Generation Interconnection

Feasibility Study Report

for

Queue Project AF2-063

LOUISA-NORTH ANNA 230 KV

90 MW Capacity / 150 MW Energy

July 2020

Table of Contents

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 a Solar generating facility located in Louisa County, Virginia. The installed facilities will have a total capability of 150 MW with 90 MW of this output being recognized by PJM

as Capacity. The proposed in-service date for this project is February 01, 2023. This study does not imply a TO commitment to this in-service date.

Queue Number	AF2-063
Project Name	LOUISA-NORTH ANNA 230 KV
State	Virginia
County	Louisa
Transmission Owner	Dominion
MFO	150
MWE	150
MWC	90
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

AF2-063 will interconnect with the Dominion transmission system. The primary POI is a single line tap between Louisa 230 kV substation and North Anna 230 kV substation. The project will be connected to the 230 kV substation that is built as part of the AF2-037 230 kV project. The IC is responsible for securing right-of-way, permits and constructing the proposed attachment line from the solar facility site to the proposed new substation. Attachment 1 shows a one-line diagram of the proposed interconnection facilities. The IC may not install any facilities on Dominion's right-of-way without first obtaining the necessary approval from Dominion Energy.

There is no secondary point of interconnection specified for AF2-063.

5 Cost Summary

The AF2-063 project will be responsible for the following costs:

Description	Total Cost
Total Physical Interconnection Costs	$ 3,300,000
Total System Network Upgrade Costs	$ 185,410,000
Total Costs	**$ 188,710,000**

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 AF2-063 was evaluated as a 90 MW Capacity (150.0 MW Energy) injection at a single line tap between Louisa 230 kV substation and North Anna 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 AF2-063 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
Attachment Facilities	$ 2,100,000
New 230kV three breaker ring-bus substation	$ 1,200,000
Total Physical Interconnection Costs	**$ 3,300,000**

It is estimated to take 24-30 months to complete this work upon execution of an Interconnection Construction Service Agreement (ICSA). 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. See Attachment One.

The scope and cost estimates provided here rely on the AF2-037 project building the 230kV substation required for that project's physical interconnection to the Dominion transmission system. If the AF2-037 project withdraws from the PJM queue, the physical interconnection scope of that project will be required for the AF2-063 project.

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.

10.1.1 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)

10.2 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 AF2-063 was evaluated as a 150.0 MW (Capacity 90.0 MW) injection on the Louisa to North Anna 230 kV line in the Dominion area. Project AF2-063 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-063 was studied with a commercial probability of 53%. 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)

None

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
98539913	314085	6REMNG CT	230.0	DVP	314110	6ELK RUN	230.0	DVP	1	DVP_P7-1: LN 2039-2040	tower	1204.0	101.27	101.85	DC	15.37
98539914	314110	6ELK RUN	230.0	DVP	941850	AE2-190 TAP	230.0	DVP	1	DVP_P7-1: LN 2039-2040	tower	1204.0	100.98	101.56	DC	15.37
96837674	314918	8NO ANNA	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P4-2: SPOTSH1T594	breaker	3938.0	108.18	109.21	DC	73.88
96837675	314918	8NO ANNA	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P4-2: H1T594	breaker	3938.0	103.92	104.86	DC	73.61
96837684	314918	8NO ANNA	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P4-2: 568T575	breaker	3938.0	105.2	105.64	DC	63.73
96837685	314918	8NO ANNA	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P4-2: H1T575	breaker	3938.0	100.59	101.08	DC	63.16
96837848	314918	8NO ANNA	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P1-2: LN 594	single	3218.560058 59	115.27	116.57	DC	43.88
96837849	314918	8NO ANNA	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P1-2: LN 573	single	3218.560058 59	114.2	115.61	DC	44.37
96837858	314918	8NO ANNA	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P1-2: LN 575	single	3218.560058 59	117.08	117.41	DC	37.9
96837664	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P4-2: 568T575	breaker	3938.0	111.67	112.29	DC	62.99
96837665	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P4-2: H1T575	breaker	3938.0	106.11	106.75	DC	62.34

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
96837832	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P1-2: LN 575	single	3218.56005859	121.9	122.22	DC	37.41
98539904	941850	AE2-190 TAP	230.0	DVP	314037	6GAINSVL	230.0	DVP	1	DVP_P7-1: LN 2039-2040	tower	1204.0	106.74	107.32	DC	15.37
97903090	957430	AF2-037 TAP	230.0	DVP	314232	6NO ANNA	230.0	DVP	1	DVP_P1-2: LN 2088	single	749.179992676	120.35	132.32	DC	89.65

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	CKT ID	CONT NAME	Type	Rating MVA	PRE PROJECT LOADING %	POST PROJECT LOADING %	AC|DC	MW IMPACT
97903462	314745	6LOISACT	230.0	DVP	314758	6GORDNVL	230.0	DVP	1	314232 6NO ANNA 230 314766 6LOUISA 230 1	operation	1072.54003906	97.87	111.8	DC	149.41
96837846	314918	8NO ANNA	500.0	DVP	314911	8LADYSMITH	500.0	DVP	1	DVP_P1-2: LN 594	operation	3218.56005859	126.43	127.58	DC	73.14
96837856	314918	8NO ANNA	500.0	DVP	314934	8SPOTSYL	500.0	DVP	1	DVP_P1-2: LN 575	operation	3218.56005859	122.92	123.52	DC	63.17
96837829	314934	8SPOTSYL	500.0	DVP	314916	8MORRSVL	500.0	DVP	1	DVP_P1-2: LN 575	operation	3218.56005859	129.7	130.48	DC	62.35
97903089	957430	AF2-037 TAP	230.0	DVP	314232	6NO ANNA	230.0	DVP	1	DVP_P1-2: LN 2088	operation	749.179992676	140.11	160.06	DC	149.41

11.5 System Reinforcements - Summer Peak Load Flow - Primary POI

ID	Idx	Facility	Upgrade Description	Cost
98539914	2	6ELK RUN 230.0 kV - AE2-190 TAP 230.0 kV Ckt 1	DVP dom-207 (1306) : Rebuild 1.7 miles of 230 kV Line 2114 from AE2-190 Tap to Elk Run with 2-795 ACSR. Project Type : FAC Cost : $2,550,000 Time Estimate : 30-36 Months	$2,550,000
98539904	6	AE2-190 TAP 230.0 kV - 6GAINSVL 230.0 kV Ckt 1	DVP dom-192 (1243) : Reconductor 20.4 miles of 230 kV Line 2114 from AE2-190 Tap to Gainsville with 795 ACSR. Project Type : FAC Cost : $16,320,000 Time Estimate : 36-42 Months	$16,320,000
98539913	1	6REMNGCT 230.0 kV - 6ELK RUN 230.0 kV Ckt 1	DVP dom-206 (1305) : Rebuild 3.46 miles of 230 kV Line 2114 from Remington CT to Elk Run with 2-795 ACSR. Project Type : FAC Cost : $5,190,000 Time Estimate : 30-36 Months	$5,190,000
97903090	7	AF2-037 TAP 230.0 kV - 6NO ANNA 230.0 kV Ckt 1	DVP dom-241 (1340) : Rebuild 9.6 miles of 230 kV Line 255 from AF2-037 Tap to North Anna with 2-795 ACSR. Upgrade Relay and Wavetrap at North Anna. Project Type : FAC Cost : $14,720,000 Time Estimate : 36-40 Months	$14,720,000
96837832,96837665,96837664	5	8SPOTSYL 500.0 kV - 8MORRSVL 500.0 kV Ckt 1	DVP n6160 (1275) : Rebuild 18.75 miles of 500 kV Line 594 from Spotsylvania to Morrisvile with 3-1351.5 113C ACSR. Project Type : FAC Cost : $58,125,000 Time Estimate : 48-60 Months	$58,125,000
96837674,96837675,96837849,96837848	3	8NO ANNA 500.0 kV - 8LADYSMITH 500.0 kV Ckt 1	DVP dom-044 (1110) : Rebuild 14.53 miles of 500 kV Line 575 from North Anna to Ladysmith with 3-1351.5 113C ACSR. Project Type : FAC Cost : $45,043,000 Time Estimate : 48-60 Months	$45,043,000

ID	Idx	Facility	Upgrade Description	Cost
96837858,96837685,96837684	4	8NO ANNA 500.0 kV - 8SPOTSYL 500.0 kV Ckt 1	DVP n6132 (1262) : Rebuild 14.02 miles of 500 kV Line 573 from North Anna to Spotsylvania with 3-1351.5 113C ACSR. Project Type : FAC Cost : $43,462,000 Time Estimate : 48-60 Months	$43,462,000
			TOTAL COST	$185,410,000

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
98539913	314085	6REMNGCT	DVP	314110	6ELK RUN	DVP	1	DVP_P7-1: LN 2039-2040	tower	1204.0	101.27	101.85	DC	15.37

