PJM Generator Interconnection Request
Feasibility Study Report

Queue Position #U1-069
Emsworth Lock & Dam Project
30 MW
July, 2008

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Preface

The intent of the feasibility study is to determine a plan, with high level 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 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.

General

The Interconnection Customer has proposed construction of a 30 MW (30 MW Capacity) hydro-electric generating facility at the Emsworth Locks and Dam located along the Ohio River on the border of Emsworth and Ben Avon Boroughs, Allegheny County, Pennsylvania. The proposed point of interconnection is the 23kV bus in the Neville Substation owned by the Duquesne Light Company (DLCO). The planned in-service date is the first quarter of 2015.

This Generation Interconnection Feasibility Study provides analysis results to aid the Interconnection Customer in assessing the practicality and cost of incorporating the facility into the PJM system. This study was limited to load flow analyses for all single and tower contingencies. Using information provided by the transmission owners, this report includes facility cost and schedule estimates where appropriate. If the interconnection customer elects to pursue a System Impact Study, a more comprehensive analysis will be performed.

PJM Analysis:

Network Impacts

The Queue Project #U1-69 was studied as a 30MW energy and capacity injection at the Neville 138 kV substation in the DLCO area. Project #U1-69 was evaluated for compliance with reliability criteria for summer peak conditions in 2012. Potential 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, Line with 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)

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

None

Transmission Owner Analysis:

Non-Direct Connection Local Upgrades

The proposed generation project will be connected to the 23 kV bus in the Neville Substation. See Figure #1 for a diagram of the proposed interconnection. The proposed interconnection will require the construction of approximately 0.4 miles of new transmission line to connect the generation site to the Neville Substation.

The following assumptions were used in the preparation of this high-level cost estimate:

- DLCO will construct approximately 0.4 miles of new 23kV line
- DLCO will be responsible for the engineering, purchasing, and construction of all new equipment required at the Neville Substation.
- The customer will be responsible for the engineering, purchasing and construction of the customer substation
- The customer must meet all National, State, Local, and DLCO requirements and must share control of the customer-purchased circuit breaker.
- The customer is responsible for providing, installing, and maintaining the steel, foundations, conduit, grounding, fencing, and control house per DLCO specifications.
- The customer is responsible for obtaining land for the interconnection substation per DLCO specification including but not limited to size, grading, and location.
- All customer substation equipment beyond the DLCO metering point must be coordinated and meet DLCO specification.

New System Reinforcements

Montour-Neville (22051) between Neville and the Shenango tap for loss of BI-Neville (22020) between Neville and Kosmos Cement resulted in the following single contingency overload:

Montour-Neville prior to U1-069 installation:	70% of its emergency rating
Montour-Neville after U1-069 installation:	115% of its emergency rating

DLCO must reconductor approximately 230 ft of underground cable to accommodate the new generation and mitigate this overload condition. DLCO will reconductor the lines or line sections.

No breaker replacements were identified during the short circuit analysis.

The preliminary cost estimate is **$300,000** in 2008 dollars, which includes the New System Reinforcement costs and tax gross-up.

Preliminary Cost Estimate

The preliminary total cost estimate is **$2,700,000** in 2008 dollars, which includes Direct Connection costs, New System Reinforcement costs, and tax gross-up. The price will be adjusted for labor rate and material cost changes based on the actual project schedule.

Construction Lead Time

This project will require 3-5 years to complete from the date of receipt of a signed Interconnection Service Agreement (ISA). This estimate is a conservative high-level estimate for the lead-time of the proposed interconnection. If Developer elects to pursue the System Impact Study, a more comprehensive analysis will be performed. Delays could be based on weather, equipment lead-time, procurement of right of ways, site preparation, and availability of outages to perform the work.