Southwest Power Pool

Facility Study
Generator Interconnection Request
GEN-2011-018
GEN-2011-027

SPP Generator Interconnection Studies

December 2013

Revision History

Date	Author	Change Description
8/30/2011	SPP	Facility Study Report Issued
05/22/2013	SPP	Modification Request
12/3/2013	SPP	Modification Request

Summary

Nebraska Public Power District (NPPD) performed the following Facility Study at the request of the Southwest Power Pool for Generation Interconnection Request GEN-2011-018 (73.6 MW/Wind) and GEN-2011-027 (120.0 MW/Wind). This study was performed to evaluate a request for modification to the GEN-2011-027 interconnection request for interconnecting directly into the generator lead for GEN-2010-051 at the proposed Dixon County Substation (GEN-2010-051 Tap).

Interconnection Customer Interconnection Facilities

The Interconnection Customers will be responsible for all of the transmission facilities connecting the customers owned substation to the Point of Interconnection (POI). The Point of Interconnection (POI) for GEN-2011-018 will be at the existing Steele City 115kV Substation. The Point of Interconnection (POI) for GEN-2011-027 will be at the GEN-2010-051 Tap (Dixon County) 230kV Substation which is a tap on the Hoskins – Twin Church 230kV transmission line. GEN-2011-027 will utilize the GEN-2010-051 generator lead to GEN-2010-051 Tap (Dixon County). The Interconnection Customer will also be responsible for any equipment located at the Interconnection Customer's 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 for GEN-2011-018 the Transmission Owner will need to construct an additional circuit breaker at the existing Steele City 115kV Substation and construct any associated equipment for acceptance of the Interconnection Customer's Interconnection Facilities. To allow interconnection for GEN-2011-027 the Transmission Owner will first need construct all Interconnection Facilities and Non-Shared Network Upgrades assigned to GEN-2010-051, including any associated equipment for acceptance of the Customer's Interconnection Facilities. At this time the Customer, GEN-2011-018 is responsible for $900,000 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. At this time the Interconnection Customer, GEN-2011-027 is responsible for $0.00 of Transmission Owner Interconnection Facilities and Network Upgrades as well as an addition $500,000.00 of Non-Shared Network Upgrades beyond the Point of Interconnection. If GEN-2010-051 withdraws from the queue, suspends, or terminates their GIA, restudies will need to be conducted to determine the Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades for GEN-2011-027.

Shared Network Upgrades

The Interconnection Customers, GEN-2011-018 and GEN-2011-027 were studied within the DISIS-2011-001-4 Impact Restudy. At this time, the Interconnection Customer GEN-2011-027 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.

Other Network Upgrades

Certain Other Network Upgrades are not the cost responsibility of the Customer, GEN-2011-018, but may be required for full Interconnection Service. This Network Upgrade is:

1. NRIS Only: Sheldon – Folsom & Pleasant Hill 115kV circuit 2, rebuild, assigned to SPP ITP NT 2011 (placed In-Service in 2013)

Certain Other Network Upgrades are not the cost responsibility of the Customer, GEN-2011-027, but may be required for full Interconnection Service. These Network Upgrades include:

1. Albion – Petersburg 115kV circuit 1, rerate, assigned to DISIS-2009-001 Customers (placed In-Service in 2011)
2. Twin Church – Dixon County 230kV, conductor clearance increase, assigned to DISIS-2010-002 Customer

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.

Affected System Facilities

There were possible Western Area Power Administration (WAPA) and MidAmerican Energy Company (MEC) Affected System Facilities were identified in the Phase 1 through Phase 4 Load flow Analysis of the Facility Study.

Conclusion

Interconnection Service for GEN-2011-018 will be delayed until the Transmission Owner Interconnection Facilities are constructed. Interconnection Service for GEN-2011-027 will be delayed until the Transmission Owner Interconnection Facilities and Non-Shared Upgrades are constructed. Also GEN-2011-027 Interconnection Service will be delayed until all Transmission Owner Interconnection Facilities and Non-Shared Upgrades that are assigned to GEN-2010-051 are completed as well. The Customer, GEN-2011-018 is responsible for $900,000 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. The Interconnection Customer, GEN-2011-027, is responsible for $0.00 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades and an additional 500,000.00 for Non-Shared Network Upgrades beyond the Point of Interconnection. At this time, the Interconnection Customers, GEN-2011-018 and GEN-2011-027 are allocated $0 for Shared Network Upgrades. After all Interconnection Facilities and Network Upgrades have been placed into service, interconnection service for GEN-2011-018 (73.6MW/Wind) and GEN-2011-027 (120MW/Wind) can be allowed.
At this time the total allocation of costs of Interconnection Service for GEN-2011-018 are estimated at $900,000 and total allocation costs of Interconnection Service for GEN-2011-027 is estimated at $500,000.00.

