

***PJM Generator Interconnection Request  
Queue #Z2-112  
Waterford 345 kV  
Feasibility Study Report***

**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,

## **General**

The Interconnection Customer (IC) proposes to increase the generation at its existing 3 x 1 Combined Cycle natural gas plant at the Waterford 345 kV station in Washington County, Ohio. The IC's request is to increase the units' total MFO by 97 MW to a new total of 1,007 MW, and total capacity by 64.5 MW to a new total of 897 MW. The break down per unit is shown in the table below.

	<b>Type of Unit</b>	<b>MFO</b>	<b>MWC</b>
Waterford Unit No. 1	CTG	202	168
Waterford Unit No. 2	CTG	202	168
Waterford Unit No. 3	CTG	202	168
Waterford Unit No. 4	STG	401	393
		1007	897

The increases are due to an Air Permit Modification, an AGP project, and changes to the controls for the plant. The plant electrical characteristics are not changing.

For this Feasibility Study, PJM project Z2-112 is represented as a 97.0 MW (Capacity 64.5 MW) injection at the Waterford 345 kV substation (Figure 1).

The requested in service date is June 1, 2015.

The objective of this 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**

### **Station Cost:**

- No work is required.

### **Protection and Relaying Cost:**

- No work is required.

## **Local and Network Impacts**

The impact of the proposed generating facility on 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 criterion were used to assess the impact of the proposed MW increase on the AEP System. The PJM project Z2-112 was studied as a 97.0 MW (Capacity 64.5 MW) injection at the Waterford 345 kV substation. Project #Z2-112 was evaluated for compliance with reliability criteria for summer peak conditions in 2018.

### **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)

- No problems identified

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

- No problems identified

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

- No problems identified

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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)

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

- No problems identified

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

- No problems identified

### Short Circuit Analysis

- Not required since no changes are planned for the electrical equipment of the plant.

### Stability Analysis

- Stability studies were not performed as part of this Feasibility Study. The stability assessments will be performed during the System Impact Study stage.

### Voltage Variations

- No problems identified.

### Additional Limitations of Concern

- No known additional limitations of concern.

### Local/Network Upgrades

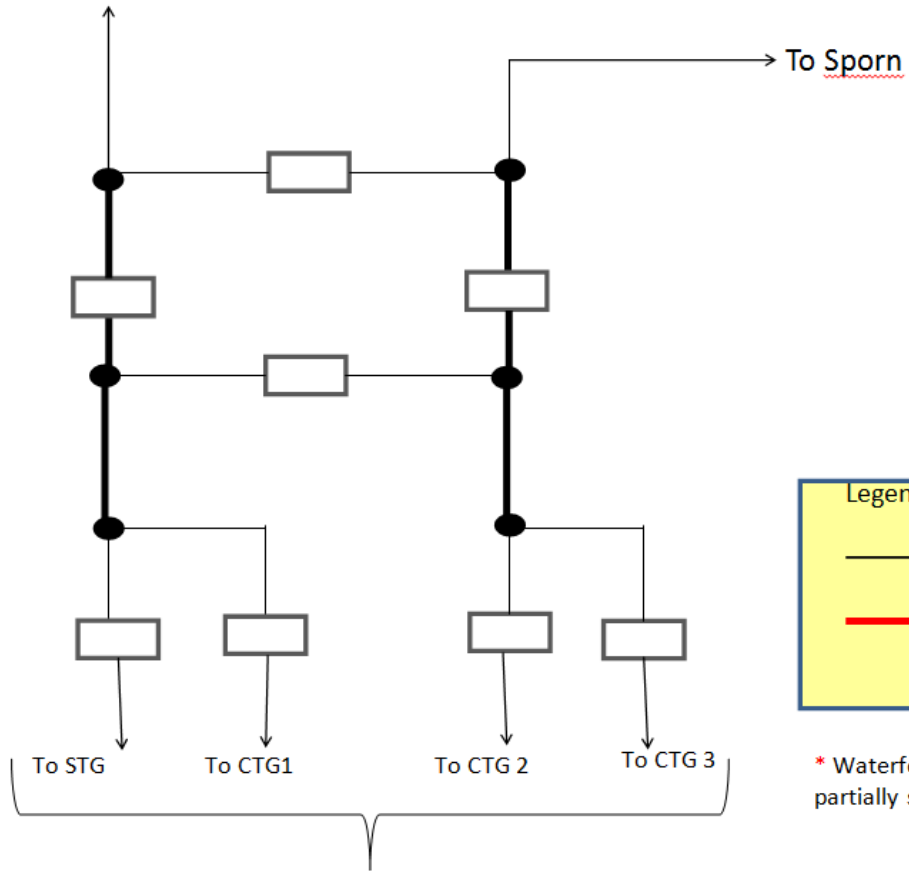
- No problems identified.

### **Conclusion**



Based upon the results of this Feasibility Study, the injection of an additional 97 MW (64.5 MW Capacity) at Waterford 345 kV substation (PJM Project #Z2-112) will not require additional interconnection charges.

**Figure 1: POI**  
Waterford 345 kV Substation \*

To Muskingum River Plant



Legend

	Existing
	Proposed

\* Waterford 345 kV Substation is partially shown.

PJM project Z2-112 with an Increase of 97.0 MW (Capacity 64.5 MW) injection