PJM Generator Interconnection Request
Queue # V2-002
Martinsburg 23 kV
Feasibility/Impact Study Report

PJM DOCS 565221
October, 2009

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. Since this is a combined Feasibility/Impact study report, this contains the cost allocation.

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 project developer 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.

V2-002 Martinsburg 23 kV Feasibility/Impact Study Report

General

Community Area Regional Digester (CARD) (Martinsburg Project) has proposed the installation of 2 - 1.6 MW methane gas fired generator and 2.65 MW (capacity). The proposed generating unit site is approximately 3.7 miles north of Curryville, PA, off Cross Cove Road. This is in the PJM queue at V2-002. The project is proposed to be in service by the 2nd quarter of 2010.

Direct Connection

It was proposed that the project be studied as an interconnection into the Curryville Substation #1 23kV bus via the 23kV RSM line. The proposed generation is to be interconnected to the First Energy distribution system at pole # 2RCR3-139.

CARD is responsible for constructing all of the facilities on its side of the point of interconnection, on the line to the generating plant. CARD will also be responsible for remote relay and control work required by First Energy at Curryville 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 the CARD 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 CARD 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

Direct Transfer Trip (DTT) using developer provided equipment & communications channel is required from Curryville substation to provide protection against unintentional generation islanding. Developer to be responsible for all DTT terminal equipment, rights of way for suitable location, all auxiliary power, environmental control and housing needs for the DTT terminal). Direct Transfer Trip (DTT) is required from any substation that may feed the generator. Currently, the generator would be fed from the Curryville Substation and the estimates provided assume that DTT will be from Curryville Substation. If the generator agrees to be disconnected from the 23kV system while

Community Area Regional Digester (CARD) is fed from an alternate source, then DTT is not required from the other alternate sources. (Alternate sources to feed this area are another circuit at Curryville substation, and Claysburg substation.)

If, in the future, upstream protection is added by First Energy, the Interconnection Customer will be responsible for the cost to add Direct Transfer Trip on any new devices.

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

Item	Description	Conceptual Cost Estimate
1	Relay and control work at Curryville Substation for trip initiation interconnection to developer provided DTT system. (PJM NUN n1624)	$89,000
2	DTT (fiber optic cable from V2-002 to Curryville Substation) communication for the project. (PJM NUN n1625)	$306,400
3	RTU programming for connection to the First Energy SCADA. (PJM NUN n1626)	$10,000
4	23kV tap, and radio controlled switch. (PJM NUN n1627)	$46,600

Conceptual Estimate: $452,000
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 developer, 3) generation SCADA to be provided by the developer, and 4) engineering and field activities for design review and commissioning of the developer's facilities.

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

Network Impacts

The #V2-002 project was studied as total injection of 2.65 MW (2.65 MW of capacity) into the Curryville #1 23 kV bus. Project #V2-002 was evaluated for compliance with reliability criteria for summer peak conditions in 2013. 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 #V2-002 project will be responsible for 100% of the direct connection costs estimated at $0.452 million. Total costs are estimated to be $0.452 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 # 2RCR3-139 and that the customer interconnection substation would be at a site approximately 3.7 miles north of Curryville, PA.

Direct Transfer Trip (DTT) using developer provided equipment & communications channel is required from Curryville substation to provide protection against unintentional generation islanding.

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

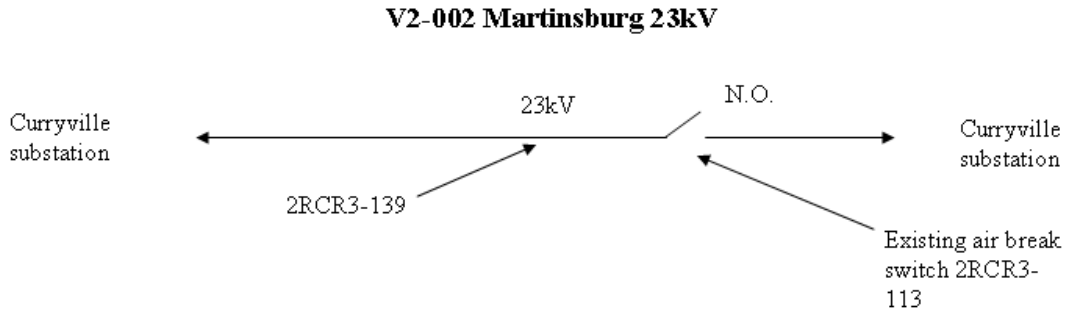

Figure #2
Proposed Interconnection