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314078	3REMNGTN	0.7201	50/50	0.7201
315021	1REMNGT1	15.8399	50/50	15.8399
315022	1REMNGT2	15.8608	50/50	15.8608
315023	1REMNGT3	15.9235	50/50	15.9235
315024	1REMNGT4	15.8608	50/50	15.8608
315028	1M RUN A	16.8344	50/50	16.8344
315029	1M RUN B	16.6992	50/50	16.6992
315030	1M RUN C	16.8344	50/50	16.8344
923892	AB2-029 E	6.7016	50/50	6.7016
925022	AB2-158 E	3.2433	Adder	3.82
925671	**AC1-043 C (Suspended)**	**12.5826**	**50/50**	**12.5826**
925672	**AC1-043 E (Suspended)**	**20.5294**	**50/50**	**20.5294**
926001	**AC1-076 C (Suspended)**	**3.2562**	**Adder**	**3.83**
926002	**AC1-076 E (Suspended)**	**5.2948**	**Adder**	**6.23**
926481	AC1-120 C O1	11.1193	50/50	11.1193
926482	AC1-120 E O1	5.7281	50/50	5.7281
926501	AC1-121 C O1	3.8187	50/50	3.8187
926502	AC1-121 E O1	1.7971	50/50	1.7971
926611	AC1-143 C O1	20.7702	50/50	20.7702
926612	AC1-143 E O1	9.4776	50/50	9.4776
934861	AD1-115 C	6.2913	50/50	6.2913
934862	AD1-115 E	10.2647	50/50	10.2647
939221	AE1-153 C O1	33.4311	50/50	33.4311
939222	AE1-153 E O1	22.2874	50/50	22.2874
939231	AE1-154 C	1.1924	Adder	1.4
939232	AE1-154 E	0.8347	Adder	0.98
941361	AE2-132	1.8506	50/50	1.8506
941381	**AE2-134 (Suspended)**	**2.2438**	**Adder**	**2.64**
944111	AF1-079 C	2.2655	Adder	2.67
944112	AF1-079 E	3.0763	Adder	3.62
946371	AF1-301 C	8.8819	Adder	10.45
946372	AF1-301 E	5.9602	Adder	7.01
957431	AF2-037 C	2.6038	Adder	5.78
957432	AF2-037 E	1.7359	Adder	3.85
957462	AF2-040 BAT	25.6605	50/50	25.6605
957691	AF2-063 C	4.1551	Adder	9.22
957692	AF2-063 E	2.7700	Adder	6.15
961101	AF2-401 C	1.3569	50/50	1.3569
961102	AF2-401 E	2.2486	50/50	2.2486
WEC	WEC	0.0794	Confirmed LTF	0.0794
LGEE	LGEE	0.1711	Confirmed LTF	0.1711

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CPLE	CPLE	0.7184	Confirmed LTF	0.7184
CBM-W2	CBM-W2	3.4808	Confirmed LTF	3.4808
NY	NY	0.7427	Confirmed LTF	0.7427
CBM-W1	CBM-W1	2.6771	Confirmed LTF	2.6771
TVA	TVA	0.7686	Confirmed LTF	0.7686
O-066	O-066	10.1338	Confirmed LTF	10.1338
CBM-S2	CBM-S2	5.4274	Confirmed LTF	5.4274
CBM-S1	CBM-S1	4.2856	Confirmed LTF	4.2856
G-007	G-007	1.5798	Confirmed LTF	1.5798
MADISON	MADISON	0.1956	Confirmed LTF	0.1956
MEC	MEC	0.5037	Confirmed LTF	0.5037

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
98539914	314110	6ELK RUN	DVP	941850	AE2-190 TAP	DVP	1	DVP_P7-1: LN 2039-2040	tower	1204.0	100.98	101.56	DC	15.37

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314078	3REMNGTN	0.7201	50/50	0.7201
315021	1REMNGT1	15.8399	50/50	15.8399
315022	1REMNGT2	15.8608	50/50	15.8608
315023	1REMNGT3	15.9235	50/50	15.9235
315024	1REMNGT4	15.8608	50/50	15.8608
315028	1M RUN A	16.8344	50/50	16.8344
315029	1M RUN B	16.6992	50/50	16.6992
315030	1M RUN C	16.8344	50/50	16.8344
923892	AB2-029 E	6.7016	50/50	6.7016
925022	AB2-158 E	3.2433	Adder	3.82
925671	**AC1-043 C (Suspended)**	**12.5826**	**50/50**	**12.5826**
925672	**AC1-043 E (Suspended)**	**20.5294**	**50/50**	**20.5294**
926001	**AC1-076 C (Suspended)**	**3.2562**	**Adder**	**3.83**
926002	**AC1-076 E (Suspended)**	**5.2948**	**Adder**	**6.23**
926481	AC1-120 C O1	11.1193	50/50	11.1193
926482	AC1-120 E O1	5.7281	50/50	5.7281
926501	AC1-121 C O1	3.8187	50/50	3.8187
926502	AC1-121 E O1	1.7971	50/50	1.7971
926611	AC1-143 C O1	20.7702	50/50	20.7702
926612	AC1-143 E O1	9.4776	50/50	9.4776
934861	AD1-115 C	6.2913	50/50	6.2913
934862	AD1-115 E	10.2647	50/50	10.2647
939221	AE1-153 C O1	33.4311	50/50	33.4311
939222	AE1-153 E O1	22.2874	50/50	22.2874
939231	AE1-154 C	1.1924	Adder	1.4
939232	AE1-154 E	0.8347	Adder	0.98
941361	AE2-132	1.8506	50/50	1.8506
941381	**AE2-134 (Suspended)**	**2.2438**	**Adder**	**2.64**
944111	AF1-079 C	2.2655	Adder	2.67
944112	AF1-079 E	3.0763	Adder	3.62
946371	AF1-301 C	8.8819	Adder	10.45
946372	AF1-301 E	5.9602	Adder	7.01
957431	AF2-037 C	2.6038	Adder	5.78
957432	AF2-037 E	1.7359	Adder	3.85
957462	AF2-040 BAT	25.6605	50/50	25.6605
957691	AF2-063 C	4.1551	Adder	9.22
957692	AF2-063 E	2.7700	Adder	6.15
961101	AF2-401 C	1.3569	50/50	1.3569
961102	AF2-401 E	2.2486	50/50	2.2486
WEC	WEC	0.0794	Confirmed LTF	0.0794
LGEE	LGEE	0.1711	Confirmed LTF	0.1711

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
CPLE	CPLE	0.7184	Confirmed LTF	0.7184
CBM-W2	CBM-W2	3.4808	Confirmed LTF	3.4808
NY	NY	0.7427	Confirmed LTF	0.7427
CBM-W1	CBM-W1	2.6771	Confirmed LTF	2.6771
TVA	TVA	0.7686	Confirmed LTF	0.7686
O-066	O-066	10.1338	Confirmed LTF	10.1338
CBM-S2	CBM-S2	5.4274	Confirmed LTF	5.4274
CBM-S1	CBM-S1	4.2856	Confirmed LTF	4.2856
G-007	G-007	1.5798	Confirmed LTF	1.5798
MADISON	MADISON	0.1956	Confirmed LTF	0.1956
MEC	MEC	0.5037	Confirmed LTF	0.5037

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
96837848	314918	8NO ANNA	DVP	314911	8LADYSMITH	DVP	1	DVP_P1-2: LN 594	single	3218.56	115.27	116.57	DC	43.88

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314333	6POWHATN	0.4041	80/20	0.4041
314435	6SAPONY	0.3302	80/20	0.3302
314677	6BUCKING	0.3113	80/20	0.3113
314947	8GREENSVILLE	51.0735	80/20	51.0735
315102	1BRUNSWICKG1	8.3810	80/20	8.3810
315103	1BRUNSWICKG2	8.3810	80/20	8.3810
315104	1BRUNSWICKG3	8.3810	80/20	8.3810
315105	1BRUNSWICKS1	17.4116	80/20	17.4116
315153	1CLOVER1	11.8773	80/20	11.8773
315154	1CLOVER2	11.7589	80/20	11.7589
315172	1LOISA A	3.2295	80/20	3.2295
315173	1LOISA B	3.2462	80/20	3.2462
315174	1LOISA C	3.2462	80/20	3.2462
315175	1LOISA D	3.2462	80/20	3.2462
315176	1LOISA E	6.6181	80/20	6.6181
315177	1S ANNAG1	2.3097	80/20	2.3097
315178	1S ANNAS1	1.1870	80/20	1.1870
315179	1S ANNAG2	2.3097	80/20	2.3097
315180	1S ANNAS2	1.1870	80/20	1.1870
315225	1N ANNA1	109.6270	80/20	109.6270
315226	1N ANNA2	109.6732	80/20	109.6732
315294	1DOMTR10	6.8222	Adder	8.03
315611	6Z1-036WIND	4.2207	Adder	4.97
923262	**AB1-132 C OP (Suspended)**	**9.0457**	**Adder**	**10.64**
923572	AB1-173 C OP	1.4733	Adder	1.73
923582	AB1-173AC OP	1.4733	Adder	1.73
923801	AB2-015 C OP	5.3762	Adder	6.32
923831	AB2-022 C	1.4218	Adder	1.67
923911	AB2-031 C O1	1.4624	Adder	1.72
923991	AB2-040 C O1	4.8018	Adder	5.65
924301	**AB2-077 C O1 (Suspended)**	**1.2872**	**Adder**	**1.51**
924311	**AB2-078 C O1 (Suspended)**	**1.2872**	**Adder**	**1.51**
924321	**AB2-079 C O1 (Suspended)**	**1.2872**	**Adder**	**1.51**
924501	**AB2-099 C (Suspended)**	**0.3713**	**Adder**	**0.44**
924511	AB2-100 C	1.5315	80/20	1.5315
925021	AB2-158 C	4.3137	80/20	4.3137
925061	**AB2-161 C O1 (Suspended)**	**1.9813**	**Adder**	**2.33**

