Generation Interconnection Combined Feasibility/System Impact Study Report

For

PJM Generation Interconnection Request Queue Position AD1-135

"Clinton 23 kV II"

February 2018

Preface

The intent of the Combined Feasibility/System Impact Study is to determine a plan, with approximate cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by the Interconnection Customer. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system. All facilities required for interconnection of a generation interconnection project must be designed to meet the technical specifications (on PJM web site) for the appropriate transmission owner.

In some instances an Interconnection Customer may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection or merchant transmission upgrade, 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, if any, is included in the System Impact Study.

The 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 associated with them will be addressed when seeking an Interconnection Agreement as outlined below. Developer will also be responsible for providing and installing metering equipment in compliance with applicable PJM and Transmission Owner standards.

General

Lendlease Energy Development LLC, the Interconnection Customer (IC), has proposed an increase in output of their future **solar** generating facility to be located at 631 Bocktown Cork Road in Clinton, Pennsylvania. The uprate will increase the maximum facility output (MFO) of the facility by 8.3 MW for a total MFO of 20 MW. The uprate will also increase the Capacity value by 3.15 MW, for a total of 7.55 MW being recognized by PJM as Capacity. See the table below for clarity on the original AC2-168 request and the proposed increase with AD1-135. This AD1-135 uprate project is expected to be in commercial operation by **May 31, 2020**.

Attachment facilities and local upgrades (if required) along with terms and conditions to interconnect AC2-168 and AD1-135 will be specified in a separate two party Interconnection Agreement (IA) between Duquesne Light Company and the Interconnection Customer as this project is considered FERC non-jurisdictional per the PJM Open Access Transmission Tariff (OATT). From the transmission perspective, no network impacts were identified as detailed below.

Queue Number	MFO (MW)	Capacity (MW)	Energy (MW)
AC2-168	11.7	4.4	11.7
AD1-135	20 (8.3 MW increase)	3.15	8.3
Total	20	7.55	20

Point of Interconnection

AD1-135 "Clinton 23 kV II" will interconnect with the Duquesne Light Company distribution system by tapping the Clinton 23 kV system as shown in **Attachment 1.**

Cost Summary

The **AD1-135** project will be responsible for the following costs.

Description	Total Cost
Attachment Facilities	To be provided in the IA
Allocation for Transmission Upgrades	$0
Total Costs	**To be provided in the IA**

Duquesne Light Company Scope of Work:

Scope, cost, and schedule will be provided in the Interconnection Agreement between the Interconnection Customer and Duquesne Light Company.

Interconnection Customer Requirements

Duquesne Light Company's "Facility Interconnection Requirements" document dated 12/30/2015:

http://www.pjm.com/planning/design-engineering/to-tech-standards/private-duquesne.aspx

Revenue Metering and SCADA Requirements

PJM Requirements

The Interconnection Customer will be required to install equipment necessary to provide Revenue Metering (KWH, KVARH) and real time data (KW, KVAR) for IC's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Sections 24.1 and 24.2.

Duquesne Light Company Requirements

The Transmission Owner will install, own and maintain the metering equipment. The metering equipment will be installed on the side of the Point of Interconnection for the IC's Facility, but the metering equipment will reside inside the Transmission Owner's Clinton Substation. The IC's facility shall be independently metered, and the IC shall provide the communication link required to send the Revenue Metering and real time data directly to PJM. All costs associated with the installation and maintenance of the metering equipment (including upgrades) shall be the responsibility of the IC. The metering installed for the AC2-168 project should fulfill the metering requirements for this AD1-135 uprate project.

Network Impacts (by PJM)

The Queue Project AD1-135 was evaluated as a 8.3 MW (Capacity 3.2 MW) injection at Clinton 138 kV substation in the Duquesne Light Company area. Project AD1-135 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AD1-135 was studied with a commercial probability of 100%. Potential network impacts were as follows:

Summer Peak Analysis - 2021

Generator Deliverability
(Single or N-1 contingencies for the Capacity portion only of the interconnection)

None

Multiple Facility Contingency
(Double Circuit Tower Line, Fault with a Stuck Breaker, and Bus Fault contingencies for the full energy output)

None

Contribution to Previously Identified Overloads
(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

None

Steady-State Voltage Requirements
(Results of the steady-state voltage studies should be inserted here)

None

Short Circuit
(Summary of impacted circuit breakers)

None

Affected System Analysis & Mitigation

None

Delivery of Energy Portion of Interconnection Request
PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.
Only the most severely overloaded conditions are listed. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed, which will study all overload conditions associated with the overloaded element(s) identified.

