



Generation Interconnection

Feasibility Study Report

for

Queue Project AF2-049

LADYSMITH CT-ST. JOHNS 230 KV

34.5 MW Capacity / 60 MW Energy

July 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 Dominion.

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.

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.

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/existing Solar generating facility located in Caroline, Virginia. This project is an increase to the Interconnection Customer's AE1-157 project, which will share the same point of interconnection. The AF2-049 queue position is a 60 MW uprate (34.5 MW Capacity uprate) to the previous project. The total installed facilities will have a capability of 180 MW with 112.3 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this uprate project is December 01, 2021. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-049
Project Name	LADYSMITH CT-ST. JOHNS 230 KV
State	Virginia
County	Caroline
Transmission Owner	Dominion
MFO	180
MWE	60
MWC	34.5
Fuel	Solar
Basecase Study Year	2023

Any new service customers who can feasibly be commercially operable prior to June 1st of the basecase study year are required to request interim deliverability analysis.

4 Point of Interconnection

AF2-049 will interconnect with the Dominion transmission system as an uprate to AE1-157 which is tapping the Ladysmith CT to St. Johns 230 kV line.

5 Cost Summary

The AF2-049 project will utilize the interconnection facilities being developed under the AE1-157 project.

The AF2-049 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	\$ 0
Total System Network Upgrade Costs	\$ 60,070,000
Total Costs	\$ 60,070,000

This cost excludes a Federal Income Tax Gross Up charges. This tax may or may not be charged based on whether this project meets the eligibility requirements of IRS Notice 88-129. If at a future date it is determined that the Federal Income Tax Gross charge is required, the Transmission Owner shall be reimbursed by the Interconnection Customer for such taxes.

Cost allocations for any System Upgrades will be provided in the System Impact Study Report.

6 Transmission Owner Scope of Work

Dominion assessed the impact of the proposed Queue Project AF2-049 was evaluated as a 34.5 MW Capacity (60.0 MW Energy) injection at the new AE1-157 230 kV substation in the Dominion Transmission System, for compliance with NERC Reliability Criteria on Dominion Transmission System. The system was assessed using the summer 2023 AF2 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 AF2-049 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.

The total physical interconnection costs is given in the table below:

Description	Total Cost
Total Physical Interconnection Costs	\$ 0

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.

7 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.

8 Transmission Owner Analysis

8.1 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.

9 Interconnection Customer Requirements

9.1 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.

9.2 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.

9.3 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.

10 Revenue Metering and SCADA Requirements

10.1 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.

10.2 Meteorological Data Reporting Requirements

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

- Back panel temperature (Fahrenheit)
- Irradiance (Watts/meter²)
- Ambient air temperature (Fahrenheit) - (Accepted, not required)
- Wind speed (meters/second) – (Accepted, not required)
- Wind direction (decimal degrees from true north) – (Accepted, not required)

10.3 Interconnected Transmission Owner 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>.

11 Summer Peak - Load Flow Analysis

The Queue Project AF2-049 was evaluated as a 60.0 MW (Capacity 34.5 MW) injection as an uprate to AE1-157 which is tapping the Ladysmith CT to St. Johns 230 kV line in the Dominion area. Project AF2-049 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-049 was studied with a commercial probability of 53.0 %. Potential network impacts were as follows:

11.1 Generation Deliverability

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

None

11.2 Multiple Facility Contingency

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

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 DC	MW IMPACT
97709457	314212	6FOUR RIVERS	230.0	DVP	939750	AE1-206 TAP	230.0	DVP	1	DVP_P4-2: 25672	breaker	1354.0	96.57	100.98	DC	59.68

11.3 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	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 DC	MW IMPACT
97892768	314134	6CRANES	230.0	DVP	314142	6STAFORD	230.0	DVP	1	DVP_P1-2: LN 2089	single	678.679992676	113.68	115.12	DC	10.06
97892743	314197	6LDYSMITH CT	230.0	DVP	314196	6LADYSMITH	230.0	DVP	1	3142226HANOVER 230939750AE1-206TAP 2301	single	1151.5	124.89	127.11	DC	25.51
97892744	314197	6LDYSMITH CT	230.0	DVP	314196	6LADYSMITH	230.0	DVP	1	DVP_P1-2: LN 2032-B	single	1151.5	124.8	127.01	DC	25.51
97892839	314212	6FOUR RIVERS	230.0	DVP	939750	AE1-206 TAP	230.0	DVP	1	DVP_P1-2: LN 256-B	single	1123.30004883	103.84	106.9	DC	34.31
97892840	314212	6FOUR RIVERS	230.0	DVP	939750	AE1-206 TAP	230.0	DVP	1	DVP_P1-2: LN 2089	single	1123.30004883	104.57	106.33	DC	19.71
97709336	314222	6HANOVER	230.0	DVP	314218	6ELMONT	230.0	DVP	1	DVP_P4-2: 25672	breaker	1409.0	118.47	122.7	DC	59.68
97892570	314222	6HANOVER	230.0	DVP	314218	6ELMONT	230.0	DVP	1	DVP_P1-2: LN 256-B	single	1123.30004883	125.95	129.0	DC	34.31