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
925611	AC1-036 C	0.6257	Adder	0.74
925671	**AC1-043 C (Suspended)**	**6.1176**	**80/20**	**6.1176**
925781	AC1-054 C O1	4.6755	Adder	5.5
926001	**AC1-076 C (Suspended)**	**6.4522**	**80/20**	**6.4522**
926071	AC1-086 C	13.3208	Adder	15.67
926201	AC1-098 C	3.9103	Adder	4.6
926211	AC1-099 C	1.3104	Adder	1.54
926271	**AC1-105 C O1 (Suspended)**	**3.6088**	**Adder**	**4.25**
926481	AC1-120 C O1	7.6784	80/20	7.6784
926501	AC1-121 C O1	2.6370	80/20	2.6370
926661	AC1-147 C	1.3751	Adder	1.62
926731	AC1-158 C	39.0561	80/20	39.0561
926751	AC1-161 C O1	18.6762	Adder	21.97
927141	AC1-208 C	5.7544	Adder	6.77
932041	AC2-012 C	6.2205	Adder	7.32
932511	AC2-071 C	1.7779	80/20	1.7779
932591	AC2-079 C O1	3.4236	Adder	4.03
932631	AC2-084 C	5.5743	Adder	6.56
933291	AC2-141 C	18.6762	Adder	21.97
933501	AC2-165 C	9.2745	80/20	9.2745
933731	AC2-196 C	1.1026	Adder	1.3
933991	AD1-023 C	8.2543	Adder	9.71
934061	AD1-033 C	4.6281	Adder	5.44
934331	AD1-057 C O1	6.3433	Adder	7.46
934521	AD1-076 C	34.1071	Adder	40.13
934571	AD1-082 C	4.5152	Adder	5.31
934611	AD1-087 C O1	6.9595	80/20	6.9595
934621	AD1-088 C	10.2416	80/20	10.2416
934861	AD1-115 C	3.0588	80/20	3.0588
935111	AD1-144 C	1.0177	Adder	1.2
935171	AD1-152 C O1	6.9163	80/20	6.9163
935221	AD1-157 C	1.1909	80/20	1.1909
936261	AD2-033 C	8.5295	Adder	10.03
936361	AD2-046 C O1	5.7508	Adder	6.77
936401	AD2-051 C O1	5.5506	Adder	6.53
936481	AD2-063 C O1	9.7515	Adder	11.47
936661	AD2-085 C	2.0525	Adder	2.41
937221	AD2-160 C O1	3.6085	Adder	4.25
937481	AD2-202 C O1	1.8444	80/20	1.8444
937541	AD2-215 C	1.0282	Adder	1.21
938171	AE1-026 C O1	20.1591	Adder	23.72
938221	AE1-035 C	1.4187	Adder	1.67
938371	AE1-056 C	5.1340	80/20	5.1340
938491	AE1-068 C O1	59.0892	80/20	59.0892
938501	AE1-069 C O1	46.2299	80/20	46.2299
938531	AE1-072 C O1	10.8274	Adder	12.74
938551	AE1-074 C	1.9211	80/20	1.9211
938561	AE1-075 C	2.0539	80/20	2.0539
938771	AE1-103 C O1	2.2600	Adder	2.66
939181	AE1-148 C O1	5.6737	Adder	6.67
939221	AE1-153 C O1	12.0985	80/20	12.0985
939231	AE1-154 C	4.0997	80/20	4.0997

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939411	AE1-173 C	81.2976	80/20	81.2976
940061	AE2-000BC O1	9.3850	Adder	11.04
940241	AE2-006	0.3184	Adder	0.37
940251	AE2-007 O1	105.8753	Adder	124.56
940471	AE2-031 C	32.2909	80/20	32.2909
940481	AE2-033 C	12.2749	80/20	12.2749
940491	AE2-034 C	4.4961	Adder	5.29
940641	AE2-051 C O1	16.4250	80/20	16.4250
940661	AE2-053 O1	2.1014	Adder	2.47
941031	AE2-094 C	38.7091	80/20	38.7091
941101	AE2-104 C O1	2.0477	Adder	2.41
941281	AE2-122 C O1	17.4436	Adder	20.52
941291	AE2-123 C O1	17.9267	Adder	21.09
941301	AE2-124 C O1	16.3108	Adder	19.19
941381	**AE2-134 (Suspended)**	**4.4460**	**80/20**	**4.4460**
941501	AE2-147 C	9.7943	Adder	11.52
941541	AE2-151 C	0.6882	Adder	0.81
941591	AE2-156 O1	10.9250	Adder	12.85
941791	AE2-182 C	1.6639	80/20	1.6639
942131	AE2-225 C	1.3109	Adder	1.54
942171	AE2-229 C	1.3109	Adder	1.54
942341	AE2-247 C	0.8894	Adder	1.05
942401	AE2-253 C	3.7955	Adder	4.47
942451	AE2-258	1.5151	Adder	1.78
942461	AE2-259 C O1	8.0742	80/20	8.0742
942471	AE2-260 C O1	11.0189	80/20	11.0189
942851	AE2-304 C	0.3907	Adder	0.46
942931	AE2-313 C	34.9633	80/20	34.9633
943171	AE2-346 C	0.8911	Adder	1.05
943461	AF1-017 C	0.8047	Adder	0.95
943611	AF1-032 C	1.0706	Adder	1.26
943901	AF1-058 C	1.2672	Adder	1.49
943911	AF1-059	10.9004	Adder	12.82
944011	AF1-069 C	12.6477	80/20	12.6477
944111	AF1-079 C	7.7894	80/20	7.7894
944581	AF1-123 C O1	29.8452	Adder	35.11
944591	AF1-124 C O1	29.8452	Adder	35.11
944601	AF1-125 C O1	29.8452	Adder	35.11
944871	AF1-152 C	3.2648	Adder	3.84
945711	AF1-236 C O1	49.2211	Adder	57.91
945811	AF1-246 C O1	6.9069	80/20	6.9069
946011	AF1-266	10.2750	80/20	10.2750
946281	AF1-292 C	0.9871	Adder	1.16
946301	AF1-294 C	2.7499	Adder	3.24
946371	AF1-301 C	31.5932	80/20	31.5932
957431	AF2-037 C	27.5012	80/20	27.5012
957481	AF2-042 C O1	49.1340	80/20	49.1340
957491	AF2-043 C	0.6948	Adder	1.54
957521	AF2-046 C	5.6371	Adder	12.51
957531	AF2-047 C	5.6622	Adder	12.57
957631	AF2-057	1.1568	Adder	2.57
957691	AF2-063 C	43.8849	80/20	43.8849

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
957791	AF2-073 C (Withdrawn : 07/02/2020)	3.1509	Adder	6.99
957801	AF2-074 C (Withdrawn : 07/02/2020)	1.4004	Adder	3.11
957821	AF2-076 C O1	1.7336	Adder	3.85
957871	AF2-081 C O1	3.2625	Adder	7.24
957911	AF2-085	3.9264	80/20	3.9264
958161	AF2-110 C	0.4474	Adder	0.99
958211	AF2-115 C	0.8887	Adder	1.97
958501	AF2-144 C	1.7313	80/20	1.7313
958801	AF2-171 C O1	5.3292	Adder	11.83
959311	AF2-222 C	5.8331	Adder	12.95
959531	AF2-244 C	1.5956	80/20	1.5956
959731	AF2-264 C	0.7550	Adder	1.68
959751	AF2-266 O1	7.7980	80/20	7.7980
960061	AF2-297 C O1	2.6866	Adder	5.96
960081	AF2-299 C	0.8817	Adder	1.96
960811	AF2-372 C	0.4309	Adder	0.96
960821	AF2-373 C	0.3213	Adder	0.71
960831	AF2-374 C	0.4276	Adder	0.95
961081	AF2-399 C	0.1149	Adder	0.26
961091	AF2-400 C	0.1539	Adder	0.34
961101	AF2-401 C	0.1955	Adder	0.43
961111	AF2-402 C O1	0.3495	Adder	0.78
WEC	WEC	0.5204	Confirmed LTF	0.5204
LGEE	LGEE	1.0286	Confirmed LTF	1.0286
CPLE	CPLE	6.6011	Confirmed LTF	6.6011
CBM-W2	CBM-W2	23.7920	Confirmed LTF	23.7920
NY	NY	2.2690	Confirmed LTF	2.2690
CBM-W1	CBM-W1	18.5899	Confirmed LTF	18.5899
TVA	TVA	5.2318	Confirmed LTF	5.2318
CBM-S2	CBM-S2	45.3152	Confirmed LTF	45.3152
CBM-S1	CBM-S1	28.7806	Confirmed LTF	28.7806
MADISON	MADISON	1.6410	Confirmed LTF	1.6410
MEC	MEC	3.3623	Confirmed LTF	3.3623
AA2-074	AA2-074	4.4973	LTF	4.4973

