PJM Generator Interconnection #G50 Dickerson 910 MW Feasibility Study Report

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Docs #156650

Preface

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, 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 of cost among responsible projects will be deferred until the Impact Study is performed and a regional plan is developed.

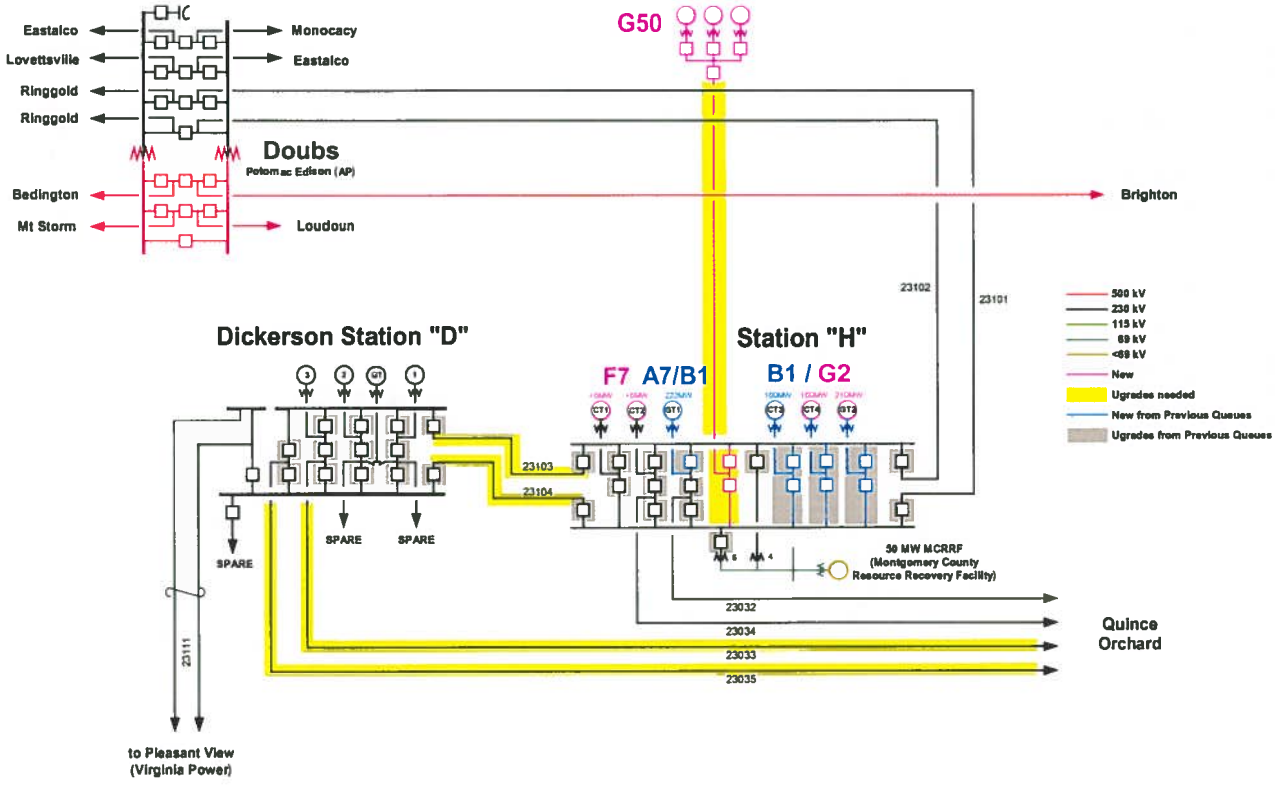
The Feasibility Study contains generic estimates which are typical for similar work which has been completed in the past. Comprehensive engineering and real estate work was not performed. The cost and time for siting, permitting, and obtaining property rights for new facilities may be considerably greater than the generic estimates which were stated. If applicable, property currently under the control of PJM Transmission Owners will be identified.