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 LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
97892573	314222	6HANOVER	230.0	DVP	314218	6ELMONT	230.0	DVP	1	DVP_P1-2: LN 2089	single	1123.30004883	122.18	123.93	DC	19.71
97892579	314222	6HANOVER	230.0	DVP	314218	6ELMONT	230.0	DVP	1	Base Case	single	1123.30004883	100.02	101.04	DC	11.48
97892540	939260	AE1-157 TAP	230.0	DVP	314197	6LDYSMITH CT	230.0	DVP	1	3142226HANOVER 230939750AE1-206 TAP 2301	single	1123.30004883	132.15	135.21	DC	34.31
97892541	939260	AE1-157 TAP	230.0	DVP	314197	6LDYSMITH CT	230.0	DVP	1	DVP_P1-2: LN 2032-B	single	1123.30004883	132.13	135.19	DC	34.31
97709301	939750	AE1-206 TAP	230.0	DVP	314222	6HANOVER	230.0	DVP	1	DVP_P4-2: 25672	breaker	1354.0	128.43	132.83	DC	59.68
97892528	939750	AE1-206 TAP	230.0	DVP	314222	6HANOVER	230.0	DVP	1	DVP_P1-2: LN 256-B	single	1123.30004883	132.15	135.21	DC	34.31
97892531	939750	AE1-206 TAP	230.0	DVP	314222	6HANOVER	230.0	DVP	1	DVP_P1-2: LN 2089	single	1123.30004883	128.38	130.13	DC	19.71
97892537	939750	AE1-206 TAP	230.0	DVP	314222	6HANOVER	230.0	DVP	1	Base Case	single	1103.56005859	108.13	109.17	DC	11.48

11.4 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 LOADING %	POST PROJECT LOADING %	AC DC	MW IMPACT
97892933	314105	6AQUIA	230.0	DVP	314186	6FULLER ROAD	230.0	DVP	1	DVP_P1-2: LN 2089	operation	678.679992676	102.7	105.28	DC	17.5
97892764	314134	6CRANES	230.0	DVP	314142	6STAFORD	230.0	DVP	1	DVP_P1-2: LN 2089	operation	678.679992676	127.84	130.42	DC	17.5
97892875	314142	6STAFORD	230.0	DVP	314145	6AQUI_HARB_B	230.0	DVP	1	DVP_P1-2: LN 2089	operation	678.679992676	112.63	115.21	DC	17.5
97892914	314144	6AQUI_HARB_A	230.0	DVP	314105	6AQUIA	230.0	DVP	1	DVP_P1-2: LN 2089	operation	678.679992676	106.37	108.95	DC	17.5
97892944	314186	6FULLER ROAD	230.0	DVP	314074	6POSSUM	230.0	DVP	1	DVP_P1-2: LN 2089	operation	678.679992676	100.83	103.41	DC	17.5

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/DC	MW IMPACT
97892741	314197	6LDYSMITH CT	230.0	DVP	314196	6LADYSMITH	230.0	DVP	1	3142226HANOVER 230939750 AE1-206 TAP 2301	operation	1151.5	128.82	132.68	DC	44.37
97892837	314212	6FOUR RIVERS	230.0	DVP	939750	AE1-206 TAP	230.0	DVP	1	DVP_P1-2: LN 256-B	operation	1123.30004883	116.28	121.59	DC	59.68
97892568	314222	6HANOVER	230.0	DVP	314218	6ELMONT	230.0	DVP	1	DVP_P1-2: LN 256-B	operation	1123.30004883	148.47	153.79	DC	59.68
97892578	314222	6HANOVER	230.0	DVP	314218	6ELMONT	230.0	DVP	1	Base Case	operation	1123.30004883	110.59	112.36	DC	19.97
97892538	939260	AE1-157 TAP	230.0	DVP	314197	6LDYSMITH CT	230.0	DVP	1	3142226HANOVER 230939750 AE1-206 TAP 2301	operation	1123.30004883	154.68	159.99	DC	59.68
97892526	939750	AE1-206 TAP	230.0	DVP	314222	6HANOVER	230.0	DVP	1	DVP_P1-2: LN 256-B	operation	1123.30004883	154.68	159.99	DC	59.68
97892533	939750	AE1-206 TAP	230.0	DVP	314222	6HANOVER	230.0	DVP	1	Base Case	operation	1103.56005859	118.88	120.69	DC	19.97