None

Light Load Analysis - 2020

Light Load Studies to be conducted during later study phases (as required by PJM Manual 14B).

Not Required for this solar queue request.

System Reinforcements

Short Circuit
(Summary form of Cost allocation for breakers will be inserted here if any)

None

Stability and Reactive Power Requirement
(Results of the dynamic studies should be inserted here)

None

Summer Peak Load Flow Analysis Reinforcements

New System Reinforcements
(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)
(Summary form of Cost allocation for transmission lines and transformers will be inserted here if any)

None

Light Load Load Flow Analysis Reinforcements

New System Reinforcements
(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this project generation)

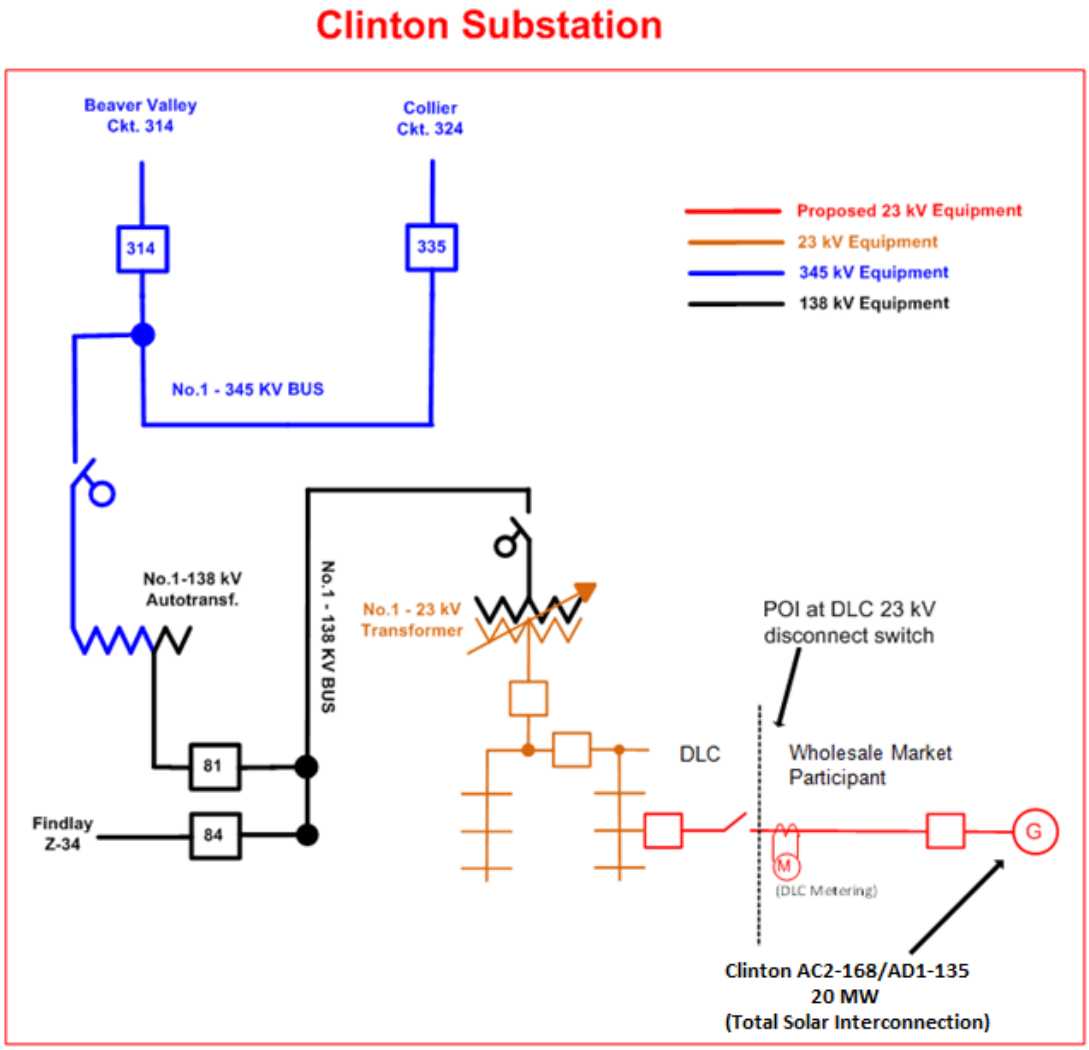
None

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)
(Summary form of Cost allocation for transmission lines and transformers will be inserted here if any)

None

Attachment 1
Interconnection Single Line Diagram

AD1-135 "Clinton 23 kV II" Generation Project



Attachment 2
Site Location

AD1-135 "Clinton 23 kV II" Generation Project