

***Generation Interconnection  
Feasibility Study Report***

***For***

***PJM Generation Interconnection Request Queue  
Position Z2-048***

***George Washington 138 kV***

August / 2014

## **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 will be deferred until the impact study is performed.

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. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

## **General**

The Interconnection Customer (IC) proposes to increase the generation of its existing queue PJM project Y3-068 by 20 MW. The 525 MFO (525 MWC) Y3-068 project is currently in the Facilities Study stage. Queue project Z2-048 is a 20 MW uprate of the 2X1 combined cycle natural gas plant (Y3-068) and is due to a planned upgrade to the duct boiler. Project Z2-048 is evaluated as an injection of 20 MW (20 MW Capacity) at George Washington 138 kV substation (Figure 1). The location of this natural gas fueled generating facility is in Moundsville, WV.

The requested in-service date is June 1, 2018.

The objective of this system feasibility study is to determine budgetary cost estimates and approximate construction timelines for identified transmission facilities required to connect the proposed generating facilities to the AEP transmission system. These reinforcements include the Attachment Facilities, Local Upgrades, and Network Upgrades required to maintain the reliability of the AEP transmission system. Stability analysis is not included as part of this study.

## **Attachment Facilities**

- PJM project Y3-068 will pay for the necessary direct connection worked required at the George Washington 138 kV Station.

## **Local and Network Impacts**

The impact of the proposed 20 MW increase at the combined cycle plant connected to the AEP System was assessed for adherence with applicable reliability criteria. AEP planning criteria require that the transmission system meet performance parameters prescribed in the AEP FERC Form 715<sup>1</sup> and Connection Requirements for AEP Transmission System<sup>2</sup>. Therefore, these criteria were used to assess the impact of the proposed 20 MW increase on the AEP System. The IC's project Z2-048 was studied as an injection of 20 MW (20 MW Capacity) at George Washington 138 kV substation consistent with the interconnection application. Project #Z2-048 was evaluated for compliance with reliability criteria for summer peak conditions in 2018.

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[http://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/GuideLines/2014%20AEP%20PJM%20FERC%20715\\_Final\\_Part%204.pdf](http://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/GuideLines/2014%20AEP%20PJM%20FERC%20715_Final_Part%204.pdf)

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[http://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/Requirements/AEP\\_Interconnection\\_Requirements\\_Rev1.pdf](http://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/Requirements/AEP_Interconnection_Requirements_Rev1.pdf)

## Potential network impacts were as follows:

### Normal System (2018 Summer Conditions Capacity Output)

- No problems identified

### Single Contingency (2018 Summer Conditions Capacity Output)

- No problems identified

### Multiple Contingency (2018 Summer Conditions Capacity Output)

- No problems identified

### Contribution to Previously Identified Overloads (2018 Summer Conditions Capacity Output)

Table 1- Contribution to Previously Identified Overloads (2018 Summer Conditions Capacity Output)					
PJM Identified overload					
#	Contingency Name	Contingency Description	Facility Description	Limiting Element	Mitigation
1	'5213_B2_TOR773'	OPEN BRANCH FROM BUS 243012 TO BUS 243026 CKT 1 / 243012 05G WASH 138 kV – 243026 05KAMMR1 138 1 END	The LOCKWOOD-MOUNDVIL 69 kV Line (from bus 245939 to bus 245942 ckt 1) loads from 116.16% to 120.24% (DC power flow) of its emergency rating (41 MVA) for the single contingency outage of '5213_B2_TOR773'.	ACSR/EHS ~ 176.9 ~ 12/7 ~ DOTTERE Conductor Section 2	Perform Sag study or Rebuild the entire 1.12 mile line section of LOCKWOOD-MOUNDVIL 69 kV Line.

### Normal System (2018 Summer Conditions Full Output)

- Not applicable

### Single Contingency (2018 Summer Conditions Full Output)

- Not applicable

### Multiple Contingency (2018 Summer Conditions Full Output)

- Not applicable

### Contribution to Previously Identified Overloads (2018 Summer Conditions Energy Output)

- Not applicable

### Short Circuit Analysis

- No problems identified

### Stability Analysis

- To be conducted during the System Impact Study.

### Voltage Variations

- No problems identified

### Additional Limitations of Concern

- No problems identified

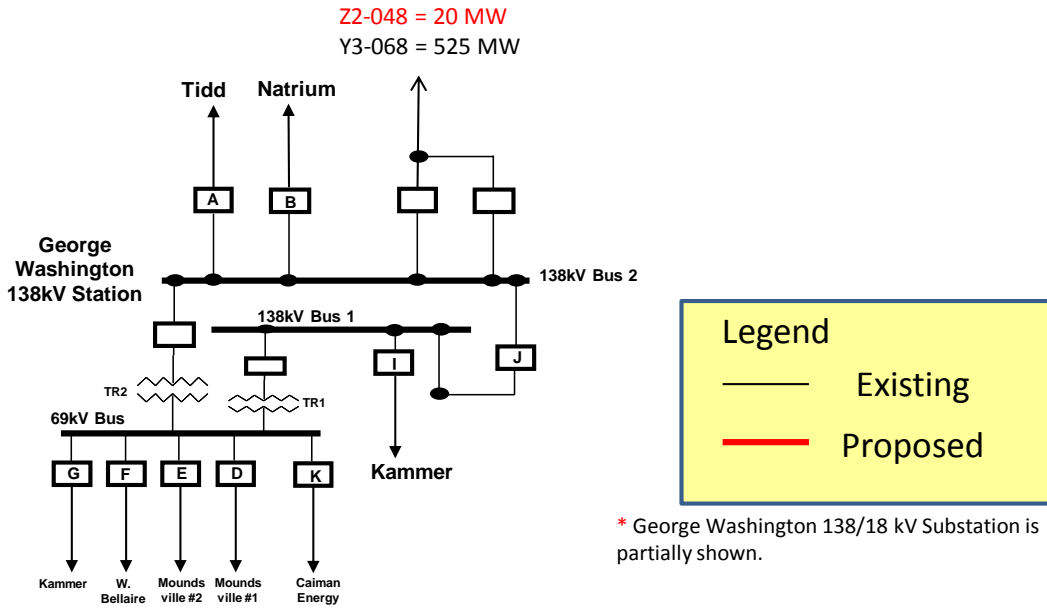
### Local/Network Upgrades

- Rebuild 1.12 mile section of the Lockwood – The IC69 kV Line.
  - Estimated Cost: \$1,334,000
  - Since project Z2-048 is not identified as causing the initial overload of this facility, it is not responsible for the cost of remediation. This is subject to change if higher queued requests contributing to this overload condition withdraw, and subsequent PJM retool analysis then indicates that project Z2-048 is causing the overload.

### Conclusion

Based upon the results of this Feasibility Study, the injection of 20 MW increase at the IC's (PJM Project #Z2-048) natural gas generation project will require no additional interconnection charges.

## Z2-048 & Y3-068 Point of Interconnection\*



**Figure 1**