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
97892537,97892528,97709301,97892531	6	AE1-206 TAP 230.0 kV - 6HANOVER 230.0 kV Ckt 1	<u>DVP</u> dom-253 (1352) : Rebuild 3.37 miles of 230 kV Line 2032 from AE1-206 Tap to Hanover with 2-768.2 ACSS 250C. Replace Line Switch at Hanover 230 kV Project Type : FAC Cost : \$5,305,000 Time Estimate : 30-36 Months	\$5,305,000
97892768	2	6CRANES 230.0 kV - 6STAFORD 230.0 kV Ckt 1	<u>DVP</u> n6131 (1261) : Rebuild 7.62 miles of 230 kV Line 2104 from Cranes Corner to Stafford with 2-636 ACSR. Project Type : FAC Cost : \$11,430,000 Time Estimate : 30-36 Months	\$11,430,000
97892840,97892839,97709457	1	6FOUR RIVERS 230.0 kV - AE1- 206 TAP 230.0 kV Ckt 1	<u>DVP</u> dom-210 (1309) : Rebuild 2.4 miles of 230 kV Line 2032 from Four Rivers to AE1-206 Tap with 2-768 ACSS (@250 C). Replace Breaker, Wavetrap, Relay (Secondary CT) and Line Lead at Four River 230 kV. Replace Breaker at AE1-206 230 kV generation station. Project Type : FAC Cost : \$6,320,000 Time Estimate : 36-40 Months	\$6,320,000
97892540,97892541	5	AE1-157 TAP 230.0 kV - 6LDYSMITH CT 230.0 kV Ckt 1	<u>DVP</u> dom-252 (1351) : Wreck and rebuild 7.9 miles of existing single circuit line 256 between Ladysmith CT to AE1-157 Tap 230 kV. Add new circuit between Ladysmith CT to AE1-157 Tap 230 kV, constructed as a double circuit line. Utilize 2-636 ACSR for all new and modified circuits. Add two breakers at Ladysmith CT and a breaker at AE1-157 Station. Project Type : CON Cost : \$23,350,000 Time Estimate : 36-40 Months	\$23,350,000
97892573,97709336,97892570,97892579	4	6HANOVER 230.0 kV - 6ELMONT 230.0 kV Ckt 1	<u>DVP</u> dom-250 (1349) : Rebuild 3.19 miles of 230 kV Line 2032 from Hanover to Elmont with 2-768.2 ACSS 250C. Replace Line Switch, Wavetrap and Relay (Secondary CT) at Elmont 230 kV. Project Type : FAC Cost : \$5,355,000 Time Estimate : 30-36 Months	\$5,355,000

ID	Idx	Facility	Upgrade Description	Cost
97892744,9789 2743	3	6LDYSMITH CT 230.0 kV - 6LADYSMITH 230.0 kV Ckt 1	<p><u>DVP</u> b3027.1 (1062) : PJM baseline upgrade b3027.1: Add a 2nd 500/230 kV 840 MVA transformer at Dominions Ladysmith Substation. The baseline project has an projected in-service date of 06/01/2021. Project Type : CON Cost : \$0</p> <p>b3027.2 (1063) : PJM Baseline Upgrade b3027.2. Re-conductor Line #2089 between Ladysmith and Ladysmith CT Substations to increase the line rating from 1047 MVA to 1225 MVA. The baseline project has an projected in-service date of 06/01/2021. Project Type : FAC Cost : \$0</p> <p>dom-249 (1348) : Install a second 230 kV circuit of 3.94 miles from Ladysmith to Ladysmith CT (Line 2089) with a 2000/2000/2300 MVA conductor. Add Breakers at both stations. Project Type : CON Cost : \$8,310,000 Time Estimate : 30-36 Months</p>	\$8,310,000
			TOTAL COST	\$60,070,000

11.6 Flow Gate Details

The following indices contain additional information about each facility presented in the body of the report. For each index, a description of the flowgate and its contingency was included for convenience. The intent of the indices is to provide more details on which projects/generators have contributions to the flowgate in question. All New Service Queue Requests, through the end of the Queue under study, that are contributors to a flowgate will be listed in the indices. Please note that there may be contributors that are subsequently queued after the queue under study that are not listed in the indices. Although this information is not used "as is" for cost allocation purposes, it can be used to gage the impact of other projects/generators. It should be noted the project/generator MW contributions presented in the body of the report are Full MW Impact contributions which are also noted in the indices column named "Full MW Impact", whereas the loading percentages reported in the body of the report, take into consideration the PJM Generator Deliverability Test rules such as commercial probability of each project as well as the ramping impact of "Adder" contributions. The MW Impact found and used in the analysis is shown in the indices column named "Gendeliv MW Impact".

