



434 Fayetteville Street
Suite 2800
Raleigh, NC 27601
☎ 919.755.8700 📠 919.755.8800
WWW.FOXROTHSCHILD.COM

BENJAMIN L. SNOWDEN
Direct No: 919-719-1257
Email: bsnowden@foxrothschild.com

December 14, 2023

Ms. A. Shonta Dunston
Chief Clerk
North Carolina Utilities Commission
430 N. Salisbury Street
Raleigh, NC 27603

Re: *In the Matter of Application of Aulander Holloman Solar, LLC, for a Certificate of Public Convenience and Necessity to Construct an 80-MW Solar Facility in Bertie County, North Carolina*
NCUC Docket Nos. SP-5259, Sub o and EMP-120, Sub o
(PUBLIC / REDACTED)

Dear Ms. Dunston:

In response to questions raised and information requested by Commissioners at the December 11, 2023, Staff Conference, Aulander Holloman Solar LLC (“Aulander Holloman” or “the Applicant”) provides the following information regarding the Aulander Holloman Project and other solar projects owned by Aulander Holloman’s parent company, SunEnergy1 LLC (“SE1”). The following issues are addressed: (1) affected system impacts from the uprate at Aulander Holloman; (2) the planned sale of the Aulander Holloman project; (3) SE1’s other merchant facilities in North Carolina; (4) the compliance of SE1’s other merchant plants with the AC capacity limits in their certificates of public convenience and necessity (CPCNs); and (5) steps that SE1 is taking to ensure compliance with NCUC requirements going forward.

For the reasons discussed below, SE1 respectfully requests that the Commission issue a decision approving the amendment of the Aulander Holloman CPCN as soon as possible.

A Pennsylvania Limited Liability Partnership

1. Affected System Impacts from Aulander Holloman project uprate

At Staff Conference, Chair Mitchell asked whether the increase in Aulander Holloman's maximum injection capacity from 80 MWac to 99.9 MWac (the "uprate") could cause operational issues or other impacts on the Duke Energy Progress System. The Public Staff's Engineer, Mr. Lawrence, accurately stated that PJM considered whether the Aulander Holloman uprate could cause such impacts and determined that they would not.

Pursuant to its Open Access Transmission Tariff, during the system impact study PJM identifies whether any neighboring systems might be impacted by a generator interconnection request. PJM notifies the operators of any system identified as potentially impacted so that the Affected System operator can conduct further study to determine whether such impacts may occur. If PJM's study process does not identify any potentially affected systems, no impacts are likely, and no study is conducted.

The Aulander Holloman uprate was studied by PJM under interconnection request no. AE1-035. The System Impact Study Report, which was issued in August 2019 and revised in January 2020, specifically concludes that there are no identified impacts to DEP and no other Affected Systems.¹

Commissioners also expressed concern at Staff Conference about the potential that a solar generator could increase its capacity without approval and cause impacts to the system. Aulander Holloman requested and received approval from PJM and Dominion Energy to operate at the increased capacity to 99.9 MWac. Aulander Holloman is obligated to operate within the terms and conditions of its Interconnection Service Agreement (ISA), which among other things limits the export of the project to the grid to the maximum capacity specified in the agreement. If Aulander Holloman were to exceed that maximum capacity, it would be in violation of its ISA and could face disconnection, termination of its ISA, or other consequences. Moreover, Aulander Holloman is required to provide real-time metering data to PJM, which would immediately detect any exceedance of the project's export limits.

¹ The 2019 and 2020 System Impact Studies are included as Attachments A and B hereto.

2. The Aulander Holloman sale

Commissioners inquired at Staff Conference whether SE1 is selling any assets other than the Aulander Holloman project. SE1 confirms that it has also contracted to sell Ranchland Solar, a 60 MWac solar project operating in Currituck County, in the same transaction.² SE1 will file a notice of the change of control in Ranchland Solar's CPCN docket.

SE1 also wishes to clarify an inadvertent misstatement made by Mr. Drooz on SE1's behalf at Staff Conference. Mr. Drooz (appearing at Staff Conference instead of the undersigned counsel, who was unable to attend for health reasons) stated that FERC had already approved the transaction and that the amended CPCN is the only approval required before the sale of Aulander Holloman can close. Although FERC approval under Section 203 of the Federal Power Act is expected imminently, it has not yet been obtained.

It is extremely important to SE1's financial health that this transaction close before December 25, 2023. The last three years have been very difficult for all solar companies in the United States. Business has been subject to tax credit sunsets without clear extension, capital constraints, pricing uncertainty, and other headwinds. Although the Inflation Reduction Act has helped tremendously, it has taken a long time for those benefits to materialize. Guidance from the IRS on some of the available tax credits has only been issued in recent months, almost three years after the commencement of the new Administration.