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
96837858	314918	8NO ANNA	DVP	314934	8SPOTSYL	DVP	1	DVP_P1-2: LN 575	single	3218.56	117.08	117.41	DC	37.9

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314295	6BIRDNECK	0.0437	80/20	0.0437
314333	6POWHATN	0.4510	80/20	0.4510
314435	6SAPONY	0.4117	80/20	0.4117
314491	3PENDLTN	0.3262	80/20	0.3262
314947	8GREENSVILLE	57.2873	80/20	57.2873
315083	**1SPRUNCA (Deactivation : 12/01/2021)**	**7.8693**	**Adder**	**9.26**
315084	**1SPRUNCB (Deactivation : 12/01/2021)**	**7.8693**	**Adder**	**9.26**
315102	1BRUNSWICKG1	9.4062	80/20	9.4062
315103	1BRUNSWICKG2	9.4062	80/20	9.4062
315104	1BRUNSWICKG3	9.4062	80/20	9.4062
315105	1BRUNSWICKS1	19.5413	80/20	19.5413
315108	1ELIZAR1	3.1861	80/20	3.1861
315109	1ELIZAR2	3.1308	80/20	3.1308
315110	1ELIZAR3	3.2269	80/20	3.2269
315153	1CLOVER1	13.3814	80/20	13.3814
315154	1CLOVER2	13.2480	80/20	13.2480
315172	1LOISA A	2.3794	80/20	2.3794
315173	1LOISA B	2.3917	80/20	2.3917
315174	1LOISA C	2.3917	80/20	2.3917
315175	1LOISA D	2.3917	80/20	2.3917
315176	1LOISA E	4.8760	80/20	4.8760
315177	1S ANNAG1	1.7326	80/20	1.7326
315178	1S ANNAS1	0.8904	80/20	0.8904
315179	1S ANNAG2	1.7326	80/20	1.7326
315180	1S ANNAS2	0.8904	80/20	0.8904
315225	1N ANNA1	98.4361	80/20	98.4361
315226	1N ANNA2	98.4776	80/20	98.4776
315294	1DOMTR10	8.5919	Adder	10.11
315611	6Z1-036WIND	5.4363	Adder	6.4
923262	**AB1-132 C OP (Suspended)**	**11.1691**	**Adder**	**13.14**
923572	AB1-173 C OP	1.8100	Adder	2.13
923582	AB1-173AC OP	1.8100	Adder	2.13
923801	AB2-015 C OP	6.8693	Adder	8.08
923831	AB2-022 C	1.8460	Adder	2.17
923911	AB2-031 C O1	1.7965	Adder	2.11
923991	AB2-040 C O1	5.8991	Adder	6.94
924501	**AB2-099 C (Suspended)**	**0.4651**	**Adder**	**0.55**
925021	AB2-158 C	3.6228	80/20	3.6228

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
925051	AB2-160 C O1 (Suspended)	3.9721	Adder	4.67
925061	AB2-161 C O1 (Suspended)	2.6441	Adder	3.11
925331	AB2-190 C	14.2990	Adder	16.82
925611	AC1-036 C	0.7192	Adder	0.85
926071	AC1-086 C	16.4478	Adder	19.35
926201	AC1-098 C	4.8084	Adder	5.66
926211	AC1-099 C	1.6113	Adder	1.9
926661	AC1-147 C	1.8050	Adder	2.12
926751	AC1-161 C O1	28.7656	80/20	28.7656
927141	AC1-208 C	7.0465	Adder	8.29
932041	AC2-012 C	8.1653	Adder	9.61
932581	AC2-078 C O1	3.1242	Adder	3.68
932591	AC2-079 C O1	4.5257	Adder	5.32
932631	AC2-084 C	6.8545	Adder	8.06
933291	AC2-141 C	28.7656	80/20	28.7656
933501	AC2-165 C	10.3027	80/20	10.3027
933731	AC2-196 C	1.6924	80/20	1.6924
933991	AD1-023 C	10.4378	Adder	12.28
934011	AD1-025 C	12.0754	Adder	14.21
934061	AD1-033 C	7.1060	80/20	7.1060
934331	AD1-057 C O1	7.7449	Adder	9.11
934521	AD1-076 C	43.2281	Adder	50.86
934571	AD1-082 C	6.0257	Adder	7.09
934611	AD1-087 C O1	6.7072	Adder	7.89
934621	AD1-088 C	9.6867	Adder	11.4
935111	AD1-144 C	1.3544	Adder	1.59
935161	AD1-151 C O1	11.4903	Adder	13.52
935171	AD1-152 C O1	6.6655	Adder	7.84
935221	AD1-157 C	1.1448	Adder	1.35
936041	AD2-007 C	0.5768	Adder	0.68
936051	AD2-008 C	2.1023	Adder	2.47
936261	AD2-033 C	9.8296	Adder	11.56
936401	AD2-051 C O1	6.9701	Adder	8.2
936481	AD2-063 C O1	10.2524	Adder	12.06
936661	AD2-085 C	2.7146	Adder	3.19
937221	AD2-160 C O1	5.5314	80/20	5.5314
937251	AD2-164 (Withdrawn : 06/30/2020)	3.4052	Adder	4.01
937481	AD2-202 C O1	1.7775	Adder	2.09
937541	AD2-215 C	1.3684	Adder	1.61
938171	AE1-026 C O1	25.4584	Adder	29.95
938221	AE1-035 C	1.7824	Adder	2.1
938371	AE1-056 C	4.9355	Adder	5.81
938491	AE1-068 C O1	66.2431	80/20	66.2431
938501	AE1-069 C O1	51.8544	80/20	51.8544
938531	AE1-072 C O1	14.0918	Adder	16.58
938551	AE1-074 C	2.4463	80/20	2.4463
938561	AE1-075 C	2.2923	80/20	2.2923
938631	AE1-085 C O1	6.8671	Adder	8.08
938771	AE1-103 C O1	2.8962	Adder	3.41
939191	AE1-149 C O1	8.1988	Adder	9.65

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
939231	AE1-154 C	3.4430	80/20	3.4430
939311	AE1-162 C	1.6415	Adder	1.93
939411	AE1-173 C	95.4384	80/20	95.4384
940061	AE2-000BC O1	12.5246	Adder	14.73
940241	AE2-006	0.3659	Adder	0.43
940251	AE2-007 O1	163.3309	80/20	163.3309
940471	AE2-031 C	36.1711	80/20	36.1711
940481	AE2-033 C	15.2893	80/20	15.2893
940491	AE2-034 C	5.7334	Adder	6.75
940541	AE2-040 O1	2.0514	Adder	2.41
940641	AE2-051 C O1	18.7767	80/20	18.7767
940651	AE2-052	2.7329	Adder	3.22
940891	AE2-078 C	1.7393	Adder	2.05
940901	AE2-079 C	1.7393	Adder	2.05
941031	AE2-094 C	43.3545	80/20	43.3545
941101	AE2-104 C O1	2.6746	Adder	3.15
941281	AE2-122 C O1	26.8414	80/20	26.8414
941291	AE2-123 C O1	27.5846	80/20	27.5846
941301	AE2-124 C O1	25.0891	80/20	25.0891
941501	AE2-147 C	12.6860	Adder	14.92
941541	AE2-151 C	0.8612	Adder	1.01
941591	AE2-156 O1	16.8650	80/20	16.8650
941791	AE2-182 C	1.5738	Adder	1.85
942001	AE2-212 C	1.5790	Adder	1.86
942131	AE2-225 C	1.7096	Adder	2.01
942161	AE2-228 C	1.5184	Adder	1.79
942171	AE2-229 C	1.7096	Adder	2.01
942341	AE2-247 C	1.1765	Adder	1.38
942371	AE2-250 C O1	7.0557	Adder	8.3
942401	AE2-253 C	5.8181	80/20	5.8181
942461	AE2-259 C O1	7.6760	Adder	9.03
942471	AE2-260 C O1	11.6092	Adder	13.66
942551	AE2-270	19.2346	Adder	22.63
942851	AE2-304 C	0.5047	Adder	0.59
942931	AE2-313 C	39.1646	80/20	39.1646
943171	AE2-346 C	1.1162	Adder	1.31
943461	AF1-017 C	1.0644	Adder	1.25
943611	AF1-032 C	1.3962	Adder	1.64
943621	AF1-033 C	1.7393	Adder	2.05
943911	AF1-059	13.0169	Adder	15.31
944011	AF1-069 C	14.1655	80/20	14.1655
944111	AF1-079 C	6.5417	80/20	6.5417
944501	AF1-115 C O1	5.2970	Adder	6.23
944581	AF1-123 C O1	45.6622	80/20	45.6622
944591	AF1-124 C O1	45.6622	80/20	45.6622
944601	AF1-125 C O1	45.6622	80/20	45.6622
944871	AF1-152 C	4.2287	Adder	4.97
945711	AF1-236 C O1	62.7673	Adder	73.84
945811	AF1-246 C O1	7.7683	80/20	7.7683
946011	AF1-266	12.7984	80/20	12.7984
946261	AF1-291 C	1.5175	Adder	1.79
946281	AF1-292 C	1.2119	Adder	1.43