11.6.1 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
97892840	314212	6FOUR RIVERS	DVP	939750	AE1-206 TAP	DVP	1	DVP_P1-2: LN 2089	single	1123.3	104.57	106.33	DC	19.71

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314131	6ARNOLDS	0.3239	80/20	0.3239
314134	6CRANES	0.0786	80/20	0.0786
314190	6WESTMOR	0.2394	80/20	0.2394
315033	1BIRCHWDA	9.3126	80/20	9.3126
315034	1NORNECKC1	0.2739	80/20	0.2739
315035	1NORNECKC2	0.2640	80/20	0.2640
315037	1LDYSMT1	12.3681	80/20	12.3681
315038	1LDYSMT2	12.3599	80/20	12.3599
315039	1LDYSMT3	13.0802	80/20	13.0802
315040	1LDYSMT4	13.1047	80/20	13.1047
315041	1LDYSMT5	13.1457	80/20	13.1457
315043	1FOUR RIVERA	13.5244	80/20	13.5244
315044	1FOUR RIVERB	13.5244	80/20	13.5244
315045	1FOUR RIVERC	16.5918	80/20	16.5918
315046	1FOUR RIVERD	13.5244	80/20	13.5244
315047	1FOUR RIVERE	13.5244	80/20	13.5244
315048	1FOUR RIVERF	16.5918	80/20	16.5918
315610	6AA1-145GAS	47.4050	80/20	47.4050
924061	AB2-050	2.7885	80/20	2.7885
926551	AC1-134	6.9713	80/20	6.9713
933011	AC2-125	7.0705	80/20	7.0705
933021	AC2-126	7.1180	80/20	7.1180
933271	AC2-138 C	0.3060	80/20	0.3060
934191	AD1-046 C	4.0453	80/20	4.0453
936341	AD2-044 C	0.0956	80/20	0.0956
936581	AD2-073 C	1.1647	80/20	1.1647
938961	AE1-124 C	1.7525	80/20	1.7525
939261	AE1-157 C O1	44.4495	80/20	44.4495
939271	AE1-158 C O1	45.3636	80/20	45.3636
942191	AE2-231 C O1	16.5665	80/20	16.5665
944491	AF1-114 C	6.1782	80/20	6.1782
945831	AF1-248	0.1339	80/20	0.1339
957191	AF2-013	18.9980	80/20	18.9980
957411	AF2-035 C	25.1008	80/20	25.1008
957551	AF2-049 C	19.7109	80/20	19.7109
957971	AF2-091 C	2.1006	80/20	2.1006
960091	AF2-300 C	7.5302	80/20	7.5302
NEWTON	NEWTON	1.3926	Confirmed LTF	1.3926
FARMERCITY	FARMERCITY	0.0756	Confirmed LTF	0.0756
G-007A	G-007A	0.6497	Confirmed LTF	0.6497
VFT	VFT	1.7028	Confirmed LTF	1.7028

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CALDERWOOD	CALDERWOOD	0.8593	Confirmed LTF	0.8593
PRAIRIE	PRAIRIE	3.5335	Confirmed LTF	3.5335
CHEOAH	CHEOAH	0.8734	Confirmed LTF	0.8734
EDWARDS	EDWARDS	0.4354	Confirmed LTF	0.4354
TILTON	TILTON	0.7818	Confirmed LTF	0.7818
GIBSON	GIBSON	0.6940	Confirmed LTF	0.6940
BLUEG	BLUEG	2.1908	Confirmed LTF	2.1908
TRIMBLE	TRIMBLE	0.6990	Confirmed LTF	0.6990
CATAWBA	CATAWBA	0.7630	Confirmed LTF	0.7630

11.6.2 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
97892768	314134	6CRANES	DVP	314142	6STAFORD	DVP	1	DVP_P1-2: LN 2089	single	678.68	113.68	115.12	DC	10.06

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314131	6ARNOLDS	0.6370	80/20	0.6370
314134	6CRANES	0.1912	80/20	0.1912
314190	6WESTMOR	0.6121	80/20	0.6121
315033	1BIRCHWDA	17.8016	80/20	17.8016
315034	1NORNECKC1	0.9125	80/20	0.9125
315035	1NORNECKC2	0.8796	80/20	0.8796
315037	1LDYSMT1	9.1591	80/20	9.1591
315038	1LDYSMT2	9.1530	80/20	9.1530
315039	1LDYSMT3	9.6864	80/20	9.6864
315040	1LDYSMT4	9.7046	80/20	9.7046
315041	1LDYSMT5	9.7349	80/20	9.7349
315043	1FOUR RIVERA	2.4320	80/20	2.4320
315044	1FOUR RIVERB	2.4320	80/20	2.4320
315045	1FOUR RIVERC	2.9836	80/20	2.9836
315046	1FOUR RIVERD	2.4320	80/20	2.4320
315047	1FOUR RIVERE	2.4320	80/20	2.4320
315048	1FOUR RIVERF	2.9836	80/20	2.9836
315050	1FOURRIVERG	4.3042	80/20	4.3042
315610	6AA1-145GAS	8.5245	80/20	8.5245
924061	AB2-050	0.5014	80/20	0.5014
925861	AC1-065 C	1.5489	Adder	1.82
926551	AC1-134	1.2536	80/20	1.2536
927041	AC1-191 C O1	4.2676	Adder	5.02
932831	AC2-110 C	0.6196	Adder	0.73
933011	AC2-125	5.2360	80/20	5.2360
933021	AC2-126	5.2712	80/20	5.2712
933271	AC2-138 C	1.0198	80/20	1.0198
934141	AD1-041 C	2.9826	80/20	2.9826
934191	AD1-046 C	9.3604	80/20	9.3604
934781	AD1-105 C	7.2066	80/20	7.2066
936241	AD2-030 C	0.2350	80/20	0.2350
936301	AD2-039 C	0.6196	Adder	0.73
936341	AD2-044 C	0.3187	80/20	0.3187
936581	AD2-073 C	3.2617	80/20	3.2617
936591	AD2-074 C	5.5866	80/20	5.5866
938031	AE1-004 C	0.6196	Adder	0.73
938961	AE1-124 C	4.0552	80/20	4.0552
939241	AE1-155 C	16.1242	80/20	16.1242
939261	AE1-157 C O1	22.6904	80/20	22.6904
939271	AE1-158 C O1	23.1570	80/20	23.1570
939611	AE1-191 C	5.9652	80/20	5.9652