SE1 is a North Carolina based company founded in 2009. It has approximately 250 employees and operates almost exclusively in North Carolina. SE1 has developed and built over 1000 MW of solar projects in the state. Since the onset of the COVID pandemic, SE1 has been treading water, waiting for the extension of the federal investment tax credits to finance and build again.

[REDACTED]

The sale of Aulander Holloman and Ranchland are much needed by SE1 [REDACTED] and provide cash to continue operations.

[REDACTED]

² Ranchland Solar was issued an amended CPCN in docket no. SP-8244 Sub o, on August 9, 2016.

In that case SE1 would be deprived of much-needed capital, would be delayed in constructing other projects, and could have difficulty meeting other financial obligations.

3. Applicant's other merchant facilities

Commissioners also asked whether the Applicant's owner, SE1, also owns other merchant facilities selling into PJM. In addition to Aulander Holloman, SE1 owns the following merchant projects currently operating in North Carolina:

Project	Permitted Capacity (MWac)	NCUC Docket
Albemarle Beach	80	EMP-103, Sub o
Ranchland Solar	60	SP-8244 Sub o
Colice Hall	17	SP-8465, Sub o

SE1 also owns the following projects, currently in development, which either have CPCNs or have CPCN applications currently pending before the Commission:

Project	Planned Capacity (MWac)	NCUC Docket
Pitt Solar	80	EMP-102, Sub 1
Shawboro East Ridge Solar	150	EMP-117, Sub o (application pending)
Oak Solar	120	EMP-112, Sub o
Cherry Solar	180	EMP-115, Sub o (application pending)

In addition to merchant projects, SE1 owns a number of non-merchant solar projects, ranging in size from approximately 166 kW to more than 20 MW, which sell their output pursuant to contracts entered into under PURPA.

4. Merchant plant compliance with CPCN capacity

Commissioners also asked whether SE1 has made similar uprates to other facilities that also require approval from the Commission. SE1 has determined that one additional merchant solar project, Albemarle Beach Solar LLC, recently implemented an uprate similar to Aulander Holloman.

Albemarle Beach received a CPCN in docket no. EMP-103, Sub o on July 15, 2019. On January 21, 2020, Albemarle Beach filed a request to amend the CPCN (the "Albemarle CPCN Amendment") to (a) add additional parcels of land to the project footprint, enabling it to add more panels (which would increase the DC rating of the project) in a possible second phase of development, and (b) increase the AC capacity of the project. Albemarle Beach also filed a request to PJM to study an increase in AC injection capability from 80 MW to 140 MW. This request was assigned PJM queue no. AE2-034.

In an order issued on August 13, 2020, the Commission determined the application for an amendment to be incomplete and directed the applicant to provide additional information regarding network upgrades or affected system upgrades triggered by the facility, as well as the applicant's offtake plans. On October 20, 2020, the Commission stayed the proposed amendment at the Applicant's request.

The Albemarle Beach facility was constructed in compliance with the certificated site plan in the original, issued CPCN. The proposed additional parcels referenced in the Albemarle CPCN Amendment were not needed or utilized.

In June 2022, Albemarle Beach received a final system impact study for the increase in AC capacity. On July 7, 2023, Albemarle Beach signed an ISA, which PJM authorized on August 28, 2023, to be effective as of July 27, 2023. That uprate was completed in July 2023. Like the uprate at Aulander Holloman, the Albemarle Beach uprate consisted only of changes to inverter and transformer settings, and did not involve the addition of panels or any other construction activity.

The System Impact Study for the Albemarle Beach uprate considered the potential impacts of the uprate on affected systems. That report initially identified Duke Energy Progress as a potentially affected system, with respect to an overload on the Everetts-Greenville 230 kV line. However, DEP has since determined that certain projects in the AD1 cluster are responsible for that overload, and has assigned the costs of that upgrade to those projects.³ The Albemarle Beach uprate has been determined not to be responsible for those impacts and has not been assigned any cost responsibility for Affected System Upgrades.

³ Affected System Study conducted for PJM Interconnection Cluster AE1 (November 30, 2023), at https://www.oasis.oati.com/woa/docs/CPL/CPLdocs/DEP_Affected_System_Study_for_PJM_Cluster_AE1_r3.pdf

SE1 has not performed uprates at any of its other merchant facilities, and affirms that none of its other merchant facilities are operating at a capacity higher than that reflected in their CPCN.

5. Steps to ensure compliance with NCUC requirements going forward

SE1 has changed the inverter and transformer settings at both Albemarle Beach and Aulander Holloman solar to prevent either project from exporting more than 80 MWac (unless and until the Commission approves the uprates), so that both projects are now operating in compliance with their existing CPCNs. Nevertheless, SE1 acknowledges that it was required by Commission Rule R8-63(d)(3) to notify the Commission of the change to the capacity of Albemarle Beach and request an amendment of its CPCN, and that it failed to do so prior to performing the uprate in July 2023. SE1 failed to notify the Commission of this uprate for the same reason it failed to notify the Commission of the Aulander Holloman uprate: it mistakenly believed that PJM's studies and approval of the change in AC capacity, and the execution of ISAs among the project company, PJM and Dominion, as submitted to FERC, were sufficient; and that because the uprate did not involve any additional construction activity it did not have to be approved by this Commission.

