Generation Interconnection Feasibility Study Report

For

PJM Generation Interconnection Request Queue Position AC1-087

Siegfried-Hauto 69kV

February 2017

Preface

The intent of the Feasibility Study is to determine a plan, with approximate cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by the Interconnection Customer. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system. All facilities required for interconnection of a generation interconnection project must be designed to meet the technical specifications (on PJM web site) for the appropriate transmission owner.

In some instances an Interconnection Customer may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection or merchant transmission upgrade, may also contribute to the need for the same network reinforcement. The possibility of sharing the reinforcement costs with other projects may be identified in the Feasibility Study, but the actual allocation will be deferred until the System Impact Study is performed.

Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The Interconnection Customer may be responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

PJM utilizes manufacturer models to ensure the performance of turbines is properly captured during the simulations performed for stability verification. Turbine manufacturers provide such models to their customers. The list of manufacturer models PJM has already validated is contained in Attachment G-2 of Manual 14A. Manufacturer models may be updated from time to time, for various reasons such as to reflect changes to the control systems or to more accurately represent the capabilities turbines and controls which are currently available in the field. Additionally, as new turbine models are developed, turbine manufacturers provide such new models which must be used in the conduct of these studies. PJM needs adequate time to evaluate the new models in order to reduce delays to the System Impact Study process timeline for the Interconnection Customer as well as other Interconnection Customers in the study group. Therefore, PJM will require that any Interconnection Customer with a new manufacturer model must supply that model to PJM, along with a **$10,000** fully refundable deposit, no later than three (3) months prior to the starting date of the System Impact Study (See Section 2.2.2. of Manual 14A for starting dates) for the Interconnection Request which shall specify the use of the new model. The Interconnection Customer will be required to submit a completed dynamic model study request form (Attachment G-1 of Manual 14A) in order to document the request for the study.

General

The Interconnection Customer (IC), has proposed a 10 MW (3.8 MWC) solar generating facility located in Carbon County, Pennsylvania, which is part of the PPL Electric Utilities (PPL EU) Central Region. PJM studied the AC1-087 project as a 10 MW injection into the 69 kV Siegfried – Hauto #1 or #4 line and evaluated it for compliance with reliability criteria for summer peak conditions in 2020. The planned in-service date, as requested by the IC during the project kick-off call, is June, 2017. **This study does not imply a PPL EU commitment to this in-service date.**

AC1-087 is a resubmittal of the IC's prior queue project V3-040. Delays in the permitting caused the V3-040 project to be withdrawn.

Point of Interconnection (POI)

The IC requested a transmission level interconnection. As a result, AC1-087 will interconnect with the PPL EU transmission network via the Siegfried – Hauto #1 & #4 69 kV lines. The AC1-087 POI is identical to the V3-040 POI. See Attachment 1 of this Study for more information. Also refer to the withdrawn queue V3-040 on the PJM website for more information.

Transmission Owner Scope of Work

No Transmission Owner work is required as part of AC1-087. All work associated with AC1-087 is identical to all work performed under V3-040, which has already been installed. Refer to the withdrawn queue V3-040 on the PJM website for more information.

Interconnection Customer (IC) Requirements

The IC requirements are identical to those specified under V3-040. Refer to the withdrawn queue V3-040 on the PJM website for more information.

Facilities Study Estimate

Not required.

Summer Peak Analysis - 2020

Transmission Network Impacts

Potential transmission network impacts were as follows:

Generator Deliverability

(Single or N-1 contingencies for the Capacity portion only of the interconnection)

None

Multiple Facility Contingency

(Double Circuit Tower Line, Fault with a Stuck Breaker, and Bus Fault contingencies for the full energy output)

None

Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

None

Steady-State Voltage Requirements
(Results of the steady-state voltage studies should be inserted here)

To be determined during the Impact Study.

Short Circuit
(Summary of impacted circuit breakers)

Not Required.

Delivery of Energy Portion of Interconnection Request
PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.
Only the most severely overloaded conditions are listed. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed, which will study all overload conditions associated with the overloaded element(s) identified.

None.

Light Load Analysis – 2020

Not Required.

System Reinforcements

Short Circuit
(Summary form of Cost allocation for breakers will be inserted here if any)

None.

Stability and Reactive Power Requirement
(Results of the dynamic studies should be inserted here)

To be determined during the Impact Study.

Summer Peak Load Flow Analysis Reinforcements

New System Reinforcements
(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)

None

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)

None.

Appendices

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact.
It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

None