

***Generation Interconnection  
Combined Study Report***

***For***

***PJM Generation Interconnection Request Queue  
Position Y3-119***

***East Lynchburg – Peakview 34 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**

Lynchburg Heat and Power L.L.C. (LHP) requested PJM, and by extension, American Electric Power (AEP) to conduct a Generation Interconnection Feasibility Study in order to determine the feasibility of adding a new generating unit with a maximum facility output of 19 MW (7 MW Capacity). The new generating unit will be located at the customer's existing Mead Corp. Substation in Lynchburg, Virginia (see Figure 1) and will be connected to their 2.3 kV bus (see Figure 2) with an existing paper mill load of approximately 12 MW. The combined heat and power plant will be fueled by waste wood feedstock. The desired service date of this potential project is spring of 2016.

## **Scope of Study**

The scope of this study is to evaluate the feasibility of adding the new generating unit at Mead Corp. Substation served from AEP's East Lynchburg-Peaksview 34.5 kV circuit and determine the attachment facilities, as well as any local and/or network upgrades, necessary to accommodate the interconnection request. The facilities, system upgrades and estimated costs provided in this Feasibility Study are conceptual in nature and are subject to change upon further investigation (i.e. information required/obtained from site visit, detailed engineering, etc.).

## **Attachment Facilities**

The point of interconnection will be at the Mead Corp. Substation served by AEP's East Lynchburg-Peaksview 34.5 kV circuit. Only those facilities that will be owned by AEP and are required to connect the generating unit will be included in this report. Attachment facilities to connect the generating unit to the customer's existing 2.3 kV bus are not included.

As part of the customer's attachment facilities, a breaker and associated relaying, compatible with AEP's protection systems, will need to be installed on the generator. This breaker may also serve as the required equipment for generator synchronization. The Interconnection Customer is responsible for this work.

## **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<sup>2</sup> for the AEP Transmission System. Therefore, these criteria were used to assess the impact of the proposed facility on the AEP System. PJM Generator Interconnection Queue Y3-119 was studied as a 19 MW (7 MW Capacity) generation injection and 12 MW load to the existing paper mill at the Mead Corp. 34.5 kV substation consistent with the interconnection application. Project #Y3-119 was evaluated for compliance with reliability criteria for summer peak conditions in 2017.

<sup>1</sup>[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)

<sup>2</sup>[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)

### Normal System (2017 Summer Conditions Capacity Output)

- No problems identified

### Single Contingency (2017 Summer Conditions Capacity Output)

- No problems identified

### Contribution to Previously Identified Overloads (2017 Summer Conditions Capacity Output)

- No problems identified

### Normal System (2017 Summer Conditions Full Output)

- No problems identified

### Single Contingency (2017 Summer Conditions Full Output)

- No problems identified

### Contribution to Previously Identified Overloads (2017 Summer Conditions Full Output)

- No problems identified

### Short Circuit Analysis

- The new generator short circuit contribution to the surrounding area did not cause any breakers to become overdutied.

### Stability Analysis

- Stability studies were not performed as part of this Feasibility Study.

### Voltage Variations

- No problems identified.

### Additional Limitations of Concern

- No known additional limitations of concern.

## **Local/Network Upgrades**

- A three terminal, fiber optic based current differential line protection scheme will need to be installed on the East Lynchburg-Peaksview 34.5 kV circuit. This will require new relays at East Lynchburg, Peaksview and Mead Corp. Substations as well as fiber optic communications to be installed between the stations. (n4252)
  - \$400,000\*
- Metering and communication is required at the generator and the customer's point of interconnection. The metering installed must provide real-time information for operational purposes to AEP/PJM and must meet applicable PJM requirements. New metering at the generator and an upgrade of the existing metering will be required. This work will include new instrument transformers and metering cabinet with meters and RTU. (n4253)
  - \$125,000\*
- The customer shall provide adequate protection to comply with IEEE Standard 1547 to clear their generation source for all types of faults on the AEP system.

As part of the customer's attachment facilities, a breaker and associated relaying, compatible with AEP's protection systems, will need to be installed on the generator. This breaker may also serve as the required generator synchronizing means.

\*Estimated costs are preliminary in nature, as it was determined without the benefit of detailed engineering studies. Final estimates will require an on-site review and coordination to determine final construction requirements.

## **Conclusion**

Based upon the results of this Feasibility Study, the injection of an additional 19 MW (7MW Capacity) at the Mead Corp. 34.5 kV substation (PJM Project #Y3-119) will require remote end relaying upgrades on the East Lynchburg-Peaksview 34.5 kV circuit as well as metering and communication as described above. It will take approximately 15 months after obtaining a signed agreement to construct the facilities as outlined above.