General

Project #G50 is an Alcoa Power Generating, Inc. 910 MW (summer capability) gas-fired combined cycle generating facility consisting of three combustion turbines and one steam turbine. The new generating facilities are proposed to be located at Eastalco Aluminum Company, 5601 Manor Woods Road, Frederick, Maryland. Project #G50 is scheduled for commercial operation by June 2005.

Direct Connection

Project #G50 can be connected to Dickerson Station "H" as shown on the one line diagram below.



Project #G50 Interconnection Customer is responsible for the cost and construction of all facilities located at the #G50 generation site. This includes the #G50 collector bus termination facilities associated with the new 230kV Direct Connection transmission line.

Note: The #G50 collector bus cannot be networked to other transmission systems.

The scope of Direct Connection work estimated herein includes:

- Construction of a new 11.0 mile, 230 kV, single circuit, steel pole transmission line from the Project #G50 generation site to Pepco's Station "H". At present the line route is undetermined, known only to run in the general vicinity of Allegheny Power's Doubs Station; and
- Construct a bay position, including two circuit breakers and all other required facilities, to terminate the new Interconnection transmission line at Station "H" .

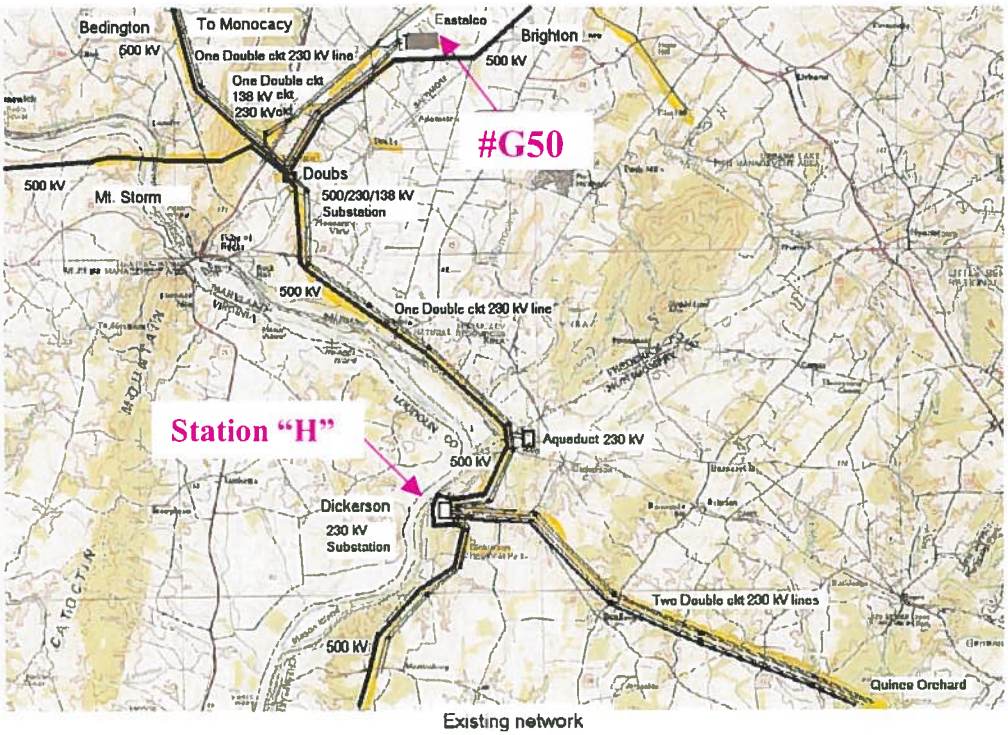
The estimated cost (incl tax gross-up) of the Direct Connection facilities is **$25 million**.

Assumptions Used To Develop Project Costs:

- The right of way easement will be 125' wide
- Estimated right of way cost is $60,000 per acre
- Costs do not include line termination at the Project #G50 generator collector bus
- Costs do not include gross up tax.

