



Generation Interconnection

Feasibility Study Report

for

Queue Project AF1-017

MYRTLE-WINDSOR 115 KV

7.6 MW Capacity / 20 MW Energy

January, 2020

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1 Introduction

This Feasibility Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 36.2, as well as the Feasibility Study Agreement between, 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 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. Cost allocation rules for network upgrades can be found in PJM Manual 14A, Attachment B. 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 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.

PJM utilizes manufacturer models to ensure the performance of turbines is properly captured during the simulations performed for stability verification and, where applicable, for compliance with low voltage ride through requirements. Turbine manufacturers provide such models to their customers. The list of manufacturer models PJM has already validated is contained in Attachment B of Manual 14G. Manufacturer models may be updated from time to time, for various reasons such as to reflect changes to the control systems or to more accurately represent the capabilities turbines and controls which are currently available in the field. Additionally, as new turbine models are developed, turbine manufacturers provide such new models which must be used in the conduct of these studies. PJM needs adequate time to evaluate the new models in order to reduce delays to the System Impact Study process timeline for the Interconnection Customer as well as other Interconnection Customers in the study group. Therefore, PJM will require that any Interconnection Customer with a new manufacturer model must supply that model to PJM, along with a \$10,000 fully refundable deposit, no later than three (3) months prior to the starting date of the System Impact Study (See Section 4.3 for starting dates) for the Interconnection Request which shall specify the use of the new model.

The Interconnection Customer will be required to submit a completed dynamic model study request form (Attachment B-1 of Manual 14G) in order to document the request for the study.

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.

3 General

The Interconnection Customer (IC), has proposed an uprate to a planned solar generating facility located in Isle of Wight County, Virginia. This projects requests an increase of 20 MW with 7.6 MW of this output being recognized by PJM as Capacity. The planned facilities will have a total capability of 91 MW with 34.6 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is 11/30/2021. This study does not imply a TO commitment to this in-service date.

Note that this project is an increase to the Interconnection Customer's AE2-247 project, which will share the same property and connection point.

Queue Number	AF1-017
Project Name	MYRTLE-WINDSOR 115 KV
State	Virginia
County	Isle of Wight
Transmission Owner	Dominion
MFO	91
MWE	20
MWC	7.6
Fuel	Solar
Basecase Study Year	2023

3.1 Point of Interconnection

AF1-017 will interconnect with the Dominion transmission system at the new 115kV three breaker AE2-247 substation tapping the Myrtle-Windsor 115 kV line.

3.2 Cost Summary

The AF1-017 project will utilize the interconnection facilities being developed under the AE2-247 project.

In addition, the AF1-017 project may be responsible for a contribution to the following costs

Description	Total Cost
System Upgrades	\$ 30,774,000

Cost allocations for these upgrades will be provided in the System Impact Study Report.

The Feasibility Study is used to make a preliminary determination of the type and scope of Attachment Facilities, Local Upgrades, and Network Upgrades that will be necessary to accommodate the Interconnection Request and to provide the Interconnection Customer a preliminary estimate of the time that will be required to construct any necessary facilities and upgrades and the Interconnection Customer's cost responsibility. The System Impact Study provides refined and comprehensive estimates of cost responsibility and construction lead times for new facilities and system upgrades. Facilities Studies will include, commensurate with the degree of engineering specificity as provided in the Facilities Study Agreement, good faith estimates of the cost, determined in accordance with Section 217 of the Tariff,

- (a) to be charged to each affected New Service Customer for the Facilities and System Upgrades that are necessary to accommodate this queue project;
- (b) the time required to complete detailed design and construction of the facilities and upgrades; and
- (c) a description of any site-specific environmental issues or requirements that could reasonably be anticipated to affect the cost or time required to complete construction of such facilities and upgrades.