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939751	AE1-206 C O1	21.8093	80/20	21.8093
940231	AE2-005 C	0.6196	Adder	0.73
940551	AE2-041 O1	3.1586	Adder	3.72
942191	AE2-231 C O1	6.7835	80/20	6.7835
943431	AF1-014 C	0.5870	Adder	0.69
943471	AF1-018	3.1586	Adder	3.72
943601	AF1-031 C	9.6273	80/20	9.6273
943741	AF1-042 C	2.9232	80/20	2.9232
943991	AF1-067 C	4.7589	80/20	4.7589
944491	AF1-114 C	13.6773	80/20	13.6773
945831	AF1-248	0.4462	80/20	0.4462
946001	AF1-265	19.1310	80/20	19.1310
957191	AF2-013	38.3720	80/20	38.3720
957411	AF2-035 C	10.2780	80/20	10.2780
957551	AF2-049 C	10.0619	80/20	10.0619
957601	AF2-054 C	1.2415	80/20	1.2415
957971	AF2-091 C	4.6503	80/20	4.6503
958261	AF2-120 C	6.7094	80/20	6.7094
960091	AF2-300 C	3.0834	80/20	3.0834
WEC	WEC	0.1487	Confirmed LTF	0.1487
LGEE	LGEE	0.2978	Confirmed LTF	0.2978
CPL	CPL	1.6782	Confirmed LTF	1.6782
CBM-W2	CBM-W2	6.5111	Confirmed LTF	6.5111
NY	NY	0.7864	Confirmed LTF	0.7864
CBM-W1	CBM-W1	5.2917	Confirmed LTF	5.2917
TVA	TVA	1.4182	Confirmed LTF	1.4182
CBM-S2	CBM-S2	11.6294	Confirmed LTF	11.6294
CBM-S1	CBM-S1	7.8469	Confirmed LTF	7.8469
MADISON	MADISON	0.4092	Confirmed LTF	0.4092
MEC	MEC	0.9407	Confirmed LTF	0.9407

11.6.3 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
97892744	314197	6LDYSMITH CT	DVP	314196	6LADYSMITH	DVP	1	DVP_P1-2: LN 2032-B	single	1151.5	124.8	127.01	DC	25.51

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314131	6ARNOLDS	0.5248	80/20	0.5248
314134	6CRANES	0.1224	80/20	0.1224
314190	6WESTMOR	0.4460	80/20	0.4460
315008	1POSSM6A	1.8214	80/20	1.8214
315009	1POSSM6B	1.8214	80/20	1.8214
315010	1POSSM6S	2.8382	80/20	2.8382
315033	1BIRCHWDA	14.8778	80/20	14.8778
315034	1NORNECKC1	0.5972	80/20	0.5972
315035	1NORNECKC2	0.5756	80/20	0.5756
315037	1LDYSMT1	19.2744	80/20	19.2744
315038	1LDYSMT2	19.2617	80/20	19.2617
315039	1LDYSMT3	20.3842	80/20	20.3842
315040	1LDYSMT4	20.4225	80/20	20.4225
315041	1LDYSMT5	20.4863	80/20	20.4863
315043	1FOUR RIVERA	12.3729	80/20	12.3729
315044	1FOUR RIVERB	12.3729	80/20	12.3729
315045	1FOUR RIVERC	15.1791	80/20	15.1791
315046	1FOUR RIVERD	12.3729	80/20	12.3729
315047	1FOUR RIVERE	12.3729	80/20	12.3729
315048	1FOUR RIVERF	15.1791	80/20	15.1791
315050	1FOURRIVERG	2.0066	80/20	2.0066
315610	6AA1-145GAS	43.3689	80/20	43.3689
924061	AB2-050	2.5511	80/20	2.5511
926551	AC1-134	6.3778	80/20	6.3778
933011	AC2-125	11.0187	80/20	11.0187
933021	AC2-126	11.0927	80/20	11.0927
933271	AC2-138 C	0.6674	80/20	0.6674
934191	AD1-046 C	7.1322	80/20	7.1322
934781	AD1-105 C	3.7584	80/20	3.7584
936341	AD2-044 C	0.2086	80/20	0.2086
936581	AD2-073 C	2.2865	80/20	2.2865
936591	AD2-074 C	3.1840	80/20	3.1840
938961	AE1-124 C	3.0899	80/20	3.0899
939241	AE1-155 C	9.5533	80/20	9.5533
939261	AE1-157 C O1	57.5331	80/20	57.5331
939271	AE1-158 C O1	58.7163	80/20	58.7163
939751	AE1-206 C O1	126.4494	80/20	126.4494
942191	AE2-231 C O1	19.5225	80/20	19.5225
943601	AF1-031 C	5.0209	80/20	5.0209
943741	AF1-042 C	1.6661	80/20	1.6661
943991	AF1-067 C	2.4819	80/20	2.4819