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
946301	AF1-294 C	3.1229	Adder	3.67
946371	AF1-301 C	26.5970	80/20	26.5970
957431	AF2-037 C	23.7512	80/20	23.7512
957481	AF2-042 C O1	55.2660	80/20	55.2660
957491	AF2-043 C	0.9061	Adder	2.01
957521	AF2-046 C	7.0794	Adder	15.71
957531	AF2-047 C	7.2206	Adder	16.03
957631	AF2-057	1.5185	Adder	3.37
957691	AF2-063 C	37.9008	80/20	37.9008
957711	AF2-065 C	5.1991	Adder	11.54
957791	**AF2-073 C (Withdrawn : 07/02/2020)**	**4.0675**	**Adder**	**9.03**
957801	**AF2-074 C (Withdrawn : 07/02/2020)**	**1.8078**	**Adder**	**4.01**
957821	AF2-076 C O1	2.2558	Adder	5.01
957871	AF2-081 C O1	4.2481	Adder	9.43
957911	AF2-085	4.4458	80/20	4.4458
958141	AF2-108	1.2735	Adder	2.83
958161	AF2-110 C	0.5844	Adder	1.3
958211	AF2-115 C	1.0092	Adder	2.24
958501	AF2-144 C	1.9324	80/20	1.9324
958801	AF2-171 C O1	6.0542	Adder	13.44
959311	AF2-222 C	6.6935	Adder	14.86
959511	AF2-242	3.2637	Adder	7.24
959531	AF2-244 C	1.7808	80/20	1.7808
959651	AF2-256 C	0.2012	Adder	0.45
959661	AF2-257 C	0.2011	Adder	0.45
959671	AF2-258 C	0.2092	Adder	0.46
959681	AF2-259 C	1.0915	Adder	2.42
959731	AF2-264 C	0.9469	Adder	2.1
959751	AF2-266 O1	8.7855	80/20	8.7855
960081	AF2-299 C	1.0826	Adder	2.4
960101	AF2-301 C	1.0341	Adder	2.3
960361	AF2-327 C	1.1752	Adder	2.61
960831	AF2-374 C	0.5324	Adder	1.18
961081	AF2-399 C	0.1305	Adder	0.29
961091	AF2-400 C	0.1966	Adder	0.44
961111	AF2-402 C O1	0.4654	Adder	1.03
WEC	WEC	0.6445	Confirmed LTF	0.6445
LGEE	LGEE	1.2779	Confirmed LTF	1.2779
CPLE	CPLE	7.7402	Confirmed LTF	7.7402
CBM-W2	CBM-W2	28.8616	Confirmed LTF	28.8616
NY	NY	2.4835	Confirmed LTF	2.4835
CBM-W1	CBM-W1	23.0684	Confirmed LTF	23.0684
TVA	TVA	6.3154	Confirmed LTF	6.3154
CBM-S2	CBM-S2	53.4361	Confirmed LTF	53.4361
CBM-S1	CBM-S1	34.8383	Confirmed LTF	34.8383
MADISON	MADISON	1.9212	Confirmed LTF	1.9212
MEC	MEC	4.1203	Confirmed LTF	4.1203
AA2-074	AA2-074	5.2740	LTF	5.2740

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
96837832	314934	8SPOTSYL	DVP	314916	8MORRSVL	DVP	1	DVP_P1-2: LN 575	single	3218.56	121.9	122.22	DC	37.41

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314295	6BIRDNECK	0.0427	80/20	0.0427
314333	6POWHATN	0.4427	80/20	0.4427
314435	6SAPONY	0.4013	80/20	0.4013
314491	3PENDLTN	0.3185	80/20	0.3185
314947	8GREENSVILLE	55.6059	80/20	55.6059
315083	**1SPRUNCA (Deactivation : 12/01/2021)**	**7.7150**	**Adder**	**9.08**
315084	**1SPRUNCB (Deactivation : 12/01/2021)**	**7.7150**	**Adder**	**9.08**
315102	1BRUNSWICKG1	9.1308	80/20	9.1308
315103	1BRUNSWICKG2	9.1308	80/20	9.1308
315104	1BRUNSWICKG3	9.1308	80/20	9.1308
315105	1BRUNSWICKS1	18.9693	80/20	18.9693
315108	1ELIZAR1	3.1110	80/20	3.1110
315109	1ELIZAR2	3.0570	80/20	3.0570
315110	1ELIZAR3	3.1509	80/20	3.1509
315153	1CLOVER1	13.0303	80/20	13.0303
315154	1CLOVER2	12.9004	80/20	12.9004
315172	1LOISA A	2.6507	80/20	2.6507
315173	1LOISA B	2.6644	80/20	2.6644
315174	1LOISA C	2.6644	80/20	2.6644
315175	1LOISA D	2.6644	80/20	2.6644
315176	1LOISA E	5.4320	80/20	5.4320
315177	1S ANNAG1	1.9036	80/20	1.9036
315178	1S ANNAS1	0.9782	80/20	0.9782
315179	1S ANNAG2	1.9036	80/20	1.9036
315180	1S ANNAS2	0.9782	80/20	0.9782
315225	1N ANNA1	94.3965	80/20	94.3965
315226	1N ANNA2	94.4363	80/20	94.4363
315294	1DOMTR10	8.3766	Adder	9.85
315611	6Z1-036WIND	5.3050	Adder	6.24
923262	**AB1-132 C OP (Suspended)**	**10.8849**	**Adder**	**12.81**
923572	AB1-173 C OP	1.7649	Adder	2.08
923582	AB1-173AC OP	1.7649	Adder	2.08
923801	AB2-015 C OP	6.7031	Adder	7.89
923831	AB2-022 C	1.8019	Adder	2.12
923911	AB2-031 C O1	1.7518	Adder	2.06
923991	AB2-040 C O1	5.7521	Adder	6.77
924501	**AB2-099 C (Suspended)**	**0.4534**	**Adder**	**0.53**
925021	AB2-158 C	3.6518	80/20	3.6518

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
925051	AB2-160 C O1 (Suspended)	3.8923	Adder	4.58
925061	AB2-161 C O1 (Suspended)	2.5837	Adder	3.04
925331	AB2-190 C	14.0201	Adder	16.49
925611	AC1-036 C	0.7054	Adder	0.83
926001	AC1-076 C (Suspended)	6.6859	80/20	6.6859
926071	AC1-086 C	16.0294	Adder	18.86
926201	AC1-098 C	4.6850	Adder	5.51
926211	AC1-099 C	1.5700	Adder	1.85
926481	AC1-120 C O1	7.0706	80/20	7.0706
926501	AC1-121 C O1	2.4283	80/20	2.4283
926661	AC1-147 C	1.7625	Adder	2.07
926731	AC1-158 C	41.1073	80/20	41.1073
926751	AC1-161 C O1	28.0860	80/20	28.0860
927141	AC1-208 C	6.8648	Adder	8.08
932041	AC2-012 C	7.9734	Adder	9.38
932511	AC2-071 C	1.6441	Adder	1.93
932581	AC2-078 C O1	3.0556	Adder	3.59
932591	AC2-079 C O1	4.4208	Adder	5.2
932631	AC2-084 C	6.6786	Adder	7.86
933291	AC2-141 C	28.0860	80/20	28.0860
933501	AC2-165 C	10.1420	80/20	10.1420
933731	AC2-196 C	1.6522	80/20	1.6522
933991	AD1-023 C	10.1782	Adder	11.97
934011	AD1-025 C	11.8375	Adder	13.93
934061	AD1-033 C	6.9376	80/20	6.9376
934521	AD1-076 C	42.1568	Adder	49.6
934571	AD1-082 C	5.8881	Adder	6.93
934611	AD1-087 C O1	6.5298	Adder	7.68
934621	AD1-088 C	9.5283	Adder	11.21
935111	AD1-144 C	1.3232	Adder	1.56
935161	AD1-151 C O1	11.2662	Adder	13.25
935171	AD1-152 C O1	6.4892	Adder	7.63
935221	AD1-157 C	1.1268	Adder	1.33
936041	AD2-007 C	0.5655	Adder	0.67
936051	AD2-008 C	2.0609	Adder	2.42
936261	AD2-033 C	0.4699	Adder	0.55
936401	AD2-051 C O1	6.7955	Adder	7.99
936661	AD2-085 C	2.6517	Adder	3.12
937221	AD2-160 C O1	5.3999	80/20	5.3999
937251	AD2-164 (Withdrawn : 06/30/2020)	3.3373	Adder	3.93
937481	AD2-202 C O1	1.7305	Adder	2.04
937541	AD2-215 C	1.3369	Adder	1.57
938171	AE1-026 C O1	24.8240	Adder	29.2
938221	AE1-035 C	1.7378	Adder	2.04
938371	AE1-056 C	4.8580	Adder	5.72
938491	AE1-068 C O1	64.2976	80/20	64.2976
938501	AE1-069 C O1	50.3325	80/20	50.3325
938531	AE1-072 C O1	13.7566	Adder	16.18
938551	AE1-074 C	2.3903	80/20	2.3903
938561	AE1-075 C	2.2502	80/20	2.2502