Based on Allegheny Power and Pepco experience in securing required approvals and property rights in this area, the estimated time required to construct the 11.0 mile, 230kV Direct Connection line may be **five years and quite possibly longer**.

Map showing geographic location of existing transmission lines, #G50 generation site, and Station "H"



Existing network

Network Impacts

The system, as planned, was evaluated for compliance with reliability criteria. **The Dickerson #G50 project was studied as 910 MW capacity.** The results are summarized below.

Generator Deliverability

1. The Burtonsville – Sandy Spring (2314) 230 kV circuit is overloaded at 107% of the normal rating (560 MVA). The Burtonsville – Sandy Spring (2334) 230 kV circuit is also contingency overloaded at 108% of the emergency rating (680 MVA) for the outage of the High Ridge – Howard - Granite (2332-A) 230 kV circuit. The G50 project contributes approximately 72 MW to the normal and 86 MW to the contingency loading on this circuit.

Multiple Facility Contingency – Tower Line Outages (MAAC Criteria IIC)

2. The Dickerson 23103 (station **D** - station **H)** 230 kV circuit is contingency overloaded at 122% of the emergency rating (680 MVA) for the Dickerson **H** – Quince Orchard tower line outage. The G50 project contributes approximately 268 MW to the loading on this circuit.
3. The Dickerson 23104 (station **D** - station **H)** 230 kV circuit is contingency overloaded at 122% of the emergency rating (680 MVA) for the Dickerson **H** – Quince Orchard tower line outage. The G50 project contributes approximately 268 MW to the loading on this circuit.
4. The Dickerson station D – Quince Orchard (23035) circuit is contingency overloaded at 101% of the emergency rating (730 MVA) for the Dickerson **H** – Quince Orchard tower line outage. The G50 project contributes approximately 133 MW to the loading on this circuit.
5. The Dickerson station D – Quince Orchard (23033) circuit is contingency overloaded at 100% of the emergency rating (730 MVA) for the Dickerson **H** – Quince Orchard tower line outage. The G50 project contributes approximately 151 MW to the loading on this circuit.

Short Circuit

Approximately 27 - 230 kV breakers at Dickerson will have to be replaced with 80 kA breakers.

New System Reinforcements

Overload **1** can be relieved by upgrading an equipment at the Burtonsville 230 substation. The cost estimates to upgrade the equipment is approximately $0.25 million.

Overloads **2** and **3** can be relieved by bundling the station **D** to station **H** 230 kV bus tie circuits at Dickerson. The cost is estimated at approximately $0.86 million.

Overloads **4** and **5** can be relieved by bundling both circuits 23035 and 23033 from Dickerson **H** – Quince Orchard. The cost is estimated at approximately $9.34 million.
The total new Network upgrades are estimated to cost $10.45 million. The estimated time required to construct the new network upgrades is a minimum of 28 month.

The cost estimate to replace all 27 breakers at Dickerson with 80 kA breakers is $15 million with a 4 year lead time. (Note: Earlier Queue projects were responsible for replacing all 27 circuit breakers with new 63kA rated CBs and upgrading the in-line substation equipment to withstand a 63kA fault level. There may be a cost allocation with these earlier queue projects)

Contribution to Previously Identified System Reinforcements

The new generator will be allocated a percentage of the costs for the previously identified network reinforcements as follows:

1. The G50 project contributes approximately 82 MW to the Burtonsville – Sandy Spring (2334) 230 kV circuit overload. The overload can be relieved by upgrading an equipment at the Burtonsville 230 substation. The equipment that needs to be upgraded includes strain busses, amp metering, disconnect switches and the HVCB isolation switch. With these line upgrades, the rating can be increased to 790/923 MVA (S/N & S/E). The cost estimates to upgrade the equipment is approximately $250,000. Estimated construction time for this work is approximately 4 months.

Project #G50 will be required to share the cost of these upgrade. Project #G50's cost allocation will be determined as part of the #G50 Impact Study.