4 Transmission Owner Scope of Work

Dominion assessed the impact of the proposed Queue Project AF1-017. The project was evaluated as a 7.6 MW Capacity (20.0 MW Energy) injection at the existing AE2-247 substation in the Dominion Transmission System, for compliance with NERC Reliability Criteria on Dominion Transmission System. The system was assessed using the summer 2023 AF1 case provided to Dominion by PJM. When performing a generation analysis, Dominion's main analysis will be load flow study results under single contingency (both normal and stressed system conditions). Dominion Criteria considers a transmission facility overloaded if it exceeds 94% of its emergency rating under normal and stressed system conditions. A full listing of Dominion's Planning Criteria and interconnection requirements can be found in the Company's Facility Connection Requirements which are publicly available at: <http://www.dominionenergy.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 generation facility 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, in Planning Studies, NERC Planning Event 3 and 6 Contingency Conditions (Loss of generator, transmission circuit, transformer, shunt device, or Single Pole of a DC line followed by the loss of a generator, transmission circuit, transformer, shunt device or single pole of a DC line) allow for re-dispatch of generating units to resolve

potential reliability deficiencies. For Dominion 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.

The required Attachment Facilities, Direct Connection and Non-Direct Connection work for the interconnection of the AF1-017 generation project to the Dominion Transmission System is detailed in the following sections. The associated one-line with the generation project attachment facilities and primary direct and non-direct connection are shown in Attachment 1.

Note that the ITO findings were made from a conceptual review of this project. A more detailed review of the connection facilities and their cost will be identified in a future study phases. Further note that the cost estimate data contained in this document should be considered high level estimates since it was produced without a detailed engineering review. The applicant will be responsible for the actual cost of construction. ITO herein reserves the right to return to any issues in this document and, upon appropriate justification, request additional monies to complete any reinforcements to the transmission systems.

5 Non-Direct Connection Cost Estimate

Remote Terminal Work: During the Facilities Study, ITO's System Protection Engineering Department will review transmission line protection as well as anti-islanding required to accommodate the new generation and interconnection substation. System Protection Engineering will determine the minimal acceptable protection requirements to reliably interconnect the proposed generating facility with the transmission system. The review is based on maintaining system reliability by reviewing ITO's protection requirements with the known transmission system configuration which includes generating facilities in the area. This review may determine that transmission line protection and communication upgrades are required at remote substations.

6 Schedule

The schedule for the required Network Impact Reinforcements will be more clearly identified in future study phases. The estimate elapsed time to complete each of the required reinforcements is identified in the "System Reinforcements" section of the report.

7 Transmission Owner Analysis

7.1 Power Flow Analysis

PJM performed a power flow analysis of the transmission system using a 2023 summer peak load flow model and the results were verified by Dominion. Additionally, Dominion performed an analysis of its transmission system and no further deficiencies were identified.

7.2 Short Circuit Analysis

PJM performed a short circuit analysis and the results were verified by Dominion. The connection of AF1-017 project to the system does not result in any newly overdutied circuit breakers on the Dominion transmission system and does not have a significant fault current contribution to existing overdutied circuit breakers

7.3 Stability Analysis

PJM will complete a dynamic stability analysis, if necessary, as part of the System Impact Study. The results of this analysis will be reviewed by Dominion. Should stability concerns be identified in PJM's study, Dominion will develop appropriate system reinforcement(s) and included the estimated cost of any reinforcement(s) in Dominion's System Impact Study report.

8 Interconnection Customer Requirements

8.1 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.

8.2 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.

8.3 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.

9 Revenue Metering and SCADA Requirements

9.1 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.

9.1.1 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

9.2 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>.

10 Network Impacts

The Queue Project AF1-017 was evaluated as a 20.0 MW (Capacity 7.6 MW) injection as an uprate to AE2-247 tapping the Myrtle-Windsor 115 kV line in the Dominion area. Project AF1-017 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF1-017 was studied with a commercial probability of 53%. Potential network impacts were as follows:

Summer Peak Load Flow

10.1 Generation Deliverability

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

None

10.2 Multiple Facility Contingency

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

None

10.3 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)