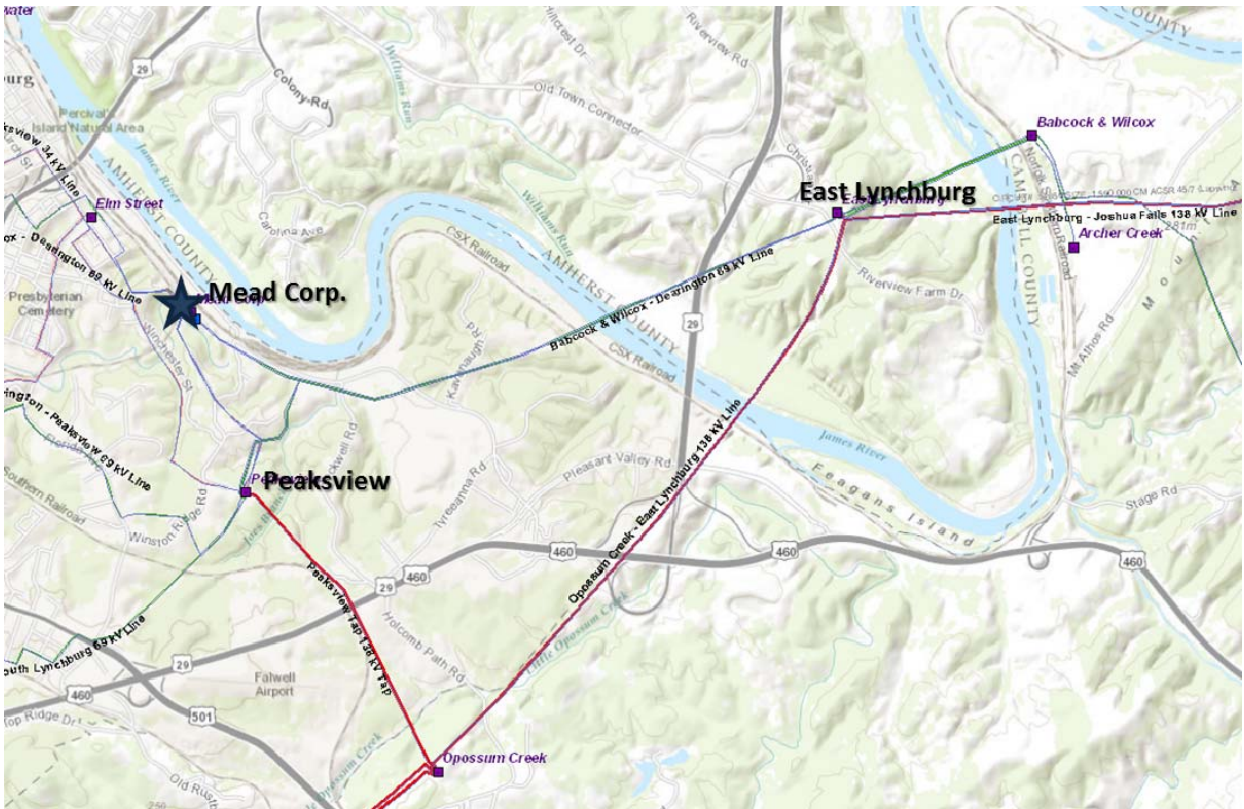


Figure 1

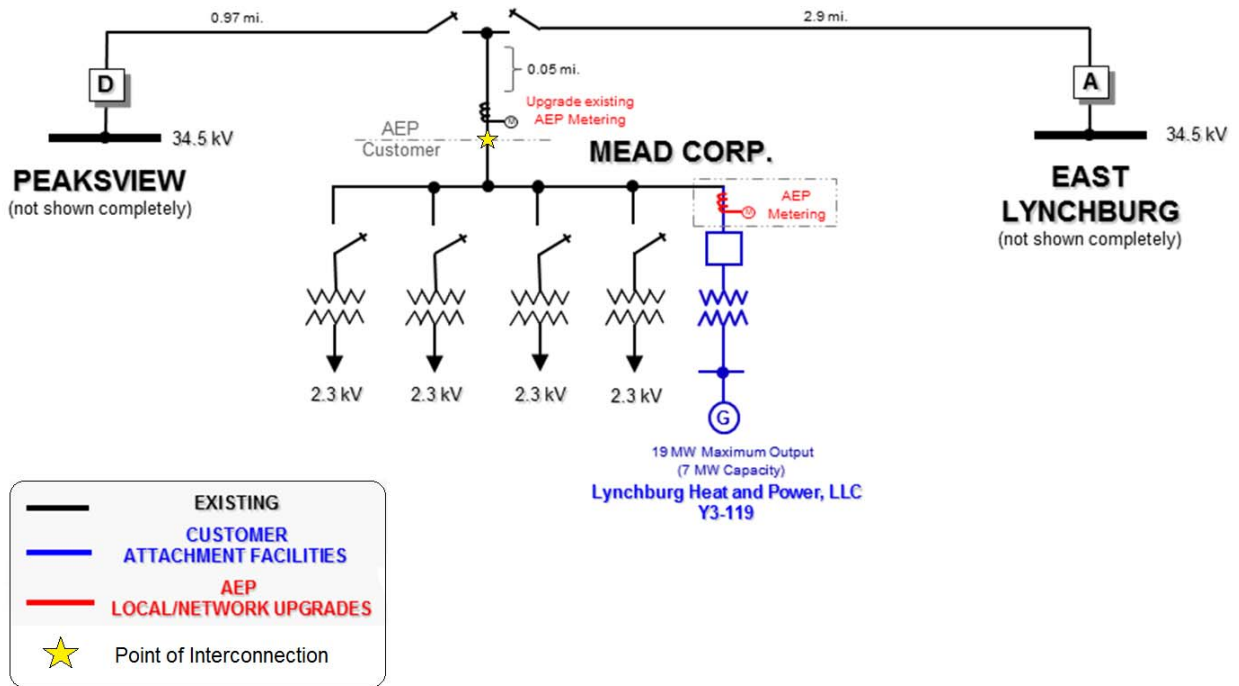


Figure 2