SE1 is preparing a proposed amendment to the Albemarle Beach CPCN to reflect the uprate. That application will include testimony addressing in more detail the issues identified in the Commission's August 13, 2020, order deeming the prior amendment application to be incomplete; the interconnection studies performed by PJM and DEP relating to that uprate; and the circumstances relating to Albemarle Beach's failure to notify the Commission of the uprate.

SE1 understands that this was a serious error, and that these events may raise concerns on the part of the Commission about SE1's overall regulatory compliance. The company takes its regulatory obligations seriously, and intends to undertake a review of compliance with NCUC requirements across its generating portfolio and implement procedures to insure continued compliance going forward. SE1 plans to report the results of that review within 60 days.

In addition, in support of the Albemarle Beach amendment, SE1 will provide testimony from the company's President and CEO, Kenny Habul, relating to the company's overall approach to regulatory compliance. In the event that an evidentiary hearing is held on



December 14, 2023
Page 7

that amendment, Mr. Habul will be available to answer Commissioner questions regarding the Albemarle Beach uprate as well as the company's general compliance approach.

SE1 respectfully requests that the Commission issue a decision approving the Aulander Holloman CPCN amendment as soon as possible.

Sincerely,

/s/Benjamin L. Snowden

Ben Snowden
Counsel for Aulander Holloman Solar LLC

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NOS. SP-5259, SUB 0
EMP-120, SUB 0
BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of	)	
Application of Aulander Holloman Solar,	)	
LLC, for a Certificate of Public Convenience	)	VERIFICATION
and Necessity to Construct an 80-MW Solar	)	
Facility in Bertie County, North Carolina	)	

I, Kenny Habul, being first duly sworn, depose and say that I am Manager of Aulander Holloman Solar, LLC, and in such capacity, I have read the foregoing and know the contents thereof, and by my signature below verify that the contents are true and correct to the best of my knowledge.



Kenny Habul

Fairfield County, Connecticut

Signed and sworn before me this day by
Kenny Habul

Date: December 13, 2023



Notary Public

My Commission Expires: 8/31/28

***Generation Interconnection
System Impact Study Report***

For

***PJM Generation Interconnection Request
Queue Position AA1-065***

***Earleys 230kV
53.6MW Capacity / 80MW Energy***

October / 2015

Introduction

This System Impact Study (SIS) has been prepared in accordance with the PJM Open Access Transmission Tariff, Section 205, as well as the System Impact Study Agreement between Aulander Holloman Solar, LLC, the Interconnection Customer (IC) and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is Virginia Electric and Power Company (VEPCO).

Preface

The intent of the 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 IC. As a requirement for interconnection, the IC 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 IC 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 will be deferred until the System Impact Study is performed.

The System Impact Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The IC 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

The IC has proposed a solar generating facility located at NC 42 and Joe Holloman Road in Aulander, NC. The installed facilities will have a total capability of 80 MW with 53.6 MW of this output being recognized by PJM as capacity. The proposed in-service date for this project is 12/31/2015. **This study does not imply an ITO commitment to this in-service date.**

Point of Interconnection

AA1-065 will interconnect with the ITO transmission system as a tap onto the Earleys 230kV substation bus.

Cost Summary

The AA1-065 interconnection request will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	\$ 645,000
Direct Connection Network Upgrades	\$2,716,713
Non Direct Connection Network Upgrades	\$ 0
Allocation for New System Upgrades	\$ 0
Contribution for Previously Identified Upgrades	\$ 0
Total Costs	\$3,361,713

Attachment Facilities

Generation Substation: Install metering and associated protection equipment. Estimated Cost \$645,000.

The estimated total cost of the Attachment Facilities is \$645,000. These preliminary cost estimates are based on typical engineering costs. A more detailed engineering cost estimates are normally done when the IC provides an exact site plan location for the generation substation during the Facility Study phase. These costs do not include CIAC Tax Gross-up. The single line is shown below in Attachment 1.

Direct Connection Cost Estimate

Substation: The proposed interconnection substation will consist of a two breaker 230 kV breakers added to an existing station. The estimated cost of this work scope is \$2,716,713. It is estimated to take 18-24 months to complete this work after execution of the ISA and ICSA.

The total preliminary cost estimate for Direct Connection work is given in the table below:

Description	Total Cost
Substation	\$2,716, 713
Transmission	\$0
Total	\$2,716,713

Interconnection Customer Requirements

ITO's Facility Connection Requirements as posted on PJM's website
<http://www.pjm.com/~media/planning/plan-standards/private-dominion/facility-connection-requirements1.ashx>

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.