ID	FROM BUS#	FROM BUS	KV	FRO M BUS AREA	TO BUS#	TO BUS	KV	TO BUS AREA	CK T ID	CONT NAME	Type	Ratin g MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
42993217	313803	3OAKRI44	115.0	DVP	314536	3SUFFOLK	115.0	DVP	1	DVP_P1-2: LN 15-A	single	110.92	128.36	135.21	DC	7.6
42993085	314329	3POE	115.0	DVP	314291	3PRGEOR G	115.0	DVP	1	DVP_P4-2: 23T44	breake r	301.0	105.79	108.39	DC	7.8
42993209	314531	3MYRTLE	115.0	DVP	313803	3OAKRI44	115.0	DVP	1	DVP_P1-2: LN 15-A	single	110.92	128.45	135.3	DC	7.6
42993225	314542	3WINDSOR	115.0	DVP	936660	AD2-085 TAP	115.0	DVP	1	DVP_P1-2: LN 15-A	single	110.92	121.17	128.02	DC	7.6
42993199	936660	AD2-085 TAP	115.0	DVP	314531	3MYRTLE	115.0	DVP	1	DVP_P1-2: LN 15-A	single	110.92	138.64	145.49	DC	7.6
42992930	939190	AE1-149 TAP	115.0	DVP	314329	3POE	115.0	DVP	1	DVP_P4-4: SUFFOL SC142	breake r	136.0	231.03	245.74	DC	20.0
42992931	939190	AE1-149 TAP	115.0	DVP	314329	3POE	115.0	DVP	1	DVP_P4-2: L1T44	breake r	136.0	231.03	245.74	DC	20.0
42992932	939190	AE1-149 TAP	115.0	DVP	314329	3POE	115.0	DVP	1	DVP_P4-2: 23T44	breake r	136.0	231.03	245.74	DC	20.0

10.4 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	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CK T ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADIN G %	POST PROJECT LOADIN G %	AC D C	MW IMPAC T
42993215	313803	3OAKRI44	115.0	DVP	314536	3SUFFOLK	115.0	DVP	1	DVP_P1-2: LN 15-A	operation	110.92	272.99	291.02	DC	20.0
42993221	313803	3OAKRI44	115.0	DVP	314536	3SUFFOLK	115.0	DVP	1	Base Case	operation	110.92	106.88	120.08	DC	14.64
42993279	314292	3DISPUTN	115.0	DVP	939190	AE1-149 TAP	115.0	DVP	1	DVP_P1-2: LN 44-A	operation	110.92	175.17	193.2	DC	20.0
45943117	314292	3DISPUTN	115.0	DVP	939190	AE1-149 TAP	115.0	DVP	1	314531 3MYRTL E 115 936660 AD2-085 TAP 115 1	operation	110.92	175.17	193.2	DC	20.0
42993356	314350	3WVLY DP	115.0	DVP	932580	AC2-078 TAP	115.0	DVP	1	DVP_P1-2: LN 44-A	operation	110.92	124.68	142.72	DC	20.0
45943244	314350	3WVLY DP	115.0	DVP	932580	AC2-078 TAP	115.0	DVP	1	314531 3MYRTL E 115 936660 AD2-085 TAP 115 1	operation	110.92	124.68	142.72	DC	20.0
42993340	314351	3WAVERLY	115.0	DVP	314350	3WVLY DP	115.0	DVP	1	DVP_P1-2: LN 44-A	operation	110.92	133.61	151.64	DC	20.0
45943218	314351	3WAVERLY	115.0	DVP	314350	3WVLY DP	115.0	DVP	1	314531 3MYRTL E 115 936660 AD2-085 TAP 115 1	operation	110.92	133.61	151.64	DC	20.0
42993207	314531	3MYRTLE	115.0	DVP	313803	3OAKRI44	115.0	DVP	1	DVP_P1-2: LN 15-A	operation	110.92	273.08	291.11	DC	20.0
42993213	314531	3MYRTLE	115.0	DVP	313803	3OAKRI44	115.0	DVP	1	Base Case	operation	110.92	106.88	120.08	DC	14.64
42993223	314542	3WINDSOR	115.0	DVP	936660	AD2-085 TAP	115.0	DVP	1	DVP_P1-2: LN 15-A	operation	110.92	237.29	255.32	DC	20.0
42993270	932580	AC2-078 TAP	115.0	DVP	314292	3DISPUTN	115.0	DVP	1	DVP_P1-2: LN 44-A	operation	110.92	178.78	196.81	DC	20.0
45943106	932580	AC2-078 TAP	115.0	DVP	314292	3DISPUTN	115.0	DVP	1	314531 3MYRTL E 115 936660 AD2-085 TAP 115 1	operation	110.92	178.78	196.81	DC	20.0
42993197	936660	AD2-085 TAP	115.0	DVP	314531	3MYRTLE	115.0	DVP	1	DVP_P1-2: LN 15-A	operation	110.92	283.27	301.3	DC	20.0
42993203	936660	AD2-085 TAP	115.0	DVP	314531	3MYRTLE	115.0	DVP	1	Base Case	operation	110.92	117.16	130.35	DC	14.64
42993190	939190	AE1-149 TAP	115.0	DVP	314329	3POE	115.0	DVP	1	Base Case	operation	110.92	169.31	174.14	DC	5.36
42993432	941600	AE2-157 TAP	115.0	DVP	944060	AF1-074 TAP	115.0	DVP	1	DVP_P1-2: LN 44-A	operation	110.92	137.94	155.97	DC	20.0

