Transmission Interconnection Combined Feasibility/System Impact Study Report

For

PJM Transmission Interconnection Request Queue Position AD2-083

"Larrabee 230 kV"

August 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 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 must be designed to meet the technical specifications (on PJM web site) for the appropriate Transmission Owner.

Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The Interconnection Customer may be 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

Anbaric Development Partners, LLC, the Interconnection Customer (IC), has proposed a 0 MW Energy, 0 MW Capacity AC offshore wind transmission system designed to inject offshore wind energy, developed and operated by others, into the Larrabee 230 kV Substation. Major equipment includes an AC offshore transformer platform, 230/66 kV transformers, protection and control equipment, shunt reactors, and a 230 kV submarine cable delivery system to the Larrabee Substation. The facility is located in the Atlantic Ocean off the coast of New Jersey at coordinates; Latitude: 40.1140000, Longitude: -74.1920000.

PJM studied AD2-083 as a 0 MW injection into the Atlantic City Electric system at the Larrabee 230 kV. The planned in-service date, as requested in the Attachment S application is **December 31, 2025.**

Point of Interconnection

The Interconnection Customer requested a Point of Interconnection at the Jersey Central Power & Light Company's Larrabee 230 kV Substation.

Cost Summary

The **AD2-083 "Larrabee 230 kV"** project will be responsible for the following costs.

Work Description	Total Cost	Tax	Total Cost with Tax
Larrabee Substation Upgrade: Install 2 new 230kV breakers and bus work for new line exit for AD2-083 Merchant Transmission Line connection.	$2,386,000	$378,700	$2,764,700

Lakewood-Larrabee (K2011) 230 kV Line Re-termination: Re-terminate the Lakewood Gen-Larrabee (K2011) 230kV line at the re-configured Larrabee substation.	$542,400	$81,800	$624,200
Total	**$2,928,400**	**$460,500**	**$3,388,900**

The transmission and substation costs given above show the Contribution in Aid of Construction ("CIAC") Federal Income Tax Gross up charge. This gross up tax would apply to a Merchant Transmission project.

Transmission Owner Scope of Work

Direct Connection Requirements

Substation Work

Scope: At Larrabee Substation, expand the northwest bus and install and new breaker and a half layout with two (2) new breakers for the proposed transmission interconnection request AD2-083. See **Attachment 1** for a one line diagram of the interconnection.

Transmission Work

Scope: Re-terminate the existing K2011 (Larrabee to Lakewood 230 kV) to new terminal. See **Attachment 1** for a one line diagram of the interconnection.

Schedule

Based on the extent of the JCP&L primary direct connection required to support the AD2-083 Merchant Transmission project, it is expected to take a minimum of **18 months** from the date of fully executed applicable agreements to complete the installation required for the project. The schedule above is based on the assumption that there will be no environmental issues with any of the new properties associated with this project, that there will be no delays in acquiring any necessary permits, and that PJM will allow all transmission system outages when requested.

Transmission Network Impacts

Potential transmission network impacts are 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

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 - 2021

None

Winter Analysis - 2021

None

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)

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)

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

Winter 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)

None

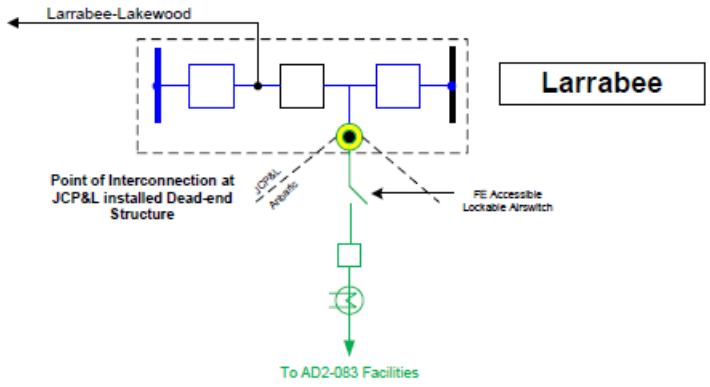
Contribution to Previously Identified System Reinforcements
(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project. This project may have a % allocation cost responsibility which will be calculated and reported for the Impact Study)
(Summary form of Cost allocation for transmission lines and transformers will be inserted here if any)

None

Attachment 1: One Line Diagram
AD2-083

Anbaric Development Partners, LLC

New 230kV Interconnection



ATTACHMENT FACILITIES
By 4/30/2025:
- Expand Northwest bus and install new breaker and a half layout with (2) new breakers
- Re-terminate circuit K2011 (Larrabee to Lakewood 230kV) to new terminal

JCP&L (Existing)
JCP&L (New)
Customer

BY: T. Cline	FirstEnergy EDPP PLAN	DIST. CODE:	OPERATING COMPANY: JERSEY CENTRAL POWER & LIGHT	REGION: CENTRAL	AREA
APP:		SCALE: NS	FACILITY: Larrabee 230kV Substation		
DATE: 8/21/2018		SIZE: 8.5x11	TITLE: New 230kV Interconnection at Larrabee 230kV Substation PJM Queue AD2-083		
ISSUE:			RFA NO: JC-18-180621-151054	FILE NAME: AD2-083 Direct Connect_Plan Drawing.vsd	REV:
REVISION NOTES:					