PJM Generator Interconnection

V3-037 Naval Academy Junction 34.5 kV

5 MW Capacity

Feasibility Study Report

January 2010

DMS #577817v1

Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, §110, 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 Baltimore Gas and Electric Company.

Preface

The intent of a 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 Local and Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM and 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 any right of way, real estate, and construction permit issues.

General

Queue V3-037 is an IC Capacity resource interconnection consisting of 5 MW of landfill gas fueled generation. V3-037 will be installed at the Millersville Landfill, 389 Burns Crossing Road, Severn, Maryland. The proposed in service date is February 2011.

Potential PJM Network Impacts

Queue V3-037 project was studied as a 5 MW capacity injection into BGE's system at the NAJ 34.5kV substation. This was the primary point of interconnection. The NAJ 13.8kV bus was chosen as the secondary point of interconnection; however, this bus is not modeled in PJM's load flow case. The project's impact on the transmission system should be the same using either modeling point, so the primary interconnection location was used. Project V3-037 was evaluated for compliance with reliability criteria for summer peak conditions in 2014. 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 contingencies only for the full energy output. Stuck breaker and bus fault contingencies will be performed for the Impact Study)

None.

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.

Short Circuit

There is no impact to breaker interrupting capabilities as a result of V3-002.

System Stability Analysis

Not required.

Interconnection Requirements

Baltimore Gas & Electric (BGE), the PJM, have determined that this magnitude of electrical generation must be connected to BGE's 33kV distribution system. The two closest 33kV feeders are feeders 33684 and 33685 from BGE's Naval Academy Junction Substation (NAJ). Feeder 33685 is the preferred feeder for interconnection. The Millersville Landfill is located in the vicinity of Burns-Crossing Road and Dicus-Mill Road - BGE's 33kV feeders are located along Maryland Route 32, to the South of the landfill.

Extending the 33kV feeders to the Millersville Facility will involve the installation of approximately 2200 ft of overhead conductor from Route 32 to the intersection of Dicus-Mill Road and Burns-Crossing Road. Existing poles will be renewed to accommodate the 33kV feeder above the existing 13kV feeder. From this intersection, approximately 2000 ft of underground conductor in direct-buried duct will be extended to the customer's 33kV substation (site not shown on submittal). BGE can also extend

both 33kV circuits to a tie point so that the generation can be tied to the “alternate” feeder if the “normal” feeder is out of service.

Export generation interconnected with BGE’s distribution requires the installation of anti-islanding protection by the customer. This protection must disconnect the generation from the distribution system when the utility supply is lost to prevent damage to the generator when feeder reclose operations occur. Transfer-trip protection is typically installed as back-up protection, whereby a signal is given when the normal supply circuit breaker in the BGE substation opens. The signal is received at the customer substation to trip the generators off line. This protection requires a communications circuit between BGE’s supply substation (NAJ) and the customer’s substation at Millersville Landfill. The customer is responsible for this communications circuit and the associated terminal equipment. The communication circuit can be fiber optic cable, dedicated data grade telephone circuits, or spread spectrum radio if a clear line of sight is available between BGE’s substation and the customer substation. Modifications to BGE’s substation to accommodate the transfer-trip protection will be furnished and installed by BGE and billed to the customer.

Export generation interconnected with BGE’s distribution system also requires the installation of Distribution Automation equipment by BGE. This equipment sends real time data from the generation substation to BGE’s operations control center. This equipment is furnished and installed by BGE and billed to the customer. For interconnection with BGE’s 33kV system, the customer is required to install a 33kV service-entrance substation, constructed in accordance with BGE guide specification CSR-2 (copy attached).

The following is a typical summary of costs for extending the feeder(s) to the Millersville Landfill Facility. This is an order-of-magnitude estimate since the actual location of the customer’s equipment is not known at this time. A firm estimate will not be available until design is complete. Also shown are typical past costs for installation of the Distribution Automation Equipment and a typical cost for transfer-trip using Spread Spectrum Radio equipment.