ID	FROM BUS#	FROM BUS	kV	FROM BUS AREA	TO BUS#	TO BUS	kV	TO BUS AREA	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC/D C	MW IMPACT
45943307	941600	AE2-157 TAP	115.0	DVP	944060	AF1-074 TAP	115.0	DVP	1	314531 3MYRTL E 115 936660 AD2-085 TAP 115 1	operation	110.92	137.94	155.97	DC	20.0
42993298	944060	AF1-074 TAP	115.0	DVP	314351	3WAVERLY	115.0	DVP	1	DVP_P1 -2: LN 44-A	operation	110.92	137.94	155.97	DC	20.0
45943172	944060	AF1-074 TAP	115.0	DVP	314351	3WAVERLY	115.0	DVP	1	314531 3MYRTL E 115 936660 AD2-085 TAP 115 1	operation	110.92	137.94	155.97	DC	20.0

10.5 System Reinforcements

ID	Index	Facility	Upgrade Description	Cost
42993217	1	3OAKRI44 115.0 kV - 3SUFFOLK 115.0 kV Ckt 1	DVP dom-054 (747) : Rebuild 2.59 miles of 115 kV Line 44 from Oak Ridge to Suffolk with 636 ACSR. Project Type : FAC Cost : \$3,367,000 Time Estimate : 30-36 Months	\$3,367,000
42992932,42992930, 42992931	6	AE1-149 TAP 115.0 kV - 3POE 115.0 kV Ckt 1	DVP n6154 (656) : Rebuild 6.6 miles of 115 kV Line 15 from AE1-149 Tap to Poe with 636 ACSR. Project Type : FAC Cost : \$8,580,000 Time Estimate : 30-36 Months	\$8,580,000
42993225	4	3WINDSOR 115.0 kV - AD2-085 TAP 115.0 kV Ckt 1	DVP dom-172 (863) : Reconnector 0.2 miles of 115 kV Line 44 from Windsor to AD2-085 Tap with 636 ACSR Project Type : FAC Cost : \$120,000 Time Estimate : 30-36 Months	\$120,000
42993209	3	3MYRTLE 115.0 kV - 3OAKRI44 115.0 kV Ckt 1	DVP dom-053 (745) : Rebuild 5.24 miles of 115 kV Line 44 from Myrtle to Oak Ridge with 636 ACSR. Project Type : FAC Cost : \$6,812,000 Time Estimate : 30-36 Months	\$6,812,000
42993085	2	3POE 115.0 kV - 3PRGEORG 115.0 kV Ckt 1	DVP dom-043 (735) : Rebuild 3.45 miles of 115 kV Line 121 from Poe to Prince George with 768 ACSS. Project Type : FAC Cost : \$4,485,000 Time Estimate : 30-36 Months	\$4,485,000
42993199	5	AD2-085 TAP 115.0 kV - 3MYRTLE 115.0 kV Ckt 1	DVP dom-187 (885) : Rebuild 5.7 miles of 115 kV Line 44 from AD2-085 Tap to Myrtle with 636 ACSR. Project Type : FAC Cost : \$7,410,000 Time Estimate : 30-36 Months	\$7,410,000
			TOTAL COST	\$30,774,000