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
938631	AE1-085 C O1	6.7150	Adder	7.9
938771	AE1-103 C O1	2.8264	Adder	3.33
939191	AE1-149 C O1	8.0198	Adder	9.44
939231	AE1-154 C	3.4706	80/20	3.4706
939311	AE1-162 C	1.6054	Adder	1.89
939411	AE1-173 C	92.7984	80/20	92.7984
940061	AE2-000BC O1	12.2385	Adder	14.4
940241	AE2-006	0.3589	Adder	0.42
940251	AE2-007 O1	159.4798	80/20	159.4798
940471	AE2-031 C	35.1132	80/20	35.1132
940481	AE2-033 C	14.9057	80/20	14.9057
940491	AE2-034 C	5.5924	Adder	6.58
940541	AE2-040 O1	2.0102	Adder	2.36
940641	AE2-051 C O1	18.2385	80/20	18.2385
940651	AE2-052	2.6733	Adder	3.15
940891	AE2-078 C	1.7031	Adder	2.0
940901	AE2-079 C	1.7031	Adder	2.0
941031	AE2-094 C	42.0802	80/20	42.0802
941101	AE2-104 C O1	2.6116	Adder	3.07
941281	AE2-122 C O1	26.2058	80/20	26.2058
941291	AE2-123 C O1	26.9314	80/20	26.9314
941301	AE2-124 C O1	24.4966	80/20	24.4966
941381	**AE2-134 (Suspended)**	**4.6071**	**80/20**	**4.6071**
941501	AE2-147 C	12.3823	Adder	14.57
941541	AE2-151 C	0.8396	Adder	0.99
941591	AE2-156 O1	16.4680	80/20	16.4680
941791	AE2-182 C	1.5480	Adder	1.82
942001	AE2-212 C	1.5470	Adder	1.82
942131	AE2-225 C	1.6690	Adder	1.96
942161	AE2-228 C	1.4898	Adder	1.75
942171	AE2-229 C	1.6690	Adder	1.96
942341	AE2-247 C	1.1492	Adder	1.35
942371	AE2-250 C O1	6.9139	Adder	8.13
942401	AE2-253 C	5.6797	80/20	5.6797
942461	AE2-259 C O1	7.5740	Adder	8.91
942471	AE2-260 C O1	11.3175	Adder	13.31
942551	AE2-270	18.8560	Adder	22.18
942851	AE2-304 C	0.4925	Adder	0.58
942931	AE2-313 C	38.0191	80/20	38.0191
943171	AE2-346 C	1.0883	Adder	1.28
943461	AF1-017 C	1.0397	Adder	1.22
943611	AF1-032 C	1.3630	Adder	1.6
943621	AF1-033 C	1.7031	Adder	2.0
943911	AF1-059	12.7118	Adder	14.96
944011	AF1-069 C	13.7492	80/20	13.7492
944111	AF1-079 C	6.5941	80/20	6.5941
944501	AF1-115 C O1	5.1867	Adder	6.1
944581	AF1-123 C O1	44.5735	80/20	44.5735
944591	AF1-124 C O1	44.5735	80/20	44.5735
944601	AF1-125 C O1	44.5735	80/20	44.5735
944871	AF1-152 C	4.1274	Adder	4.86
945711	AF1-236 C O1	61.2235	Adder	72.03

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
945811	AF1-246 C O1	7.5562	80/20	7.5562
946011	AF1-266	12.4773	80/20	12.4773
946261	AF1-291 C	1.4890	Adder	1.75
946281	AF1-292 C	1.1819	Adder	1.39
946301	AF1-294 C	3.0711	Adder	3.61
946371	AF1-301 C	26.7611	80/20	26.7611
957431	AF2-037 C	23.4449	80/20	23.4449
957481	AF2-042 C O1	53.7630	80/20	53.7630
957491	AF2-043 C	0.8846	Adder	1.96
957521	AF2-046 C	6.9040	Adder	15.33
957531	AF2-047 C	7.0430	Adder	15.63
957631	AF2-057	1.4828	Adder	3.29
957691	AF2-063 C	37.4121	80/20	37.4121
957711	AF2-065 C	5.0968	Adder	11.31
957791	**AF2-073 C (Withdrawn : 07/02/2020)**	**3.9696**	**Adder**	**8.81**
957801	**AF2-074 C (Withdrawn : 07/02/2020)**	**1.7642**	**Adder**	**3.92**
957821	AF2-076 C O1	2.2020	Adder	4.89
957871	AF2-081 C O1	4.1472	Adder	9.21
957911	AF2-085	4.3264	80/20	4.3264
958141	AF2-108	1.2458	Adder	2.77
958161	AF2-110 C	0.5706	Adder	1.27
958211	AF2-115 C	0.9925	Adder	2.2
958501	AF2-144 C	1.8969	80/20	1.8969
958801	AF2-171 C O1	5.9532	Adder	13.21
959311	AF2-222 C	6.5674	Adder	14.58
959511	AF2-242	3.1800	Adder	7.06
959531	AF2-244 C	1.7481	80/20	1.7481
959651	AF2-256 C	0.1974	Adder	0.44
959661	AF2-257 C	0.1973	Adder	0.44
959671	AF2-258 C	0.2050	Adder	0.46
959681	AF2-259 C	1.0678	Adder	2.37
959731	AF2-264 C	0.9233	Adder	2.05
959751	AF2-266 O1	8.5550	80/20	8.5550
960081	AF2-299 C	1.0557	Adder	2.34
960101	AF2-301 C	1.0129	Adder	2.25
960361	AF2-327 C	1.1487	Adder	2.55
960831	AF2-374 C	0.5191	Adder	1.15
961081	AF2-399 C	0.1283	Adder	0.28
961091	AF2-400 C	0.1918	Adder	0.43
961111	AF2-402 C O1	0.4547	Adder	1.01
WEC	WEC	0.5856	Confirmed LTF	0.5856
LGEE	LGEE	1.1724	Confirmed LTF	1.1724
CPLE	CPLE	7.5107	Confirmed LTF	7.5107
CBM-W2	CBM-W2	27.1908	Confirmed LTF	27.1908
NY	NY	2.5676	Confirmed LTF	2.5676
CBM-W1	CBM-W1	20.7541	Confirmed LTF	20.7541
TVA	TVA	6.0144	Confirmed LTF	6.0144
CBM-S2	CBM-S2	51.7194	Confirmed LTF	51.7194
CBM-S1	CBM-S1	33.0576	Confirmed LTF	33.0576
MADISON	MADISON	1.8930	Confirmed LTF	1.8930
MEC	MEC	3.8152	Confirmed LTF	3.8152

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
AA2-074	AA2-074	5.1170	LTF	5.1170

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
98539904	941850	AE2-190 TAP	DVP	314037	6GAINSVL	DVP	1	DVP_P7-1: LN 2039-2040	tower	1204.0	106.74	107.32	DC	15.37

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
314078	3REMNGTN	0.7201	50/50	0.7201
315021	1REMNGT1	15.8399	50/50	15.8399
315022	1REMNGT2	15.8608	50/50	15.8608
315023	1REMNGT3	15.9235	50/50	15.9235
315024	1REMNGT4	15.8608	50/50	15.8608
315028	1M RUN A	16.8344	50/50	16.8344
315029	1M RUN B	16.6992	50/50	16.6992
315030	1M RUN C	16.8344	50/50	16.8344
923892	AB2-029 E	6.7016	50/50	6.7016
925022	AB2-158 E	3.2433	Adder	3.82
925671	**AC1-043 C (Suspended)**	**12.5826**	**50/50**	**12.5826**
925672	**AC1-043 E (Suspended)**	**20.5294**	**50/50**	**20.5294**
926001	**AC1-076 C (Suspended)**	**3.2562**	**Adder**	**3.83**
926002	**AC1-076 E (Suspended)**	**5.2948**	**Adder**	**6.23**
926481	AC1-120 C O1	11.1193	50/50	11.1193
926482	AC1-120 E O1	5.7281	50/50	5.7281
926501	AC1-121 C O1	3.8187	50/50	3.8187
926502	AC1-121 E O1	1.7971	50/50	1.7971
926611	AC1-143 C O1	20.7702	50/50	20.7702
926612	AC1-143 E O1	9.4776	50/50	9.4776
934861	AD1-115 C	6.2913	50/50	6.2913
934862	AD1-115 E	10.2647	50/50	10.2647
939221	AE1-153 C O1	33.4311	50/50	33.4311
939222	AE1-153 E O1	22.2874	50/50	22.2874
939231	AE1-154 C	1.1924	Adder	1.4
939232	AE1-154 E	0.8347	Adder	0.98
941361	AE2-132	1.8506	50/50	1.8506
941381	**AE2-134 (Suspended)**	**2.2438**	**Adder**	**2.64**
941851	AE2-190 C	17.7754	50/50	17.7754
941852	AE2-190 E	28.2748	50/50	28.2748
944111	AF1-079 C	2.2655	Adder	2.67
944112	AF1-079 E	3.0763	Adder	3.62
946371	AF1-301 C	8.8819	Adder	10.45
946372	AF1-301 E	5.9602	Adder	7.01
957431	AF2-037 C	2.6038	Adder	5.78
957432	AF2-037 E	1.7359	Adder	3.85
957461	AF2-040	49.3395	50/50	49.3395
957691	AF2-063 C	4.1551	Adder	9.22
957692	AF2-063 E	2.7700	Adder	6.15
961101	AF2-401 C	1.3569	50/50	1.3569
961102	AF2-401 E	2.2486	50/50	2.2486