This study was performed in response to the Interconnection Customer under GIP 4.4.2 to evaluate the modification of its request. In accordance with GIP 4.4.2, the Interconnection Customer may choose to withdraw this request for modification.

Cost Allocation Per Request (Revised)

(Including Previously Allocated Network Upgrades*)

Interconnection Request and Upgrades	Upgrade Type	Allocated Cost	Upgrade Cost
GEN-2011-018			
GEN-2011-018 Interconnection Costs See Oneline Diagram.	Current Study	$900,000.00	$900,000.00
Sheldon - Folsom & Pleasant Hill 115kV CKT 2 NRIS only required upgrade: Per ITP NT 2011	In-Service		$6,534,843.00
	Current Study Total	$900,000.00	
GEN-2011-027			
GEN-2011-027 Interconnection Costs See Oneline Diagram.	Current Study	$0.00	$0.00
Hoskins - Dixon County - Twin Church 230kV Rerate per NPPD Facility Study	Current Study	$500,000.00	$500,000.00
Albion - Petersbug 115kV CKT 1 Rerate line to 100◦C	In-Service		$900,000.00
Twin Church - Dixon County 230kV Increase conductor clearances to accommodate 320MVA facility rating	Previously Allocated		$100,000.00
	Current Study Total	$500,000.00	

* Withdrawal of higher queued projects will cause a restudy and may result in higher costs

DISIS-2011-001-4
GENERATION INTERCONNECTION FACILITY RE-STUDY

SPP GEN-2011-018 **73.6 MW Wind Generation Facility at Steele City 115 kV**

SPP GEN-2011-027 **120.0 MW Wind Generation Facility at Dixon Co. 230 kV**

JULY 2013

PREPARED FOR:
SOUTHWEST POWER POOL

PREPARED BY:
NEBRASKA PUBLIC POWER DISTRICT OPERATIONS
TRANSMISSION ASSET PLANNING
T&D ASSET MANAGEMENT
T&D ENGINEERING

Nebraska Public Power District
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DISIS-2011-001-4 Re-Study

Introduction

The *NPPD DISIS-2011-001-4 Facility Re-Study* was performed to document the impact of moving the point-of-interconnection for GEN-2011-027 back to the Dixon County 230 kV substation. This wind generation interconnection request will now share a generator lead with GEN-2010-051 at the Dixon County 230 kV substation. In the original DISIS-2011-001 and DISIS-2011-001-2 studies, the GEN-2011-027 project was interconnected at the Dixon County 230 kV substation with a separate generator lead. Now, the GEN-2011-027 project will share the GEN-2010-051 generator lead. The remaining two wind generation projects in DISIS-2011-001 are listed below:

Project	MW	Point-of-Interconnection
GEN-2011-018	73.6	Steele City 115 kV
GEN-2011-027	120.0	New Dixon Co. Sub on Twin Church–Hoskins 230kV
	193.6	

The following three projects are the upgrades required for interconnection of the remaining two DISIS-2011-001-4 generation projects:

- Steele City 115 kV substation expansion
- Dixon County 230 kV substation
- Hoskins-DixonCounty-Twin Church 230 kV upgrade

Evaluation

The GEN-2011-027 project will now share a generator lead with the GEN-2010-051 project at the proposed Dixon County 230 kV substation. This development will not affect the study results presented in the original DISIS-2011-001 and DISIS-2011-001-2 studies. This development will nullify DISIS-2011-001-3 re-study and require this facility re-study due to the material modifications requested at the proposed Dixon County substation. The results of those original studies with GEN-2011-027 interconnected at Dixon County 230 kV remain valid with the GEN-2011-027 project sharing a generator lead with the GEN-2010-051 project.

Summary

Overall, the *NPPD DISIS-2011-001-4 Facility Re-Study* evaluated the impact of the interconnection of GEN-2011-027 sharing a generator lead with GEN-2010-051 at Dixon County 230 kV. The Facility Re-Study documents the transmission plan required for interconnection for the DISIS-2011-001-4 projects and these details are listed below.

DISIS-2011-001-4 Generation Interconnection Plan

- GEN-2011-018 Interconnection Facilities – Steele City 115 kV substation expansion to accommodate new 115 kV interconnection.

  $ 0.9 Million

- GEN-2011-027 Interconnection Facilities – Dixon County 230 kV substation.