10.6 Flow Gate Details

The following indices contain additional information about each flowgate presented in the body of the report. For each index, 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.

10.6.1 Contingency Descriptions

Contingency Name	Contingency Definition
DVP_P4-2: L1T44	CONTINGENCY 'DVP_P4-2: L1T44' /* SUFFOLK 115 KV OPEN BRANCH FROM BUS 313803 TO BUS 314531 CKT 1 /* 3OAKRI44 115.00 - 3MYRTLE 115.00 OPEN BRANCH FROM BUS 313803 TO BUS 314536 CKT 1 /* 3OAKRI44 115.00 - 3SUFFOLK 115.00 OPEN BRANCH FROM BUS 314531 TO BUS 936660 CKT 1 /* 3MYRTLE 115.00 - AD2-085 TAP 115.00 OPEN BRANCH FROM BUS 314536 TO BUS 314823 CKT 1 /* 3SUFFOLK 115.00 - 3SUFFO_1 115.00 OPEN BUS 313803 /* ISLAND: 3OAKRI44 115.00 OPEN BUS 314531 /* ISLAND: 3MYRTLE 115.00 OPEN BUS 314823 /* ISLAND: 3SUFFO_1 115.00 OPEN BRANCH FROM BUS 314536 TO BUS 314537 CKT 3 /* 3SUFFOLK 115.00 - 6SUFFOLK 230.00 END
DVP_P4-4: SUFFOL SC142	CONTINGENCY 'DVP_P4-4: SUFFOL SC142' /* SUFFOLK 115 KV OPEN BRANCH FROM BUS 313803 TO BUS 314531 CKT 1 /* 3OAKRI44 115.00 - 3MYRTLE 115.00 OPEN BRANCH FROM BUS 313803 TO BUS 314536 CKT 1 /* 3OAKRI44 115.00 - 3SUFFOLK 115.00 OPEN BRANCH FROM BUS 314531 TO BUS 936660 CKT 1 /* 3MYRTLE 115.00 - AD2-085 TAP 115.00 OPEN BRANCH FROM BUS 314536 TO BUS 314823 CKT 1 /* 3SUFFOLK 115.00 - 3SUFFO_1 115.00 OPEN BUS 313803 /* ISLAND: 3OAKRI44 115.00 OPEN BUS 314531 /* ISLAND: 3MYRTLE 115.00 OPEN BUS 314823 /* ISLAND: 3SUFFO_1 115.00 END
314531 3MYRTLE 115 936660 AD2-085 TAP 115 1	CONTINGENCY '314531 3MYRTLE 115 936660 AD2-085 TAP 115 1' OPEN BRANCH FROM BUS 314531 TO BUS 936660 CKT 1 END
Base Case	

