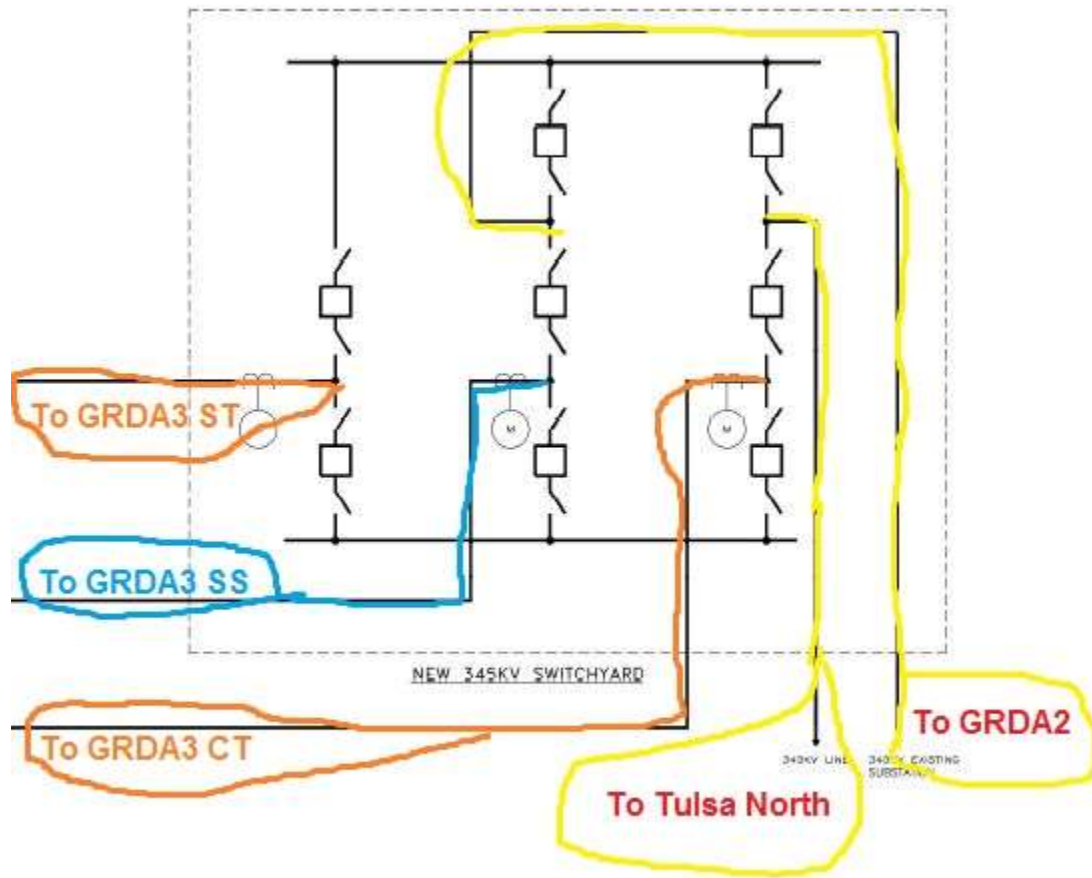
Table 1

Description	Cost
Non-Shared Network Upgrades: New relay settings for the AEP ends of the tapped 345kV line at Tulsa North & potentially the remote Flint Creek facility.	TBD by AEP
Interconnection Facilities: (GRDA) – (3) 345kV dead end structures, concrete foundations with conductor supporting equipment, with relaying, (3) interconnect metering, communications, fault recorder, current & potential transformers, SCADA, along with station lot supporting equipment.	\$5,583,511
Network Upgrades: GRDA) – Add 2 -345kV terminals with a breaker and a half design including 8 circuit breakers, with relaying, metering, communications, fault recorder, current & potential transformers, SCADA, along with station lot supporting equipment. Line equipment for the terminals of existing lines.	\$17,847,821
Total:	\$23,431,333

