PJM Generator Interconnection Request
Queue # V4-076
Carlisle Pike 23 kV
Feasibility/Impact Study Report

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Preface

The intent of the Feasibility/Impact study is to determine a plan, with estimated costs and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

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, 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 impact study is performed.

The 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 is 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.

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General

Interconnection Customer of this project (Carlisle Pike Project), has proposed the installation of 11 PV arrays totaling 5.3 MW and 2.0 MW (capacity). The proposed generating unit site is approximately 1.8 miles northeast of Shippensburg, PA, off Rt. 11. This is in the PJM queue at V4-076. The project is proposed to be in service by the 2nd quarter of 2011.

Direct Connection

It was proposed that the project be studied as an interconnection into the Carlisle Pike Substation #1 23kV bus via the 23kV 1CPS line. The proposed generation is to be interconnected to the First Energy distribution system at pole # 9-193.

Interconnection Customer is responsible for constructing all of the facilities on its side of the point of interconnection, on the line to the generating plant. Interconnection Customer will also be responsible for remote relay and control work required by First Energy at Carlisle Pike substation that is required due to connecting the facility.

The proposed interconnection facilities must be designed in accordance with the FirstEnergy "Requirements for Transmission Connected Facilities" document and must meet IEEE 1547.

The 23kV interconnection point will require the installation an Interconnection Customer installed/owned main line breaker (which will act as the disconnect point between First Energy and the generator interconnection) and a radio controlled switch on the utility side of the interconnection.

Interconnection metering is also required for this generation connection. The 23 kV revenue quality metering equipment shall be designed, furnished and installed by the Interconnection Customer in its generation substation. Equipment ratings shall be subject to approval by Penelec. The Interconnection Customer will be responsible for designing, furnishing and installing a SCADA RTU in their generation substation and obtaining the telecommunication circuits from the RTU to the Penelec Data Center. The connection to the Penelec Data Center will be to provide MW, MVAR and 23kV voltage at Interconnection Customer's generation substation. The Interconnection Customer shall also provide Penelec with dial-up communication to the revenue meter. Please reference the FirstEnergy Revenue Metering Requirements for Interconnection Customers, for more details on the revenue metering requirements for FirstEnergy. This document can be found on the FE website at:
http://www.firstenergycorp.com/feconnect/Requirements_for_Transmission_Connected_Facilities.html

Below are conceptual estimates for the engineering/construction associated with Direct Connection requirements.

Item	Description	Conceptual Cost Estimate
1	RTU programming for connection to the First Energy SCADA.	$10,000
2	23kV tap, and radio controlled switch.	$45,600

Conceptual Estimate: $55,600
Estimated Lead Time: 0.5 year from signed IA

Notes:

- Detailed Engineering & Construction Estimates TBD via Facility Study
- The above estimates do not include 1) tax gross-up, 2) property costs and site development up to rough grade which is to be provided by the Interconnection Customer, 3) generation SCADA to be provided by the Interconnection Customer, and 4) engineering and field activities for design review and commissioning of the Interconnection Customer's facilities.

The attached Figure 2 provides a conceptual one-line of the direct connection facilities needed.

Network Impacts

The queue V4-076 project was studied as a 5.3MW (2 MW capacity) injection into PENELEC's system at the CARLISLE PIKE 23kV substation. The project was studied on a combined feasibility-impact basis which utilizes an AC analysis, and incorporates all contingency types. Project V4-076 was evaluated for compliance with reliability criteria for summer peak conditions in 2014. Potential network impacts were as follows:

Generator Deliverability
None

Multiple Facility Contingency
None

Contribution to Previously Identified Overloads
None

New System Reinforcements
None

Contribution to Previously Identified System Reinforcements

None

Short Circuit
No identified problems

Cost Allocation
The #V4-076 project will be responsible for 100% of the direct connection costs estimated at $0.056 million. Total costs are estimated to be $0.056 million to accommodate interconnection of the project.

Summary
Conceptual estimates are provided for the assumption that the point of interconnection would be at the 23kV tie point at pole # 9-193 and that the customer interconnection substation would be at a site approximately 1.8 miles northeast of Shippensburg, PA.

Figure #1
Penelec Area 34.5 kV Transmission Facilities - Existing Configuration

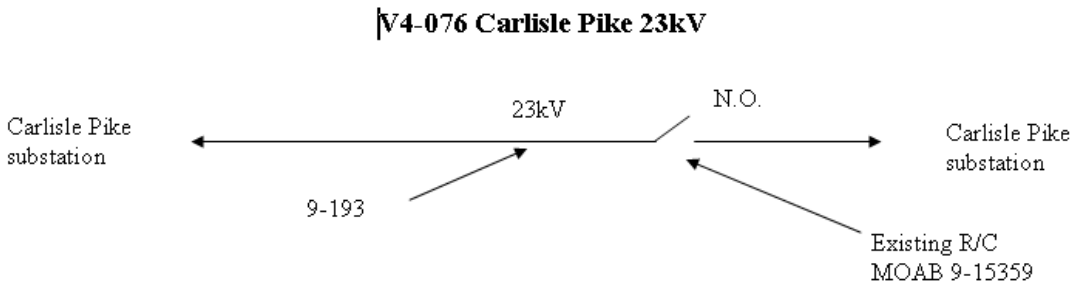

Figure #2
Proposed Interconnection