Contingency Name	Contingency Definition
DVP_P4-2: 23T44	CONTINGENCY 'DVP_P4-2: 23T44' /* SUFFOLK 115 KV OPEN BRANCH FROM BUS 314206 TO BUS 314529 CKT 1 /* 3OAKRIDG 115.00 - 3KINGFORK 115.00 OPEN BRANCH FROM BUS 314206 TO BUS 314532 CKT Z1 /* 3OAKRIDG 115.00 - 3OAKRI23 115.00 OPEN BRANCH FROM BUS 932590 TO BUS 314532 CKT 1 /* AC2-079 TAP 115.00 - 3OAKRI23 115.00 OPEN BRANCH FROM BUS 314532 TO BUS 314536 CKT 1 /* 3OAKRI23 115.00 - 3SUFFOLK 115.00 OPEN BUS 314206 /* ISLAND: 3OAKRIDG 115.00 OPEN BUS 314261 /* ISLAND: 3OAKRI_1 115.00 OPEN BUS 314529 /* ISLAND: 3KINGFORK 115.00 OPEN BUS 314532 /* ISLAND: 3OAKRI23 115.00 OPEN BRANCH FROM BUS 313803 TO BUS 314531 CKT 1 /* 3OAKRI44 115.00 - 3MYRTLE 115.00 OPEN BRANCH FROM BUS 313803 TO BUS 314536 CKT 1 /* 3OAKRI44 115.00 - 3SUFFOLK 115.00 OPEN BRANCH FROM BUS 314531 TO BUS 936660 CKT 1 /* 3MYRTLE 115.00 - AD2-085 TAP 115.00 OPEN BRANCH FROM BUS 314536 TO BUS 314823 CKT 1 /* 3SUFFOLK 115.00 - 3SUFFO_1 115.00 OPEN BUS 313803 /* ISLAND: 3OAKRI44 115.00 OPEN BUS 314531 /* ISLAND: 3MYRTLE 115.00 OPEN BUS 314823 /* ISLAND: 3SUFFO_1 115.00 END
DVP_P1-2: LN 44-A	CONTINGENCY 'DVP_P1-2: LN 44-A' OPEN BRANCH FROM BUS 313803 TO BUS 314531 CKT 1 /* 3OAKRI44 115.00 - 3MYRTLE 115.00 OPEN BRANCH FROM BUS 313803 TO BUS 314536 CKT 1 /* 3OAKRI44 115.00 - 3SUFFOLK 115.00 OPEN BRANCH FROM BUS 314531 TO BUS 936660 CKT 1 /* 3MYRTLE 115.00 - AD2-085 TAP 115.00 OPEN BRANCH FROM BUS 314536 TO BUS 314823 CKT 1 /* 3SUFFOLK 115.00 - 3SUFFO_1 115.00 OPEN BUS 313803 /* ISLAND: 3OAKRI44 115.00 OPEN BUS 314531 /* ISLAND: 3MYRTLE 115.00 OPEN BUS 314823 /* ISLAND: 3SUFFO_1 115.00 END
DVP_P1-2: LN 15-A	CONTINGENCY 'DVP_P1-2: LN 15-A' OPEN BRANCH FROM BUS 939190 TO BUS 314329 CKT 1 /* AE1-149 TAP 115.00 - 3POE 115.00 END

10.6.2 Index 1

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
42993217	313803	30AKRI44	DVP	314536	3SUFFOLK	DVP	1	DVP_P1-2: LN 15-A	single	110.92	128.36	135.21	DC	7.6

Bus #	Bus	MW Impact
932581	AC2-078 C O1	22.8000
936661	AD2-085 C	19.3800
939191	AE1-149 C O1	60.0000
940651	AE2-052	20.0000
941601	AE2-157 C	60.0000
942341	AE2-247 C	8.4000
943461	AF1-017 C	7.6000
944061	AF1-074 C O1	40.8000

10.6.3 Index 2

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
42993085	314329	3POE	DVP	314291	3PRGEORG	DVP	1	DVP_P4-2: 23T44	breaker	301.0	105.79	108.39	DC	7.8