Interconnected Transmission Owner Requirements

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

Network Impacts

The Queue Project AA1-065 was studied as an 80.0 MW (Capacity 53.6 MW) injection at the Earleys 230 kV substation in the ITO's area. Project AA1-065 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AA1-065 was studied with a commercial probability of 100%. Potential network impacts were as follows:

Contingency Descriptions

The following contingencies resulted in overloads:

Contingency Name	Description
LN 2056-2058	OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-RMOUNT#4230.00 - 6NASH 230.00 OPEN BRANCH FROM BUS 313829 TO BUS 314591 CKT 1 /* 6BATTLEBORO 230.00 - 6NASH 230.00 OPEN BUS 314591 /* ISLAND OPEN BRANCH FROM BUS 304222 TO BUS 314564 CKT 1 /* 6ROCKYMT230T230.00 - 6EDGEOM 230.00 END
2056&2058	OPEN BRANCH FROM BUS 313829 TO BUS 314591 CKT 1 /* 2056 BATTLEBORO OPEN BRANCH FROM BUS 314591 TO BUS 304226 CKT 1 /* 2056 OPEN BRANCH FROM BUS 304226 TO BUS 304222 CKT 1 /* 2056 OPEN BRANCH FROM BUS 314564 TO BUS 304222 CKT 1 /* 2058 ROCKY MT END

ATTACHMENT A
SP-5259 SUB 0 AND EMP-120 SUB 0

Summer Peak Analysis – 2018

Generator Deliverability

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

#	Contingency		Affected Area	Facility Description	Bus		Circuit	Power Flow	Loading %		Rating		MW Contribution
	Type	Name			From	To			Initial	Final	Type	MVA	
1	DCTL	LN 2056-2058	DVP - CPLE	3BTLEBRO-3ROCKYMT115T 115 kV line	314554	304223	1	AC	114.47	118.09	ER	94	4.06
2	DCTL	2056&2058	DVP - CPLE	3BTLEBRO-3ROCKYMT115T 115 kV line	314554	304223	1	AC	112.4	116.02	ER	94	4.06

The PJM baseline project (b1794) will eliminate the identified overloads. The scheduled in service date b1794 is 06/01/2016.

Multiple Facility Contingency

(Double Circuit Tower Line contingencies were studied for the full energy output. The contingencies of Line with Failed Breaker and Bus Fault is performed for the Impact Study.)

None

Short Circuit

(Summary of impacted circuit breakers)

New circuit breakers found to be over-duty:

None

Contributions to previously identified circuit breakers found to be over-duty:

None

ATTACHMENT A
SP-5259 SUB 0 AND EMP-120 SUB 0

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

(Summary of the VAR requirements based upon the results of the steady-state voltage studies)

None

Stability and Reactive Power Requirement for Low Voltage Ride Through

(Summary of the VAR requirements based upon the results of the dynamic studies)

None

New System Reinforcements

(Upgrades required to mitigate reliability criteria violations, i.e. Network Impacts, initially caused by the addition of this interconnection request)

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 is calculated and reported for the Impact Study)

The PJM baseline project (b1794) will eliminate the identified overloads. The scheduled in service date b1794 is 06/01/2016.

Potential Congestion due to Local Energy Deliverability

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 IC can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

ATTACHMENT A
SP-5259 SUB 0 AND EMP-120 SUB 0

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this interconnection request by resolving only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

None

Light Load Analysis in 2018

Light Load Studies not required per PJM Manual 14B.

ITO Analysis

ITO assessed the impact of the proposed Queue Project #AA1-065 interconnection of 80 MW of energy (Capacity 53.6 MW) for compliance with reliability criteria on ITO's Transmission System. The system was assessed using the summer 2018 RTEP case provided to ITO by PJM. When performing a generation analysis, ITO's main analysis will be load flow study results under single contingency and multiple facility contingency (both normal and stressed system conditions). ITO Criteria considers a transmission facility overloaded if it exceeds 94% of its emergency rating under normal and stressed system conditions. A full listing of ITO's Planning Criteria and interconnection requirements can be found in the ITO's Facility Connection Requirements which are publicly available at: <http://www.dom.com>.

The results of these studies evaluate the system under a limited set of operating conditions and do not guarantee the full delivery of the capacity and associated energy of this proposed interconnection request under all operating conditions. NERC Planning and Operating Reliability Criteria allow for the re-dispatch of generating units to resolve projected and actual deficiencies in real time and planning studies. Specifically NERC Category C Contingency Conditions (Bus Fault, Tower Line, N-1-1, and Stuck Breaker scenarios) allow for re-dispatch of generating units to resolve potential reliability deficiencies. For ITO Planning Criteria the re-dispatch of generating units for these contingency conditions is allowed as long as the projected loading does not exceed 100% of a facility Load Dump Rating.