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
944491	AF1-114 C	10.6382	80/20	10.6382
945831	AF1-248	0.2920	80/20	0.2920
946001	AF1-265	110.9205	80/20	110.9205
957191	AF2-013	31.1970	80/20	31.1970
957411	AF2-035 C	29.5796	80/20	29.5796
957551	AF2-049 C	25.5127	80/20	25.5127
957971	AF2-091 C	3.6170	80/20	3.6170
958261	AF2-120 C	3.9752	80/20	3.9752
960091	AF2-300 C	8.8739	80/20	8.8739
NEWTON	NEWTON	1.2378	Confirmed LTF	1.2378
FARMERCITY	FARMERCITY	0.0656	Confirmed LTF	0.0656
CALDERWOOD	CALDERWOOD	0.6550	Confirmed LTF	0.6550
NY	NY	0.1797	Confirmed LTF	0.1797
PRAIRIE	PRAIRIE	3.0454	Confirmed LTF	3.0454
CHEOAH	CHEOAH	0.6622	Confirmed LTF	0.6622
EDWARDS	EDWARDS	0.3955	Confirmed LTF	0.3955
TILTON	TILTON	0.7125	Confirmed LTF	0.7125
GIBSON	GIBSON	0.6246	Confirmed LTF	0.6246
BLUEG	BLUEG	1.9825	Confirmed LTF	1.9825
TRIMBLE	TRIMBLE	0.6344	Confirmed LTF	0.6344
CATAWBA	CATAWBA	0.5135	Confirmed LTF	0.5135

11.6.4 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
97892570	314222	6HANOVER	DVP	314218	6ELMONT	DVP	1	DVP_P1-2: LN 256-B	single	1123.3	125.95	129.0	DC	34.31

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
315043	1FOUR RIVERA	16.6420	80/20	16.6420
315044	1FOUR RIVERB	16.6420	80/20	16.6420
315045	1FOUR RIVERC	20.4165	80/20	20.4165
315046	1FOUR RIVERD	16.6420	80/20	16.6420
315047	1FOUR RIVERE	16.6420	80/20	16.6420
315048	1FOUR RIVERF	20.4165	80/20	20.4165
315610	6AA1-145GAS	58.3329	80/20	58.3329
924061	AB2-050	3.4313	80/20	3.4313
926551	AC1-134	8.5784	80/20	8.5784
939261	AE1-157 C O1	77.3822	80/20	77.3822
939271	AE1-158 C O1	78.9736	80/20	78.9736
939751	AE1-206 C O1	170.0817	80/20	170.0817
942191	AE2-231 C O1	26.2582	80/20	26.2582
946001	AF1-265	149.1945	80/20	149.1945
957411	AF2-035 C	39.7852	80/20	39.7852
957551	AF2-049 C	34.3147	80/20	34.3147
960091	AF2-300 C	11.9356	80/20	11.9356
NEWTON	NEWTON	0.5770	Confirmed LTF	0.5770
FARMERCITY	FARMERCITY	0.0301	Confirmed LTF	0.0301
CALDERWOOD	CALDERWOOD	0.2669	Confirmed LTF	0.2669
NY	NY	0.3003	Confirmed LTF	0.3003
PRAIRIE	PRAIRIE	1.3871	Confirmed LTF	1.3871
CHEOAH	CHEOAH	0.2688	Confirmed LTF	0.2688
EDWARDS	EDWARDS	0.1879	Confirmed LTF	0.1879
TILTON	TILTON	0.3383	Confirmed LTF	0.3383
GIBSON	GIBSON	0.2932	Confirmed LTF	0.2932
BLUEG	BLUEG	0.9322	Confirmed LTF	0.9322
TRIMBLE	TRIMBLE	0.2988	Confirmed LTF	0.2988
CATAWBA	CATAWBA	0.1879	Confirmed LTF	0.1879

11.6.5 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
97892541	939260	AE1-157 TAP	DVP	314197	6LDYSMITH CT	DVP	1	DVP_P1-2: LN 2032-B	single	1123.3	132.13	135.19	DC	34.31

