PJM Generator Interconnection
U1-036 North Point 115-kV
Feasibility Study

August 2008
DMS #498440
Web version

Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, §36.2n, as well as the Feasibility Study Agreement between Interconnection Customer (IC) and PJM Interconnection, LLC (PJM) (Transmission Provider).

Preface

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

Potential Network Impacts

The queue project U1-036 was studied as a 100 MW (capacity) and 120MW (additional energy) injection into the BGE system at the Finishing Mill 115kV substation. U1-036 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)

No problems 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.

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.

Short Circuit

PJM analyzed the 230-kV system and above and did not identify any over duty breakers. Analysis below 230-kV was performed by BG&E and is identified separately in their write-ups for each option.

BG&E Analysis

At the request of IC, two Point of Interconnections (POI) were studied for U1-036. Additional breakers were also included at IC direction to increase reliability of service. Queue U1-036 IC is responsible for design, construction and costs for all facilities associated with the U1-36 115-kV interconnecting transmission line and generating station on the Interconnection Customer side of the POI. Any needed additional land for expansion of electrical facilities is assumed to be made on land owned by the developer.

Alternative 1 - Expand Steel Side Substation

Direct Connection Network Upgrades

- Construct a new 115-kV breaker & a half, three full bay stations adjacent to Steel Side Substation at an estimated cost of $16M.
- Rebuild 1.5 miles of lines 110983/110984 for higher capacity for an estimated $3.5M. (Cost increases by an additional $4.0M if local officials require1300 feet of underground line section, similar to what exists today).
- Construct 2000-3000 feet of single circuit overhead line from Generator A to new substation at an estimated cost of $1M.
- Construct 5000-6000 feet of single circuit overhead line from Generator B to new substation at an estimated cost of $1.8M.
- Install two 115-kV isolation breakers at North Point at an estimated cost of $1.75M. The isolation breakers will be under BG&E control.

It is estimated that the expansion will take 36 months to complete.

Non-Direct Connection Network Upgrades

Riverside 115kV station

Six 115-kV breakers are over duty: four have duties above the maximum asymmetrical rating (75.6-kA) of a 115-kV breaker design. One possible solution for the four breakers may be to install an 80-kA 230-kV breaker at a total estimated cost of $4M. The estimated cost to replace the remaining two 115-kV breakers is $1.2M. It is estimated to take 24 to 36 months to complete the replacements.

Wagner Station

Three 115-kV breakers are over duty requiring replacement at an estimated cost of $1.8M. It is estimated to take 24 months to complete these replacements.

Alternative 2 – Expand North Point Substation

Direct Connection Network Upgrades

- Construct a new two ring, eight breaker station adjacent to BGE's North Point substation at an estimated cost of $12M.
- Construct 2.5 miles of overhead double circuit line from Generator A to new substation at estimated cost of $6.25M.
- Construct 100-1000 feet of overhead double circuit line from Generator B to tap Generator A's line at an estimated cost of $750K.

It is estimated to take 36 months to complete this work.

Non-Direct Connection Network Upgrades

Riverside 115kV station

Six 115-kV breakers are over duty: four have duties above the maximum asymmetrical rating (75.6-kA) of a 115-kV breaker design. One possible solution for the four breakers may be to install an 80-kA 230-kV breaker at a total estimated cost of $4M. The estimated cost to replace the remaining two 115-kV breakers is $1.2M. It is estimated to take 24 to 36 months to complete the replacements.

Wagner Station

One 115kV breaker is over duty requiring replacement at an estimated cost of $0.6M. It is estimated to take 24 months to complete this replacement.