As part of its generation impact analysis ITO routinely evaluates the impact that a proposed new generation resource will have under maximum generation conditions, stress system conditions and import/export system conditions. The results of these studies are discussed in more detail below.

Category B Analysis (Single Contingency):

- System Normal – No deficiencies identified
- Critical System Condition (No Surry 230 kV Unit) – No deficiencies identified.

Category C Analysis: (Multiple Facility Contingency)

- Bus Fault - No deficiencies identified

ATTACHMENT A
SP-5259 SUB 0 AND EMP-120 SUB 0

- Line Stuck Breaker - No deficiencies identified
- Tower Line – No deficiencies identified

As part of its generation impact analysis ITO routinely evaluates the impact that a proposed new generation resource (greater than 20 MW) will have under maximum generation conditions, stress system conditions and import/export system conditions. The results of these studies are discussed in Table A and B below.

Table A: Import Study Results

Import Study Results			
Area	Summer 2018	Summer 2018 with AA1-065	Limiting Element
AEP	2000+	2000+	None
APS	2000+	2000+	None
CPL	2000+	2000+	None
PJM	2000+	2000+	None

Table B: Export Study Results

Export Study Results			
Area	Summer 2018	Summer 2018 with AA1-065	Limiting Element
AEP	2000+	2000+	None
APS	2000+	2000+	None

ATTACHMENT A
SP-5259 SUB 0 AND EMP-120 SUB 0

CPL	2000+	2000+	None
PJM	2000+	2000+	None

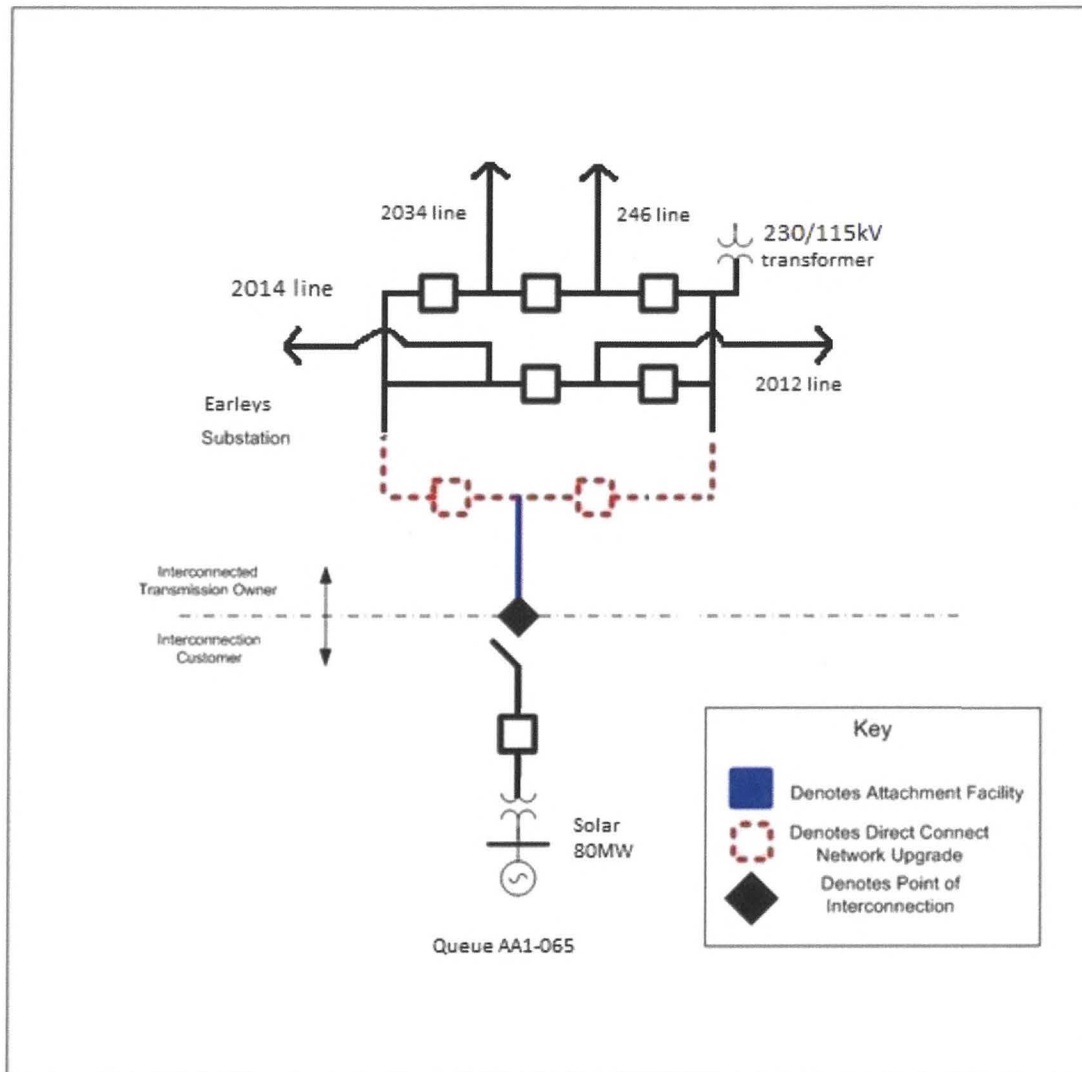
ITO's Planning Criteria indicates a need to have approximately 2000 MW of import and export capability. The results of these import and export studies indicate that the proposed AA1-065 (Transfer) will not impact ITO's import or export capability

Affected System Analysis & Mitigation

Duke Energy:

None

Attachment 1.
System Configuration



Appendices

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact.

