PJM Generator Interconnection Request
Queue #V2-023
Galion-Muskingum River 345kV
Feasibility Study

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Preface

The intent of the feasibility study is to determine a plan, with ballpark cost 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 a generator interconnection 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 Feasibility 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.

V2-023 Galion-Muskingum River 345kV Feasibility Study

General

The Interconnection Customer proposes to install PJM Project #V2-023, a 250.5 MW generating facility connecting to the American Electric Power (AEP) Galion – Ohio Central portion of the Galion-Muskingum River 345 kV line. The proposed location of the generating facilities and switching station is in Morrow County, Ohio (see Exhibit 1 for general location for proposed facility). The projected energized date is October 31, 2012 and a commercial operation scheduled for December 31st, 2012

Direct Connection

V2-023 proposes to connect via a new in-line 345kV switching station located near First Energy's Galion Station. The proposed facility would connect to the Galion - Ohio Central - Muskingum River 345kV circuit.

The new in-line switching station would typically consist of three (3) 345 kV circuit breakers configured in a ring-bus arrangement with 345 kV metering (see Exhibit 2). AEP will retain ownership of the proposed in-line station facilities. In addition, relaying at remote stations will need to be upgraded. Since this generating facility will be located in close proximity to First Energy's Galion Station, relaying upgrades may be required at Galion Station. It is understood that the customer will be responsible for the all costs associated with this construction, as well as facilities associated with connecting the 250.5 MW of generation to the in-line facilities.

It is expected that a 400' x 400' (minimum) station site will be provided to AEP by the customer. Note that the customer's station facilities and any facilities outside the new station were not included in the cost estimate. These are assumed to be the customer's responsibility.

The AEP construction scope includes:

- Constructing a new switching station connecting to the Galion – Ohio Central – Muskingum River 345 kV circuit, including three (3) 345 kV circuit breakers, relays, 345 kV metering, SCADA, and associated equipment.

  Estimated Cost (2009 Dollars): **$8,000,000**

- Replacing relaying with AEP standard package at Muskingum River and Ohio Central stations.

  Estimated Cost (2009 Dollars): **$1,000,000**

- Replacing relaying at FirstEnergy's Galion Station.

  Estimated Cost by PJM (2009 Dollars): **$500,000**

Total Attachment Facilities Cost[1]: **$9,500,000**

Local Network Impacts

The impact of the proposed generating facility on the AEP System was assessed for adherence with applicable reliability criteria. AEP planning criteria require that the transmission system meet single contingency performance criteria in accordance with the AEP FERC Form 715. Therefore, this set of criteria was used to assess the impact of the proposed facility on the AEP System. The project was studied as a 250.5 MW net energy injection consistent with the interconnection application. The results are summarized below.

Normal System (2013 Summer Conditions)

- No problems identified

Single Contingency (2013 Summer Conditions)

- No problems identified

Multiple Contingency (2012 Summer Conditions)

- No problems identified

Short Circuit Analysis

- No problems identified

Stability Analysis

- Stability analysis was not performed as part of this Feasibility Study. The stability assessments are part of the System Impact Study. Based upon the results of this System Impact Study, the extent of system upgrades could change and the associated costs could be significantly different.

Network Upgrades

- None

[1] Estimates are preliminary in nature, as they were determined without the benefit of detailed engineering studies. Final estimates will require an on-site review and coordination to determine final construction requirements. It will take approximately one year after obtaining the authorization to construct the facilities as detailed.

Network Impacts

The queue V2-023 project was studied as a 250MW injection (37.5MW of which was capacity) into AEP's system a tap of the Galion – Ohio Center 345kV line,. Project V2-023 was evaluated for compliance with reliability criteria for summer peak conditions in 2013. Potential network impacts were as follows:

Generator Deliverability

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

No problems were identified.

Multiple Facility Contingency

(Double Circuit Tower Line contingencies only for the full energy output. Stuck breaker and bus fault contingencies will be performed for the Impact Study)

No problems identified

Short Circuit

No problems identified.

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

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

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

MISO Impacts

Impacts on MISO facilities will be identified in the Impact Study.