PJM Generator Interconnection

X3-032 Poe – Suffolk 115 kV

20 MW Capacity / 20 MW Energy

Feasibility Study Report

January 2012
DMS #671195v1

Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, §36.2, as well as the Feasibility Study Agreement between Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is Virginia Electric and Power Company. An Affected System Operator is Prince George Electric Cooperative.

Preface

The intent of this 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 IC. As a requirement for interconnection, IC 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 and the underlying system. All facilities required for interconnection of a generation interconnection project must be designed to meet ITO technical specifications.

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. IC is responsible for its right of way, real estate, and construction permit issues.

General

Queue project X3-032 was studied as a(n) 20.0 MW (20.0 MW of which was Capacity) injection into VEPCO system through two 115 kV connections through the PGEC system. This request increases V1-080 bringing the total capability of the two gas turbine facility to 155 MW. Project X3-032 was evaluated for compliance with reliability criteria for summer peak conditions in 2015.

Primary Option

Primary option was a tap between Morgantown Bus and Hawkins Gate 076 230 kV line and tap between Morgantown bus and Hawkins Gate 077 230 kV line.

Network Impacts:

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 with full energy output. Stuck Breaker and Bus Fault contingencies will be applied during the Impact Study)

No problems identified.

Contribution to Previously Identified Overloads

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have % allocation of cost responsibility which will be calculated and reported for the Impact Study.)

No problems identified.

Short Circuit

(Report Overdutied breakers here)

No problems identified.

Energy Portion of Interconnection Request

PJM also studied the delivery of the energy portion of the surrounding generation. Any potential 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 Transmission Interconnection request.

Note: 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 analyzes all overload conditions associated with the overloaded element(s) identified. As a result of the aggregate energy resources in the area, the following violations were identified.

No violations identified.

ITO Analysis

ITO assessed the impact of the proposed queue project, X3-032, interconnection of an additional 20 MW of Capacity on the ITO system. The system was assessed using the summer 2015 RTEP case provided to ITO by PJM, this 20 MW capacity injection occurred near the New Bohemia Substation at the location of the previous queue project X1-080. This analysis did include the impacts of the generation capacity for all higher order queue generators within the ITO system. When performing a generation analysis, ITO main analysis is load flow study results under single contingency (both normal and stressed system conditions) and import/export system conditions. ITO criterion considers a transmission facility overloaded if it exceeds 94% of its emergency rating under normal and stressed system conditions. For import/export studies, ITO considers a transmission facility overloaded if it exceeded 100% of its emergency rating. A full listing of ITO planning criteria and interconnection requirements can be found in the company's facility connection requirements which are publicly available at: http://www.dom.com.

As part of its generation impact analysis ITO routinely evaluates the impact that a proposed new generation resource will have under maximum generation conditions and import/export system conditions. The results of these studies is discussed in more detail below.

Selected Option: Total output of X1-080 and X3-032 split evenly between New Bohemia delivery point off of line #106 and proposed New Bohemia delivery point off of line #15:

This option will require the developer to obtain an agreement with Prince George Electric Cooperative (PGEC) to interconnect and wheel power generated by the proposed facility through the PGEC transmission system to the Point of Interconnection on ITO system located at the New Bohemia delivery point on line #106 and line #15. The net capacity and energy delivered to the PJM system will be measured at that location.

1. The first being when local generation including the proposed X3-032 Facility is operated at their maximum capability. The result of this study is shown below.

   None identified.

2. The second being import and export conditions into and out of the Dominion System. Any new facility that is interconnected with the Dominion System should not significantly decrement FCITC between utilities. The results of these studies can be found in Tables A and B.

Table A: Import Study Results			
Area	**Summer 2015**	**Summer 2015 with X3-032**	**Limiting Element**
AEP	2000+	2000+	None
APS	2000+	2000+	None
CPL	2000+	2000+	None
PJM	2000+	2000+	None

Table 2: Export Study Results			
Area	**Summer 2015**	**Summer 2015 with X3-032**	**Limiting Element**
AEP	2000+	2000+	None
APS	2000+	2000+	None
CPL	2000+	2000+	None
PJM	2000+	2000+	None

Dominion’s Planning Criteria requires at least 2000 MW of import and export capability. The results of these import and export studies are indicate that the proposed generation facility will not impact Dominion’s import or export capability.

Attachment Facilities:
The proposed layout and attachment facilities are illustrated below in Figure A. The proposed X3-032 generation will be added to the ITO System through previous generation interconnect queue X1-080. The necessary attachment facilities will be included with the previous Queue.

Network Upgrades:

The proposed network upgrades are illustrated below in Figure A. The proposed X3-032 generation will be added to the ITO system through previous generation interconnect queue X1-080. The necessary network upgrades will be included with the previous queue. This will include the installation of an islanding scheme between Poe Substation and the point of interconnection at PGEC New Bohemia Substation and install necessary System Protection upgrades at Poe and Suffolk Substations. The estimated costs are $3.6M.