It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

Appendix 1

(DVP - CPLE) The 3BTLEBRO-3ROCKYMT115T 115 kV line (from bus 314554 to bus 304223 ckt 1) loads from 114.47% to 118.09% (AC power flow) of its emergency rating (94 MVA) for the tower line contingency outage of 'LN 2056-2058'. This project contributes approximately 4.06 MW to the thermal violation.

CONTINGENCY 'LN 2056-2058'

OPEN BRANCH FROM BUS 304226 TO BUS 314591 CKT 1 /* 6PA-
RMOUNT#4230.00 - 6NASH 230.00
OPEN BRANCH FROM BUS 313829 TO BUS 314591 CKT 1 /* 6BATTLEBORO
230.00 - 6NASH 230.00
OPEN BUS 314591 /* ISLAND
OPEN BRANCH FROM BUS 304222 TO BUS 314564 CKT 1 /*
6ROCKYMT230T230.00 - 6EDGECON 230.00
END

<i>Bus Number</i>	<i>Bus Name</i>	<i>Full Contribution</i>
315139	1GASTONA	1.04
315141	1GASTONB	1.03
315126	1ROARAP2	0.47
315128	1ROARAP4	0.45
315134	1ROAVALA	1.4
315135	1ROAVALB	0.37
315136	1ROSEMG1	0.85
315138	1ROSEMG2	0.4
315137	1ROSEMS1	0.53
314539	3UNCAMP	0.84
314541	3WATKINS	0.27
900672	V4-068 E	0.14
907092	X1-038 E	2.09
917331	Z2-043 C	0.88
917332	Z2-043 E	0.38
917341	Z2-044 C	3.72
917342	Z2-044 E	1.59
917591	Z2-099 C	0.5
917592	Z2-099 E	0.22
LTF	AA1-053	5.92
LTF	AA1-054	5.02
LTF	AA1-055	9.16
918481	AA1-063AC OP	5.98
918482	AA1-063AE OP	2.82
918511	AA1-065 C OP	2.72
918512	AA1-065 E OP	1.34
918561	AA1-072 C	0.13
918562	AA1-072 E	0.06



**Generation Interconnection
System Impact Study Report
for
Queue Project AE1-035
EARLEYS 230 KV
13.4 MW Capacity / 20 MW Energy**

Revised January, 2020

August, 2019

Table of Contents

1	Introduction.....	3
2	Preface.....	3
3	General.....	3
3.1	Point of Interconnection	4
3.2	Cost Summary.....	4
4	Transmission Owner Scope of Work.....	4
4.1	Attachment Facilities.....	4
5	Interconnection Customer Requirements.....	5
5.1	System Protection.....	5
5.2	Compliance Issues and Interconnection Customer Requirements	5
5.3	Power Factor Requirements.....	5
6	Revenue Metering and SCADA Requirements	6
6.1	PJM Requirements.....	6
6.1.1	Meteorological Data Reporting Requirement.....	6
6.2	Dominion Requirements.....	6
7	Network Impacts	6
8	Generation Deliverability	8
9	Multiple Facility Contingency	8
10	Contribution to Previously Identified Overloads	8
11	Potential Congestion due to Local Energy Deliverability.....	8
12	System Reinforcements.....	9
13	Flow Gate Details	9
13.1	Contingency Descriptions.....	9
14	Affected Systems	12
15	Short Circuit.....	14
16	Stability	16
	Attachment 1.....	17

1 Introduction

This System Impact Study (SIS) has been prepared in accordance with the PJM Open Access Transmission Tariff, 205, as well as the Feasibility Study Agreement between Aulander Holloman Solar, LLC, the Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is Virginia Electric and Power Company (VEPCO).

2 Preface

The intent of the 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 will be deferred until the System Impact Study is performed.

The System Impact 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.

The Interconnection Customer seeking to interconnect a wind or solar generation facility shall maintain meteorological data facilities as well as provide that meteorological data which is required per Schedule H to the Interconnection Service Agreement and Section 8 of Manual 14D.

An Interconnection Customer with a proposed new Customer Facility that has a Maximum Facility Output equal to or greater than 100 MW shall install and maintain, at its expense, phasor measurement units (PMUs). See Section 8.5.3 of Appendix 2 to the Interconnection Service Agreement as well as section 4.3 of PJM Manual 14D for additional information.

