Generation Interconnection Facility Study Report

For

PJM Generation Interconnection Request Queue Position AD2-073

"Sanders DP 230 kV"

13.32 MW Capacity / 19.92 MW Energy

December, 2020

General

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff §207, as well as the Facilities Study Agreement between Westmoreland County Solar Project, LLC, (Interconnection Customer (IC)) and PJM Interconnection, LLC (Transmission Provider (TP)). IC has proposed a solar generating facility located in Warsaw, Virginia (Westmoreland Township). The installed facilities will have a total capability of 19.92 MW with 13.32 MW of this output being recognized by PJM as capacity. The expected Commercial Operation Date for this project is by December 1, 2021. **This study does not imply an ITO commitment to this in-service date.**

Attachment facilities and local upgrades (if required) along with terms and conditions to interconnect AD2-073 will be specified in a separate two party Interconnection Agreement (IA) between Northern Neck Electric Cooperative and the Interconnection Customer as this project is considered FERC non-jurisdictional per the PJM Open Access Transmission Tariff (OATT).

Point of Interconnection

AD2-073 "Sanders DP 230 kV" will interconnect to the Northern Neck Electric Cooperative and participate in the PJM market via a Wholesale Market Participation Agreement (WMPA) with VEPCO and PJM. The Point of Interconnection for purposes of effectuating sales of Capacity or energy into PJM's wholesale markets is shown as a yellow star on the high side of the 230-34.5 kV transformer at the Sanders DP Substation in **Attachment 1**. This is the point of demarcation between VEPCO and the Northern Neck Electric Cooperative. The physical interconnection point to the system (point of common coupling) will be on the Northern Neck Electric Cooperative 34.5 kV system via a single 34.5 kV breaker. This point of common coupling is shown as a blue triangle in Attachment 1. The VEPCO system feeds the Sanders DP 230 kV Substation. See the one line in Attachment 1 for clarity.

Cost Summary

The AC1-042 project will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	$ 0
Direct Connection Network Upgrades	$ 0
Non Direct Connection Network Upgrades	$ 0
Allocation for New System Upgrades	$ 3,673
Contribution for Previously Identified Upgrades	$ 0
Total Costs	**$ 3,673**

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A. Transmission Owner Facilities Study Summary

1. Description of Project

Queue AD2-073 is a request to interconnect a 19.92 MW new solar generating facility to be located in Warsaw, Virginia (Westmoreland Township). The proposed generating facility will interconnect to the Northern Neck Electric Cooperative. The Point of Interconnection is at the Sanders DP substation in Attachment 1. This is the point of demarcation between VEPCO and the Northern Neck Electric Cooperative. The physical interconnection point to the system (point of common coupling) will be on the Northern Neck Electric Cooperative 34.5 kV system via a single 34.5 kV breaker. This point of common coupling is shown as a blue triangle in Attachment 1.

2. Amendments to the System Impact Study data or System Impact Study Results

None

3. Scope of Customer's Work

IC will build a solar generating facility in Warsaw County, Virginia. The generating facility (Westmoreland County Solar Project) will be comprised of solar arrays. AD2-073 consists of 8 x 2.5 MW TMEIC PVH-L2700GR inverters. The 8 x 34.5/0.60 kV grounded wye, wye 2.7 MVA generator step up transformers will connect to the solar inverters to the 34.5 kV collector system.

4. Description of Facilities Included in the Facilities Study

The ITO's System Protection Engineering Department reviewed the transmission line protection as well as anti-islanding required to accommodate the new generation from queue AD2-073.

5. Total Costs of Transmission Owner Facilities included in Facilities Study

	Direct		Indirect		
Work Description	Labor	Material	Labor	Material	Total Cost
Line #2076 transfer trip to Sanders DP (n6635)	$3,049	$ 0	$624	$ 0	$3,673

6. Summary of Milestone Schedules for Completion of Work Included in Facilities Study:

Facilities are estimated to take 14 - 24 months to construct and this is based on the ability to obtain outages to construct and test the proposed facilities.

Proposed Schedule

- Detailed design: 6-12 months
- Permitting: 6-12 months (Timeline runs concurrent with design)
- Construction 8 to 12 months

B. Transmission Owner Facilities Study Results

1. Upgrades to Substation / Switchyard Facilities

PJM Network Upgrade n6635 - Remote protection and communication work. ITO protection requirements to reliably interconnect the proposed generating facility determined that transfer trip to the generation facility is required in the event of a trip of the #2076 Dahlgren – Northern Neck 230kV line. The ITOs only scope of work will be to coordinate with the Northern Neck Electric Cooperative.

The ITO recommends the following scope of work to Northern Neck Electric Cooperative (NNEC) for the installation of a Line 2076 Transfer Trip Receivers at Sanders DP:

> NNEC will be responsible to procure, install and maintain the transfer trip equipment at their facility. These transfer trip receivers will receive line #2076 transfer trips from Northern Neck and Dahlgren substations. The transfer trip receivers will provide a trip output via PRS relays to NNEC, so that NNEC can trip the AD2-073 generation facility from feeding into Sanders DP in the event of a line #2076 fault to prevent the generator from sourcing the fault.

2. Metering & Communications

PJM Requirements

The IC 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.

ITO Requirements

Metering and SCADA/Communication equipment must meet the requirements outlined in section 3.1.6 Metering and Telecommunications of ITO's Facility Interconnection Connection Requirement NERC Standard FAC-001 which is publically available at www.dom.com.

At the IC's expense, the ITO will supply and own at the Point of Interconnection bi-directional revenue metering equipment that will provide the following data:

a. Hourly compensated MWh received from the Customer Facility to the ITO;
b. Hourly compensated MVARh received from the Customer Facility to the ITO;
c. Hourly compensated MWh delivered from the ITO to the Customer Facility; and
d. Hourly compensated MVARh delivered from the ITO to the Customer Facility.

The IC will supply and own metering equipment that will provide Instantaneous net MW and MVar per unit values in accordance with PJM Manuals M-01 and M-14D, and Sections 8.1 through 8.5 of Appendix 2 to the ISA;

The IC will access revenue meter via wireless transceivers or fiber cabling to meter with RS-485 or Ethernet communication port for dial-up reads. IC must provide revenue and real time data to PJM from Interconnection Customer Market Operations Center per "PJM Telemetry Data Exchange Summary" document available at PJM.com.

3. Environmental, Real Estate and Permitting Issues

- None

Attachment 1.
Single Line