Bus #	Bus	MW Impact
925061	AB2-161 C O1	7.4098
925062	AB2-161 E O1	12.0897
932581	AC2-078 C O1	8.8918
932582	AC2-078 E O1	14.5076
932591	AC2-079 C O1	12.5967
932592	AC2-079 E O1	20.5525
934571	AD1-082 C	16.8866
934572	AD1-082 E	9.6328
935211	AD1-156 C	1.2488
935212	AD1-156 E	0.8326
936661	AD2-085 C	7.5580
936662	AD2-085 E	12.3315
938631	AE1-085 C O1	19.4995
938632	AE1-085 E O1	9.7498
939191	AE1-149 C O1	23.3994
939192	AE1-149 E O1	15.5996
940061	AE2-000BC O1	35.0991
940062	AE2-000BE O1	23.3994
940651	AE2-052	7.7998
941601	AE2-157 C	23.3994
941602	AE2-157 E	15.5996
942341	AE2-247 C	3.2759
942342	AE2-247 E	4.5239
943461	AF1-017 C	2.9639
943462	AF1-017 E	4.8359
944061	AF1-074 C O1	15.9116
944062	AF1-074 E O1	10.6077
LGEE	LGEE	0.0685
CPL	CPL	0.3155
WEC	WEC	0.0365
CBM-W2	CBM-W2	1.3432
NY	NY	0.0177

Bus #	Bus	MW Impact
CBM-W1	CBM-W1	1.3886
TVA	TVA	0.2744
O-066	O-066	0.2822
CBM-S2	CBM-S2	2.1559
CBM-S1	CBM-S1	1.5506
G-007	G-007	0.0447
MADISON	MADISON	0.0665
MEC	MEC	0.2129

10.6.4 Index 3

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
42993209	314531	3MYRTLE	DVP	313803	3OAKRI44	DVP	1	DVP_P1-2: LN 15-A	single	110.92	128.45	135.3	DC	7.6

Bus #	Bus	MW Impact
932581	AC2-078 C O1	22.8000
936661	AD2-085 C	19.3800
939191	AE1-149 C O1	60.0000
940651	AE2-052	20.0000
941601	AE2-157 C	60.0000
942341	AE2-247 C	8.4000
943461	AF1-017 C	7.6000
944061	AF1-074 C O1	40.8000

10.6.5 Index 4

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
42993225	314542	3WINDSOR	DVP	936660	AD2-085 TAP	DVP	1	DVP_P1-2: LN 15-A	single	110.92	121.17	128.02	DC	7.6

Bus #	Bus	MW Impact
932581	AC2-078 C O1	22.8000
939191	AE1-149 C O1	60.0000
940651	AE2-052	20.0000
941601	AE2-157 C	60.0000
942341	AE2-247 C	8.4000
943461	AF1-017 C	7.6000
944061	AF1-074 C O1	40.8000

10.6.6 Index 5

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
42993199	936660	AD2-085 TAP	DVP	314531	3MYRTLE	DVP	1	DVP_P1-2: LN 15-A	single	110.92	138.64	145.49	DC	7.6

Bus #	Bus	MW Impact
932581	AC2-078 C O1	22.8000
936661	AD2-085 C	19.3800
939191	AE1-149 C O1	60.0000
940651	AE2-052	20.0000
941601	AE2-157 C	60.0000
942341	AE2-247 C	8.4000
943461	AF1-017 C	7.6000
944061	AF1-074 C O1	40.8000

10.6.7 Index 6

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
42992932	939190	AE1-149 TAP	DVP	314329	3POE	DVP	1	DVP_P4-2: 23T44	breaker	136.0	231.03	245.74	DC	20.0

Bus #	Bus	MW Impact
932581	AC2-078 C O1	22.8000
932582	AC2-078 E O1	37.2000
936661	AD2-085 C	19.3800
936662	AD2-085 E	31.6200
939191	AE1-149 C O1	60.0000
939192	AE1-149 E O1	40.0000
940651	AE2-052	20.0000
941601	AE2-157 C	60.0000
941602	AE2-157 E	40.0000
942341	AE2-247 C	8.4000
942342	AE2-247 E	11.6000
943461	AF1-017 C	7.6000
943462	AF1-017 E	12.4000
944061	AF1-074 C O1	40.8000
944062	AF1-074 E O1	27.2000

Short Circuit

10.7 Short Circuit

The following Breakers are overdutied:

None

Affected Systems

11 Affected Systems

11.1 Duke Energy Progress

Duke Energy Progress Impacts to be determined during later study phases (as applicable).

Attachment 1

System Configuration