PJM Generator Interconnection

W4-010 White Oak 69 kV

29 MW Energy

Combined Feasibility & System Impact Study Report

September 2011
DMS #643394v2

Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, §36.2 and §205, as well as the study agreement between General Service Administration, the 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 W4-010 is adding 29 MW energy capability to its existing facility. The added 29 MW was requested to be behind the meter. However, PJM and Pepco determined that the proposed generation could be additive to the facility's existing export capability under certain loss of load scenarios. The total generation capability at the site is 53 MW. Generation exported from the facility is currently limited by the capability of the Pepco transformers that step-up the voltage from 13.8 kV to 69 kV (limit is 9.8 MVA per transformer). Export levels in excess of the transformers' capabilities will actuate transformer(s) protection. Future export increases up to 53 MW will be allowed if the 13.8 kV to 69 kV transformers are replaced by higher capability units and associated protection changes are implemented. The added generation will consist of the following:

- Two (2) Solar Taurus 70's (7.5 MW each);
- One (1) Solar Mercury 50 (4.6 MW);
- One (1) steam turbine generator (4.5 MW); and
- Two (2) diesel engine stand-by generators

This generator will be operated in parallel to the existing 24 MW facilities (former PJM Queues J08, P32 and V2-037) at White Oak. W4-010 generators 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 units are February 2014.

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.

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

(Report Overdutied breakers here)

No problems identified.

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.

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

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.

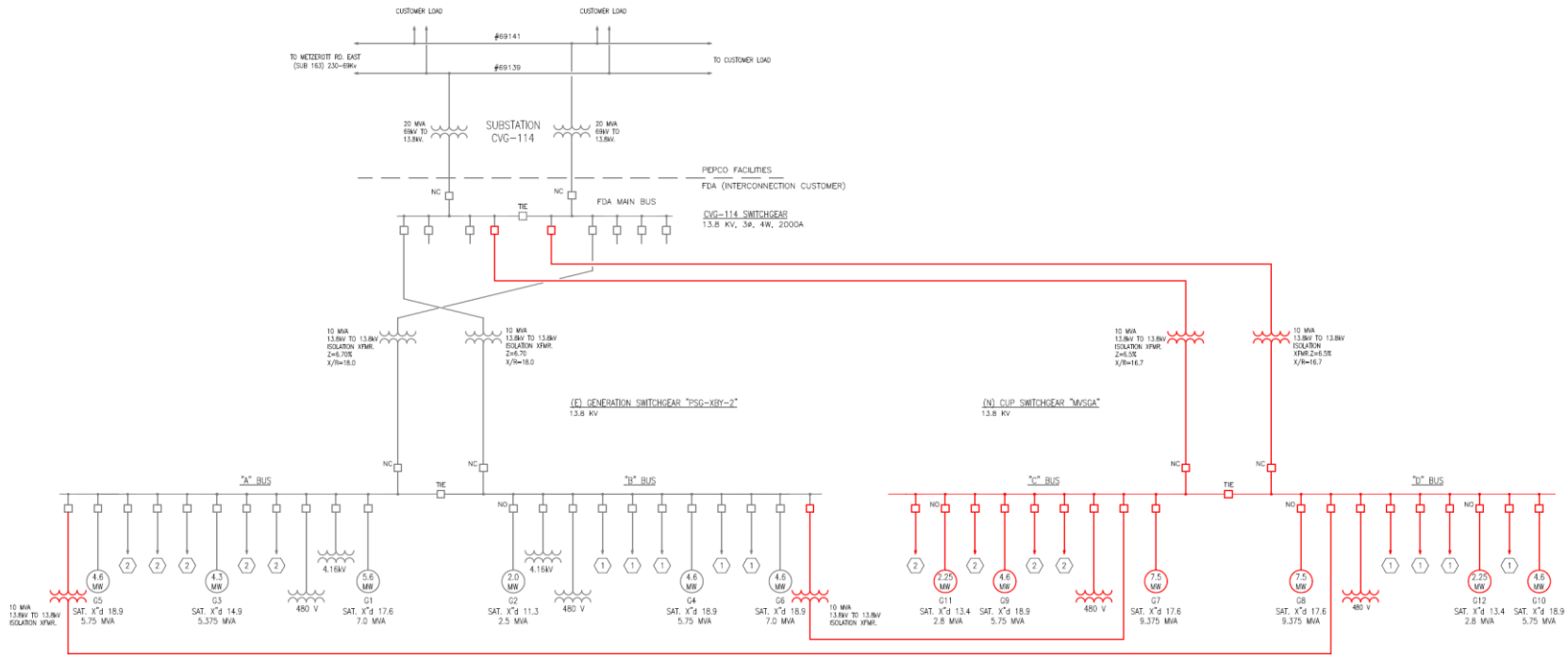
IC will furnish a 4-wire telecommunication circuit from the IC facility's DNP-3.0 compatible RTU to ITO to provide the following status data:

- 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.