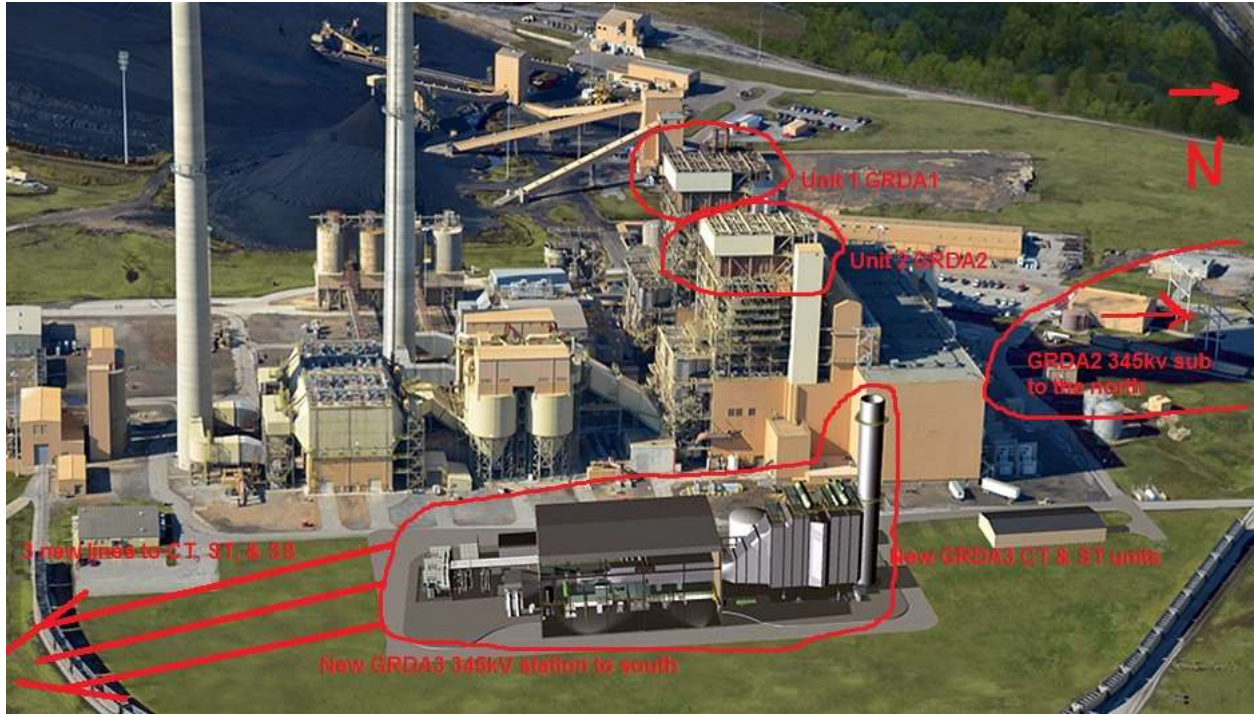
Schedule

The scheduled in-service date of the facility is for April 17, 2017. GRDA has purchased the turbine units along with other long lead time equipment needed for the reliable operation of the facility. No delays are anticipated.

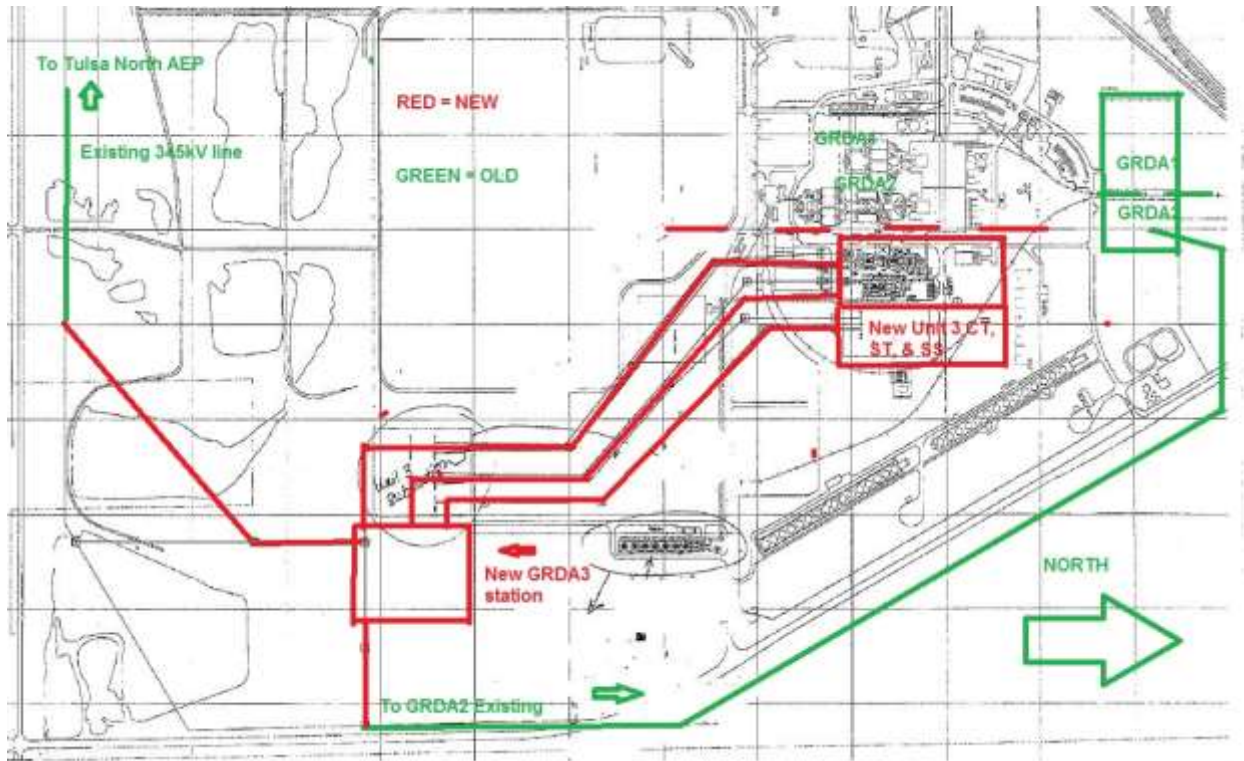
GRDA3 station layout:



GRDA3 Ariel View:



GRDA3 Property Top Down View:



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