3 General

The IC has proposed a solar generating facility located at NC 42 and Joe Holloman Road in Aulander, NC in Hertford County. The installed facilities will have a total capability of 100 MW with 67 MW of this output

being recognized by PJM as capacity. This queue request is for an additional 20 MW with 13.4MW's being recognized by PJM as capacity. The proposed in-service date for this project is 5/31/2019. **This study does not imply an ITO commitment to this in-service date.**

Queue Number	AE1-035
Project Name	EARLEYS 230 KV
Interconnection Customer	Aulander Holloman Solar, LLC
State	North Carolina
County	Hertford
Transmission Owner	Dominion
MFO	100
MWE	20
MWC	13.4
Fuel	Solar
Basecase Study Year	2022

3.1 Point of Interconnection

AE1-035 is an uprate to the AA1-065 queue position which is a tap onto the Earleys 230kV substation bus.

3.2 Cost Summary

The AE1-035 project will be responsible for the following costs:

Description	Total Cost
Attachment Facilities	\$ NA
Direct Connection Network Upgrade	\$ NA
Non Direct Connection Network Upgrades	\$ NA
Total Costs	\$ 0

In addition, the AE1-035 project may be responsible for a contribution to the following costs

Description	Total Cost
System Upgrades	\$ 0

4 Transmission Owner Scope of Work

4.1 Attachment Facilities

The existing AA1-065 scope of work is sufficient to accommodate this queue request from an Attachment Facilities and substation expansion perspective. The single line is shown below in Attachment 1.

5 Interconnection Customer Requirements

5.1 System Protection

The IC must design its Customer Facilities in accordance with all applicable standards, including the standards in Dominion's "Dominion Energy Electric Transmission Generator Interconnection Requirements" documented in Dominion's Facility Interconnection Requirements "Exhibit C" located at: <https://www.dominionenergy.com/company/moving-energy/electric-transmission-access>. Preliminary Protection requirements will be provided as part of the Facilities Study. Detailed Protection Requirements will be provided once the project enters the construction phase.

5.2 Compliance Issues and Interconnection Customer Requirements

The proposed Customer Facilities must be designed in accordance with Dominion's "Dominion's Facility Interconnection Requirements" document located at: <https://www.dominionenergy.com/company/moving-energy/electric-transmission-access>. In particular, the IC is responsible for the following:

1. The purchase and installation of a fully rated protection device (circuit breaker, circuit switcher, fuse) to protect the IC's GSU transformer(s).
2. The purchase and installation of the minimum required Dominion generation interconnection relaying and control facilities as described in the System Protection noted above. This includes over/under voltage protection, over/under frequency protection, and zero sequence voltage protection relays.
3. The purchase and installation of supervisory control and data acquisition ("SCADA") equipment to provide information in a compatible format to the Dominion Transmission System Control Center.
4. Compliance with the Dominion and PJM generator power factor and voltage control requirements.

The GSU(s) associated with the IC queue request shall meet the grounding requirements as noted in Dominion's "Dominion's Facility Interconnection Requirements" document located at: <https://www.dominionenergy.com/company/moving-energy/electric-transmission-access>.

The IC will also be required to meet all PJM, SERC, and NERC reliability criteria and operating procedures for standards compliance. For example, the IC will need to properly locate and report the over and under voltage and over and under frequency system protection elements for its units as well as the submission of the generator model and protection data required to satisfy the PJM and SERC audits. Failure to comply with these requirements may result in a disconnection of service if the violation is found to compromise the reliability of the Dominion system.

5.3 Power Factor Requirements

The IC shall design its non-synchronous Customer Facility with the ability to maintain a power factor of at least 0.95 leading (absorbing VARs) to 0.95 lagging (supplying VARs) measured at the high-side of the facility substation transformer(s) connected to the Dominion transmission system.

6 Revenue Metering and SCADA Requirements

6.1 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 Section 8 of Attachment O.

6.1.1 Meteorological Data Reporting Requirement

The solar generation facility shall provide the Transmission Provider with site-specific meteorological data including:

- Temperature (degrees Fahrenheit)
- Atmospheric pressure (hectopascals)
- Irradiance
- Forced outage data

6.2 Dominion Requirements

See Section 3.4.6 "Metering and Telecommunications" of Dominion's "Dominion's Facility Interconnection Requirements" document located at: <https://www.dominionenergy.com/company/moving-energy/electric-transmission-access>.

7 Network Impacts

The Queue Project AE1-035 was evaluated as a 20.0 MW (Capacity 13.4 MW) injection at the Earleys 230kV substation in the Dominion area. Project AE1-035 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AE1-035 was studied with a commercial probability of 100%. Potential network impacts were as follows:

Summer Peak Load Flow

8 Generation Deliverability

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

None

9 Multiple Facility Contingency

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

None

10 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

11 Potential Congestion due to Local Energy Deliverability

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.

