PJM Generator Interconnection
V2-037 White Oak 69 kV
4.5 MW Energy
Combined Feasibility & System Impact Study

October 2009
DMS #561913v1

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 U.S. General Services Administration Federal Research Center White Oak, Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is Potomac Electric Power Company (PEPCO).

Preface

The intent of a combined Feasibility and System Impact 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 and System Impact 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 V2-037 is an IC 4.5 MW energy resource interconnection consisting of a single natural gas fired simple cycle combustion turbine generator. This generator will be operated in parallel to the existing 19.5 MW facilities (former PJM Queues J08 and P32) at White Oak. V2-037 generator will be installed on site at the Federal Research Center at White Oak located at 10903 New Hampshire Ave., Silver Spring, Montgomery County, Maryland. The planned in-service date for the unit is March 2010.

Potential PJM Network Impacts

In Queue V2-037, IC requested connection of its generation to existing IC facilities connected through two dedicated 13.8kV feeders from the IC CVG 114 switchgear that is supplied by two ITO 69 kV-13.8 kV transformers as shown in Figure 1, the facility one line diagram. The project was studied on a combined feasibility-impact bases which utilizes an AC analysis, and incorporates all contingency types. Project V2-037 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)

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 V2-037.

System Stability Analysis

Not required.

Interconnection Requirements

The following provides ITO requirements, estimated costs and schedule for the Non-Direct and Direct Connection Local Upgrades and the Attachment Facilities:

Non – Direct Connection Local Upgrades

(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.

Direct Connection Local Upgrades

None.

Attachment Facilities

IC will design and construct all Attachment Facilities at the Customer's site.

Metering and Telemetering Requirements

Metering for PJM "Net" and real time metering of the generator is required[1]. PJM requires Net Generation (generation less unit station service), so placement of the current transformers is critical unless compensation is used. Load connections which are not generator station service should not be made between the generator and the bus. IC will be required to install a 4-wire (data grade) telecommunications circuit from IC facility to the ITO Control Center.

IC will install the required metering and a dual port Remote Terminal Unit (RTU) equipment to provide the following telemetered data to PJM and ITO:

- KW and KWH (generators)
- Net KW and KWH (for the two Interconnection Feeders)

ITO will obtain the net (real time) KW and KWH metering from PJM.

IC will furnish a 4-wire telecommunication circuit from the IC facility's DNP-3.0 compatible RTU to ITO to provide the following status data:

- Open/Close status for IC inter-tie circuit breakers for the two interconnection feeders.
- Trip control of the IC inter-tie breakers or generator breakers.

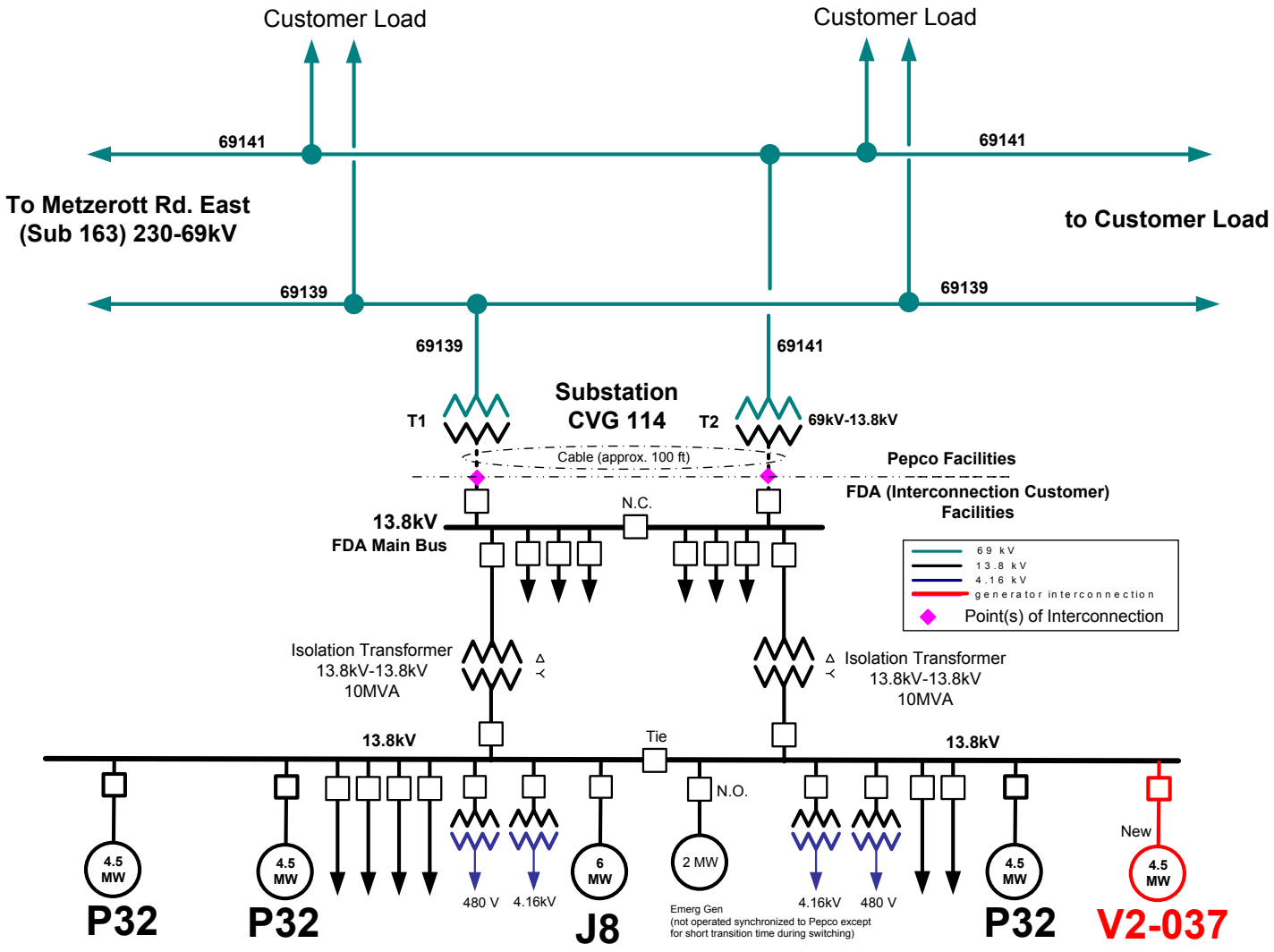
Pepco System Protection Requirements

Typical protective relays as specified in ITO Applicable Standards posted on the PJM website "Engineering Requirements And Performance Standards For Generation Interconnection Customers Connecting To The Potomac Electric Power Company System Under The PJM Open Access Transmission Tariff (OATT)" Revision 1, Dated 7-1-03 are required at IC substation. IC must obtain the username and password from PJM to access the standard: http://www.pjm.com/planning/design-engineering/to-tech-standards.aspx.

IC is required to submit a "Relay Coordination Study" to ITO for review and approval before operating their new generation in parallel with ITO system.

[1] An economical internet-based option is available from PJM. Please contact PJM's metering group.

Figure 1 – V2-037 One Line Diagram



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