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
315043	1FOUR RIVERA	16.6420	80/20	16.6420
315044	1FOUR RIVERB	16.6420	80/20	16.6420
315045	1FOUR RIVERC	20.4165	80/20	20.4165
315046	1FOUR RIVERD	16.6420	80/20	16.6420
315047	1FOUR RIVERE	16.6420	80/20	16.6420
315048	1FOUR RIVERF	20.4165	80/20	20.4165
315610	6AA1-145GAS	58.3329	80/20	58.3329
924061	AB2-050	3.4313	80/20	3.4313
926551	AC1-134	8.5784	80/20	8.5784
939261	AE1-157 C O1	77.3822	80/20	77.3822
939271	AE1-158 C O1	78.9736	80/20	78.9736
939751	AE1-206 C O1	170.0817	80/20	170.0817
942191	AE2-231 C O1	26.2582	80/20	26.2582
946001	AF1-265	149.1945	80/20	149.1945
957411	AF2-035 C	39.7852	80/20	39.7852
957551	AF2-049 C	34.3147	80/20	34.3147
960091	AF2-300 C	11.9356	80/20	11.9356
NEWTON	NEWTON	0.5770	Confirmed LTF	0.5770
FARMERCITY	FARMERCITY	0.0301	Confirmed LTF	0.0301
CALDERWOOD	CALDERWOOD	0.2669	Confirmed LTF	0.2669
NY	NY	0.3003	Confirmed LTF	0.3003
PRAIRIE	PRAIRIE	1.3871	Confirmed LTF	1.3871
CHEOAH	CHEOAH	0.2688	Confirmed LTF	0.2688
EDWARDS	EDWARDS	0.1879	Confirmed LTF	0.1879
TILTON	TILTON	0.3383	Confirmed LTF	0.3383
GIBSON	GIBSON	0.2932	Confirmed LTF	0.2932
BLUEG	BLUEG	0.9322	Confirmed LTF	0.9322
TRIMBLE	TRIMBLE	0.2988	Confirmed LTF	0.2988
CATAWBA	CATAWBA	0.1879	Confirmed LTF	0.1879

11.6.6 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
97892528	939750	AE1-206 TAP	DVP	314222	6HANOVER	DVP	1	DVP_P1-2: LN 256-B	single	1123.3	132.15	135.21	DC	34.31

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
315043	1FOUR RIVERA	16.6420	80/20	16.6420
315044	1FOUR RIVERB	16.6420	80/20	16.6420
315045	1FOUR RIVERC	20.4165	80/20	20.4165
315046	1FOUR RIVERD	16.6420	80/20	16.6420
315047	1FOUR RIVERE	16.6420	80/20	16.6420
315048	1FOUR RIVERF	20.4165	80/20	20.4165
315610	6AA1-145GAS	58.3329	80/20	58.3329
924061	AB2-050	3.4313	80/20	3.4313
926551	AC1-134	8.5784	80/20	8.5784
939261	AE1-157 C O1	77.3822	80/20	77.3822
939271	AE1-158 C O1	78.9736	80/20	78.9736
939751	AE1-206 C O1	170.0817	80/20	170.0817
942191	AE2-231 C O1	26.2582	80/20	26.2582
946001	AF1-265	149.1945	80/20	149.1945
957411	AF2-035 C	39.7852	80/20	39.7852
957551	AF2-049 C	34.3147	80/20	34.3147
960091	AF2-300 C	11.9356	80/20	11.9356
NEWTON	NEWTON	0.5770	Confirmed LTF	0.5770
FARMERCITY	FARMERCITY	0.0301	Confirmed LTF	0.0301
CALDERWOOD	CALDERWOOD	0.2669	Confirmed LTF	0.2669
NY	NY	0.3003	Confirmed LTF	0.3003
PRAIRIE	PRAIRIE	1.3871	Confirmed LTF	1.3871
CHEOAH	CHEOAH	0.2688	Confirmed LTF	0.2688
EDWARDS	EDWARDS	0.1879	Confirmed LTF	0.1879
TILTON	TILTON	0.3383	Confirmed LTF	0.3383
GIBSON	GIBSON	0.2932	Confirmed LTF	0.2932
BLUEG	BLUEG	0.9322	Confirmed LTF	0.9322
TRIMBLE	TRIMBLE	0.2988	Confirmed LTF	0.2988
CATAWBA	CATAWBA	0.1879	Confirmed LTF	0.1879

11.7 Queue Dependencies

The Queue Projects below are listed in one or more indices for the overloads identified in your report. These projects contribute to the loading of the overloaded facilities identified in your report. The percent overload of a facility and cost allocation you may have towards a particular reinforcement could vary depending on the action of these earlier projects. The status of each project at the time of the analysis is presented in the table. This list may change as earlier projects withdraw or modify their requests.