Note: Only the most severely overloaded conditions are listed below. 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 shall study all overload conditions associated with the overloaded element(s) identified.

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC/DC	MW IMPACT
3318746	314569	6EARLEYS	DVP	314575	6NUCO TP	DVP	1	DVP_P1-2: LN 2092	operation	571.52	169.18	170.28	AC	7.28
3318754	314569	6EARLEYS	DVP	314575	6NUCO TP	DVP	1	Base Case	operation	571.52	105.9	106.79	AC	6.08
3318893	314574	6EVERETS	DVP	936530	AD2-068 TAP	DVP	1	DVP_P1-2: LN 246	operation	449.32	151.07	152.03	AC	4.8
3318796	314575	6NUCO TP	DVP	919140	AA1-138 TAP	DVP	1	DVP_P1-2: LN 2092	operation	571.52	162.67	163.76	AC	7.28
3318804	314575	6NUCO TP	DVP	919140	AA1-138 TAP	DVP	1	Base Case	operation	571.52	99.64	100.53	AC	6.08
3318936	314583	6LAKEVEW	DVP	924510	AB2-100 TAP	DVP	1	DVP_P1-2: LN 246	operation	375.06	145.38	146.39	AC	3.79

ID	FROM BUS#	FROM BUS	FROM BUS AREA	TO BUS#	TO BUS	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
3318806	919140	AA1-138 TAP	DVP	314537	6SUFFOLK	DVP	1	DVP_P1-2: LN 2092	operation	571.52	162.47	163.57	AC	7.28
3318814	919140	AA1-138 TAP	DVP	314537	6SUFFOLK	DVP	1	Base Case	operation	571.52	99.54	100.43	AC	6.08
3318816	924510	AB2-100 TAP	DVP	314563	6CLUBHSE	DVP	1	DVP_P1-2: LN 246	operation	375.06	164.61	165.62	AC	3.79
3318919	936530	AD2-068 TAP	DVP	304451	6GREENVILE T	CPL	1	DVP_P1-2: LN 246	operation	478.0	148.34	149.23	AC	4.8

12 System Reinforcements

None

13 Flow Gate Details

The following appendices contain additional information about each flowgate presented in the body of the report. For each appendix, a description of the flowgate and its contingency was included for convenience. However, the intent of the appendix section is to provide more information on which projects/generators have contributions to the flowgate in question. Although this information is not used "as is" for cost allocation purposes, it can be used to gage other generators impact. It should be noted the generator contributions presented in the appendices sections are full contributions, whereas in the body of the report, those contributions take into consideration the commercial probability of each project.

13.1 Contingency Descriptions

Contingency Name	Contingency Definition
Base Case	
DVP_P1-2: LN 246	CONTINGENCY 'DVP_P1-2: LN 246' OPEN BRANCH FROM BUS 314537 TO BUS 919140 CKT 1 /* 6SUFFOLK 230.00 - AA1-138 TAP 230.00 OPEN BRANCH FROM BUS 314569 TO BUS 314575 CKT 1 /* 6EARLEYS 230.00 - 6NUCO TP 230.00 OPEN BRANCH FROM BUS 314575 TO BUS 314590 CKT 1 /* 6NUCO TP 230.00 - 6NUCOR 230.00 OPEN BRANCH FROM BUS 314575 TO BUS 919140 CKT 1 /* 6NUCO TP 230.00 - AA1-138 TAP 230.00 OPEN BUS 314575 /* ISLAND: 6NUCO TP 230.00 OPEN BUS 314590 /* ISLAND: 6NUCOR 230.00 OPEN BUS 919140 /* ISLAND: AA1-138 TAP 230.00 END

ATTACHMENT B
SP-5259 SUB 0 AND EMP-120 SUB 0

Contingency Name	Contingency Definition
DVP_P1-2: LN 2092	CONTINGENCY 'DVP_P1-2: LN 2092' OPEN BRANCH FROM BUS 313714 TO BUS 314662 CKT 1 /* 6PERQUIMANS 230.00 - 6S HERTFORD 230.00 OPEN BRANCH FROM BUS 314651 TO BUS 314662 CKT 1 /* 6WINFALL 230.00 - 6S HERTFORD 230.00 OPEN BUS 314662 /* ISLAND: 6S HERTFORD 230.00 END

OFFICIAL COPY

Dec 14 2023

Affected Systems

14 Affected Systems

None

Short Circuit

15 Short Circuit

The following Breakers are overduty

None

Stability

16 Stability

16.1 Steady-State Voltage Requirements

(Summary of the VAR requirements based upon the results of the steady-state voltage studies)

None

16.2 Stability and Reactive Power Requirement for Low Voltage Ride Through

(Summary of the VAR requirements based upon the results of the dynamic studies)

No mitigations were found to be required.

Attachment 1
System Configuration