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
WEC	WEC	0.0794	Confirmed LTF	0.0794
LGEE	LGEE	0.1711	Confirmed LTF	0.1711
CPLE	CPLE	0.7184	Confirmed LTF	0.7184
CBM-W2	CBM-W2	3.4808	Confirmed LTF	3.4808
NY	NY	0.7427	Confirmed LTF	0.7427
CBM-W1	CBM-W1	2.6771	Confirmed LTF	2.6771
TVA	TVA	0.7686	Confirmed LTF	0.7686
O-066	O-066	10.1338	Confirmed LTF	10.1338
CBM-S2	CBM-S2	5.4274	Confirmed LTF	5.4274
CBM-S1	CBM-S1	4.2856	Confirmed LTF	4.2856
G-007	G-007	1.5798	Confirmed LTF	1.5798
MADISON	MADISON	0.1956	Confirmed LTF	0.1956
MEC	MEC	0.5037	Confirmed LTF	0.5037

11.6.7 Index 7

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
97903090	957430	AF2-037 TAP	DVP	314232	6NO ANNA	DVP	1	DVP_P1-2: LN 2088	single	749.18	120.35	132.32	DC	89.65

Bus #	Bus	Gendeliv MW Impact	Type	Full MW Impact
315172	1LOISA A	13.2469	80/20	13.2469
315173	1LOISA B	13.3156	80/20	13.3156
315174	1LOISA C	13.3156	80/20	13.3156
315175	1LOISA D	13.3156	80/20	13.3156
315176	1LOISA E	27.1466	80/20	27.1466
315177	1S ANNAG1	8.9729	80/20	8.9729
315178	1S ANNAS1	4.6111	80/20	4.6111
315179	1S ANNAG2	8.9729	80/20	8.9729
315180	1S ANNAS2	4.6111	80/20	4.6111
925021	AB2-158 C	10.4806	80/20	10.4806
939231	AE1-154 C	9.9606	80/20	9.9606
944111	AF1-079 C	18.9251	80/20	18.9251
946371	AF1-301 C	75.7006	80/20	75.7006
957431	AF2-037 C	56.1778	80/20	56.1778
957691	AF2-063 C	89.6454	80/20	89.6454
NEWTON	NEWTON	0.4234	Confirmed LTF	0.4234
FARMERCITY	FARMERCITY	0.0221	Confirmed LTF	0.0221
CALDERWOOD	CALDERWOOD	0.1958	Confirmed LTF	0.1958
NY	NY	0.2201	Confirmed LTF	0.2201
PRAIRIE	PRAIRIE	1.0177	Confirmed LTF	1.0177
CHEOAH	CHEOAH	0.1972	Confirmed LTF	0.1972
EDWARDS	EDWARDS	0.1379	Confirmed LTF	0.1379
TILTON	TILTON	0.2482	Confirmed LTF	0.2482
GIBSON	GIBSON	0.2151	Confirmed LTF	0.2151
BLUEG	BLUEG	0.6840	Confirmed LTF	0.6840
TRIMBLE	TRIMBLE	0.2193	Confirmed LTF	0.2193
CATAWBA	CATAWBA	0.1379	Confirmed LTF	0.1379

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
AA2-074	CPLE-PJM	Confirmed
AB1-132	Thelma 230kV	Suspended
AB1-173	Brink-Trego 115kV	Engineering and Procurement
AB1-173A	Brink-Trego 115kV	Engineering and Procurement
AB2-015	Franklin 115kV	Engineering and Procurement
AB2-022	Elizabeth City 34.5kV	Engineering and Procurement
AB2-029	Remington 34.5kV	In Service
AB2-031	Brink-Trego 115kV	Engineering and Procurement
AB2-040	Brink 115kV	Engineering and Procurement
AB2-077	Buggs Island-Chase City 115kV	Suspended
AB2-078	Buggs Island-Chase City 115kV	Suspended
AB2-079	Buggs Island-Chase City 115kV	Suspended
AB2-099	Ahoskie 34.5kV	Suspended
AB2-100	Clubhouse-Lakeview 230kV	Under Construction
AB2-158	Louisa-South Anna 230kV	Under Construction
AB2-160	Reams 115kV	Suspended
AB2-161	Waverly #2 DP 115kV	Suspended
AB2-190	Hopewell-Surry 230kV	Engineering and Procurement
AC1-036	Twittys Creek 34.5kV	Engineering and Procurement
AC1-043	Mountain Run-Mitchell 115 kV	Suspended
AC1-054	Kerr Dam–Eatons Ferry 115 kV	Engineering and Procurement
AC1-076	Locust Grove-Paytes 115kV	Suspended
AC1-086	Thelma 230kV	Active
AC1-098	Dawson-South Justice 115kV	Engineering and Procurement
AC1-099	Dawson-South Justice 115kV	Engineering and Procurement
AC1-105	Halifax-Mt. Laurel 115kV	Suspended
AC1-120	Mitchell-Mountain Run 115kV	Engineering and Procurement
AC1-121	Mitchell-Mountain Run 115kV	Engineering and Procurement
AC1-143	Brandy-Remington 115kV	Active
AC1-147	Grassfield 34.5kV	Engineering and Procurement
AC1-158	Spotsylvania 500kV	Under Construction
AC1-161	Septa 500kV	Active
AC1-208	Cox-Whitakers 115kV	Active
AC2-012	Grassfield-Great Bridge 115kV	Active
AC2-071	Buckingham 35kV	Engineering and Procurement
AC2-078	Disputanta-Waverly 115kV	Active
AC2-079	Ivor-Oakridge 115kV	Active
AC2-084	Dawson-South Justice 115kV	Active
AC2-141	Septa 500kV	Active

Queue Number	Project Name	Status
AC2-165	Bremo-Powhatan 230kV	Active
AC2-196	Fentress 34.5kV	Engineering and Procurement
AD1-023	Cashie-Trowbridge 230 kV	Active
AD1-025	Hopewell-Surry 230 kV	Active
AD1-033	Fentress-Landstown 230 kV	Active
AD1-057	Hornertown-Hathaway 230 kV	Active
AD1-076	Trowbridge 230 kV	Active
AD1-082	Bakers Pond-Ivor 115kV	Active
AD1-087	Clover-Sedge Hill 230 kV	Active
AD1-088	Briery-Clover 230 kV	Active
AD1-115	Mountain Run-Mitchell 115 kV	Active
AD1-144	Kings Fork 34.5 kV	Engineering and Procurement
AD1-151	Hopewell-Surry 230 kV	Active
AD1-152	Clover-Sedge Hill 230 kV	Active
AD1-157	South Creek 34.5 kV	Engineering and Procurement
AD2-007	Hopewell-Surry 230 kV	Active
AD2-008	Hopewell-Surry 230 kV	Active
AD2-033	Chase City-Lunenburg 115 kV	Active
AD2-046	Boydton DP-Kerr Dam 115 kV	Active
AD2-051	Earleys – Northampton 230kV	Active
AD2-063	Central-Chase City 115kV	Active
AD2-085	Myrtle-Windsor DP 115kV	Active
AD2-160	Hickory-Moyock 230kV	Active
AD2-164	Peninsula 34.5kV	Withdrawn
AD2-202	Clover-Sedge Hill 230kV	Active
AD2-215	Kings Fork 34.5 kV	Engineering and Procurement
AE1-026	Cashie 230 kV	Active
AE1-035	Earleys 230 kV	Engineering and Procurement
AE1-056	Red House-South Creek 115 kV	Active
AE1-068	Carson-Rogers Rd 500 kV	Active
AE1-069	Carson-Rogers Road 500 kV	Active
AE1-072	Shawboro-Sligo 230 kV	Active
AE1-074	Winterpock 34.5 kV	Engineering and Procurement
AE1-075	Powhatan 34.5 kV	Engineering and Procurement
AE1-085	Bakers Pond-Bell Ave 115 kV	Active
AE1-103	Holland-Union Camp 115 kV	Active
AE1-148	Kerr Dam-Ridge Rd 115 kV	Active
AE1-149	Disputanta-Poe 115 kV	Active
AE1-153	Remington-Gordonsville 230 kV	Active
AE1-154	Louisa-South Anna 230 kV	Engineering and Procurement
AE1-162	Smithfield 34.5 kV	Engineering and Procurement
AE1-173	Carson-Suffolk 500 kV	Active
AE2-000B	N/A	N/A
AE2-006	Twittys Creek 34.5 kV	Engineering and Procurement
AE2-007	Chesapeake 230 kV	Active
AE2-031	Carson-Rawlings 500 kV	Active
AE2-033	Clubhouse-Sappony 230 kV	Active
AE2-034	Mackeys 230 kV	Active
AE2-040	Sapony 34.5 kV	Active
AE2-051	Carson-Septa 500 kV	Active
AE2-052	Disputanta-Poe 115 kV	Active
AE2-053	Kerr Dam-Ridge Road 115 kV	Active