KEYED NOTES

(1) 13.8KV FEEDERS TO CAMPUS BUILDING UNIT SUBSTATIONS WITH LOAD OF 6.0 MVA MAXIMUM.

(2) REDUNDANT 13.8KV FEEDER TO CAMPUS BUILDING UNIT SUBSTATIONS WITH LOAD OF 6.0 MVA MAXIMUM.

ONE LINE DIAGRAM

DATE: 1 DECEMBER 2010

Honeywell

Honeywell Building Solutions
1250 West Sam Houston Parkway S, Suite 200
Houston, Tx. 77042 823.252.3308

FEDERAL RESEARCH CENTER
AT WHITE OAK ESPC-III
EXPANSION
ENERGY CONSERVATION PERFORMANCE CONTRACT

PJM Generator Interconnection

W4-010 White Oak 69 kV

29 MW Energy

Combined Feasibility & System Impact Study Report

April 2011
DMS #643394v1

Introduction

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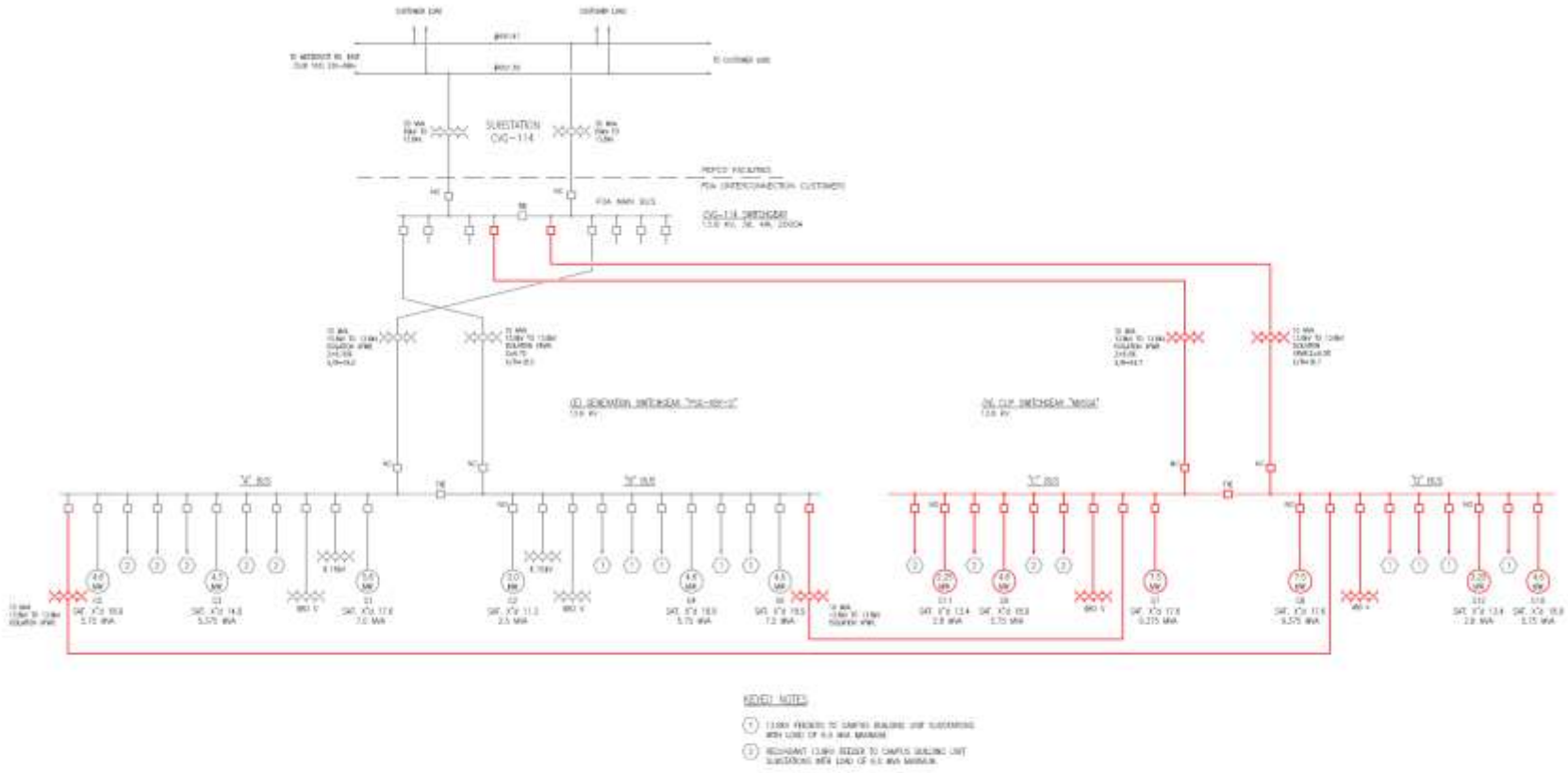

ONE LINE DIAGRAM

DATE: 7 DECEMBER 2010

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