Distribution Costs

	Single Circuit	Dual Circuit
Labor	$430,000	$ 520,000
Materials	$330,000	$ 600,000
Total	$760,000	$1,120,000

Distribution Automation Costs

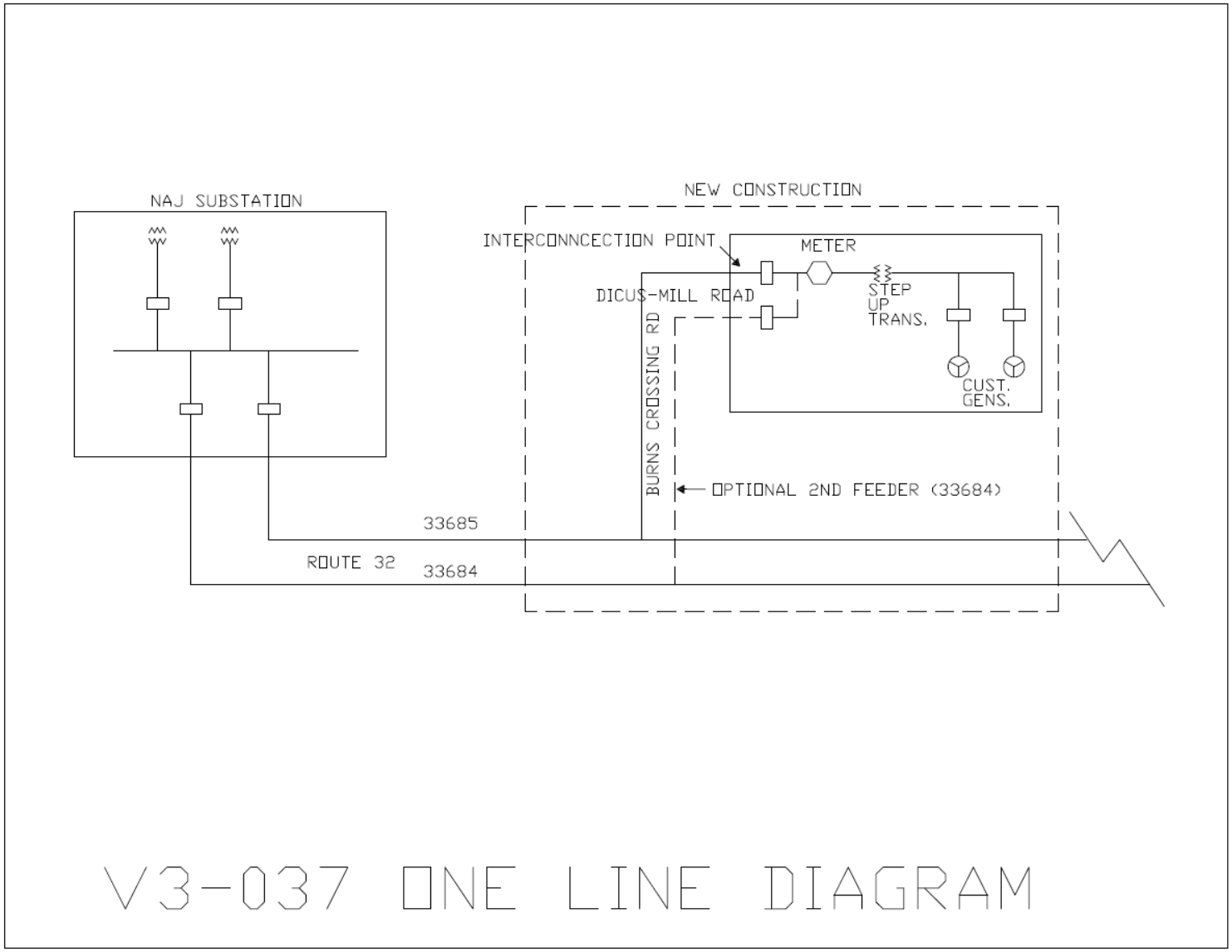
Labor	$15,000
Materials	$ 5,300
Total	$20,300

Typical Spread Spectrum Transfer-Trip Costs

Labor and Materials	$45,061

Cost Summary

Single Circuit	$ 825,361
Dual Circuit	$1,185,361



V3-037 ONE LINE DIAGRAM