Queue Number	Project Name	Status
AE2-078	Poolesville 34.5 kV	Engineering and Procurement
AE2-079	Poolesville 34.5 kV	Engineering and Procurement
AE2-094	Carson-Rogers Road 500 kV	Active
AE2-104	Suffolk 115 kV	Active
AE2-122	Birdneck-Landstown 230 kV	Active
AE2-123	Birdneck-Landstown 230 kV	Active
AE2-124	Landstown 230 kV	Active
AE2-132	Remington CT 230 kV	In Service
AE2-134	Locust Grove-Paytes 115 kV	Suspended
AE2-147	Swamp 230 kV	Active
AE2-151	Earleys 34.5kV	Engineering and Procurement
AE2-156	Yadkin 115 kV	Active
AE2-182	Briery-Clover 230 kV	Active
AE2-190	Elk Run D.P.-Gainesville 230 kV	Active
AE2-212	Harrowgate 34 kV	Active
AE2-225	Suffolk 34 kV	Engineering and Procurement
AE2-228	Tyler 34 kv	Active
AE2-229	Suffolk 34 kV	Engineering and Procurement
AE2-247	Myrtle-Windsor 115 kV	Active
AE2-250	Purdy Sw.-Reams 115 kV	Active
AE2-253	Hickory-Moyock 230 kV	Active
AE2-258	Chase City 115 kV	Active
AE2-259	Curdsville-Willis Mtn 115 kV	Active
AE2-260	Clubhouse 230 kV	Active
AE2-270	Hopewell-Surry 230 kV	Active
AE2-304	South Hertford 34 kV	Engineering and Procurement
AE2-313	Carson-Rawlings 500 kV	Active
AE2-346	Ahoskie 34.5 kV	Active
AF1-017	Myrtle-Windsor 115 kV	Active
AF1-032	Suffolk 34.5 kV	Engineering and Procurement
AF1-033	Poolesville 34 kV	Engineering and Procurement
AF1-058	Welco 34.5 kV	Engineering and Procurement
AF1-059	Brodnax-South Hill 115 kV	Active
AF1-069	Carson-Rogers Rd 500 kV	Active
AF1-079	Louisa-South Anna 230 kV	Active
AF1-115	Poolesville 230 kV	Active
AF1-123	Fentress 500 kV	Active
AF1-124	Fentress 500 kV	Active
AF1-125	Fentress 500 kV	Active
AF1-152	Swamp 230 kV	Active
AF1-236	Mackeys 230 kV	Active
AF1-246	Clover-Rawlings 500 kV	Active
AF1-266	Clubhouse-Sapony 230 kV	Active
AF1-291	Tyler 34.5 kV	Engineering and Procurement
AF1-292	Fields Crossroads 34.5 kV	Active
AF1-294	Jetersville-Ponton 115 kV	Active
AF1-301	Louisa-South Anna 230 kV	Active
AF2-037	Louisa-North Anna 230 kV	Active
AF2-040	Elk Run-Gainesville 230 kV	Active
AF2-042	Clover 500 kV	Active
AF2-043	Suffolk 34.5 kV	Active
AF2-046	Tunis-Mapleton 115 kV	Active

Queue Number	Project Name	Status
AF2-047	Creswell-Riders Creek 115 kV	Active
AF2-057	Grassfield 34.5 kV	Active
AF2-063	Louisa-North Anna 230 kV	Active
AF2-065	Surry-Hopewell 230 kV	Active
AF2-073	Nucor Steel-Suffolk 230 kV	Withdrawn
AF2-074	Nucor Steel-Suffolk 230 kV	Withdrawn
AF2-076	Suffolk-Nucor Steel 230 kV	Active
AF2-081	Moyock 230 kV	Active
AF2-085	Midlothian 34.5 kV	Active
AF2-108	Locks 34.5 kV	Active
AF2-110	Suffolk 115 kV	Active
AF2-115	Jetersville-Ponton 115 kV	Active
AF2-144	Powhatan 34.5 kV	Active
AF2-171	Madisonville 115 kV	Active
AF2-222	Pamplin-Chase City 115 kV	Active
AF2-242	Wharton 115 kV	Active
AF2-244	Powhatan 34.5 kV	Active
AF2-256	Tyler 34.5 kV	Active
AF2-257	Tyler 34.5 kV	Active
AF2-258	Harrowgate 34.5 kV	Active
AF2-259	Locks 34.5 kV	Active
AF2-264	Tunis 34.5 kV	Active
AF2-266	Clover 230 kV	Active
AF2-297	Sedge Hill 115 kV	Active
AF2-299	Fields 34.5 kV	Active
AF2-301	Poolesville-Winchester 230 kV	Active
AF2-327	Wakefield 13 kV	Active
AF2-372	Black Branch 34.5 kV	Active
AF2-373	Mount Laurel 115 kV	Active
AF2-374	Woodland 34.5 kV	Active
AF2-399	Crewe 12.5 kV	Active
AF2-400	Franklin 13.2 kV	Active
AF2-401	Culpeper 34.5 kV	Active
AF2-402	Ivor-Oak Ridge 115 kV	Active
Z1-036	WinFall-Chowan 230kV	Suspended

11.8 Contingency Descriptions

Contingency Name	Contingency Definition
DVP_P1-2: LN 594	CONTINGENCY 'DVP_P1-2: LN 594' OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00 END
DVP_P1-2: LN 573	CONTINGENCY 'DVP_P1-2: LN 573' OPEN BRANCH FROM BUS 314918 TO BUS 314934 CKT 1 /* 8NO ANNA 500.00 - 8SPOTSYL 500.00 END

Contingency Name	Contingency Definition
DVP_P1-2: LN 575	CONTINGENCY 'DVP_P1-2: LN 575' OPEN BRANCH FROM BUS 314911 TO BUS 314918 CKT 1 /* 8LADYSMITH 500.00 - 8NO ANNA 500.00 END
DVP_P7-1: LN 2039-2040	CONTINGENCY 'DVP_P7-1: LN 2039-2040' /* . OPEN BRANCH FROM BUS 314063 TO BUS 314099 CKT 1 /* 6MORRSVL 230.00 - 6GI1MRUN 230.00 OPEN BRANCH FROM BUS 314063 TO BUS 314099 CKT 2 /* 6MORRSVL 230.00 - 6GI1MRUN 230.00 END
314232 6NO ANNA 230 314766 6LOUISA 230 1	CONTINGENCY '314232 6NO ANNA 230 314766 6LOUISA 230 1' OPEN BRANCH FROM BUS 314232 TO BUS 957430 CKT 1 END
DVP_P4-2: H1T594	CONTINGENCY 'DVP_P4-2: H1T594' /* MORRISVILLE 500 KV OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00 OPEN BRANCH FROM BUS 314063 TO BUS 314916 CKT 1 /* 6MORRSVL 230.00 - 8MORRSVL 500.00 OPEN BUS 314897 /* 8MORRS_1 500.00 KV END
DVP_P1-2: LN 2088	CONTINGENCY 'DVP_P1-2: LN 2088' OPEN BRANCH FROM BUS 314745 TO BUS 314758 CKT 1 /* 6LOISACT 230.00 - 6GORDNVL 230.00 END
DVP_P4-2: 568T575	CONTINGENCY 'DVP_P4-2: 568T575' /* LADYSMITH 500 KV OPEN BRANCH FROM BUS 314911 TO BUS 314922 CKT 1 /* 8LADYSMITH 500.00 - 8POSSUM 500.00 OPEN BRANCH FROM BUS 314911 TO BUS 314918 CKT 1 /* 8LADYSMITH 500.00 - 8NO ANNA 500.00 END
DVP_P4-2: SPOTS H1T594	CONTINGENCY 'DVP_P4-2: SPOTS H1T594' /* SPOTSYLVANIA 500 KV OPEN BRANCH FROM BUS 314916 TO BUS 314934 CKT 1 /* 8MORRSVL 500.00 - 8SPOTSYL 500.00 OPEN BRANCH FROM BUS 314755 TO BUS 314934 CKT 1 /* 3SPOTSYL 115.00 - 8SPOTSYL 500.00 END

Contingency Name	Contingency Definition
DVP_P4-2: H1T575	CONTINGENCY 'DVP_P4-2: H1T575' /* LADYSMITH 500 KV OPEN BRANCH FROM BUS 314911 TO BUS 314918 CKT 1 /* 8LADYSMITH 500.00 - 8NO ANNA 500.00 OPEN BRANCH FROM BUS 314196 TO BUS 314911 CKT 1 /* 6LADYSMITH 230.00 - 8LADYSMITH 500.00 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).

Attachment 1: One Line Diagram