  $ 0.0 Million*

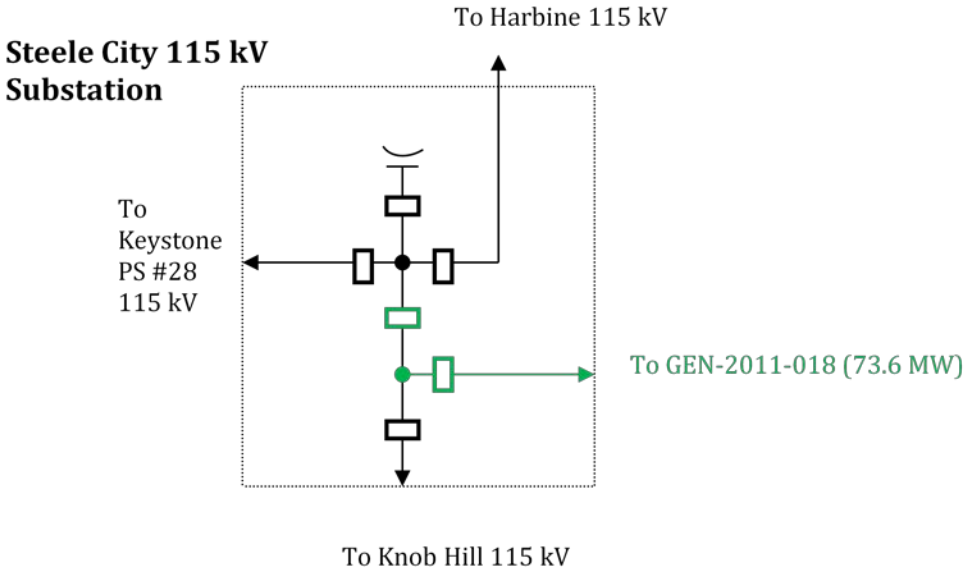
- GEN-2011-027 Hoskins – Dixon County – Twin Church 230 kV Line Upgrade – Increase clearances on Hoskins – Dixon County – Twin Church 230 kV line and terminal upgrades to accommodate increased facility rating to address N-1 contingency loading issues identified in DISIS-2011-001 Facility Study.

  $ 0.5 Million

Total Interconnection & Network Upgrades: $ 1.4 Million

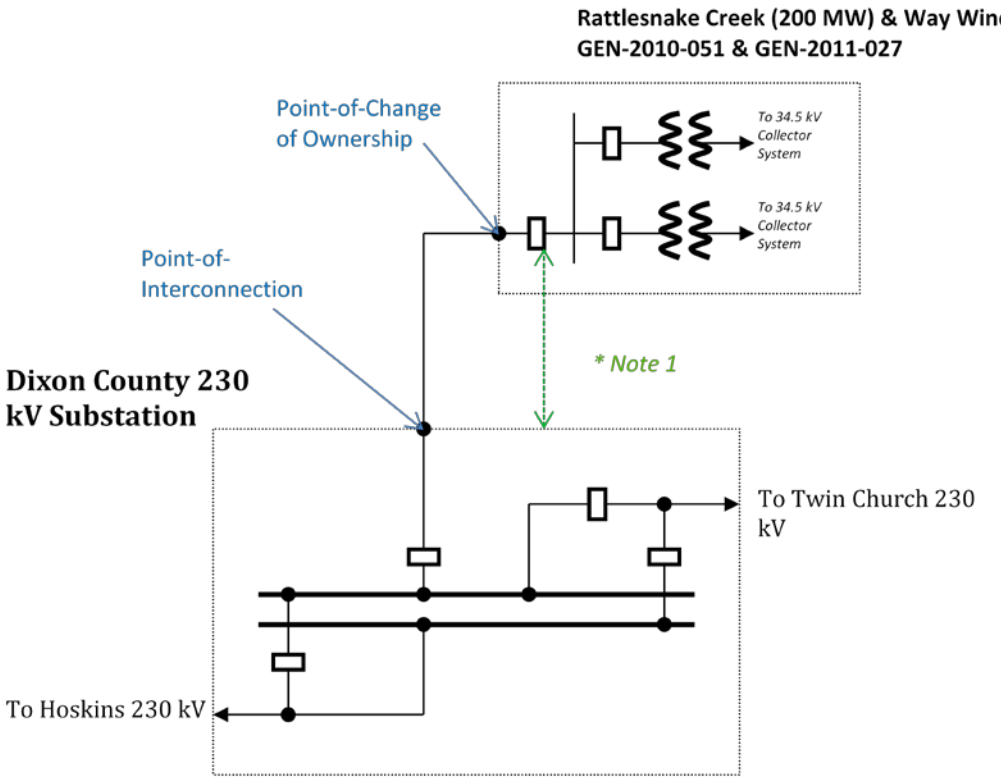
** $2.8 Million Dixon County substation expansion cost no longer applicable to GEN-2011-027 from DISIS-2011-001-2 re-study. Incidentally, the $6.2 Million Cost of Dixon County 230 kV substation remains assigned to GEN-2010-051 from DISIS-2010-002 whose generator lead will now be shared with GEN-2011-027.*

GEN-2011-018



- GEN-2011-018 Interconnection Facility

GEN-2011-027



**Note 1: Breaker status & control signal to Transmission Owner to allow operation by Transmission Owner of 230 kV breaker during Emergency Condition. Breaker operation will need coordination to ensure safe operation of the transmission line.*