Generation Interconnection Combined Feasibility/Impact Study Report

For

PJM Generation Interconnection Request Queue Position Z1-113

West Winchester 13.2 kV Project

September 2014

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Introduction

This combined Feasibility/System Impact Study report provides the documentation of an assessment that has been performed by PJM Interconnection LLC and FirstEnergy (FE) in response to a request made by HP Hood, LLC for the connection of a 12.0 MW (5.0 MW Capacity) West Winchester 13.2 kV Generation Project to the Shenandoah Valley Electric Cooperative (SVEC) system and the affected Potomac Edison transmission system. This assessment was accomplished by: 1. Evaluating the reliability impact of the proposed facilities and connection on the interconnected subtransmission and transmission systems by the performance of a power flow study; 2. Ensuring compliance with the NERC, ReliabilityFirst, PJM and FE Reliability Standards by identifying the system reinforcements that will need to be installed for an interconnection of the proposed project; 3. Coordinating and cooperating with the PJM staff , Shenandoah Valley Electric Cooperative staff, and HP Hood, LLC by conducting meetings and issuing this report as a part of the RTEP study process; 4. Performing a Steady State, Short-Circuit and Dynamics Study as necessary; 5. Conducting all studies in accordance with the PJM Manuals and the FE "Requirements for Transmission Connected Facilities" document to assure that the assessment performed incorporates study assumptions, follows the documented system performance procedures, considers alternative connection and reinforcement plans, and jointly coordinates the study recommendations.

Connection Facilities

In compliance with the Regional Transmission Expansion Planning (RTEP) protocol, HP Hood, LLC has submitted a "Form of Generation Interconnection Feasibility Study Agreement " to PJM (see Attachment 1) that identifies its plan to construct the West Winchester 13.2 kV Generation Project that will interconnect with the Shenandoah Valley Electric Cooperative (SVEC) subtransmission system near the SVEC and FE jointly owned Bartonville substation. The installed facilities will have a total generating capability of 12.0 MW with 5.0 MW of this output being recognized by PJM as capacity.

As defined by HP Hood, LLC, the proposed West Winchester 13.2 kV Generation Project site will be located at a point approximately 1.0 mile from Bartonville substation. The direct connection of this project will be accomplished by utilizing the SVEC 34.5 kV subtransmission system which will interconnect into the FE Bartonville 138 kV substation

Transmission (PJM) Network Impacts

The Queue Project #Z1-113 was studied as a 12.0 MW (Capacity 5.0 MW) injection at the Bartonville 138 kV substation in the APS area. Project #Z1-113 was evaluated for compliance

with reliability criteria for summer peak conditions in 2017. Potential network impacts were as follows:

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

None

Light Load Analysis

Light Load Studies to be conducted during later study phases (applicable to wind, coal, nuclear, and pumped storage projects).

Multiple Facility Contingency
(Double Circuit Tower Line, Failed Breaker and Bus Fault contingencies for the full energy output)

None

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

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)

Not Applicable

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

None

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)
(Summary form of Cost allocation for transmission lines and transformers will be inserted here if any)

None

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

Sub-transmission (FE) Power Flow Analysis

A power flow study was conducted to determine the reliability impact of the proposed West Winchester 13.2 kV Generation Project on the FE transmission system. This study was completed using a 2017 and 2018 summer peak load power flow model that contains a detailed representation of the Potomac Edison transmission network in the area of the proposed West Winchester 13.2 kV Generation Project. The findings and the recommendations from this analysis are based on a contingency review that was performed to identify the facility loadings and/or voltage conditions that violate the ReliabilityFirst, PJM or FE Planning Criteria and are attributable to this project. Note that in accordance with PJM RTEP study procedures, this West Winchester 13.2 kV Generation Project under study and earlier active generation queue projects are considered to be in service. Therefore, all active generation queue projects after Z1-113 are considered not in service.

The POI of the 12.0 MW West Winchester 13.2 kV Generation Project was modeled as connected to the Bartonville 138 kV bus. The results of the FE analysis show that there are no transmission network upgrades required for the deliverability of the West Winchester 13.2 kV Generation Project generation to the FE transmission system.

Short Circuit Analysis

In accordance with the RTEP process, a short circuit analysis was conducted by PJM and confirmed by the FE staff for the West Winchester 13.2 kV Generation Project. The analysis determined that no transmission FE circuit breaker will exceed its interrupting capability with the interconnection of West Winchester 13.2 kV Generation Project. Therefore no circuit breaker reinforcements will be required.

Summary

The results of the FE power flow analysis show that the West Winchester 13.2 kV Generation Project does not attribute to any planning criteria violations.

Note that the FE findings were made from a conceptual review of this project. FE herein reserves the right to return to any issues in this document and, upon appropriate justification, request additional monies to complete any upgrades to the transmission and/or subtransmission systems.

Single Line Diagram