Queue Number	Project Name	Status
AA1-145	Four Rivers 230kV	In Service
AB2-050	Four Rivers 230kV	In Service
AC1-065	Harmony Village-Shackleford 115kV	Engineering and Procurement
AC1-134	Four Rivers 230kV	In Service
AC1-191	Elmont 115kV	Active
AC2-110	Harmony Village-Shackleford 115kV	Engineering and Procurement
AC2-125	Ladysmith 230 kV I	Engineering and Procurement
AC2-126	Ladysmith 230 kV II	Engineering and Procurement
AC2-138	Northern Neck 34.5kV	Under Construction
AD1-041	Harmony Village-Shackleford 115 kV	Active
AD1-046	Oak Grove 34.5 kV III	Engineering and Procurement
AD1-105	Kings Dominion DP 115 kV	Active
AD2-030	Wan 34.5 kV	In Service
AD2-039	Harmony Village-Shackleford 115 kV	Engineering and Procurement
AD2-044	Northern Neck 34.5 kV	Under Construction
AD2-073	Sanders DP 230 kV	Active
AD2-074	Garner DP-Lancaster 115 kV	Active
AE1-004	Harmony Village-Shackleford 115 kV	Engineering and Procurement
AE1-124	Oak Grove 34.5 kV	Engineering and Procurement
AE1-155	Garner-Northern Neck 115 kV	Active
AE1-157	Ladysmith CT-St. Johns 230 kV	Active
AE1-158	Ladysmith CT-St. Johns 230 kV	Active
AE1-191	Harmony Village-Shackleford 115 kV	Active
AE1-206	Four Rivers-Hanover 230 kV	Active
AE2-005	Harmony Village-Shackleford 115 kV	Engineering and Procurement
AE2-041	Harmony Village 230 kV	Active
AE2-231	St. Johns 115 kV	Active
AF1-014	Harmony Village-Shackleford 115 kV	Active
AF1-018	Harmony Village 230 kV	Active
AF1-031	Kings Dominion DP 115 kV	Active
AF1-042	Garner DP-Lancaster 115 kV	Active
AF1-067	Kings Dominion DP 115 kV	Active
AF1-114	Oak Grove-Dahlgren 230 kV	Active
AF1-248	Northern Neck 34.5 kV	Engineering and Procurement
AF1-265	Four Rivers-Hanover 230 kV	Active
AF2-013	Arnold's Corner-Dahlgren 230 kV	Active
AF2-035	St. Johns 115 kV	Active
AF2-049	Ladysmith CT-St. Johns 230 kV	Active
AF2-054	Wan 34.5 kV	Active

Queue Number	Project Name	Status
AF2-091	Oak Grove-Dahlgren 230 kV	Active
AF2-120	Garner-Northern Neck 115 kV	Active
AF2-300	St. Johns 115 kV	Active

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
DVP_P1-2: LN 2032-B	CONTINGENCY 'DVP_P1-2: LN 2032-B' OPEN BRANCH FROM BUS 939750 TO BUS 314222 CKT 1 /* AE1-206 TAP 230.00 - 6HANOVER 230.00 OPEN BRANCH FROM BUS 314218 TO BUS 314222 CKT 1 /* 6ELMONT 230.00 - 6HANOVER 230.00 OPEN BUS 314222 /* ISLAND: 6HANOVER 230.00 END
DVP_P4-2: 25672	CONTINGENCY 'DVP_P4-2: 25672' /* LADYSMITH CT 230 KV OPEN BRANCH FROM BUS 939260 TO BUS 314197 CKT 1 /* AE1-157 TAP 230.00 - 6LDYSMITH CT230.00 OPEN BRANCH FROM BUS 314197 TO BUS 315039 CKT 1 /* 6LDYSMITH CT230.00 - 1LDYSMT3 18.000 OPEN BUS 315039 /* ISLAND: 1LDYSMT3 18.000 OPEN BRANCH FROM BUS 314197 TO BUS 315040 CKT 1 /* 6LDYSMITH CT230.00 - 1LDYSMT4 18.000 OPEN BUS 315040 /* ISLAND: 1LDYSMT4 18.000 OPEN BRANCH FROM BUS 314197 TO BUS 315041 CKT 1 /* 6LDYSMITH CT230.00 - 1LDYSMT5 18.000 OPEN BUS 315041 /* ISLAND: 1LDYSMT5 18.000 END
DVP_P1-2: LN 2089	CONTINGENCY 'DVP_P1-2: LN 2089' OPEN BRANCH FROM BUS 314196 TO BUS 314197 CKT 1 /* 6LADYSMITH 230.00 - 6LDYSMITH CT230.00 END
Base Case	
DVP_P1-2: LN 256-B	CONTINGENCY 'DVP_P1-2: LN 256-B' OPEN BRANCH FROM BUS 939260 TO BUS 314197 CKT 1 /* AE1-157 TAP 230.00 - 6LDYSMITH CT230.00 END
314222 6HANOVER 230 939750 AE1-206 TAP 230 1	CONTINGENCY '314222 6HANOVER 230 939750 AE1-206 TAP 230 1' OPEN BRANCH FROM BUS 314222 TO BUS 939750 CKT 1 END

12 Short Circuit Analysis

Short circuit analysis will be provided in the System Impact Study report.

13 Affected Systems

13.1 TVA

TVA Impacts to be determined during later study phases (as applicable).

13.2 Duke Energy Progress

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

14 Attachment 1: One Line Diagram